

Form 3160-3
(June 2015)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 20185. Lease Serial No.
NMSF078764

6. If Indian, Allottee or Tribe Name

7. If Unit or CA Agreement, Name and No.
NMNM078407E/ROSA UNIT8. Lease Name and Well No.
ROSA UNIT

710H

9. API Well No.
30-039-3147710. Field and Pool, or Exploratory
BASIN MANCOS/BASIN MANCOS11. Sec., T. R. M. or Blk. and Survey or Area
SEC 17/T31N/R5W/NMP1a. Type of work: ☒ DRILL ☐ REENTER
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone2. Name of Operator
LOGOS OPERATING LLC3a. Address
2010 AFTON PLACE, FARMINGTON, NM 874013b. Phone No. (include area code)
(505) 278-87204. Location of Well (Report location clearly and in accordance with any State requirements. *)
At surface SWNW / 2137 FNL / 539 FWL / LAT 36.900914 / LONG -107.392877
At proposed prod. zone NWNE / 227 FNL / 1601 FEL / LAT 36.906248 / LONG -107.42861914. Distance in miles and direction from nearest town or post office*
38 miles12. County or Parish
RIO ARRIBA13. State
NM15. Distance from proposed*
location to nearest
property or lease line, ft.
(Also to nearest drig. unit line, if any)
227 feet

16. No of acres in lease

17. Spacing Unit dedicated to this well
823.4318. Distance from proposed location*
to nearest well, drilling, completed,
applied for, on this lease, ft. 15 feet19. Proposed Depth
6925 feet / 17225 feet20. BLM/BIA Bond No. in file
FED:21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6300 feet22. Approximate date work will start*
05/01/202323. 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) 324-4145Date
03/03/2023Title
Regulatory SpecialistApproved by (Signature)
(Electronic Submission)Name (Printed/Typed)
DAVE J MANKIEWICZ / Ph: (505) 564-7761Date
08/06/2024Title
AFM-MineralsOffice
Farmington Field OfficeApplication 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.

(Continued on page 2)

*(Instructions on page 2)



INSTRUCTIONS

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

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

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

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, 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 directionally 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 well 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 will 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 connects this information to a new 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 Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

0. SHL: SWNW / 2137 FNL / 539 FWL / TWSP: 31N / RANGE: 5W / SECTION: 17 / LAT: 36.900914 / LONG: -107.392877 (TVD: 0 feet, MD: 0 feet)

PPP: LOT 1 / 0 FNL / 0 FEL / TWSP: 31N / RANGE: 6W / SECTION: 13 / LAT: 0.0 / LONG: 0.0 (TVD: 0 feet, MD: 0 feet)

PPP: NENE / 0 FNL / 0 FEL / TWSP: 31N / RANGE: 6W / SECTION: 14 / LAT: 0.0 / LONG: 0.0 (TVD: 0 feet, MD: 0 feet)

PPP: NENE / 238 FNL / 253 FEL / TWSP: 31N / RANGE: 5W / SECTION: 18 / LAT: 36.906131 / LONG: -107.395592 (TVD: 6950 feet, MD: 7568 feet)

BHL: NWNE / 227 FNL / 1601 FEL / TWSP: 31N / RANGE: 6W / SECTION: 14 / LAT: 36.906248 / LONG: -107.428619 (TVD: 6925 feet, MD: 17225 feet)

BLM Point of Contact

Name: JEFFREY J TAFOYA

Title: Assistant Field Manager

Phone: (505) 564-7672

Email: JTAFOYA@BLM.GOV

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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.

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Conditions of Approval

Operator: LOGOS Operating, LLC
Well Names: Rosa Unit Pad 26 (Rosa Unit 710H, 712H, 714H, 716H, 720H, 724H, 726H, and 4 futures)
Legal Location: Sec 17, T31N, R05W, Rio Arriba County, NM
NEPA Log Number: DOI-BLM-NM-F010-2023-0039-EA
Inspection Date: November 2, 2022
Lease Number: NMSF078769E

The following conditions of approval will apply to LOGOS Operating LLC's Rosa Unit Pad 26 Project, and other associated facilities, unless a particular Surface Managing Agency or private surface owner has supplied to Bureau of Land Management and the operator a contradictory environmental stipulation. The failure of the operator to comply with these requirements may result in an assessment or civil penalties pursuant to 43 CFR 3163.1 or 3163.2.

Disclaimers: BLM's approval of the APD does not relieve the lessee and operator from obtaining any other authorizations that may be required by the BIA, BOR, Tribes, State, or other jurisdictional entities.

Copy of Plans: A complete copy of the APD package, including Surface Use Plan of Operations, Bare Soil Reclamation Plan, Plan of Development (if required), and Conditions of Approval be at the project area at all times and available to all persons.

Review of NEPA documents: It is the responsibility of the operator to follow all the design features, best management practices, and mitigation measures as contained in the Environmental Assessment DOI-BLM-NM-F010-2023-0039-EA, which contains additional design features and best management practices that must be followed. Copies of the EA, Decision Record, and Finding of No Significant Impact may be obtained from the BLM FFO public room, or online at: [EplanningUi \(blm.gov\)](https://www.blm.gov/eplanningui).

Best Management Practices (BMPs): Farmington Field Office established environmental Best Management Practices (BMP's) will be followed during construction and reclamation of well site pads, access roads, pipeline ties, facility placement or any other surface disturbing activity associated with this project. Bureau wide standard BMP's are found in the Gold Book, Fourth Edition-Revised 2007 and at <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/the-gold-book>. Farmington Field Office BMPs are integrated into the Environmental Assessment, Surface Use Plan of Operations, Bare Soil Reclamation Plan, and COAs.

Construction, Production, Facilities, Reclamation & Maintenance

Construction & Reclamation Notification: The operator or their contractor will contact the Farmington Field Office Surface and Environmental Protection Staff by phone at (505) 564-7600 or by email at least 48 hours prior to any construction or reclamation on this project.

Production Facilities: design and layout of facilities will be deferred until an onsite with BLM-FFO surface protection staff is conducted to determine the best location. LOGOS or their contractor will contact the Farmington Field Office Surface and Environmental Protection Staff by phone at (505) 564-7600 or by email to schedule a facility layout onsite.

Berms: Berms or firewalls will be constructed around all storage facilities sufficient in size to contain the storage capacity of 110% of the largest tank, or 110% of the combined capacity of tanks if a rupture could drain more than one tank. Berm walls will be compacted with appropriate equipment to assure proper construction. Metal containment barriers, used for secondary containment, will be properly installed, per the manufacturer directions.

Painting of Equipment: Within 90 days of installation, all above ground structures not subject to safety requirements shall be painted by the Holder to blend with the natural color of the landscape. A reflective material may be used to reduce hazards that may occur when such structures are near roads. Otherwise, the paint use shall be a non-glare, non-reflective, non-chalking color of: **Juniper Green.**

Staking: The holder shall place slope stakes, culvert location and grade stakes, and other construction control stakes as deemed necessary by the authorized officer to ensure construction in accordance with the application. If stakes are disturbed, they shall be replaced before proceeding with construction.

Weather: No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts more than 6 inches deep, the soil shall be deemed too wet.

Stockpile of Soil: The top 6 inches of soil material will be stripped and stockpiled in the construction zones around the pad [construction zones may be restricted or deleted to provide resource avoidance]. The stockpiled soil will be free of brush and tree limbs, trunks, and roots. The stockpiled soil material will be spread on the reclaimed portions of the pad [including the reserve pit, cut and fill slopes] prior to re-seeding. Spreading shall not be done when the ground or topsoil is frozen or wet.

Storage Tanks: All open top permanent production or storage tanks regardless of diameter made of fiberglass, steel, or other material used for the containment of oil, condensate, produced or recycled water and or other production waste shall be screened, netted, or otherwise covered to protect migratory birds and other wildlife from access.

Compressors: Compressor units on this well location not equipped with a drip pan for containment of fluids shall be lined with an impervious material at least 8 mils thick and a 12-inch berm. The compressor will be painted to match the well facilities. Any variance to this will be approved by the Authorized Officer (AO). Noise mitigation may be required at the time of compressor installation.

Culverts: Silt Traps/Bell Holes will be built upstream of all culvert locations.

Driving Surface Area: All activities associated within the construction, operation, maintenance, and abandonment of the well location is limited to areas approved in the APD or ROW permit. During the production of the well, vehicular traffic is limited to the daily driving surface area established during interim reclamation construction operations. This area typically forms a keyhole or teardrop driving surface from which all production facilities may be serviced or inspected. A v-type ditch will be constructed on the outside of the driving surface to further define the driving surface and to deter vehicular traffic from entering onto the interim reclamation areas.

Contouring of Cut and Fill Slopes: The interim cut and fill slope grade shall be as close to the original contour as possible. To obtain this ratio, pits and slopes shall be back sloped into the pad during interim reclamation. Only subsurface soil and material shall be utilized in the contouring of the cut and fill slopes. Under no circumstances shall topsoil be utilized as substrate material for contouring of cut and fill slopes.

Maintenance: In order to perform subsequent well operations, right-of-way (ROW) operations, or install new/additional equipment, it may be necessary to drive, park, and operate on restored, interim vegetation within the previously disturbed area. This is generally acceptable provided damage is promptly repaired and reclaimed following use. Where vehicular travel has occurred as a “convenience” and interim reclamation/vegetation has been compromised, immediate remediation of the affected areas is required. Additionally, where erosion has occurred and compromised the reclamation of the well location, the affected area must be promptly remediated so that future erosion is prevented, and the landform is stabilized.

Layflat Lines: Layflat lines used for development of the wells may be on the ground for a maximum of 6 months and shall be retrieved within 30 days of ending completion operations. If the layflat lines are needed for longer than 6 months or cannot be retrieved within 30 days of ending completion operations, a Sundry NOI shall be submitted to the BLM FFO for review and decision that includes a rationale for the time extension.

“Hotwork” and Construction Affecting Fire Safety: The holder or its contractors will notify the BLM of any fires and comply with all rules and regulations administered by the BLM concerning the use, prevention and suppression of fires on federal lands, including any fire prevention orders that may be in effect at the time of the permitted activity. The holder or its contractors may be held liable for the cost of fire suppression, stabilization and rehabilitation. In the event of a fire, personal safety will be the first priority of the holder or its contractors. The holder or its contractors shall:

1. Operate all internal and external combustion engines (including off-highway vehicles, chainsaws, generators, heavy equipment, etc.) with a qualified spark arrester. Qualified spark arresters are maintained and not modified, and meet the Society of Automotive Engineers (SAE) Recommended Practices J335 or J350. Refer to 43 CFR §8343.1.
 - a. *Refueling of any combustible engine equipment must be minimum of 3 meters away from any ignition source (open flame, smoking, etc.).*

2. Maintain and clean all equipment regularly to remove flammable debris buildup and prevent fluid leaks that can lead to ignitions.
3. Carry at least one shovel or wildland fire hand tool (combi, Pulaski, McLeod) per person working, minimum 5 gallons of water, and a fire extinguisher rated at a minimum as ABC - 10 pound on each piece of equipment and each vehicle.
4. When conducting "hotwork" such as, but not limited to welding, grinding, cutting, spark-producing work with metal, work that creates hot material or slag; choose an area large enough to contain all hot material that is naturally free of all flammable vegetation or remove the flammable vegetation in a manner compliant with the permitted activity. If adequate clearance cannot be made, wet an area large enough to contain all hot material prior to the activity and periodically throughout the activity to reduce the risk of wildfire ignition. Regardless of clearance, maintain readiness to respond to an ignition at all times. In addition, keep one hand tool per person and at least one fire extinguisher ready, minimum, as specified earlier (#3) during this activity.
5. Keep apprised of current and forecasted weather at <https://www.weather.gov/abq/forecasts-fireweather-links> and fire conditions at www.wfas.net and take additional fire precautions when fire danger is rated High or greater. Red Flag Warnings are issued by the National Weather Service when fire conditions are most dangerous, and ignitions escape control quickly. Extra precautions are required during these warnings such as additional water, designate a fire watch/patrol and tools. If work is being conducted in an area that is not clear of vegetation within 50 feet of work area; then, when fire danger is rated High or greater and 1. There is a predicted Red Flag warning for your area or 2. If winds are predicted to be greater than 10 mph, stop all hotwork activities for the day at 10 am.
6. In the event of an ignition, initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If a fire spreads beyond the capability of workers with the stipulated tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes.
7. Call **911** or the **Taos Interagency Fire Dispatch Center (575-758-6208)** immediately of the location and status of any fire.

AND

Notify the respective BLM field office for which the permit or contract was issued immediately of the incident.

Farmington Field Office at 505-564-7600

Noxious Weeds

Inventory the proposed site for the presence of noxious and invasive weeds. Noxious weeds are those listed on the New Mexico Noxious Weed List and USDA's Federal Noxious Weed List. The New Mexico Noxious Weed List or USDA's Noxious Weed List can be updated at any time and should be regularly check for any changes. Invasive species may or may not be listed as a noxious weed but have been identified to likely cause economic or environmental harm or harm to human health. The following noxious weeds have been identified as occurring on lands within

the boundaries of the Farmington Field Office (FFO). There are numerous invasive species on the FFO such as Russian thistle (*Salsola spp.*) and field bindweed (*Convolvulus arvensis*).

Russian Knapweed (<i>Centaurea repens</i>)	Musk Thistle (<i>Carduus nutans</i>)
Bull Thistle (<i>Cirsium vulgare</i>)	Canada Thistle (<i>Cirsium arvense</i>)
Scotch Thistle (<i>Onopordum acanthium</i>)	Hoary Cress (<i>Cardaria draba</i>)
Perennial Pepperweed (<i>Lepidium latifolium</i>)	Halogeton (<i>Halogeton glomeratus</i>)
Spotted Knapweed (<i>Centaurea maculosa</i>)	Dalmation Toadflax (<i>Linaria genistifolia</i>)
Yellow Toadflax (<i>Linaria vulgaris</i>)	Camelthorn (<i>Alhagi pseudalhagi</i>)
African Rue (<i>Peganum harmala</i>)	Salt Cedar (<i>Tamarix spp.</i>)
Diffuse Knapweed (<i>Centaurea diffusa</i>)	Leafy Spurge (<i>Euphorbia esula</i>)

- a. Identified weeds will be treated prior to new surface disturbance if determined by the FFO Noxious Weed Coordinator. A Pesticide Use Proposal (PUP) must be submitted to and approved by the FFO Noxious Weed Coordinator prior to application of pesticide. The FFO Noxious Weeds Coordinator (505-564-7600) can provide assistance in the development of the PUP.
- b. Vehicles and equipment should be inspected and cleaned prior to coming onto the work site. This is especially important on vehicles from out of state or if coming from a weed-infested site.
- c. Fill dirt or gravel may be needed for excavation, road construction/repair, or for spill remediation. If fill dirt or gravel will be required, the source shall be noxious weed free and approved by the FFO Noxious Weed Coordinator.
- d. The site shall be monitored for the life of the project for the presence of noxious weeds (includes maintenance and construction activities). If weeds are found the FFO Coordinator shall be notified at (505) 564-7600 and provided with a Weed Management Plan and if necessary, a Pesticide Use Proposal (PUP). The FFO Coordinator can provide assistance developing the Weed Management Plan and/or the Pesticide Use Proposal.
- e. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. Logos's weed-control contractor would contact the BLM-FFO prior to using these chemicals.
- f. Noxious/invasive weed treatments must be reported to the FFO Noxious Weed Coordinator. A Pesticide Use Report (PUR) is required to report any mechanical, chemical, biological, or cultural treatments used to eradicate, and/or control noxious or invasive species. Reporting will be required quarterly and annually or per request from the FFO Noxious Weed Coordinator.

Bare ground vegetation trim-out: If bare ground vegetation treatment (trim-out) is desired around facility structures, the operator will submit a bare ground/trim-out design included in their Surface Use Plan of Operations (SUPO). The design will address vegetation safety concerns of the operator and BLM while minimizing impacts to interim reclamation efforts. The design must include what structures to be treated and buffer distances of trim-out. Pesticide use for vegetation control around anchor structures is not approved. If pesticides are used for bare ground trim-out, the trim-out will not exceed three feet from the edge of any eligible permanent structure (i.e., well heads, fences, tanks). Additional distance/areas may be requested and must be approved by the FFO authorized officer. The additional information below must also be provided to the FFO:

- a. Pesticide use for trim out will require a Pesticide Use Proposal (PUP). A PUP is required *prior* to any treatment and must be approved by the FFO Noxious Weed Coordinator. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. Logos's weed-control contractor would contact the BLM-FFO prior to using these chemicals and provide Pesticide Use Reports (PURs) post treatment.
- b. A Pesticide Use Report (PUR) or a Biological Use Report (BUR) is required to report any chemical, or biological treatments used to eradicate, or control vegetation on site. Reporting will be required quarterly and annually or per request from the FFO Noxious Weed Coordinator.

Paleontology

Any paleontological resource discovered by the Operator, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant scientific values. The Holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Holder.

Visual Resources

All permanent lighting will use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the lowest part of the light source). All permanent lighting will be pointed straight down at the ground in order to prevent light spill to the sides. All permanent lighting will be 4000° Kelvin or less with 3000° Kelvin preferred. Warmer light colors are less noticeable by humans and cause less impact to wildlife. All permanent lighting will be controlled by a switch and/or timer which allows the lights to be turned on when workers are on location during dark periods but will keep the lights off the majority of the time.

Wildlife Resources

Wildlife: Rosa Mesa Wildlife SDA. No surface use (outside of routine operation) is allowed during the following time period: December 1 - March 31.

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

Migratory Bird: Any new disturbance over 4.0 acres within nesting season (5/15-7/31) will require a migratory bird nest survey to be conducted by BLM FFO biologist. Once drilling and completion activities are complete, any open water that could be harmful to birds and wildlife must be covered, screened, or netted to prevent entry.

Threatened, Endangered or Sensitive Species: If, in operations the operator/holder discovers any Threatened, Endangered, or Sensitive species, work in the vicinity of the discovery will be suspended and the discovery promptly reported to the BLM-FFO T&E specialist at (505) 564-7600. The BLM-FFO will then specify what action is to be taken. Failure to notify the BLM-FFO about a discovery may result in civil or criminal penalties in accordance with The Endangered Species Act (as amended).

Nesting: If a bird nest containing eggs or young is encountered in the path of construction the operator will cease construction and consult with BLM to determine appropriate actions.

Grazing Permittee Notification and Concerns: The operator will notify the grazing lease operator(s) at least ten business days prior to beginning any construction activity to ensure there will be no conflicts between construction activities and livestock grazing operations. The operator is not obligated to cease or delay construction unless directed by the Authorized Officer (AO). Any range improvement (fences, pipelines, ponds, etc.) disturbed by construction activities will be repaired immediately following construction and will be repaired to the condition the improvement was in prior to disturbance. Cattle guards will be installed to replace any livestock fencing or gates removed for road construction.

Soil, Air, Water

Land Farming: No excavation, remediation or closure activities will be authorized without prior approval, on any federal or Indian mineral estate, federal surface, or federal ROW. A Sundry Notice (DOI, BLM Form 3160-5) must be submitted with an explanation of the remediation or closure plan for on-lease actions.

Emission Control Standard: Compressor engines 300 horsepower or less used during well production must be rated by the manufacturer as emitting NOx at 2 grams per horsepower hour or less to comply with the New Mexico Environmental Department, Air Quality Bureau's guidance.

Waste Disposal: All fluids (i.e., scrubber cleaners) used during washing of production equipment, including compressors, will be properly disposed of to avoid ground contamination, or hazard to livestock or wildlife.

Cultural Resources

Non-Permitted Disturbance: Construction, construction maintenance or any other activity outside the areas permitted by the APD will require additional approval and may require a new cultural survey and clearance.

Employee Education: All employees of the project, including the Project Sponsor and its contractors and sub-contractors will be informed that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment. They will also be notified that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm) when on federal land and the New Mexico Cultural Properties Act NMSA 1978 when on state land.

Discovery of Cultural Resources in the Absence of Monitoring: Discovery of Cultural Resources in the Absence of Monitoring: If, in its operations, operator/holder discovers any previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the discovery promptly reported to BLM Field Manager. BLM will then specify what action is to be taken. If there is an approved "discovery plan" in place for the project, then the plan will be executed. In the absence of an approved plan, the BLM will evaluate the significance of the discovery in accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property, **or in accordance with an approved program alternative.** Minor recordation, stabilization, or data recovery may be performed by BLM or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive **archaeological or alternative mitigation**, likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any **mitigations determined appropriate through the agency's Section 106 consultation are completed.** Failure to notify the BLM about a discovery may result in civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, **the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws.**

Discovery of Cultural Resources during Monitoring: If monitoring confirms the presence of previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the monitor will promptly report the discovery to the BLM Field Manager. BLM will then specify what action is to be taken. **If there is an approved "discovery plan" in place for the project, then the plan will be executed. In the absence of an approved plan, the BLM will evaluate the significance of the discovery in accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property, or in accordance with an approved program alternative. Minor recordation, stabilization, or data recovery may be performed by BLM**

or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive archaeological or alternative mitigation, likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any mitigations determined appropriate through the agency's Section 106 consultation are completed.

Damage to Sites: If, in its operations, operator/holder damages, or is found to have damaged any previously documented or undocumented historic or prehistoric cultural resources, excluding "discoveries" as noted above, the operator/holder agrees at his/her expense to have a permitted cultural resources consultant prepare a BLM approved damage assessment and/or data recovery plan. The operator/holder agrees at his/her expense to implement a **mitigation** that the agency finds appropriate given the significance of the site, which the agency determines in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property. **This mitigation may entail execution of the data recovery plan by a permitted cultural resources consultant and/or alternative mitigations.** Damage to cultural resources may result in **civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws.**

See additional cultural stipulations below.



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

#710H ROSA UNIT

Lease: NMSF078764 Unit: NMNM78407E
SH: SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 17, T.31 N., R.5 W.
Rio Arriba County, New Mexico
BH: NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 14, T.31 N., R.6 W.
Rio Arriba County, New Mexico

***Above Data Required on Well Sign**

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

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

- A. ☒ Note all surface/drilling conditions of approval attached.
- B. ☒ The required wait on cement (WOC) time will be a minimum of 500 psi compressive strength at 60 degrees. Blowout preventor (BOP) nipple-up operations may then be initiated
- C. ☒ Test 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.

INTERIOR REGION 7 • UPPER COLORADO BASIN

COLORADO, NEW MEXICO, UTAH, WYOMING

I. GENERAL

- A. Full compliance with all applicable laws, regulations, and Onshore Orders, with the approved Permit to drill, and with the approved Surface Use and Operations Plan is required. Lessees and/or operators are fully accountable for the actions of their contractors and subcontractors. Failure to comply with these requirements and the filing of required reports will result in strict enforcement pursuant to 43 CFR 3163.1 or 3163.2.
- B. Each well shall have a well sign in legible condition from spud date to final abandonment. The sign should show the operator's name, lease serial number, or unit name, well number, location of the well, and whether lease is Tribal or Allotted, (See 43 CFR 3162.6(b)).
- C. A complete copy of the approved Application for Permit to Drill, along with any conditions of approval, shall be available to authorized personnel at the drill site whenever active drilling operations are under way.
- D. For Wildcat wells only, a drilling operations progress report is to be submitted, to the BLM-Field Office, weekly from the spud date until the well is completed and the Well Completion Report 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. (OO2 III.A.2.i.i.)
- 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 (OO2 III.C.7.)
- 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. (OO2 III.C.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 two years, approval of the Application for Permit to Drill will expire. A written request for a two-year extension may be granted if submitted prior to expiration.
- 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.

II. REPORTING REQUIREMENTS

- A. For reporting purposes, all well Sundry notices, well completion and other well actions shall be referenced by the appropriate lease, communitization agreement and/or unit agreement numbers.
- B. The following reports shall be filed with the BLM-Authorized Officer within 30 days after the work is completed.
 - 1. 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 or 50 MMCF following its (completion)(recompletion), whichever first occurs, without the prior, written approval of the authorized officer. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted. You shall be required to compensate the lessor for the portion of the gas vented or flared without approval which is determined to have been avoidably lost.

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

V. SAFETY

- A. All rig heating stoves are to be of the explosion-proof type.
- B. Rig safety lines are to be installed.
- C. Hard hats and other Personal Protective Equipment (PPE) must be utilized.

VI. CHANGE OF PLANS OR ABANDONMENT

- A. Any changes of plans required to mitigate unanticipated conditions encountered during drilling operations, will require approval as set forth in Section 1.F.
- B. If the well is dry, it is to be plugged in accordance with 43 CFR 3162.3-4, approval of the proposed plugging program is required as set forth in Section 1.F. The report should show the total depth reached, the reason for plugging, and the proposed intervals, by depths, where cement plugs are to be placed, type of plugging mud, etc. A Subsequent Report of Abandonment is required as set forth in Section II.B.1c.
- C. Unless a well has been properly cased and cemented, or properly plugged, the drilling rig must not be moved from the drill site without prior approval from the BLM-Authorized Officer.

Submit one copy to
Appropriate District OfficeOIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31477	² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 320608	⁵ Property Name ROSA UNIT	⁶ Well Number 710H
⁷ OGRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC	⁹ Elevation 6300'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	17	31N	5W		2137	NORTH	539	WEST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	14	31N	6W		227	NORTH	1601	EAST	RIO ARriba

¹² Dedicated Acres 823.43	N/2 - Section 13, T31N, R6W N/2 - Section 14, T31N, R6W N/2 - Section 18, T31N, R5W	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-13457
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE
BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

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

Etta Trujillo 11/23/2022
Signature Date

Etta Trujillo
Printed Name
etrujillo@logosresourcesllc.com
E-mail Address

18 SURVEYOR CERTIFICATION
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.
Date Revised: NOVEMBER 23, 2022
Date of Survey: JUNE 22, 2022

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

LAST TAKE POINT
227' FNL 1601' FEL
SEC 14, T31N, R6W
LAT: 36.906242°N
LONG: 107.428016°W
DATUM: NAD1927

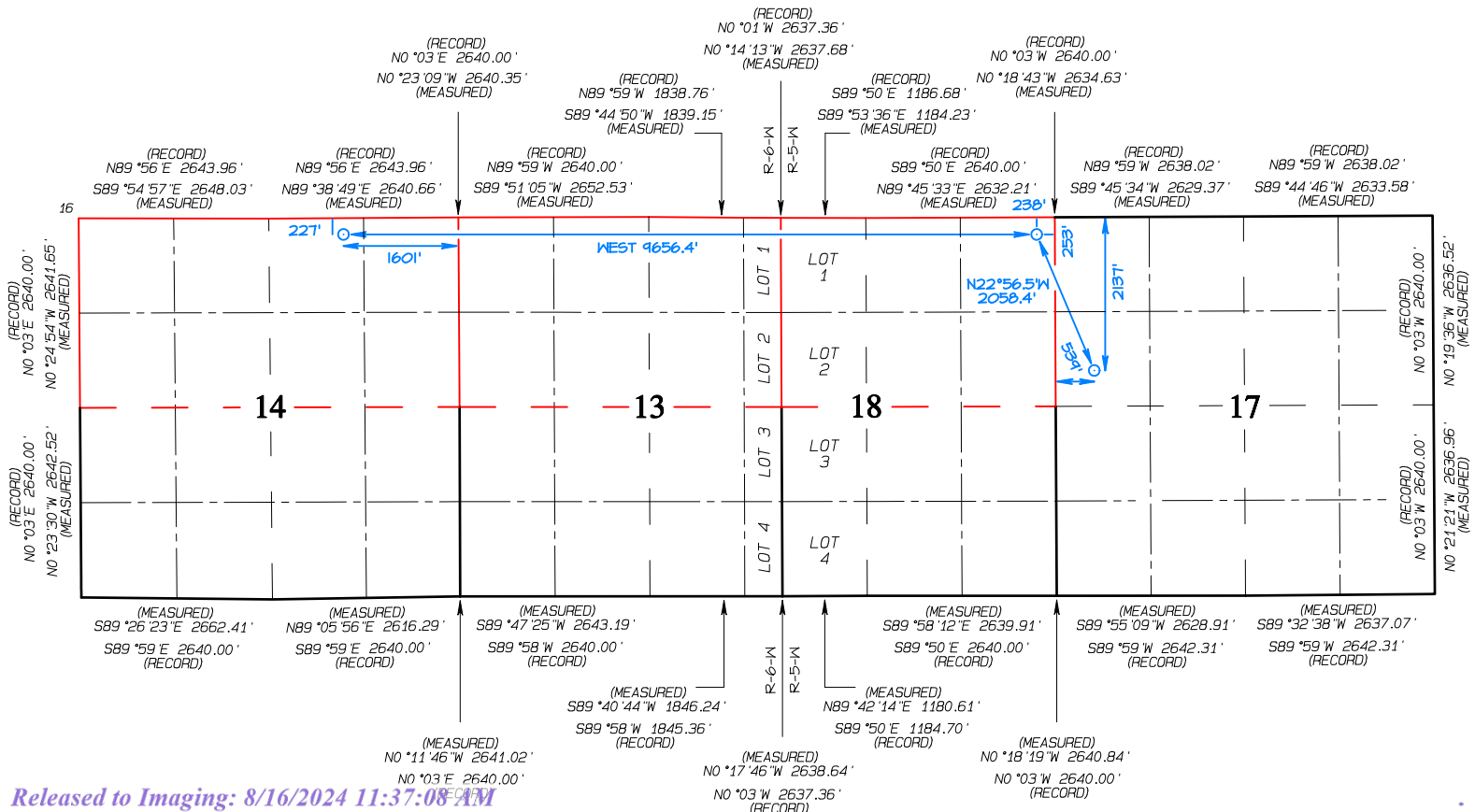
LAT: 36.906248°N
LONG: 107.428619°W
DATUM: NAD1983

FIRST TAKE POINT
238' FNL 253' FEL
SEC 18, T31N, R5W
LAT: 36.906125°N
LONG: 107.394989°W
DATUM: NAD1927

LAT: 36.906131°N
LONG: 107.395592°W
DATUM: NAD1983

SURFACE LOCATION
2137' FNL 539' FWL
SEC 17, T31N, R5W
LAT: 36.900908°N
LONG: 107.392275°W
DATUM: NAD1927

LAT: 36.900914°N
LONG: 107.392877°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:** 03 / 02 / 2023

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 710H	30-039-pending	E-17-T31N-R5W	2137 FNL, 539 FWL	N/A	15,847	508
Rosa Unit 712H	30-039-pending	E-17-T31N-R5W	2151 FNL, 543 FWL	N/A	15,847	507
Rosa Unit 714H	30-039-pending	E-17-T31N-R5W	2166 FNL, 547 FWL	N/A	16,997	551
Rosa Unit 716H	30-039-pending	E-17-T31N-R5W	2180 FNL, 551 FWL	N/A	17,381	557
Rosa Unit 720H	30-039-pending	E-17-T31N-R5W	2195 FNL, 555 FWL	N/A	16,230	526
Rosa Unit 722H	30-039-pending	E-17-T31N-R5W	2209 FNL, 558 FWL	N/A	14,696	526
Rosa Unit 724H	30-039-pending	E-17-T31N-R5W	2224 FNL, 562 FWL	N/A	16,230	525
Rosa Unit 726H	30-039-pending	E-17-T31N-R5W	2238 FNL, 566 FWL	N/A	14,696	523

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 710H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 712H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 714H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 716H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 720H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 722H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 724H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 726H	30-039-pending	Pending	Pending	Pending	Pending	Pending

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

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

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

Section 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 well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

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

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

Section 4 - Notices

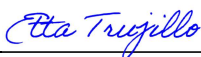
1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

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

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

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

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

Signature: 
Printed Name: Etta Trujillo
Title: Regulatory Specialist
E-mail Address: etrujillo@logosresourcesllc.com
Date: 3/2/2023
Phone: 505-324-4154
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
Approved By:
Title:
Approval Date:
Conditions of Approval:



LOGOS Operating, LLC Operations Plan

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

Date:	February 23, 2023	Pool:	Basin Mancos
Well Name:	Rosa Unit 710H	GL Elevation:	6,300'
Surface Location:	Sec 17, T31N, R5W 2137 FNL, 539 FWL (36.900914° N, 107.392877° W – NAD83)	Measured Depth:	17,225' (KB)
Bottom Hole Location:	Sec 14, T31N, R6W 227 FNL, 1601 FEL (36.906248° N, 107.428619° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF078764 CA Serial #NMNM78407E

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	2,499'	2,432'	*POINT LOOKOUT	5,856'	5,631'
KIRTLAND	2,614'	2,542'	*MANCOS	6,419'	6,168'
*FRUITLAND	3,103'	3,008'	KICKOFF POINT	6,689'	6,425'
*PICTURED CLIFFS	3,466'	3,354'	LANDING POINT	7,568'	6,950'
LEWIS	3,576'	3,459'			
CHACRA	4,757'	4,584'			
*CLIFF HOUSE	5,572'	5,361'			
MENEFEE	5,615'	5,402'	TD	17,225'	6,925'

* indicates depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered.

B. **MUD LOGGING PROGRAM:** Mudlogger on location from KOP to TD.

C. **LOGGING PROGRAM:** LWD GR from surface casing to TD.

D. **NATURAL GAUGES:** Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.

II. DRILLING

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

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

ROSA UNIT 710H



- B. BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip or but not more than once a day. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when initially installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30 day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30 day interval of first full test.
- C. GeoHazards:** There are no Geohazards
- D. Maximum Anticipated Pressure:** 6950' TVD x 0.43 = 2989 psi
- E. H2S Concerns:** There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	320' or greater	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,305'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17,225'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

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

B. FLOAT EQUIPMENT:

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



C. CEMENTING:

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

1. SURFACE: Casing shall be set at ~ 320' and cemented to surface. TOC at Surface.
263 sks of 15.8 ppg Type Neat G, 1.18 cuf/sk yield or equivalent 223 sks of 14.6 ppg Type III with 1.39 cuf/sk yield, 30% excess.
2. INTERMEDIATE: Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. Operator proposes optional DV tools above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. If losses are not observed during the second stage a cancellation plug will be pumped and the remaining cement will be pumped during stage 2. If cement does not circulate to the DV tool(s) or to surface, a CBL will be run to determine TOC.

	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,306	1,188	0.3132	1.3	501	89	1.15	436	15.8
Stage 1 Lead	4,810	496	0.31318	1.3	202	36	2.30	88	12.3
					703	125		524	
Stage 2 Tail	3,635	1,175	0.31318	1.3	478	85	1.50	319	13.5
Stage 2 Lead	3,135	500	0.31318	1.3	204	36	2.30	89	12.3
					682	121		407	
Stage 3 Tail	2,485	650	0.31318	1.3	265	47	1.99	133	12.8
Stage 3 Lead	320	2,165	0.31318	1.3	881	157	2.53	348	12
Stage 3 Lead	-	320	0.36268	1	116	21	2.53	46	12
					1,262	225		527	
All Stage Totals					2,647	472		1,458	

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

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

	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	5,494	100	0.2531	1	25	5	1.56	16	13
Open Hole Lead	6,494	10,731	0.2291	1.15	2,838	505	1.56	1,819	13
					2,863	510		1,835	

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.

ROSA UNIT 710H



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 *6925'TVD=1524 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.

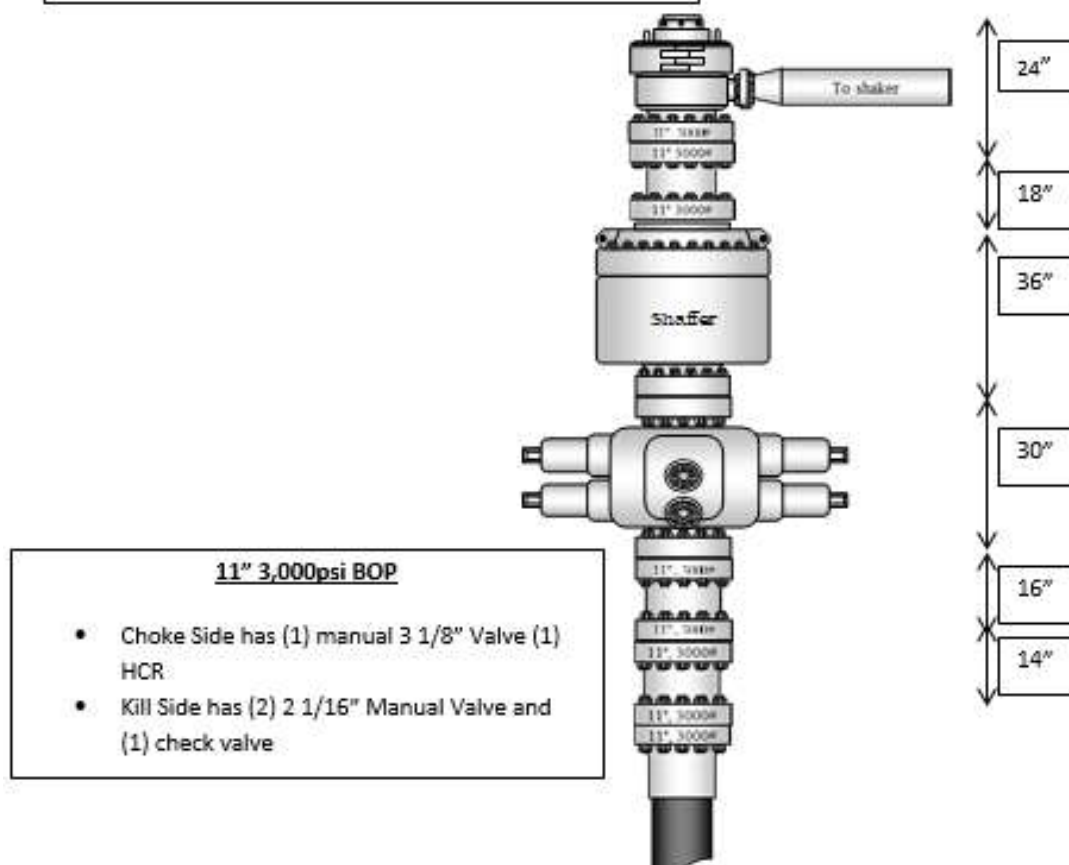
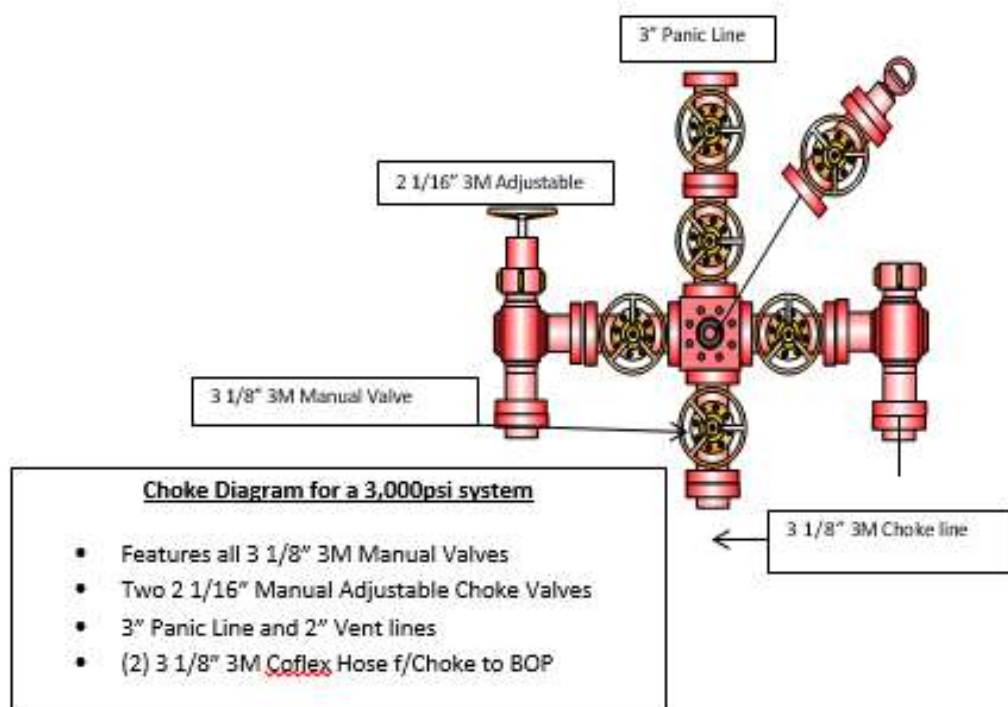
E. PRODUCTION TUBING

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.



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



ROSA UNIT 710H

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Pad 26

Rosa Unit #710H

OH

Prelim #1

Anticollision Report

21 January, 2023

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Reference	Prelim #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 19,999.96 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/19/2023	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,223.97	Prelim #1 (OH)	MWD-SDI	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Pad 26						
(Offset) RU 010C - OH - OH - inc only	14,716.16	6,121.00	1,135.97	1,006.69	8.787	CC, ES
(Offset) RU 010C - OH - OH - inc only	14,900.00	6,121.00	1,150.75	1,019.59	8.773	SF
(Offset) RU 020 - OH - OH - vert no surveys	17,224.92	5,870.00	1,722.34	1,470.86	6.849	CC, ES, SF
(Offset) RU 020B - OH - OH - inc only	16,300.00	6,145.00	1,079.55	954.07	8.604	SF
(Offset) RU 020B - OH - OH - inc only	16,918.12	6,145.00	885.07	801.71	10.617	CC, ES
(Offset) RU 020D - OH - OH	16,137.61	7,145.87	1,776.11	1,696.86	22.410	CC, ES, SF
(Offset) RU 020D - ST01 - ST01	16,087.27	7,148.25	1,807.33	1,733.02	24.322	CC, ES, SF
(Offset) RU 022B - OH - OH	9,735.66	7,246.20	809.96	748.49	13.177	CC, ES
(Offset) RU 022B - OH - OH	9,800.00	7,247.86	812.51	750.84	13.175	SF
(Offset) RU 030B - OH - OH - inc only	13,259.55	7,098.17	256.65	57.28	1.287	Level 3, CC, ES, SF
(Offset) RU 031B - OH - OH - inc only	5,960.05	5,722.14	172.05	30.24	1.213	Level 2, CC
(Offset) RU 031B - OH - OH - inc only	6,000.00	5,760.21	172.48	29.84	1.209	Level 2, ES, SF
(Offset) RU 066M - OH - OH	13,800.00	7,490.30	1,020.39	950.15	14.527	SF
(Offset) RU 066M - OH - OH	13,845.65	7,489.53	1,019.37	949.37	14.564	CC, ES
(Offset) RU 067 - OH - OH - inc only	17,120.96	6,966.31	1,272.46	1,085.11	6.792	CC, ES, SF
(Offset) RU 125 - OH - OH - inc only	12,316.08	7,094.72	739.63	489.22	2.954	CC, ES, SF
(Offset) RU 207A - OH - OH - inc only	2,941.16	2,845.67	169.91	105.08	2.621	CC, ES, SF
Rosa Unit #712H - OH - Prelim #1	665.47	666.32	14.67	10.82	3.813	CC
Rosa Unit #712H - OH - Prelim #1	800.00	801.51	14.83	10.17	3.185	ES
Rosa Unit #712H - OH - Prelim #1	900.00	901.55	16.50	11.25	3.141	SF
Rosa Unit #714H - OH - Prelim #1	500.00	500.00	29.75	26.89	10.427	CC
Rosa Unit #714H - OH - Prelim #1	800.00	802.94	30.47	25.81	6.540	ES
Rosa Unit #714H - OH - Prelim #1	1,200.00	1,206.46	36.88	29.82	5.220	SF
Rosa Unit #716H - OH - Prelim #1	500.00	500.00	44.88	42.03	15.730	CC
Rosa Unit #716H - OH - Prelim #1	600.00	601.31	45.15	41.69	13.062	ES
Rosa Unit #716H - OH - Prelim #1	800.00	801.69	51.14	46.48	10.979	SF
Rosa Unit #720H - OH - Prelim #1	500.00	500.00	59.92	57.07	21.004	CC, ES
Rosa Unit #720H - OH - Prelim #1	700.00	695.95	72.31	68.27	17.894	SF
Rosa Unit #722H - OH - Prelim #1	500.00	500.00	74.62	71.77	26.155	CC, ES
Rosa Unit #722H - OH - Prelim #1	700.00	694.42	87.85	83.81	21.763	SF
Rosa Unit #724H - OH - Prelim #1	500.00	500.00	89.75	86.90	31.459	CC, ES
Rosa Unit #724H - OH - Prelim #1	700.00	693.08	103.35	99.32	25.629	SF
Rosa Unit #726H - OH - Prelim #1	500.00	500.00	104.80	101.95	36.733	CC, ES
Rosa Unit #726H - OH - Prelim #1	800.00	786.65	135.09	130.48	29.280	SF

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Pad 7						
Rosa Unit 574H - OH - Plan #2	17,224.92	18,786.08	178.50	70.53	1.653	CC, ES, SF
Rosa Unit 576H - OH - Plan #2	17,224.92	18,672.65	1,351.19	1,243.65	12.564	CC, ES, SF

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 175-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	34.50	34.50	0.00	0.31	-81.59	1,174.42	-7,943.04	8,029.40					
100.00	100.00	134.50	134.50	0.23	1.19	-81.59	1,174.42	-7,943.04	8,029.40	8,027.98	1.42	5,662.430		
200.00	200.00	234.50	234.50	0.53	2.60	-81.59	1,174.42	-7,943.04	8,029.40	8,026.27	3.13	2,564.562		
300.00	300.00	334.50	334.50	0.83	4.39	-81.59	1,174.42	-7,943.04	8,029.40	8,024.18	5.22	1,538.512		
400.00	400.00	434.50	434.50	1.13	6.23	-81.59	1,174.42	-7,943.04	8,029.40	8,022.04	7.36	1,090.944		
500.00	500.00	534.50	534.50	1.43	8.07	-81.59	1,174.42	-7,943.04	8,029.40	8,019.90	9.50	845.098		
600.00	599.98	635.27	635.27	1.73	9.93	-74.35	1,174.66	-7,943.04	8,028.96	8,017.31	11.66	688.798		
700.00	699.84	736.17	736.16	2.03	11.79	-74.41	1,174.55	-7,943.04	8,027.53	8,013.72	13.81	581.115		
800.00	799.45	836.80	836.79	2.33	13.64	-74.52	1,174.35	-7,943.04	8,025.16	8,009.20	15.97	502.618		
900.00	898.70	933.22	933.20	2.63	15.55	-74.66	1,174.42	-7,943.04	8,021.91	8,003.73	18.18	441.281		
1,000.00	997.47	1,031.99	1,031.97	2.93	17.48	-74.85	1,174.42	-7,943.04	8,017.75	7,997.35	20.40	392.967		
1,100.00	1,095.62	1,132.37	1,132.34	3.23	19.43	-75.07	1,175.16	-7,943.04	8,012.81	7,990.16	22.66	353.624		
1,200.00	1,193.06	1,232.63	1,232.60	3.53	21.39	-75.35	1,174.83	-7,943.04	8,006.88	7,981.97	24.91	321.399		
1,300.00	1,289.64	1,331.88	1,331.84	3.83	23.32	-75.66	1,174.24	-7,943.04	8,000.11	7,972.96	27.15	294.702		
1,382.94	1,369.03	1,403.59	1,403.53	4.08	24.92	-75.92	1,174.42	-7,943.04	7,993.99	7,964.99	28.99	275.716		
1,400.00	1,385.28	1,419.85	1,419.78	4.13	25.27	-75.96	1,174.42	-7,943.04	7,992.67	7,963.28	29.39	271.906		
1,500.00	1,480.57	1,515.14	1,515.07	4.43	27.32	-76.16	1,174.42	-7,943.04	7,985.02	7,953.28	31.75	251.514		
1,600.00	1,575.86	1,611.76	1,611.69	4.73	29.40	-76.36	1,175.21	-7,943.04	7,977.58	7,943.45	34.13	233.745		
1,700.00	1,671.15	1,709.40	1,709.33	5.03	31.51	-76.57	1,174.95	-7,943.04	7,970.12	7,933.59	36.53	218.163		
1,800.00	1,766.44	1,822.90	1,800.94	5.33	34.04	-76.77	1,174.42	-7,943.04	7,962.73	7,923.37	39.36	202.289		
1,900.00	1,861.72	1,896.39	1,896.22	5.63	36.19	-76.97	1,174.42	-7,943.04	7,955.52	7,913.70	41.82	190.228		
2,000.00	1,957.01	1,991.68	1,991.51	5.93	38.99	-77.17	1,174.42	-7,943.04	7,948.42	7,903.50	44.92	176.952		
2,100.00	2,052.30	2,088.06	2,087.87	6.23	41.82	-77.37	1,176.04	-7,943.04	7,941.59	7,893.54	48.05	165.283		
2,200.00	2,147.59	2,187.47	2,187.27	6.53	44.74	-77.59	1,175.65	-7,943.04	7,934.66	7,883.40	51.27	154.772		
2,300.00	2,242.88	2,350.06	2,277.38	6.83	49.50	-77.79	1,174.42	-7,943.04	7,927.76	7,871.44	56.32	140.758		
2,400.00	2,338.16	2,373.23	2,372.66	7.13	50.16	-77.99	1,174.42	-7,943.04	7,921.10	7,863.81	57.29	138.263		
2,500.00	2,433.45	2,468.52	2,467.95	7.44	52.91	-78.20	1,174.42	-7,943.04	7,914.55	7,854.21	60.34	131.170		
2,600.00	2,528.74	2,566.52	2,566.86	7.74	55.74	-78.39	1,177.22	-7,943.04	7,908.34	7,844.88	63.46	124.611		
2,700.00	2,624.03	2,669.81	2,669.10	8.04	58.72	-78.62	1,176.18	-7,943.04	7,901.92	7,835.18	66.74	118.393		
2,800.00	2,719.32	2,772.37	2,771.58	8.34	61.67	-78.86	1,173.89	-7,943.05	7,895.53	7,825.53	70.00	112.792		
2,900.00	2,814.60	2,849.96	2,849.10	8.64	63.17	-79.02	1,174.42	-7,943.04	7,889.44	7,817.65	71.80	109.884		
3,000.00	2,909.89	2,945.25	2,944.39	8.94	65.19	-79.23	1,174.42	-7,943.04	7,883.45	7,809.33	74.12	106.364		
3,100.00	3,005.18	3,041.57	3,040.70	9.24	67.23	-79.43	1,175.39	-7,943.04	7,877.63	7,801.17	76.46	103.030		
3,200.00	3,100.47	3,138.59	3,137.72	9.54	69.29	-79.64	1,175.03	-7,943.04	7,871.83	7,793.02	78.82	99.875		
3,300.00	3,195.76	3,235.40	3,234.52	9.84	71.34	-79.86	1,174.32	-7,943.04	7,866.13	7,784.96	81.17	96.911		
3,400.00	3,291.04	3,326.47	3,325.54	10.14	73.18	-80.06	1,174.42	-7,943.04	7,860.59	7,777.29	83.30	94.361		
3,500.00	3,386.33	3,421.76	3,420.83	10.44	75.11	-80.26	1,174.42	-7,943.04	7,855.16	7,769.62	85.53	91.836		
3,600.00	3,481.62	3,892.89	3,516.12	10.74	84.35	-80.47	1,174.42	-7,943.04	7,849.84	7,754.77	95.07	82.567		
3,700.00	3,576.91	3,797.61	3,611.41	11.04	82.57	-80.68	1,174.42	-7,943.04	7,844.63	7,751.04	93.60	83.812		
3,800.00	3,672.20	3,710.46	3,709.51	11.34	80.96	-80.90	1,174.37	-7,943.04	7,839.54	7,747.26	92.28	84.950		
3,900.00	3,767.48	3,802.97	3,801.98	11.64	82.67	-81.10	1,174.42	-7,943.04	7,834.57	7,740.27	94.30	83.083		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 175-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4,000.00	3,862.77	3,898.26	3,897.27	11.94	84.45	-81.31	1,174.42	-7,943.04	7,829.70	7,733.33	96.37	81.244	
4,100.00	3,958.06	3,993.55	3,992.56	12.24	86.22	-81.52	1,174.42	-7,943.04	7,824.96	7,726.51	98.45	79.484	
4,200.00	4,053.35	4,088.83	4,087.85	12.54	87.99	-81.73	1,174.42	-7,943.04	7,820.32	7,719.80	100.52	77.798	
4,300.00	4,148.64	4,184.12	4,183.14	12.84	89.77	-81.94	1,174.42	-7,943.04	7,815.80	7,713.21	102.60	76.181	
4,400.00	4,243.92	4,279.41	4,278.42	13.14	91.54	-82.15	1,174.42	-7,943.04	7,811.40	7,706.73	104.67	74.629	
4,500.00	4,339.21	4,374.70	4,373.71	13.44	93.32	-82.36	1,174.42	-7,943.04	7,807.11	7,700.37	106.74	73.139	
4,600.00	4,434.50	4,469.99	4,469.00	13.74	95.09	-82.57	1,174.42	-7,943.04	7,802.94	7,694.12	108.82	71.706	
4,700.00	4,529.79	4,565.27	4,564.29	14.04	96.87	-82.78	1,174.42	-7,943.04	7,798.88	7,687.99	110.89	70.328	
4,800.00	4,625.08	4,660.56	4,659.58	14.34	98.64	-82.99	1,174.42	-7,943.04	7,794.94	7,681.98	112.97	69.002	
4,900.00	4,720.36	4,755.85	4,754.86	14.64	100.41	-83.20	1,174.42	-7,943.04	7,791.12	7,676.08	115.04	67.725	
5,000.00	4,815.65	4,851.14	4,850.15	14.94	102.19	-83.41	1,174.42	-7,943.04	7,787.41	7,670.30	117.12	66.493	
5,100.00	4,910.94	4,946.43	4,945.44	15.24	103.96	-83.62	1,174.42	-7,943.04	7,783.82	7,664.63	119.19	65.306	
5,200.00	5,006.23	5,041.71	5,040.73	15.54	105.74	-83.84	1,174.42	-7,943.04	7,780.35	7,659.08	121.26	64.160	
5,300.00	5,101.52	5,137.00	5,136.02	15.84	107.51	-84.05	1,174.42	-7,943.04	7,776.99	7,653.65	123.34	63.054	
5,400.00	5,196.80	5,232.29	5,231.30	16.14	109.29	-84.26	1,174.42	-7,943.04	7,773.75	7,648.33	125.41	61.985	
5,500.00	5,292.09	5,327.58	5,326.59	16.44	111.06	-84.47	1,174.42	-7,943.04	7,770.62	7,643.14	127.49	60.952	
5,600.00	5,387.38	5,422.87	5,421.88	16.74	112.84	-84.68	1,174.42	-7,943.04	7,767.62	7,638.05	129.56	59.953	
5,700.00	5,482.67	5,518.15	5,517.17	17.04	114.61	-84.90	1,174.42	-7,943.04	7,764.73	7,633.09	131.64	58.986	
5,800.00	5,577.96	5,613.44	5,612.46	17.34	116.38	-85.11	1,174.42	-7,943.04	7,761.95	7,628.24	133.71	58.051	
5,900.00	5,673.24	5,708.73	5,707.74	17.64	118.16	-85.32	1,174.42	-7,943.04	7,759.30	7,623.51	135.78	57.144	
6,000.00	5,768.53	5,804.02	5,803.03	17.94	119.93	-85.53	1,174.42	-7,943.04	7,756.76	7,618.90	137.86	56.266	
6,100.00	5,863.82	5,899.31	5,898.32	18.24	121.71	-85.75	1,174.42	-7,943.04	7,754.34	7,614.41	139.93	55.415	
6,200.00	5,959.11	5,994.59	5,993.61	18.54	123.48	-85.96	1,174.42	-7,943.04	7,752.04	7,610.04	142.01	54.589	
6,300.00	6,054.40	6,089.88	6,088.90	18.84	125.26	-86.17	1,174.42	-7,943.04	7,749.86	7,605.78	144.08	53.788	
6,400.00	6,149.68	6,185.17	6,184.18	19.14	127.03	-86.39	1,174.42	-7,943.04	7,747.79	7,601.64	146.16	53.010	
6,500.00	6,244.97	6,280.46	6,279.47	19.44	128.80	-86.60	1,174.42	-7,943.04	7,745.85	7,597.62	148.23	52.256	
6,551.42	6,293.97	6,329.46	6,328.47	19.59	129.72	-86.71	1,174.42	-7,943.04	7,744.89	7,595.60	149.30	51.876	
6,600.00	6,340.26	6,375.75	6,374.76	19.74	130.64	-86.82	1,174.42	-7,943.04	7,743.93	7,593.64	150.37	51.486	
6,689.41	6,425.45	6,460.94	6,459.95	20.01	131.56	-86.93	1,174.42	-7,943.04	7,742.97	7,591.68	151.44	51.096	
6,700.00	6,435.54	6,471.03	6,470.04	20.04	131.68	-86.97	1,174.42	-7,943.04	7,742.51	7,591.22	151.60	51.040	
6,750.00	6,482.96	6,518.45	6,517.46	20.19	132.60	-87.08	1,174.42	-7,943.04	7,741.55	7,590.26	151.67	51.000	
6,800.00	6,529.78	6,565.27	6,564.28	20.34	133.52	-87.19	1,174.42	-7,943.04	7,740.59	7,589.30	151.74	50.960	
6,850.00	6,575.63	6,611.09	6,610.10	20.49	134.44	-87.30	1,174.42	-7,943.04	7,739.63	7,588.34	151.81	50.920	
6,900.00	6,620.18	6,656.94	6,655.95	20.64	135.36	-87.41	1,174.42	-7,943.04	7,738.67	7,587.38	151.88	50.880	
6,950.00	6,663.07	6,698.85	6,697.86	20.79	136.28	-87.52	1,174.42	-7,943.04	7,737.71	7,586.42	151.95	50.840	
7,000.00	6,704.00	6,739.91	6,738.92	20.94	137.20	-87.63	1,174.42	-7,943.04	7,736.75	7,585.46	152.02	50.800	
7,050.00	6,742.63	6,778.54	6,777.55	21.09	138.12	-87.74	1,174.42	-7,943.04	7,735.79	7,584.50	152.09	50.760	
7,100.00	6,778.69	6,814.60	6,813.61	21.24	139.04	-87.85	1,174.42	-7,943.04	7,734.83	7,583.54	152.16	50.720	
7,150.00	6,811.89	6,847.80	6,846.81	21.39	140.00	-87.96	1,174.42	-7,943.04	7,733.87	7,582.58	152.23	50.680	
7,200.00	6,841.98	6,877.91	6,876.92	21.54	140.92	-88.07	1,174.42	-7,943.04	7,732.91	7,581.62	152.30	50.640	
7,250.00	6,868.74	6,904.67	6,903.68	21.69	141.84	-88.18	1,174.42	-7,943.04	7,731.95	7,580.66	152.37	50.600	
7,300.00	6,891.96	6,927.89	6,926.90	21.84	142.76	-88.29	1,174.42	-7,943.04	7,730.99	7,579.70	152.44	50.560	
7,350.00	6,911.46	6,947.40	6,946.41	21.99	143.68	-88.40	1,174.42	-7,943.04	7,730.03	7,578.74	152.51	50.520	
7,400.00	6,927.10	6,963.04	6,962.05	22.14	144.60	-88.51	1,174.42	-7,943.04	7,729.07	7,577.78	152.58	50.480	
7,450.00	6,938.75	6,974.69	6,973.70	22.29	145.52	-88.62	1,174.42	-7,943.04	7,728.11	7,576.82	152.65	50.440	
7,500.00	6,946.33	6,982.27	6,981.28	22.44	146.44	-88.73	1,174.42	-7,943.04	7,727.15	7,575.86	152.72	50.400	
7,550.00	6,949.78	6,985.72	6,984.73	22.59	147.36	-88.84	1,174.42	-7,943.04	7,726.19	7,574.90	152.79	50.360	
7,568.05	6,950.00	6,985.94	6,984.95	22.65	147.48	-88.88	1,174.42	-7,943.04	7,725.73	7,574.44	152.82	50.340	
7,600.00	6,949.92	6,985.86	6,984.87	22.74	147.60	-88.92	1,174.42	-7,943.04	7,724.77	7,573.48	152.89	50.300	
7,700.00	6,949.66	6,985.60	6,984.61	23.04	148.52	-89.03	1,174.42	-7,943.04	7,722.85	7,571.56	152.96	50.260	
7,800.00	6,949.40	6,985.34	6,984.35	23.35	149.44	-89.14	1,174.42	-7,943.04	7,720.93	7,569.64	153.03	50.220	
7,900.00	6,949.14	6,985.08	6,984.09	23.65	150.36	-89.25	1,174.42	-7,943.04	7,719.01	7,567.72	153.10	50.180	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 175-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
8,000.00	6,948.88	6,121.00	6,119.87	23.95	125.83	-41.85	1,174.42	-7,943.04	6,811.56	6,662.78	148.77	45.785	
8,100.00	6,948.62	6,121.00	6,119.87	24.25	125.83	-41.85	1,174.42	-7,943.04	6,712.98	6,563.93	149.04	45.040	
8,200.00	6,948.36	6,121.00	6,119.87	24.55	125.83	-41.85	1,174.42	-7,943.04	6,614.44	6,465.13	149.31	44.299	
8,300.00	6,948.11	6,121.00	6,119.87	24.85	125.83	-41.85	1,174.42	-7,943.04	6,515.95	6,366.36	149.58	43.560	
8,400.00	6,947.85	6,121.00	6,119.87	25.15	125.83	-41.85	1,174.42	-7,943.04	6,417.50	6,267.65	149.85	42.826	
8,500.00	6,947.59	6,121.00	6,119.87	25.45	125.83	-41.85	1,174.42	-7,943.04	6,319.11	6,168.99	150.12	42.094	
8,600.00	6,947.33	6,121.00	6,119.87	25.75	125.83	-41.85	1,174.42	-7,943.04	6,220.76	6,070.38	150.38	41.366	
8,700.00	6,947.07	6,121.00	6,119.87	26.05	125.83	-41.85	1,174.42	-7,943.04	6,122.47	5,971.83	150.65	40.642	
8,800.00	6,946.81	6,121.00	6,119.87	26.35	125.83	-41.85	1,174.42	-7,943.04	6,024.24	5,873.33	150.91	39.920	
8,900.00	6,946.55	6,121.00	6,119.87	26.65	125.83	-41.85	1,174.42	-7,943.04	5,926.06	5,774.89	151.17	39.202	
9,000.00	6,946.29	6,121.00	6,119.87	26.95	125.83	-41.85	1,174.42	-7,943.04	5,827.95	5,676.52	151.42	38.488	
9,100.00	6,946.03	6,121.00	6,119.87	27.25	125.83	-41.85	1,174.42	-7,943.04	5,729.90	5,578.22	151.68	37.777	
9,200.00	6,945.78	6,121.00	6,119.87	27.55	125.83	-41.85	1,174.42	-7,943.04	5,631.92	5,479.99	151.93	37.069	
9,300.00	6,945.52	6,121.00	6,119.87	27.85	125.83	-41.85	1,174.42	-7,943.04	5,534.01	5,381.83	152.18	36.365	
9,400.00	6,945.26	6,121.00	6,119.87	28.15	125.83	-41.85	1,174.42	-7,943.04	5,436.18	5,283.75	152.43	35.664	
9,500.00	6,945.00	6,121.00	6,119.87	28.45	125.83	-41.85	1,174.42	-7,943.04	5,338.43	5,185.76	152.67	34.967	
9,600.00	6,944.74	6,121.00	6,119.87	28.75	125.83	-41.85	1,174.42	-7,943.04	5,240.76	5,087.85	152.91	34.273	
9,700.00	6,944.48	6,121.00	6,119.87	29.05	125.83	-41.85	1,174.42	-7,943.04	5,143.18	4,990.03	153.15	33.583	
9,800.00	6,944.22	6,121.00	6,119.87	29.35	125.83	-41.85	1,174.42	-7,943.04	5,045.70	4,892.32	153.38	32.896	
9,900.00	6,943.96	6,121.00	6,119.87	29.66	125.83	-41.85	1,174.42	-7,943.04	4,948.32	4,794.71	153.61	32.213	
10,000.00	6,943.70	6,121.00	6,119.87	29.96	125.83	-41.85	1,174.42	-7,943.04	4,851.04	4,697.21	153.84	31.533	
10,100.00	6,943.45	6,121.00	6,119.87	30.26	125.83	-41.85	1,174.42	-7,943.04	4,753.88	4,599.82	154.06	30.858	
10,200.00	6,943.19	6,121.00	6,119.87	30.56	125.83	-41.85	1,174.42	-7,943.04	4,656.84	4,502.57	154.28	30.185	
10,300.00	6,942.93	6,121.00	6,119.87	30.86	125.83	-41.85	1,174.42	-7,943.04	4,559.93	4,405.44	154.49	29.517	
10,400.00	6,942.67	6,121.00	6,119.87	31.16	125.83	-41.85	1,174.42	-7,943.04	4,463.15	4,308.46	154.69	28.852	
10,500.00	6,942.41	6,121.00	6,119.87	31.46	125.83	-41.85	1,174.42	-7,943.04	4,366.52	4,211.63	154.89	28.191	
10,600.00	6,942.15	6,121.00	6,119.87	31.76	125.83	-41.85	1,174.42	-7,943.04	4,270.04	4,114.96	155.08	27.534	
10,700.00	6,941.89	6,121.00	6,119.87	32.06	125.83	-41.85	1,174.42	-7,943.04	4,173.73	4,018.46	155.26	26.881	
10,800.00	6,941.63	6,121.00	6,119.87	32.36	125.83	-41.85	1,174.42	-7,943.04	4,077.59	3,922.15	155.44	26.232	
10,900.00	6,941.37	6,121.00	6,119.87	32.66	125.83	-41.85	1,174.42	-7,943.04	3,981.65	3,826.04	155.61	25.588	
11,000.00	6,941.11	6,121.00	6,119.87	32.96	125.83	-41.85	1,174.42	-7,943.04	3,885.91	3,730.15	155.76	24.947	
11,100.00	6,940.86	6,121.00	6,119.87	33.26	125.83	-41.85	1,174.42	-7,943.04	3,790.39	3,634.48	155.91	24.311	
11,200.00	6,940.60	6,121.00	6,119.87	33.56	125.83	-41.85	1,174.42	-7,943.04	3,695.11	3,539.06	156.05	23.680	
11,300.00	6,940.34	6,121.00	6,119.87	33.86	125.83	-41.85	1,174.42	-7,943.04	3,600.08	3,443.92	156.17	23.053	
11,400.00	6,940.08	6,121.00	6,119.87	34.16	125.83	-41.85	1,174.42	-7,943.04	3,505.34	3,349.06	156.27	22.431	
11,500.00	6,939.82	6,121.00	6,119.87	34.46	125.83	-41.85	1,174.42	-7,943.04	3,410.89	3,254.52	156.37	21.814	
11,600.00	6,939.56	6,121.00	6,119.87	34.76	125.83	-41.85	1,174.42	-7,943.04	3,316.76	3,160.32	156.44	21.202	
11,700.00	6,939.30	6,121.00	6,119.87	35.06	125.83	-41.85	1,174.42	-7,943.04	3,222.99	3,066.50	156.49	20.595	
11,800.00	6,939.04	6,121.00	6,119.87	35.36	125.83	-41.85	1,174.42	-7,943.04	3,129.61	2,973.08	156.52	19.994	
11,900.00	6,938.78	6,121.00	6,119.87	35.66	125.83	-41.85	1,174.42	-7,943.04	3,036.64	2,880.11	156.53	19.399	
12,000.00	6,938.53	6,121.00	6,119.87	35.96	125.83	-41.85	1,174.42	-7,943.04	2,944.14	2,787.63	156.51	18.811	
12,100.00	6,938.27	6,121.00	6,119.87	36.26	125.83	-41.85	1,174.42	-7,943.04	2,852.15	2,695.68	156.46	18.229	
12,200.00	6,938.01	6,121.00	6,119.87	36.56	125.83	-41.85	1,174.42	-7,943.04	2,760.71	2,604.33	156.38	17.654	
12,300.00	6,937.75	6,121.00	6,119.87	36.86	125.83	-41.85	1,174.42	-7,943.04	2,669.88	2,513.63	156.26	17.087	
12,400.00	6,937.49	6,121.00	6,119.87	37.16	125.83	-41.85	1,174.42	-7,943.04	2,579.74	2,423.65	156.09	16.527	
12,500.00	6,937.23	6,121.00	6,119.87	37.46	125.83	-41.85	1,174.42	-7,943.04	2,490.34	2,334.47	155.88	15.976	
12,600.00	6,936.97	6,121.00	6,119.87	37.77	125.83	-41.85	1,174.42	-7,943.04	2,401.79	2,246.18	155.61	15.435	
12,700.00	6,936.71	6,121.00	6,119.87	38.07	125.83	-41.85	1,174.42	-7,943.04	2,314.16	2,158.89	155.27	14.904	
12,800.00	6,936.45	6,121.00	6,119.87	38.37	125.83	-41.85	1,174.42	-7,943.04	2,227.58	2,072.71	154.87	14.384	
12,900.00	6,936.20	6,121.00	6,119.87	38.67	125.83	-41.85	1,174.42	-7,943.04	2,142.17	1,987.78	154.39	13.875	
13,000.00	6,935.94	6,121.00	6,119.87	38.97	125.83	-41.85	1,174.42	-7,943.04	2,058.07	1,904.26	153.81	13.381	
13,100.00	6,935.68	6,121.00	6,119.87	39.27	125.83	-41.85	1,174.42	-7,943.04	1,975.45	1,822.32	153.13	12.900	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 175-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,200.00	6,935.42	6,121.00	6,119.87	39.57	125.83	-41.85	1,174.42	-7,943.04	1,894.52	1,742.18	152.34	12,436	
13,300.00	6,935.16	6,121.00	6,119.87	39.87	125.83	-41.85	1,174.42	-7,943.04	1,815.48	1,664.07	151.41	11,990	
13,400.00	6,934.90	6,121.00	6,119.87	40.17	125.83	-41.85	1,174.42	-7,943.04	1,738.60	1,588.26	150.34	11,564	
13,500.00	6,934.64	6,121.00	6,119.87	40.47	125.83	-41.85	1,174.42	-7,943.04	1,664.18	1,515.07	149.11	11,161	
13,600.00	6,934.38	6,121.00	6,119.87	40.77	125.83	-41.85	1,174.42	-7,943.04	1,592.56	1,444.86	147.70	10,782	
13,700.00	6,934.12	6,121.00	6,119.87	41.07	125.83	-41.85	1,174.42	-7,943.04	1,524.15	1,378.03	146.11	10,431	
13,800.00	6,933.87	6,121.00	6,119.87	41.37	125.83	-41.85	1,174.42	-7,943.04	1,459.38	1,315.04	144.34	10,111	
13,900.00	6,933.61	6,121.00	6,119.87	41.67	125.83	-41.85	1,174.42	-7,943.04	1,398.77	1,256.39	142.38	9,824	
14,000.00	6,933.35	6,121.00	6,119.87	41.97	125.83	-41.85	1,174.42	-7,943.04	1,342.88	1,202.60	140.28	9,573	
14,100.00	6,933.09	6,121.00	6,119.87	42.27	125.83	-41.85	1,174.42	-7,943.04	1,292.32	1,154.26	138.06	9,360	
14,200.00	6,932.83	6,121.00	6,119.87	42.57	125.83	-41.85	1,174.42	-7,943.04	1,247.74	1,111.91	135.83	9,186	
14,300.00	6,932.57	6,121.00	6,119.87	42.87	125.83	-41.85	1,174.42	-7,943.04	1,209.81	1,076.12	133.69	9,050	
14,400.00	6,932.31	6,121.00	6,119.87	43.17	125.83	-41.85	1,174.42	-7,943.04	1,179.15	1,047.36	131.79	8,947	
14,500.00	6,932.05	6,121.00	6,119.87	43.47	125.83	-41.85	1,174.42	-7,943.04	1,156.36	1,026.05	130.31	8,874	
14,600.00	6,931.79	6,121.00	6,119.87	43.77	125.83	-41.85	1,174.42	-7,943.04	1,141.90	1,012.48	129.42	8,823	
14,700.00	6,931.54	6,121.00	6,119.87	44.07	125.83	-41.85	1,174.42	-7,943.04	1,136.09	1,006.85	129.24	8,791	
14,716.16	6,931.49	6,121.00	6,119.87	44.12	125.83	-41.85	1,174.42	-7,943.04	1,135.97	1,006.69	129.28	8,787	CC, ES
14,800.00	6,931.28	6,121.00	6,119.87	44.37	125.83	-41.85	1,174.42	-7,943.04	1,139.06	1,009.23	129.83	8,773	
14,900.00	6,931.02	6,121.00	6,119.87	44.67	125.83	-41.85	1,174.42	-7,943.04	1,150.75	1,019.59	131.17	8,773	SF
15,000.00	6,930.76	6,121.00	6,119.87	44.97	125.83	-41.85	1,174.42	-7,943.04	1,170.90	1,037.77	133.12	8,796	
15,100.00	6,930.50	6,121.00	6,119.87	45.27	125.83	-41.85	1,174.42	-7,943.04	1,199.07	1,063.52	135.55	8,846	
15,200.00	6,930.24	6,121.00	6,119.87	45.57	125.83	-41.85	1,174.42	-7,943.04	1,234.72	1,096.46	138.26	8,930	
15,300.00	6,929.98	6,121.00	6,119.87	45.87	125.83	-41.85	1,174.42	-7,943.04	1,277.22	1,136.12	141.11	9,052	
15,400.00	6,929.72	6,121.00	6,119.87	46.17	125.83	-41.85	1,174.42	-7,943.04	1,325.92	1,181.97	143.95	9,211	
15,500.00	6,929.46	6,121.00	6,119.87	46.47	125.83	-41.85	1,174.42	-7,943.04	1,380.16	1,233.45	146.71	9,407	
15,600.00	6,929.21	6,121.00	6,119.87	46.77	125.83	-41.85	1,174.42	-7,943.04	1,439.31	1,289.98	149.32	9,639	
15,700.00	6,928.95	6,121.00	6,119.87	47.07	125.83	-41.85	1,174.42	-7,943.04	1,502.79	1,351.03	151.76	9,902	
15,800.00	6,928.69	6,121.00	6,119.87	47.37	125.83	-41.85	1,174.42	-7,943.04	1,570.08	1,416.07	154.01	10,195	
15,900.00	6,928.43	6,121.00	6,119.87	47.67	125.83	-41.85	1,174.42	-7,943.04	1,640.70	1,484.64	156.07	10,513	
16,000.00	6,928.17	6,121.00	6,119.87	47.97	125.83	-41.85	1,174.42	-7,943.04	1,714.26	1,556.31	157.95	10,853	
16,100.00	6,927.91	6,121.00	6,119.87	48.27	125.83	-41.85	1,174.42	-7,943.04	1,790.37	1,630.71	159.66	11,214	
16,200.00	6,927.65	6,121.00	6,119.87	48.57	125.83	-41.85	1,174.42	-7,943.04	1,868.75	1,707.52	161.23	11,591	
16,300.00	6,927.39	6,121.00	6,119.87	48.87	125.83	-41.85	1,174.42	-7,943.04	1,949.10	1,786.44	162.66	11,983	
16,400.00	6,927.13	6,121.00	6,119.87	49.17	125.83	-41.85	1,174.42	-7,943.04	2,031.19	1,867.23	163.96	12,388	
16,500.00	6,926.88	6,121.00	6,119.87	49.47	125.83	-41.85	1,174.42	-7,943.04	2,114.83	1,949.67	165.16	12,804	
16,600.00	6,926.62	6,121.00	6,119.87	49.77	125.83	-41.85	1,174.42	-7,943.04	2,199.84	2,033.57	166.27	13,231	
16,700.00	6,926.36	6,121.00	6,119.87	50.07	125.83	-41.85	1,174.42	-7,943.04	2,286.05	2,118.76	167.29	13,665	
16,800.00	6,926.10	6,121.00	6,119.87	50.37	125.83	-41.85	1,174.42	-7,943.04	2,373.35	2,205.12	168.24	14,107	
16,900.00	6,925.84	6,121.00	6,119.87	50.67	125.83	-41.85	1,174.42	-7,943.04	2,461.62	2,292.50	169.12	14,555	
17,000.00	6,925.58	6,121.00	6,119.87	50.97	125.83	-41.85	1,174.42	-7,943.04	2,550.75	2,380.81	169.95	15,009	
17,100.00	6,925.32	6,121.00	6,119.87	51.27	125.83	-41.85	1,174.42	-7,943.04	2,640.67	2,469.94	170.72	15,467	
17,200.00	6,925.06	6,121.00	6,119.87	51.58	125.83	-41.85	1,174.42	-7,943.04	2,731.28	2,559.82	171.45	15,930	
17,224.45	6,925.00	6,121.00	6,119.87	51.65	125.83	-41.85	1,174.42	-7,943.04	2,753.53	2,581.90	171.63	16,044	
17,224.92	6,925.00	6,121.00	6,119.87	51.65	125.83	-41.85	1,174.42	-7,943.04	2,753.96	2,582.33	171.63	16,046	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 5870-A028Ua_INC-ONLY_PLANNED_5_DEG													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	22.50	22.50	0.00	0.98	-86.70	612.83	-10,633.47	10,651.11					
100.00	100.00	122.50	122.50	0.23	5.35	-86.70	612.83	-10,633.47	10,651.11	10,645.54	5.57	1,911.622		
200.00	200.00	222.50	222.50	0.53	9.71	-86.70	612.83	-10,633.47	10,651.11	10,640.88	10.24	1,040.647		
300.00	300.00	322.50	322.50	0.83	14.07	-86.70	612.83	-10,633.47	10,651.11	10,636.21	14.90	714.916		
400.00	400.00	422.50	422.50	1.13	18.44	-86.70	612.83	-10,633.47	10,651.11	10,631.55	19.56	544.487		
500.00	500.00	522.50	522.50	1.43	22.80	-86.70	612.83	-10,633.47	10,651.11	10,626.89	24.23	439.674		
600.00	599.98	622.48	622.48	1.73	27.16	-79.45	612.83	-10,633.47	10,650.79	10,621.91	28.89	368.699		
700.00	699.84	722.34	722.34	2.03	31.52	-79.50	612.83	-10,633.47	10,649.84	10,616.29	33.54	317.483		
800.00	799.45	821.95	821.95	2.33	35.86	-79.58	612.83	-10,633.47	10,648.25	10,610.06	38.19	278.815		
900.00	898.70	921.20	921.20	2.63	40.20	-79.69	612.83	-10,633.47	10,646.04	10,603.22	42.82	248.613		
1,000.00	997.47	1,019.97	1,019.97	2.93	44.50	-79.82	612.83	-10,633.47	10,643.22	10,595.79	47.43	224.393		
1,100.00	1,095.62	1,118.12	1,118.12	3.23	48.79	-79.99	612.83	-10,633.47	10,639.82	10,587.80	52.01	204.557		
1,200.00	1,193.06	1,215.56	1,215.56	3.53	53.04	-80.18	612.83	-10,633.47	10,635.84	10,579.28	56.57	188.028		
1,300.00	1,289.64	1,312.14	1,312.14	3.83	57.25	-80.41	612.83	-10,633.47	10,631.33	10,570.25	61.08	174.056		
1,382.94	1,369.03	1,391.53	1,391.53	4.08	60.72	-80.61	612.83	-10,633.47	10,627.20	10,562.41	64.79	164.019		
1,400.00	1,385.28	1,407.78	1,407.78	4.13	61.43	-80.64	612.83	-10,633.47	10,626.32	10,560.76	65.55	162.103		
1,500.00	1,480.57	1,503.07	1,503.07	4.43	65.58	-80.79	612.83	-10,633.47	10,621.19	10,551.17	70.01	151.708		
1,600.00	1,575.86	1,598.36	1,598.36	4.73	69.74	-80.94	612.83	-10,633.47	10,616.14	10,541.67	74.47	142.559		
1,700.00	1,671.15	1,693.65	1,693.65	5.03	73.90	-81.10	612.83	-10,633.47	10,611.18	10,532.25	78.93	134.444		
1,800.00	1,766.44	1,788.94	1,788.94	5.33	78.06	-81.25	612.83	-10,633.47	10,606.30	10,522.91	83.38	127.198		
1,900.00	1,861.72	1,884.22	1,884.22	5.63	82.21	-81.41	612.83	-10,633.47	10,601.51	10,513.66	87.84	120.689		
2,000.00	1,957.01	1,979.51	1,979.51	5.93	86.37	-81.56	612.83	-10,633.47	10,596.80	10,504.50	92.30	114.809		
2,100.00	2,052.30	2,074.80	2,074.80	6.23	90.53	-81.72	612.83	-10,633.47	10,592.17	10,495.42	96.76	109.472		
2,200.00	2,147.59	2,170.09	2,170.09	6.53	94.69	-81.87	612.83	-10,633.47	10,587.63	10,486.42	101.21	104.606		
2,300.00	2,242.88	2,265.38	2,265.38	6.83	98.85	-82.03	612.83	-10,633.47	10,583.18	10,477.51	105.67	100.151		
2,400.00	2,338.16	2,360.66	2,360.66	7.13	103.00	-82.18	612.83	-10,633.47	10,578.81	10,468.68	110.13	96.057		
2,500.00	2,433.45	2,455.95	2,455.95	7.44	107.16	-82.34	612.83	-10,633.47	10,574.53	10,459.94	114.59	92.283		
2,600.00	2,528.74	2,551.24	2,551.24	7.74	111.32	-82.49	612.83	-10,633.47	10,570.33	10,451.28	119.05	88.792		
2,700.00	2,624.03	2,646.53	2,646.53	8.04	115.48	-82.65	612.83	-10,633.47	10,566.22	10,442.71	123.50	85.554		
2,800.00	2,719.32	2,741.82	2,741.82	8.34	119.63	-82.80	612.83	-10,633.47	10,562.19	10,434.23	127.96	82.542		
2,900.00	2,814.60	2,837.10	2,837.10	8.64	123.79	-82.96	612.83	-10,633.47	10,558.25	10,425.83	132.42	79.734		
3,000.00	2,909.89	2,932.39	2,932.39	8.94	127.95	-83.12	612.83	-10,633.47	10,554.39	10,417.51	136.88	77.109		
3,100.00	3,005.18	3,027.68	3,027.68	9.24	132.11	-83.27	612.83	-10,633.47	10,550.62	10,409.29	141.33	74.650		
3,200.00	3,100.47	3,122.97	3,122.97	9.54	136.27	-83.43	612.83	-10,633.47	10,546.94	10,401.14	145.79	72.342		
3,300.00	3,195.76	3,218.26	3,218.26	9.84	140.42	-83.58	612.83	-10,633.47	10,543.34	10,393.09	150.25	70.172		
3,400.00	3,291.04	3,313.54	3,313.54	10.14	144.58	-83.74	612.83	-10,633.47	10,539.83	10,385.12	154.71	68.128		
3,500.00	3,386.33	3,408.83	3,408.83	10.44	148.74	-83.90	612.83	-10,633.47	10,536.40	10,377.24	159.17	66.198		
3,600.00	3,481.62	3,504.12	3,504.12	10.74	152.90	-84.05	612.83	-10,633.47	10,533.06	10,369.44	163.62	64.374		
3,700.00	3,576.91	3,599.41	3,599.41	11.04	157.05	-84.21	612.83	-10,633.47	10,529.81	10,361.73	168.08	62.647		
3,800.00	3,672.20	3,694.70	3,694.70	11.34	161.21	-84.37	612.83	-10,633.47	10,526.64	10,354.10	172.54	61.010		
3,900.00	3,767.48	3,789.98	3,789.98	11.64	165.37	-84.52	612.83	-10,633.47	10,523.56	10,346.56	177.00	59.457		
4,000.00	3,862.77	3,885.27	3,885.27	11.94	169.53	-84.68	612.83	-10,633.47	10,520.57	10,339.11	181.45	57.979		
4,100.00	3,958.06	3,980.56	3,980.56	12.24	173.68	-84.84	612.83	-10,633.47	10,517.66	10,331.75	185.91	56.574		
4,200.00	4,053.35	4,075.85	4,075.85	12.54	177.84	-84.99	612.83	-10,633.47	10,514.84	10,324.47	190.37	55.234		
4,300.00	4,148.64	4,171.14	4,171.14	12.84	182.00	-85.15	612.83	-10,633.47	10,512.10	10,317.28	194.83	53.956		
4,400.00	4,243.92	4,266.42	4,266.42	13.14	186.16	-85.31	612.83	-10,633.47	10,509.46	10,310.17	199.28	52.736		
4,500.00	4,339.21	4,361.71	4,361.71	13.44	190.32	-85.46	612.83	-10,633.47	10,506.90	10,303.15	203.74	51.570		
4,600.00	4,434.50	4,457.00	4,457.00	13.74	194.47	-85.62	612.83	-10,633.47	10,504.42	10,296.22	208.20	50.454		
4,700.00	4,529.79	4,552.29	4,552.29	14.04	198.63	-85.78	612.83	-10,633.47	10,502.04	10,289.38	212.66	49.385		
4,800.00	4,625.08	4,647.58	4,647.58	14.34	202.79	-85.94	612.83	-10,633.47	10,499.74	10,282.62	217.12	48.360		
4,900.00	4,720.36	4,742.86	4,742.86	14.64	206.95	-86.09	612.83	-10,633.47	10,497.53	10,275.95	221.57	47.377		
5,000.00	4,815.65	4,838.15	4,838.15	14.94	211.10	-86.25	612.83	-10,633.47	10,495.40	10,269.37	226.03	46.434		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 5870-A028Ua_INC-ONLY_PLANNED_5_DEG													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	4,910.94	4,933.44	4,933.44	15.24	215.26	-86.41	612.83	-10,633.47	10,493.36	10,262.88	230.49	45.527		
5,200.00	5,006.23	5,028.73	5,028.73	15.54	219.42	-86.57	612.83	-10,633.47	10,491.41	10,256.47	234.95	44.655		
5,300.00	5,101.52	5,124.02	5,124.02	15.84	223.58	-86.72	612.83	-10,633.47	10,489.55	10,250.15	239.40	43.815		
5,400.00	5,196.80	5,219.30	5,219.30	16.14	227.74	-86.88	612.83	-10,633.47	10,487.78	10,243.91	243.86	43.007		
5,500.00	5,292.09	5,314.59	5,314.59	16.44	231.89	-87.04	612.83	-10,633.47	10,486.09	10,237.77	248.32	42.228		
5,600.00	5,387.38	5,409.88	5,409.88	16.74	236.05	-87.20	612.83	-10,633.47	10,484.49	10,231.71	252.78	41.477		
5,700.00	5,482.67	5,505.17	5,505.17	17.04	240.21	-87.35	612.83	-10,633.47	10,482.97	10,225.74	257.23	40.753		
5,800.00	5,577.96	5,600.46	5,600.46	17.34	244.37	-87.51	612.83	-10,633.47	10,481.55	10,219.86	261.69	40.053		
5,900.00	5,673.24	5,695.74	5,695.74	17.64	248.52	-87.67	612.83	-10,633.47	10,480.21	10,214.06	266.15	39.377		
6,000.00	5,768.53	5,791.03	5,791.03	17.94	252.68	-87.83	612.83	-10,633.47	10,478.96	10,208.35	270.61	38.724		
6,100.00	5,863.82	5,886.32	5,886.32	18.24	256.84	-87.99	612.83	-10,633.47	10,477.80	10,202.73	275.07	38.092		
6,200.00	5,959.11	5,981.61	5,981.61	18.54	261.00	-88.14	612.83	-10,633.47	10,476.72	10,197.20	279.52	37.481		
6,300.00	6,054.40	6,076.90	6,076.90	18.84	265.15	-88.30	612.83	-10,633.47	10,475.74	10,191.76	283.98	36.889		
6,400.00	6,149.68	6,172.18	6,172.18	19.14	269.31	-88.46	612.83	-10,633.47	10,474.84	10,186.40	288.44	36.316		
6,500.00	6,244.97	6,267.47	6,267.47	19.44	273.47	-88.62	612.83	-10,633.47	10,474.03	10,181.13	292.90	35.760		
6,600.00	6,340.26	6,362.76	6,362.76	19.74	277.63	-88.78	612.83	-10,633.47	10,473.30	10,175.95	297.35	35.222		
6,689.41	6,425.45	6,447.95	6,447.95	20.01	281.35	-88.92	612.83	-10,633.47	10,472.73	10,171.39	301.34	34.754		
6,694.75	6,430.55	6,453.05	6,453.05	20.02	281.57	-87.27	612.83	-10,633.47	10,472.67	10,171.10	301.58	34.726		
6,700.00	6,435.54	5,870.00	5,870.00	20.04	256.13	-84.68	612.83	-10,633.47	10,489.07	10,213.32	275.75	38.038		
6,750.00	6,482.96	5,870.00	5,870.00	20.19	256.13	-70.47	612.83	-10,633.47	10,488.47	10,212.64	275.83	38.025		
6,800.00	6,529.78	5,870.00	5,870.00	20.34	256.13	-59.03	612.83	-10,633.47	10,483.77	10,207.86	275.91	37.997		
6,850.00	6,575.63	5,870.00	5,870.00	20.49	256.13	-50.37	612.83	-10,633.47	10,475.01	10,199.02	275.98	37.955		
6,900.00	6,620.18	5,870.00	5,870.00	20.64	256.13	-43.96	612.83	-10,633.47	10,462.23	10,186.17	276.05	37.899		
6,950.00	6,663.07	5,870.00	5,870.00	20.79	256.13	-39.21	612.83	-10,633.47	10,445.52	10,169.40	276.12	37.830		
7,000.00	6,704.00	5,870.00	5,870.00	20.94	256.13	-35.68	612.83	-10,633.47	10,424.99	10,148.80	276.19	37.746		
7,050.00	6,742.63	5,870.00	5,870.00	21.09	256.13	-33.07	612.83	-10,633.47	10,400.77	10,124.52	276.25	37.650		
7,100.00	6,778.69	5,870.00	5,870.00	21.24	256.13	-31.17	612.83	-10,633.47	10,373.03	10,096.71	276.32	37.540		
7,150.00	6,811.89	5,870.00	5,870.00	21.39	256.13	-29.84	612.83	-10,633.47	10,341.94	10,065.55	276.39	37.419		
7,200.00	6,841.98	5,870.00	5,870.00	21.54	256.13	-29.01	612.83	-10,633.47	10,307.71	10,031.25	276.46	37.285		
7,250.00	6,868.74	5,870.00	5,870.00	21.69	256.13	-28.64	612.83	-10,633.47	10,270.58	9,994.05	276.53	37.141		
7,300.00	6,891.96	5,870.00	5,870.00	21.84	256.13	-28.76	612.83	-10,633.47	10,230.79	9,954.18	276.61	36.986		
7,350.00	6,911.46	5,870.00	5,870.00	21.99	256.13	-29.43	612.83	-10,633.47	10,188.63	9,911.93	276.70	36.822		
7,400.00	6,927.10	5,870.00	5,870.00	22.14	256.13	-30.82	612.83	-10,633.47	10,144.37	9,867.58	276.80	36.649		
7,450.00	6,938.75	5,870.00	5,870.00	22.29	256.13	-33.31	612.83	-10,633.47	10,098.35	9,821.44	276.90	36.469		
7,500.00	6,946.33	5,870.00	5,870.00	22.44	256.13	-37.71	612.83	-10,633.47	10,050.87	9,773.85	277.02	36.282		
7,550.00	6,949.78	5,870.00	5,870.00	22.59	256.13	-46.09	612.83	-10,633.47	10,002.29	9,725.15	277.14	36.091		
7,568.05	6,950.00	5,870.00	5,870.00	22.65	256.13	-51.04	612.83	-10,633.47	9,984.56	9,707.37	277.19	36.020		
7,600.00	6,949.92	5,870.00	5,870.00	22.74	256.13	-51.04	612.83	-10,633.47	9,953.08	9,675.80	277.28	35.896		
7,700.00	6,949.66	5,870.00	5,870.00	23.04	256.13	-51.04	612.83	-10,633.47	9,854.59	9,577.04	277.55	35.506		
7,800.00	6,949.40	5,870.00	5,870.00	23.35	256.13	-51.04	612.83	-10,633.47	9,756.12	9,478.31	277.82	35.117		
7,900.00	6,949.14	5,870.00	5,870.00	23.65	256.13	-51.04	612.83	-10,633.47	9,657.69	9,379.61	278.08	34.729		
8,000.00	6,948.88	5,870.00	5,870.00	23.95	256.13	-51.04	612.83	-10,633.47	9,559.29	9,280.94	278.35	34.343		
8,100.00	6,948.62	5,870.00	5,870.00	24.25	256.13	-51.04	612.83	-10,633.47	9,460.93	9,182.31	278.62	33.957		
8,200.00	6,948.36	5,870.00	5,870.00	24.55	256.13	-51.04	612.83	-10,633.47	9,362.60	9,083.72	278.88	33.572		
8,300.00	6,948.11	5,870.00	5,870.00	24.85	256.13	-51.04	612.83	-10,633.47	9,264.31	8,985.16	279.15	33.188		
8,400.00	6,947.85	5,870.00	5,870.00	25.15	256.13	-51.04	612.83	-10,633.47	9,166.05	8,886.64	279.41	32.805		
8,500.00	6,947.59	5,870.00	5,870.00	25.45	256.13	-51.04	612.83	-10,633.47	9,067.83	8,788.16	279.67	32.423		
8,600.00	6,947.33	5,870.00	5,870.00	25.75	256.13	-51.04	612.83	-10,633.47	8,969.65	8,689.72	279.93	32.043		
8,700.00	6,947.07	5,870.00	5,870.00	26.05	256.13	-51.04	612.83	-10,633.47	8,871.51	8,591.32	280.19	31.663		
8,800.00	6,946.81	5,870.00	5,870.00	26.35	256.13	-51.04	612.83	-10,633.47	8,773.41	8,492.97	280.45	31.284		
8,900.00	6,946.55	5,870.00	5,870.00	26.65	256.13	-51.04	612.83	-10,633.47	8,675.36	8,394.66	280.70	30.906		
9,000.00	6,946.29	5,870.00	5,870.00	26.95	256.13	-51.04	612.83	-10,633.47	8,577.35	8,296.40	280.95	30.529		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 5870-A028Ua_INC-ONLY_PLANNED_5_DEG												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	5,870.00	5,870.00	27.25	256.13	-51.04	612.83	-10,633.47	8,479.39	8,198.18	281.21	30.154	
9,200.00	6,945.78	5,870.00	5,870.00	27.55	256.13	-51.04	612.83	-10,633.47	8,381.48	8,100.02	281.46	29.779	
9,300.00	6,945.52	5,870.00	5,870.00	27.85	256.13	-51.04	612.83	-10,633.47	8,283.61	8,001.90	281.71	29.405	
9,400.00	6,945.26	5,870.00	5,870.00	28.15	256.13	-51.04	612.83	-10,633.47	8,185.80	7,903.84	281.95	29.032	
9,500.00	6,945.00	5,870.00	5,870.00	28.45	256.13	-51.04	612.83	-10,633.47	8,088.04	7,805.84	282.20	28.661	
9,600.00	6,944.74	5,870.00	5,870.00	28.75	256.13	-51.04	612.83	-10,633.47	7,990.34	7,707.89	282.44	28.290	
9,700.00	6,944.48	5,870.00	5,870.00	29.05	256.13	-51.04	612.83	-10,633.47	7,892.69	7,610.01	282.68	27.921	
9,800.00	6,944.22	5,870.00	5,870.00	29.35	256.13	-51.04	612.83	-10,633.47	7,795.10	7,512.18	282.92	27.552	
9,900.00	6,943.96	5,870.00	5,870.00	29.66	256.13	-51.04	612.83	-10,633.47	7,697.58	7,414.42	283.16	27.185	
10,000.00	6,943.70	5,870.00	5,870.00	29.96	256.13	-51.04	612.83	-10,633.47	7,600.12	7,316.73	283.39	26.818	
10,100.00	6,943.45	5,870.00	5,870.00	30.26	256.13	-51.04	612.83	-10,633.47	7,502.73	7,219.10	283.62	26.453	
10,200.00	6,943.19	5,870.00	5,870.00	30.56	256.13	-51.04	612.83	-10,633.47	7,405.40	7,121.55	283.85	26.089	
10,300.00	6,942.93	5,870.00	5,870.00	30.86	256.13	-51.04	612.83	-10,633.47	7,308.15	7,024.07	284.08	25.726	
10,400.00	6,942.67	5,870.00	5,870.00	31.16	256.13	-51.04	612.83	-10,633.47	7,210.98	6,926.67	284.30	25.364	
10,500.00	6,942.41	5,870.00	5,870.00	31.46	256.13	-51.04	612.83	-10,633.47	7,113.88	6,829.36	284.52	25.003	
10,600.00	6,942.15	5,870.00	5,870.00	31.76	256.13	-51.04	612.83	-10,633.47	7,016.86	6,732.12	284.74	24.643	
10,700.00	6,941.89	5,870.00	5,870.00	32.06	256.13	-51.04	612.83	-10,633.47	6,919.93	6,634.98	284.95	24.285	
10,800.00	6,941.63	5,870.00	5,870.00	32.36	256.13	-51.04	612.83	-10,633.47	6,823.09	6,537.93	285.16	23.927	
10,900.00	6,941.37	5,870.00	5,870.00	32.66	256.13	-51.04	612.83	-10,633.47	6,726.34	6,440.97	285.37	23.571	
11,000.00	6,941.11	5,870.00	5,870.00	32.96	256.13	-51.04	612.83	-10,633.47	6,629.68	6,344.11	285.57	23.216	
11,100.00	6,940.86	5,870.00	5,870.00	33.26	256.13	-51.04	612.83	-10,633.47	6,533.13	6,247.36	285.77	22.862	
11,200.00	6,940.60	5,870.00	5,870.00	33.56	256.13	-51.04	612.83	-10,633.47	6,436.68	6,150.72	285.96	22.509	
11,300.00	6,940.34	5,870.00	5,870.00	33.86	256.13	-51.04	612.83	-10,633.47	6,340.34	6,054.20	286.14	22.158	
11,400.00	6,940.08	5,870.00	5,870.00	34.16	256.13	-51.04	612.83	-10,633.47	6,244.12	5,957.79	286.33	21.808	
11,500.00	6,939.82	5,870.00	5,870.00	34.46	256.13	-51.04	612.83	-10,633.47	6,148.02	5,861.51	286.50	21.459	
11,600.00	6,939.56	5,870.00	5,870.00	34.76	256.13	-51.04	612.83	-10,633.47	6,052.04	5,765.37	286.68	21.111	
11,700.00	6,939.30	5,870.00	5,870.00	35.06	256.13	-51.04	612.83	-10,633.47	5,956.20	5,669.36	286.84	20.765	
11,800.00	6,939.04	5,870.00	5,870.00	35.36	256.13	-51.04	612.83	-10,633.47	5,860.49	5,573.49	287.00	20.420	
11,900.00	6,938.78	5,870.00	5,870.00	35.66	256.13	-51.04	612.83	-10,633.47	5,764.93	5,477.78	287.15	20.076	
12,000.00	6,938.53	5,870.00	5,870.00	35.96	256.13	-51.04	612.83	-10,633.47	5,669.53	5,382.23	287.29	19.734	
12,100.00	6,938.27	5,870.00	5,870.00	36.26	256.13	-51.04	612.83	-10,633.47	5,574.28	5,286.85	287.43	19.394	
12,200.00	6,938.01	5,870.00	5,870.00	36.56	256.13	-51.04	612.83	-10,633.47	5,479.21	5,191.65	287.56	19.054	
12,300.00	6,937.75	5,870.00	5,870.00	36.86	256.13	-51.04	612.83	-10,633.47	5,384.31	5,096.63	287.68	18.717	
12,400.00	6,937.49	5,870.00	5,870.00	37.16	256.13	-51.04	612.83	-10,633.47	5,289.60	5,001.82	287.79	18.380	
12,500.00	6,937.23	5,870.00	5,870.00	37.46	256.13	-51.04	612.83	-10,633.47	5,195.09	4,907.21	287.89	18.046	
12,600.00	6,936.97	5,870.00	5,870.00	37.77	256.13	-51.04	612.83	-10,633.47	5,100.79	4,812.82	287.97	17.713	
12,700.00	6,936.71	5,870.00	5,870.00	38.07	256.13	-51.04	612.83	-10,633.47	5,006.71	4,718.66	288.05	17.381	
12,800.00	6,936.45	5,870.00	5,870.00	38.37	256.13	-51.04	612.83	-10,633.47	4,912.86	4,624.75	288.11	17.052	
12,900.00	6,936.20	5,870.00	5,870.00	38.67	256.13	-51.04	612.83	-10,633.47	4,819.27	4,531.10	288.16	16.724	
13,000.00	6,935.94	5,870.00	5,870.00	38.97	256.13	-51.04	612.83	-10,633.47	4,725.93	4,437.73	288.20	16.398	
13,100.00	6,935.68	5,870.00	5,870.00	39.27	256.13	-51.04	612.83	-10,633.47	4,632.87	4,344.65	288.22	16.074	
13,200.00	6,935.42	5,870.00	5,870.00	39.57	256.13	-51.04	612.83	-10,633.47	4,540.11	4,251.88	288.22	15.752	
13,300.00	6,935.16	5,870.00	5,870.00	39.87	256.13	-51.04	612.83	-10,633.47	4,447.66	4,159.45	288.21	15.432	
13,400.00	6,934.90	5,870.00	5,870.00	40.17	256.13	-51.04	612.83	-10,633.47	4,355.54	4,067.37	288.18	15.114	
13,500.00	6,934.64	5,870.00	5,870.00	40.47	256.13	-51.04	612.83	-10,633.47	4,263.78	3,975.66	288.12	14.799	
13,600.00	6,934.38	5,870.00	5,870.00	40.77	256.13	-51.04	612.83	-10,633.47	4,172.40	3,884.36	288.04	14.485	
13,700.00	6,934.12	5,870.00	5,870.00	41.07	256.13	-51.04	612.83	-10,633.47	4,081.42	3,793.48	287.94	14.174	
13,800.00	6,933.87	5,870.00	5,870.00	41.37	256.13	-51.04	612.83	-10,633.47	3,990.88	3,703.06	287.82	13.866	
13,900.00	6,933.61	5,870.00	5,870.00	41.67	256.13	-51.04	612.83	-10,633.47	3,900.79	3,613.13	287.66	13.560	
14,000.00	6,933.35	5,870.00	5,870.00	41.97	256.13	-51.04	612.83	-10,633.47	3,811.20	3,523.73	287.47	13.258	
14,100.00	6,933.09	5,870.00	5,870.00	42.27	256.13	-51.04	612.83	-10,633.47	3,722.14	3,434.89	287.25	12.958	
14,200.00	6,932.83	5,870.00	5,870.00	42.57	256.13	-51.04	612.83	-10,633.47	3,633.65	3,346.66	287.00	12.661	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 020 - OH - OH - vert no surveys												Offset Site Error:	0.00 usft
Survey Program: 5870-A028Ua_INC-ONLY_PLANNED_5_DEG												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	5,870.00	5,870.00	42.87	256.13	-51.04	612.83	-10,633.47	3,545.78	3,259.07	286.70	12.367	
14,400.00	6,932.31	5,870.00	5,870.00	43.17	256.13	-51.04	612.83	-10,633.47	3,458.56	3,172.19	286.36	12.077	
14,500.00	6,932.05	5,870.00	5,870.00	43.47	256.13	-51.04	612.83	-10,633.47	3,372.05	3,086.07	285.98	11.791	
14,600.00	6,931.79	5,870.00	5,870.00	43.77	256.13	-51.04	612.83	-10,633.47	3,286.30	3,000.75	285.55	11.509	
14,700.00	6,931.54	5,870.00	5,870.00	44.07	256.13	-51.04	612.83	-10,633.47	3,201.39	2,916.33	285.06	11.231	
14,800.00	6,931.28	5,870.00	5,870.00	44.37	256.13	-51.04	612.83	-10,633.47	3,117.36	2,832.85	284.52	10.957	
14,900.00	6,931.02	5,870.00	5,870.00	44.67	256.13	-51.04	612.83	-10,633.47	3,034.31	2,750.41	283.91	10.688	
15,000.00	6,930.76	5,870.00	5,870.00	44.97	256.13	-51.04	612.83	-10,633.47	2,952.31	2,669.08	283.23	10.424	
15,100.00	6,930.50	5,870.00	5,870.00	45.27	256.13	-51.04	612.83	-10,633.47	2,871.45	2,588.97	282.48	10.165	
15,200.00	6,930.24	5,870.00	5,870.00	45.57	256.13	-51.04	612.83	-10,633.47	2,791.83	2,510.18	281.65	9.912	
15,300.00	6,929.98	5,870.00	5,870.00	45.87	256.13	-51.04	612.83	-10,633.47	2,713.56	2,432.82	280.73	9.666	
15,400.00	6,929.72	5,870.00	5,870.00	46.17	256.13	-51.04	612.83	-10,633.47	2,636.75	2,357.03	279.73	9.426	
15,500.00	6,929.46	5,870.00	5,870.00	46.47	256.13	-51.04	612.83	-10,633.47	2,561.55	2,282.93	278.63	9.194	
15,600.00	6,929.21	5,870.00	5,870.00	46.77	256.13	-51.04	612.83	-10,633.47	2,488.10	2,210.68	277.42	8.969	
15,700.00	6,928.95	5,870.00	5,870.00	47.07	256.13	-51.04	612.83	-10,633.47	2,416.55	2,140.44	276.12	8.752	
15,800.00	6,928.69	5,870.00	5,870.00	47.37	256.13	-51.04	612.83	-10,633.47	2,347.09	2,072.38	274.70	8.544	
15,900.00	6,928.43	5,870.00	5,870.00	47.67	256.13	-51.04	612.83	-10,633.47	2,279.89	2,006.71	273.18	8.346	
16,000.00	6,928.17	5,870.00	5,870.00	47.97	256.13	-51.04	612.83	-10,633.47	2,215.17	1,943.62	271.55	8.157	
16,100.00	6,927.91	5,870.00	5,870.00	48.27	256.13	-51.04	612.83	-10,633.47	2,153.16	1,883.33	269.82	7.980	
16,200.00	6,927.65	5,870.00	5,870.00	48.57	256.13	-51.04	612.83	-10,633.47	2,094.08	1,826.08	268.00	7.814	
16,300.00	6,927.39	5,870.00	5,870.00	48.87	256.13	-51.04	612.83	-10,633.47	2,038.20	1,772.10	266.10	7.660	
16,400.00	6,927.13	5,870.00	5,870.00	49.17	256.13	-51.04	612.83	-10,633.47	1,985.78	1,721.64	264.14	7.518	
16,500.00	6,926.88	5,870.00	5,870.00	49.47	256.13	-51.04	612.83	-10,633.47	1,937.12	1,674.96	262.16	7.389	
16,600.00	6,926.62	5,870.00	5,870.00	49.77	256.13	-51.04	612.83	-10,633.47	1,892.49	1,632.30	260.19	7.274	
16,700.00	6,926.36	5,870.00	5,870.00	50.07	256.13	-51.04	612.83	-10,633.47	1,852.19	1,593.91	258.27	7.171	
16,800.00	6,926.10	5,870.00	5,870.00	50.37	256.13	-51.04	612.83	-10,633.47	1,816.50	1,560.03	256.47	7.083	
16,900.00	6,925.84	5,870.00	5,870.00	50.67	256.13	-51.04	612.83	-10,633.47	1,785.71	1,530.87	254.84	7.007	
17,000.00	6,925.58	5,870.00	5,870.00	50.97	256.13	-51.04	612.83	-10,633.47	1,760.07	1,506.63	253.44	6.945	
17,100.00	6,925.32	5,870.00	5,870.00	51.27	256.13	-51.04	612.83	-10,633.47	1,739.81	1,487.46	252.35	6.895	
17,200.00	6,925.06	5,870.00	5,870.00	51.58	256.13	-51.04	612.83	-10,633.47	1,725.12	1,473.51	251.60	6.856	
17,224.45	6,925.00	5,870.00	5,870.00	51.65	256.13	-51.04	612.83	-10,633.47	1,722.39	1,470.91	251.48	6.849	
17,224.92	6,925.00	5,870.00	5,870.00	51.65	256.13	-51.04	612.83	-10,633.47	1,722.34	1,470.86	251.48	6.849 CC, ES, SF	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 163-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	83.50	83.50	0.00	0.74	-80.18	1,755.64	-10,142.28	10,293.11				
100.00	100.00	183.50	183.50	0.23	1.81	-80.18	1,755.64	-10,142.28	10,293.11	10,291.08	2.03	5,061.424	
200.00	200.00	287.48	287.48	0.53	3.65	-80.18	1,755.63	-10,142.28	10,293.11	10,288.94	4.18	2,464.930	
213.45	213.45	301.82	301.82	0.57	3.90	-80.18	1,755.60	-10,142.28	10,293.11	10,288.64	4.47	2,302.554	
300.00	300.00	383.50	383.50	0.83	5.47	-80.18	1,755.64	-10,142.28	10,293.11	10,286.82	6.29	1,635.604	
400.00	400.00	483.50	483.50	1.13	7.36	-80.18	1,755.64	-10,142.28	10,293.11	10,284.63	8.48	1,213.420	
500.00	500.00	584.11	584.11	1.43	9.26	-80.18	1,755.91	-10,142.28	10,293.16	10,282.48	10.68	963.435	
600.00	599.98	685.59	685.59	1.73	11.17	-72.93	1,755.83	-10,142.28	10,292.64	10,279.73	12.90	797.792	
700.00	699.84	818.63	783.34	2.03	13.73	-72.99	1,755.64	-10,142.28	10,291.07	10,275.31	15.75	653.308	
800.00	799.45	882.99	882.95	2.33	15.08	-73.09	1,755.64	-10,142.28	10,288.52	10,271.11	17.40	591.162	
900.00	898.70	982.24	982.20	2.63	17.16	-73.22	1,755.64	-10,142.28	10,284.96	10,265.17	19.79	519.752	
1,000.00	997.47	1,081.00	1,080.97	2.93	19.24	-73.39	1,755.64	-10,142.28	10,280.41	10,258.25	22.16	463.868	
1,100.00	1,095.62	1,179.16	1,179.12	3.23	21.30	-73.60	1,755.64	-10,142.28	10,274.90	10,250.37	24.52	418.977	
1,200.00	1,193.06	1,276.59	1,276.56	3.53	23.34	-73.84	1,755.64	-10,142.28	10,268.44	10,241.57	26.87	382.153	
1,300.00	1,289.64	1,375.50	1,375.44	3.83	25.42	-74.11	1,757.74	-10,142.28	10,261.40	10,232.15	29.25	350.852	
1,382.94	1,369.03	1,457.19	1,457.13	4.08	27.14	-74.37	1,757.57	-10,142.28	10,254.58	10,223.37	31.21	328.550	
1,400.00	1,385.28	1,473.92	1,473.85	4.13	27.49	-74.39	1,757.52	-10,142.28	10,253.11	10,221.50	31.61	324.322	
1,500.00	1,480.57	1,571.87	1,571.80	4.43	29.54	-74.56	1,757.13	-10,142.28	10,244.56	10,210.59	33.97	301.567	
1,600.00	1,575.86	1,669.72	1,669.64	4.73	31.60	-74.72	1,756.57	-10,142.28	10,236.06	10,199.74	36.33	281.784	
1,700.00	1,671.15	1,827.17	1,754.65	5.03	34.89	-74.87	1,755.64	-10,142.28	10,227.59	10,187.68	39.91	256.253	
1,800.00	1,766.44	1,865.10	1,865.00	5.33	35.70	-75.05	1,754.94	-10,142.29	10,219.26	10,178.23	41.03	249.073	
1,900.00	1,861.72	1,945.41	1,945.22	5.63	37.30	-75.18	1,755.64	-10,142.28	10,211.19	10,168.26	42.93	237.864	
2,000.00	1,957.01	2,040.70	2,040.51	5.93	39.25	-75.34	1,755.64	-10,142.28	10,203.12	10,157.94	45.18	225.852	
2,100.00	2,052.30	2,140.86	2,140.66	6.23	41.30	-75.50	1,756.56	-10,142.28	10,195.26	10,147.73	47.52	214.532	
2,200.00	2,147.59	2,240.85	2,240.65	6.53	43.34	-75.67	1,756.04	-10,142.28	10,187.28	10,137.42	49.87	204.290	
2,300.00	2,242.88	2,340.63	2,340.41	6.83	45.38	-75.84	1,755.17	-10,142.28	10,179.35	10,127.14	52.21	194.984	
2,400.00	2,338.16	2,421.91	2,421.66	7.13	47.04	-75.97	1,755.64	-10,142.28	10,171.66	10,117.50	54.17	187.781	
2,500.00	2,433.45	2,517.20	2,516.95	7.44	48.99	-76.13	1,755.64	-10,142.28	10,164.01	10,107.60	56.42	180.163	
2,600.00	2,528.74	2,615.02	2,614.76	7.74	50.99	-76.29	1,756.37	-10,142.28	10,156.53	10,097.82	58.72	172.979	
2,700.00	2,624.03	2,713.44	2,713.19	8.04	53.00	-76.45	1,756.04	-10,142.28	10,149.01	10,087.98	61.03	166.303	
2,800.00	2,719.32	2,811.71	2,811.45	8.34	55.01	-76.62	1,755.46	-10,142.28	10,141.55	10,078.21	63.34	160.123	
2,900.00	2,814.60	2,898.41	2,898.10	8.64	56.87	-76.76	1,755.64	-10,142.28	10,134.25	10,068.76	65.50	154.732	
3,000.00	2,909.89	2,993.70	2,993.39	8.94	58.89	-76.92	1,755.64	-10,142.28	10,127.02	10,059.21	67.82	149.328	
3,100.00	3,005.18	3,090.44	3,090.13	9.24	60.94	-77.08	1,756.77	-10,142.28	10,120.01	10,049.84	70.17	144.221	
3,200.00	3,100.47	3,189.21	3,188.88	9.54	63.04	-77.25	1,756.47	-10,142.28	10,112.92	10,040.35	72.57	139.363	
3,300.00	3,195.76	3,350.36	3,279.26	9.84	66.46	-77.40	1,755.64	-10,142.28	10,105.86	10,029.57	76.29	132.474	
3,400.00	3,291.04	3,374.93	3,374.54	10.14	66.98	-77.56	1,755.64	-10,142.28	10,098.98	10,021.87	77.11	130.973	
3,500.00	3,386.33	3,470.22	3,469.83	10.44	69.00	-77.73	1,755.64	-10,142.28	10,092.18	10,012.75	79.43	127.057	
3,600.00	3,481.62	3,568.13	3,567.74	10.74	71.08	-77.89	1,756.39	-10,142.28	10,085.54	10,003.73	81.81	123.281	
3,700.00	3,576.91	3,739.15	3,660.41	11.04	74.71	-78.05	1,755.64	-10,142.28	10,078.85	9,993.11	85.74	117.549	
3,800.00	3,672.20	3,756.14	3,755.70	11.34	75.08	-78.21	1,755.64	-10,142.28	10,072.31	9,985.91	86.40	116.574	
3,900.00	3,767.48	3,851.43	3,850.98	11.64	77.10	-78.37	1,755.64	-10,142.28	10,065.87	9,977.14	88.73	113.448	
4,000.00	3,862.77	3,946.71	3,946.27	11.94	79.12	-78.53	1,755.64	-10,142.28	10,059.51	9,968.45	91.05	110.482	
4,100.00	3,958.06	4,044.36	4,043.90	12.24	81.20	-78.69	1,756.64	-10,142.28	10,053.31	9,959.89	93.43	107.607	
4,200.00	4,053.35	4,294.63	4,136.85	12.54	86.52	-78.85	1,755.64	-10,142.28	10,047.05	9,948.00	99.04	101.440	
4,300.00	4,148.64	4,239.71	4,239.24	12.84	85.35	-79.03	1,755.42	-10,142.28	10,040.93	9,942.76	98.18	102.275	
4,400.00	4,243.92	4,327.95	4,327.42	13.14	87.23	-79.18	1,755.64	-10,142.28	10,034.94	9,934.59	100.35	99.997	
4,500.00	4,339.21	4,423.23	4,422.71	13.44	89.25	-79.34	1,755.64	-10,142.28	10,029.02	9,926.34	102.68	97.675	
4,600.00	4,434.50	4,518.52	4,518.00	13.74	91.28	-79.50	1,755.64	-10,142.28	10,023.18	9,918.18	105.00	95.456	
4,700.00	4,529.79	4,613.81	4,613.29	14.04	93.30	-79.67	1,755.64	-10,142.28	10,017.44	9,910.11	107.33	93.334	
4,800.00	4,625.08	4,709.10	4,708.58	14.34	95.33	-79.83	1,755.64	-10,142.28	10,011.78	9,902.13	109.65	91.303	
4,900.00	4,720.36	4,805.29	4,804.75	14.64	97.37	-79.98	1,757.74	-10,142.28	10,006.33	9,894.33	112.00	89.343	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 020B - OH - OH - inc only												Offset Site Error:	0.00 usft
Survey Program: 163-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,815.65	4,901.44	4,900.90	14.94	99.42	-80.15	1,757.51	-10,142.28	10,000.83	9,886.49	114.34	87.463	
5,100.00	4,910.94	4,997.50	4,996.94	15.24	101.46	-80.32	1,757.11	-10,142.28	9,995.42	9,878.73	116.68	85.662	
5,200.00	5,006.23	5,093.45	5,092.89	15.54	103.50	-80.48	1,756.56	-10,142.28	9,990.09	9,871.06	119.02	83.933	
5,300.00	5,101.52	5,240.31	5,185.02	15.84	106.62	-80.65	1,755.64	-10,142.28	9,984.83	9,862.39	122.45	81.544	
5,400.00	5,196.80	5,285.06	5,284.48	16.14	107.57	-80.82	1,754.96	-10,142.29	9,979.69	9,855.99	123.70	80.678	
5,500.00	5,292.09	5,376.27	5,375.59	16.44	109.51	-80.98	1,755.64	-10,142.28	9,974.68	9,848.74	125.94	79.203	
5,600.00	5,387.38	5,471.55	5,470.88	16.74	111.54	-81.14	1,755.64	-10,142.28	9,969.74	9,841.47	128.26	77.728	
5,700.00	5,482.67	5,566.84	5,566.17	17.04	113.56	-81.30	1,755.64	-10,142.28	9,964.89	9,834.29	130.59	76.306	
5,800.00	5,577.96	5,662.13	5,661.46	17.34	115.59	-81.47	1,755.64	-10,142.28	9,960.12	9,827.21	132.92	74.935	
5,900.00	5,673.24	5,757.42	5,756.74	17.64	117.62	-81.63	1,755.64	-10,142.28	9,955.45	9,820.21	135.24	73.612	
6,000.00	5,768.53	5,852.71	5,852.03	17.94	119.64	-81.80	1,755.64	-10,142.28	9,950.87	9,813.30	137.57	72.333	
6,100.00	5,863.82	5,947.99	5,947.32	18.24	121.67	-81.96	1,755.64	-10,142.28	9,946.38	9,806.48	139.90	71.098	
6,200.00	5,959.11	6,043.28	6,042.61	18.54	123.70	-82.13	1,755.64	-10,142.28	9,941.98	9,799.75	142.22	69.905	
6,300.00	6,054.40	6,138.57	6,137.90	18.84	125.72	-82.29	1,755.64	-10,142.28	9,937.67	9,793.12	144.55	68.750	
6,400.00	6,149.68	6,233.86	6,233.18	19.14	127.75	-82.46	1,755.64	-10,142.28	9,933.45	9,786.57	146.87	67.632	
6,500.00	6,244.97	6,329.15	6,328.47	19.44	129.78	-82.63	1,755.64	-10,142.28	9,929.22	9,781.86	149.19	66.514	
6,600.00	6,340.26	6,424.44	6,423.76	19.74	131.81	-82.80	1,755.64	-10,142.28	9,925.00	9,777.15	151.51	65.396	
6,689.41	6,425.45	6,509.73	6,509.05	20.01	133.84	-82.97	1,755.64	-10,142.28	9,920.78	9,772.44	153.83	64.278	
6,700.00	6,435.54	6,519.82	6,519.14	20.04	134.88	-79.03	1,755.64	-10,142.28	9,928.32	9,782.52	145.80	68.097	
6,750.00	6,482.96	6,567.24	6,566.56	20.19	136.91	-64.81	1,755.64	-10,142.28	9,925.19	9,779.26	145.92	68.016	
6,800.00	6,529.78	6,614.06	6,613.38	20.34	138.94	-53.32	1,755.64	-10,142.28	9,917.97	9,771.92	146.05	67.909	
6,850.00	6,575.63	6,660.91	6,660.23	20.49	140.97	-44.57	1,755.64	-10,142.28	9,906.71	9,760.54	146.17	67.776	
6,900.00	6,620.18	6,707.76	6,707.08	20.64	143.00	-38.02	1,755.64	-10,142.28	9,891.48	9,745.20	146.29	67.617	
6,950.00	6,663.07	6,754.61	6,753.93	20.79	145.03	-33.08	1,755.64	-10,142.28	9,872.38	9,725.98	146.41	67.432	
7,000.00	6,704.00	6,799.54	6,798.86	20.94	147.06	-29.31	1,755.64	-10,142.28	9,849.53	9,703.01	146.52	67.222	
7,050.00	6,742.63	6,846.39	6,845.71	21.09	149.09	-26.38	1,755.64	-10,142.28	9,823.08	9,676.45	146.64	66.989	
7,100.00	6,778.69	6,893.24	6,892.56	21.24	151.12	-24.07	1,755.64	-10,142.28	9,793.21	9,646.45	146.75	66.732	
7,150.00	6,811.89	6,939.09	6,938.41	21.39	153.15	-22.23	1,755.64	-10,142.28	9,760.10	9,613.23	146.87	66.454	
7,200.00	6,841.98	6,984.94	6,984.26	21.54	155.18	-20.74	1,755.64	-10,142.28	9,723.98	9,576.99	146.99	66.155	
7,250.00	6,868.74	6,999.68	6,999.00	21.69	157.21	-19.52	1,755.64	-10,142.28	9,685.09	9,537.98	147.11	65.838	
7,300.00	6,891.96	6,999.68	6,999.00	21.84	159.24	-18.52	1,755.64	-10,142.28	9,643.70	9,496.47	147.23	65.502	
7,350.00	6,911.46	6,999.68	6,999.00	21.99	161.27	-17.67	1,755.64	-10,142.28	9,600.09	9,452.74	147.35	65.151	
7,400.00	6,927.10	6,999.68	6,999.00	22.14	163.30	-16.91	1,755.64	-10,142.28	9,554.57	9,407.09	147.48	64.786	
7,450.00	6,938.75	6,999.68	6,999.00	22.29	165.33	-16.17	1,755.64	-10,142.28	9,507.46	9,359.84	147.61	64.409	
7,500.00	6,946.33	6,999.68	6,999.00	22.44	167.36	-15.26	1,755.64	-10,142.28	9,459.08	9,311.34	147.75	64.023	
7,550.00	6,949.78	6,999.68	6,999.00	22.59	169.39	-13.53	1,755.64	-10,142.28	9,409.81	9,261.92	147.89	63.629	
7,568.05	6,950.00	6,999.68	6,999.00	22.65	171.42	-12.19	1,755.64	-10,142.28	9,391.87	9,243.94	147.94	63.485	
7,600.00	6,949.92	6,999.68	6,999.00	22.74	173.45	-12.19	1,755.64	-10,142.28	9,360.06	9,212.03	148.03	63.230	
7,700.00	6,949.66	6,999.68	6,999.00	23.04	175.48	-12.19	1,755.64	-10,142.28	9,260.51	9,112.19	148.32	62.436	
7,800.00	6,949.40	6,999.68	6,999.00	23.35	177.51	-12.19	1,755.64	-10,142.28	9,160.98	9,012.37	148.61	61.645	
7,900.00	6,949.14	6,999.68	6,999.00	23.65	179.54	-12.19	1,755.64	-10,142.28	9,061.45	8,912.55	148.90	60.857	
8,000.00	6,948.88	6,999.68	6,999.00	23.95	181.57	-12.19	1,755.64	-10,142.28	8,961.93	8,812.75	149.19	60.072	
8,100.00	6,948.62	6,999.68	6,999.00	24.25	183.60	-12.19	1,755.64	-10,142.28	8,862.43	8,712.96	149.47	59.291	
8,200.00	6,948.36	6,999.68	6,999.00	24.55	185.63	-12.19	1,755.64	-10,142.28	8,762.93	8,613.17	149.76	58.513	
8,300.00	6,948.11	6,999.68	6,999.00	24.85	187.66	-12.19	1,755.64	-10,142.28	8,663.45	8,513.40	150.05	57.738	
8,400.00	6,947.85	6,999.68	6,999.00	25.15	189.69	-12.19	1,755.64	-10,142.28	8,563.98	8,413.65	150.33	56.967	
8,500.00	6,947.59	6,999.68	6,999.00	25.45	191.72	-12.19	1,755.64	-10,142.28	8,464.52	8,313.90	150.62	56.198	
8,600.00	6,947.33	6,999.68	6,999.00	25.75	193.75	-12.19	1,755.64	-10,142.28	8,365.08	8,214.17	150.90	55.433	
8,700.00	6,947.07	6,999.68	6,999.00	26.05	195.78	-12.19	1,755.64	-10,142.28	8,265.65	8,114.46	151.19	54.671	
8,800.00	6,946.81	6,999.68	6,999.00	26.35	197.81	-12.19	1,755.64	-10,142.28	8,166.23	8,014.76	151.47	53.913	
8,900.00	6,946.55	6,999.68	6,999.00	26.65	199.84	-12.19	1,755.64	-10,142.28	8,066.82	7,915.07	151.75	53.157	
9,000.00	6,946.29	6,999.68	6,999.00	26.95	201.87	-12.19	1,755.64	-10,142.28	7,967.43	7,815.40	152.04	52.405	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 163-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	6,145.00	6,144.18	27.25	125.86	-12.19	1,755.64	-10,142.28	7,868.06	7,715.74	152.32	51.655	
9,200.00	6,945.78	6,145.00	6,144.18	27.55	125.86	-12.19	1,755.64	-10,142.28	7,768.70	7,616.10	152.60	50.909	
9,300.00	6,945.52	6,145.00	6,144.18	27.85	125.86	-12.19	1,755.64	-10,142.28	7,669.36	7,516.48	152.88	50.166	
9,400.00	6,945.26	6,145.00	6,144.18	28.15	125.86	-12.19	1,755.64	-10,142.28	7,570.04	7,416.88	153.16	49.426	
9,500.00	6,945.00	6,145.00	6,144.18	28.45	125.86	-12.19	1,755.64	-10,142.28	7,470.74	7,317.30	153.44	48.689	
9,600.00	6,944.74	6,145.00	6,144.18	28.75	125.86	-12.19	1,755.64	-10,142.28	7,371.45	7,217.73	153.72	47.955	
9,700.00	6,944.48	6,145.00	6,144.18	29.05	125.86	-12.19	1,755.64	-10,142.28	7,272.18	7,118.19	153.99	47.224	
9,800.00	6,944.22	6,145.00	6,144.18	29.35	125.86	-12.19	1,755.64	-10,142.28	7,172.94	7,018.67	154.27	46.497	
9,900.00	6,943.96	6,145.00	6,144.18	29.66	125.86	-12.19	1,755.64	-10,142.28	7,073.71	6,919.17	154.54	45.772	
10,000.00	6,943.70	6,145.00	6,144.18	29.96	125.86	-12.19	1,755.64	-10,142.28	6,974.51	6,819.69	154.82	45.050	
10,100.00	6,943.45	6,145.00	6,144.18	30.26	125.86	-12.19	1,755.64	-10,142.28	6,875.33	6,720.24	155.09	44.332	
10,200.00	6,943.19	6,145.00	6,144.18	30.56	125.86	-12.19	1,755.64	-10,142.28	6,776.17	6,620.81	155.36	43.616	
10,300.00	6,942.93	6,145.00	6,144.18	30.86	125.86	-12.19	1,755.64	-10,142.28	6,677.04	6,521.41	155.63	42.904	
10,400.00	6,942.67	6,145.00	6,144.18	31.16	125.86	-12.19	1,755.64	-10,142.28	6,577.94	6,422.04	155.90	42.194	
10,500.00	6,942.41	6,145.00	6,144.18	31.46	125.86	-12.19	1,755.64	-10,142.28	6,478.86	6,322.70	156.16	41.487	
10,600.00	6,942.15	6,145.00	6,144.18	31.76	125.86	-12.19	1,755.64	-10,142.28	6,379.81	6,223.38	156.43	40.784	
10,700.00	6,941.89	6,145.00	6,144.18	32.06	125.86	-12.19	1,755.64	-10,142.28	6,280.80	6,124.10	156.69	40.083	
10,800.00	6,941.63	6,145.00	6,144.18	32.36	125.86	-12.19	1,755.64	-10,142.28	6,181.81	6,024.85	156.95	39.386	
10,900.00	6,941.37	6,145.00	6,144.18	32.66	125.86	-12.19	1,755.64	-10,142.28	6,082.86	5,925.64	157.21	38.691	
11,000.00	6,941.11	6,145.00	6,144.18	32.96	125.86	-12.19	1,755.64	-10,142.28	5,983.94	5,826.47	157.47	38.000	
11,100.00	6,940.86	6,145.00	6,144.18	33.26	125.86	-12.19	1,755.64	-10,142.28	5,885.06	5,727.33	157.73	37.311	
11,200.00	6,940.60	6,145.00	6,144.18	33.56	125.86	-12.19	1,755.64	-10,142.28	5,786.21	5,628.23	157.98	36.626	
11,300.00	6,940.34	6,145.00	6,144.18	33.86	125.86	-12.19	1,755.64	-10,142.28	5,687.41	5,529.18	158.23	35.943	
11,400.00	6,940.08	6,145.00	6,144.18	34.16	125.86	-12.19	1,755.64	-10,142.28	5,588.65	5,430.17	158.48	35.264	
11,500.00	6,939.82	6,145.00	6,144.18	34.46	125.86	-12.19	1,755.64	-10,142.28	5,489.94	5,331.21	158.73	34.587	
11,600.00	6,939.56	6,145.00	6,144.18	34.76	125.86	-12.19	1,755.64	-10,142.28	5,391.27	5,232.30	158.97	33.914	
11,700.00	6,939.30	6,145.00	6,144.18	35.06	125.86	-12.19	1,755.64	-10,142.28	5,292.65	5,133.44	159.21	33.244	
11,800.00	6,939.04	6,145.00	6,144.18	35.36	125.86	-12.19	1,755.64	-10,142.28	5,194.09	5,034.64	159.44	32.576	
11,900.00	6,938.78	6,145.00	6,144.18	35.66	125.86	-12.19	1,755.64	-10,142.28	5,095.58	4,935.90	159.68	31.912	
12,000.00	6,938.53	6,145.00	6,144.18	35.96	125.86	-12.19	1,755.64	-10,142.28	4,997.13	4,837.22	159.90	31.251	
12,100.00	6,938.27	6,145.00	6,144.18	36.26	125.86	-12.19	1,755.64	-10,142.28	4,898.74	4,738.61	160.13	30.593	
12,200.00	6,938.01	6,145.00	6,144.18	36.56	125.86	-12.19	1,755.64	-10,142.28	4,800.42	4,640.07	160.35	29.938	
12,300.00	6,937.75	6,145.00	6,144.18	36.86	125.86	-12.19	1,755.64	-10,142.28	4,702.17	4,541.61	160.56	29.286	
12,400.00	6,937.49	6,145.00	6,144.18	37.16	125.86	-12.19	1,755.64	-10,142.28	4,604.00	4,443.23	160.77	28.638	
12,500.00	6,937.23	6,145.00	6,144.18	37.46	125.86	-12.19	1,755.64	-10,142.28	4,505.90	4,344.93	160.97	27.992	
12,600.00	6,936.97	6,145.00	6,144.18	37.77	125.86	-12.19	1,755.64	-10,142.28	4,407.89	4,246.73	161.16	27.350	
12,700.00	6,936.71	6,145.00	6,144.18	38.07	125.86	-12.19	1,755.64	-10,142.28	4,309.98	4,148.63	161.35	26.712	
12,800.00	6,936.45	6,145.00	6,144.18	38.37	125.86	-12.19	1,755.64	-10,142.28	4,212.16	4,050.63	161.53	26.076	
12,900.00	6,936.20	6,145.00	6,144.18	38.67	125.86	-12.19	1,755.64	-10,142.28	4,114.45	3,952.74	161.70	25.444	
13,000.00	6,935.94	6,145.00	6,144.18	38.97	125.86	-12.19	1,755.64	-10,142.28	4,016.84	3,854.98	161.87	24.816	
13,100.00	6,935.68	6,145.00	6,144.18	39.27	125.86	-12.19	1,755.64	-10,142.28	3,919.36	3,757.35	162.02	24.191	
13,200.00	6,935.42	6,145.00	6,144.18	39.57	125.86	-12.19	1,755.64	-10,142.28	3,822.01	3,659.86	162.16	23.570	
13,300.00	6,935.16	6,145.00	6,144.18	39.87	125.86	-12.19	1,755.64	-10,142.28	3,724.80	3,562.52	162.28	22.952	
13,400.00	6,934.90	6,145.00	6,144.18	40.17	125.86	-12.19	1,755.64	-10,142.28	3,627.75	3,465.35	162.40	22.339	
13,500.00	6,934.64	6,145.00	6,144.18	40.47	125.86	-12.19	1,755.64	-10,142.28	3,530.85	3,368.36	162.50	21.729	
13,600.00	6,934.38	6,145.00	6,144.18	40.77	125.86	-12.19	1,755.64	-10,142.28	3,434.14	3,271.56	162.58	21.123	
13,700.00	6,934.12	6,145.00	6,144.18	41.07	125.86	-12.19	1,755.64	-10,142.28	3,337.61	3,174.98	162.64	20.522	
13,800.00	6,933.87	6,145.00	6,144.18	41.37	125.86	-12.19	1,755.64	-10,142.28	3,241.30	3,078.62	162.68	19.925	
13,900.00	6,933.61	6,145.00	6,144.18	41.67	125.86	-12.19	1,755.64	-10,142.28	3,145.22	2,982.53	162.69	19.332	
14,000.00	6,933.35	6,145.00	6,144.18	41.97	125.86	-12.19	1,755.64	-10,142.28	3,049.39	2,886.71	162.68	18.744	
14,100.00	6,933.09	6,145.00	6,144.18	42.27	125.86	-12.19	1,755.64	-10,142.28	2,953.84	2,791.20	162.64	18.162	
14,200.00	6,932.83	6,145.00	6,144.18	42.57	125.86	-12.19	1,755.64	-10,142.28	2,858.59	2,696.03	162.56	17.584	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 163-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	6,145.00	6,144.18	42.87	125.86	-12.19	1,755.64	-10,142.28	2,763.68	2,601.23	162.45	17.013	
14,400.00	6,932.31	6,145.00	6,144.18	43.17	125.86	-12.19	1,755.64	-10,142.28	2,669.14	2,506.85	162.29	16.447	
14,500.00	6,932.05	6,145.00	6,144.18	43.47	125.86	-12.19	1,755.64	-10,142.28	2,575.01	2,412.93	162.08	15.888	
14,600.00	6,931.79	6,145.00	6,144.18	43.77	125.86	-12.19	1,755.64	-10,142.28	2,481.34	2,319.53	161.80	15.335	
14,700.00	6,931.54	6,145.00	6,144.18	44.07	125.86	-12.19	1,755.64	-10,142.28	2,388.18	2,226.72	161.47	14.791	
14,800.00	6,931.28	6,145.00	6,144.18	44.37	125.86	-12.19	1,755.64	-10,142.28	2,295.60	2,134.55	161.05	14.254	
14,900.00	6,931.02	6,145.00	6,144.18	44.67	125.86	-12.19	1,755.64	-10,142.28	2,203.67	2,043.13	160.54	13.727	
15,000.00	6,930.76	6,145.00	6,144.18	44.97	125.86	-12.19	1,755.64	-10,142.28	2,112.47	1,952.55	159.92	13.209	
15,100.00	6,930.50	6,145.00	6,144.18	45.27	125.86	-12.19	1,755.64	-10,142.28	2,022.11	1,862.92	159.18	12.703	
15,200.00	6,930.24	6,145.00	6,144.18	45.57	125.86	-12.19	1,755.64	-10,142.28	1,932.69	1,774.39	158.30	12.209	
15,300.00	6,929.98	6,145.00	6,144.18	45.87	125.86	-12.19	1,755.64	-10,142.28	1,844.36	1,687.13	157.24	11.730	
15,400.00	6,929.72	6,145.00	6,144.18	46.17	125.86	-12.19	1,755.64	-10,142.28	1,757.28	1,601.32	155.97	11.267	
15,500.00	6,929.46	6,145.00	6,144.18	46.47	125.86	-12.19	1,755.64	-10,142.28	1,671.65	1,517.20	154.45	10.823	
15,600.00	6,929.21	6,145.00	6,144.18	46.77	125.86	-12.19	1,755.64	-10,142.28	1,587.70	1,435.06	152.65	10.401	
15,700.00	6,928.95	6,145.00	6,144.18	47.07	125.86	-12.19	1,755.64	-10,142.28	1,505.71	1,355.23	150.49	10.006	
15,800.00	6,928.69	6,145.00	6,144.18	47.37	125.86	-12.19	1,755.64	-10,142.28	1,426.03	1,278.12	147.91	9.641	
15,900.00	6,928.43	6,145.00	6,144.18	47.67	125.86	-12.19	1,755.64	-10,142.28	1,349.05	1,204.22	144.82	9.315	
16,000.00	6,928.17	6,145.00	6,144.18	47.97	125.86	-12.19	1,755.64	-10,142.28	1,275.27	1,134.12	141.14	9.035	
16,100.00	6,927.91	6,145.00	6,144.18	48.27	125.86	-12.19	1,755.64	-10,142.28	1,205.27	1,068.51	136.76	8.813	
16,200.00	6,927.65	6,145.00	6,144.18	48.57	125.86	-12.19	1,755.64	-10,142.28	1,139.76	1,008.19	131.57	8.663	
16,300.00	6,927.39	6,145.00	6,144.18	48.87	125.86	-12.19	1,755.64	-10,142.28	1,079.55	954.07	125.48	8.604 SF	
16,400.00	6,927.13	6,145.00	6,144.18	49.17	125.86	-12.19	1,755.64	-10,142.28	1,025.57	907.13	118.44	8.659	
16,500.00	6,926.88	6,145.00	6,144.18	49.47	125.86	-12.19	1,755.64	-10,142.28	978.87	868.34	110.53	8.856	
16,600.00	6,926.62	6,145.00	6,144.18	49.77	125.86	-12.19	1,755.64	-10,142.28	940.51	838.50	102.01	9.220	
16,700.00	6,926.36	6,145.00	6,144.18	50.07	125.86	-12.19	1,755.64	-10,142.28	911.55	817.99	93.57	9.742	
16,800.00	6,926.10	6,145.00	6,144.18	50.37	125.86	-12.19	1,755.64	-10,142.28	892.92	806.31	86.61	10.310	
16,900.00	6,925.84	6,145.00	6,144.18	50.67	125.86	-12.19	1,755.64	-10,142.28	885.26	801.88	83.38	10.617	
16,918.12	6,925.79	6,145.00	6,144.18	50.73	125.86	-12.19	1,755.64	-10,142.28	885.07	801.71	83.37	10.617 CC, ES	
17,000.00	6,925.58	6,145.00	6,144.18	50.97	125.86	-12.19	1,755.64	-10,142.28	888.85	803.27	85.58	10.386	
17,100.00	6,925.32	6,145.00	6,144.18	51.27	125.86	-12.19	1,755.64	-10,142.28	903.57	811.33	92.24	9.796	
17,200.00	6,925.06	6,145.00	6,144.18	51.58	125.86	-12.19	1,755.64	-10,142.28	928.87	827.85	101.03	9.194	
17,224.45	6,925.00	6,145.00	6,144.18	51.65	125.86	-12.19	1,755.64	-10,142.28	936.58	833.29	103.29	9.068	
17,224.92	6,925.00	6,145.00	6,144.18	51.65	125.86	-12.19	1,755.64	-10,142.28	936.74	833.40	103.33	9.065	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 100-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	2,961.80	2,785.59	0.00	19.95	-88.24	295.01	-9,577.60	9,966.77					
100.00	100.00	3,000.00	2,822.02	0.23	20.20	-88.27	289.51	-9,567.53	9,939.61	9,925.46	14.15	702.273		
200.00	200.00	3,077.38	2,895.90	0.53	20.70	-88.33	278.31	-9,547.41	9,912.91	9,898.08	14.83	668.458		
300.00	300.00	3,100.00	2,917.47	0.83	20.85	-88.35	274.93	-9,541.51	9,886.42	9,871.18	15.24	648.571		
400.00	400.00	3,100.00	2,917.47	1.13	20.85	-88.35	274.93	-9,541.51	9,860.86	9,845.31	15.55	634.230		
500.00	500.00	3,150.43	2,965.75	1.43	21.15	-88.39	267.74	-9,528.86	9,835.56	9,819.47	16.09	611.458		
600.00	599.98	3,200.00	3,013.57	1.73	21.45	-81.67	261.44	-9,517.44	9,811.33	9,794.71	16.62	590.334		
700.00	699.84	3,200.00	3,013.57	2.03	21.45	-82.17	261.44	-9,517.44	9,786.91	9,769.98	16.93	578.202		
800.00	799.45	3,200.00	3,013.57	2.33	21.45	-82.66	261.44	-9,517.44	9,762.99	9,745.75	17.23	566.480		
900.00	898.70	3,200.00	3,013.57	2.63	21.45	-83.14	261.44	-9,517.44	9,739.60	9,722.06	17.54	555.149		
1,000.00	997.47	3,200.00	3,013.57	2.93	21.45	-83.60	261.44	-9,517.44	9,716.78	9,698.92	17.86	544.194		
1,100.00	1,095.62	3,247.63	3,059.85	3.23	21.70	-84.15	256.07	-9,507.55	9,693.81	9,675.44	18.37	527.657		
1,200.00	1,193.06	3,300.00	3,111.09	3.53	21.96	-84.70	250.85	-9,498.07	9,672.16	9,653.25	18.91	511.480		
1,300.00	1,289.64	3,300.00	3,111.09	3.83	21.96	-85.15	250.85	-9,498.07	9,650.28	9,631.06	19.23	501.882		
1,382.94	1,369.03	3,300.00	3,111.09	4.08	21.96	-85.51	250.85	-9,498.07	9,632.67	9,613.17	19.49	494.149		
1,400.00	1,385.28	3,300.00	3,111.09	4.13	21.96	-85.51	250.85	-9,498.07	9,629.11	9,609.56	19.55	492.585		
1,500.00	1,480.57	3,300.00	3,111.09	4.43	21.96	-85.51	250.85	-9,498.07	9,608.83	9,588.97	19.87	483.633		
1,600.00	1,575.86	3,300.00	3,111.09	4.73	21.96	-85.51	250.85	-9,498.07	9,589.56	9,569.37	20.19	475.037		
1,700.00	1,671.15	3,349.94	3,160.20	5.03	22.17	-85.63	246.49	-9,490.15	9,570.73	9,550.03	20.70	462.308		
1,800.00	1,766.44	3,400.00	3,209.60	5.33	22.39	-85.74	242.64	-9,483.04	9,553.08	9,531.87	21.22	450.249		
1,900.00	1,861.72	3,400.00	3,209.60	5.63	22.39	-85.74	242.64	-9,483.04	9,535.89	9,514.36	21.53	442.814		
2,000.00	1,957.01	3,452.12	3,261.13	5.93	22.59	-85.86	239.05	-9,476.10	9,519.55	9,497.50	22.05	431.784		
2,100.00	2,052.30	3,500.00	3,308.50	6.23	22.78	-85.97	236.01	-9,469.76	9,503.57	9,481.03	22.54	421.573		
2,200.00	2,147.59	3,500.00	3,308.50	6.53	22.78	-85.97	236.01	-9,469.76	9,488.49	9,465.63	22.86	415.092		
2,300.00	2,242.88	3,550.16	3,358.19	6.83	22.96	-86.08	233.04	-9,463.60	9,473.85	9,450.49	23.36	405.629		
2,400.00	2,338.16	3,600.00	3,407.67	7.13	23.14	-86.19	230.27	-9,458.36	9,460.43	9,436.57	23.85	396.636		
2,500.00	2,433.45	3,600.00	3,407.67	7.44	23.14	-86.19	230.27	-9,458.36	9,447.47	9,423.30	24.17	390.953		
2,600.00	2,528.74	3,600.00	3,407.67	7.74	23.14	-86.19	230.27	-9,458.36	9,435.55	9,411.07	24.48	385.477		
2,700.00	2,624.03	3,645.25	3,452.68	8.04	23.28	-86.29	228.03	-9,454.26	9,424.31	9,399.37	24.94	377.804		
2,800.00	2,719.32	3,700.00	3,507.22	8.34	23.45	-86.40	225.90	-9,450.01	9,414.04	9,388.59	25.44	369.986		
2,900.00	2,814.60	3,700.00	3,507.22	8.64	23.45	-86.40	225.90	-9,450.01	9,404.28	9,378.52	25.75	365.154		
3,000.00	2,909.89	3,700.00	3,507.22	8.94	23.45	-86.40	225.90	-9,450.01	9,395.57	9,369.51	26.06	360.494		
3,100.00	3,005.18	3,756.11	3,563.19	9.24	23.61	-86.52	224.11	-9,446.45	9,387.35	9,360.80	26.55	353.514		
3,200.00	3,100.47	3,800.00	3,607.01	9.54	23.73	-86.61	222.83	-9,444.23	9,380.11	9,353.10	27.01	347.344		
3,300.00	3,195.76	3,800.00	3,607.01	9.84	23.73	-86.61	222.83	-9,444.23	9,373.58	9,346.27	27.31	343.212		
3,400.00	3,291.04	3,800.00	3,607.01	10.14	23.73	-86.61	222.83	-9,444.23	9,368.11	9,340.50	27.62	339.226		
3,500.00	3,386.33	3,851.08	3,658.04	10.44	23.85	-86.71	221.62	-9,442.43	9,363.09	9,335.01	28.08	333.466		
3,600.00	3,481.62	4,628.14	4,430.65	10.74	26.18	-88.34	192.50	-9,391.57	9,353.33	9,322.30	31.03	301.427		
3,700.00	3,576.91	4,677.64	4,479.78	11.04	26.37	-88.46	188.92	-9,386.66	9,342.54	9,311.00	31.54	296.238		
3,800.00	3,672.20	3,800.00	4,587.97	11.34	23.23	-88.70	182.69	-9,376.08	9,331.99	9,303.21	28.78	324.281		
3,900.00	3,767.48	4,800.00	4,601.36	11.64	26.81	-88.73	181.94	-9,374.77	9,321.87	9,289.24	32.63	285.718		
4,000.00	3,862.77	4,844.67	4,645.79	11.94	26.96	-88.83	179.86	-9,370.65	9,312.30	9,279.20	33.10	281.350		
4,100.00	3,958.06	4,900.00	4,700.94	12.24	27.14	-88.95	177.77	-9,366.68	9,304.06	9,270.45	33.61	276.835		
4,200.00	4,053.35	4,900.00	4,700.94	12.54	27.14	-88.95	177.77	-9,366.68	9,296.12	9,262.21	33.92	274.068		
4,300.00	4,148.64	4,900.00	4,700.94	12.84	27.14	-88.95	177.77	-9,366.68	9,289.26	9,255.03	34.23	271.395		
4,400.00	4,243.92	4,941.12	4,741.97	13.14	27.26	-89.03	176.48	-9,364.37	9,283.20	9,248.52	34.68	267.715		
4,500.00	4,339.21	5,000.00	4,800.77	13.44	27.43	-89.16	174.86	-9,361.68	9,278.00	9,242.82	35.18	263.702		
4,600.00	4,434.50	5,000.00	4,800.77	13.74	27.43	-89.16	174.86	-9,361.68	9,273.34	9,237.85	35.49	261.302		
4,700.00	4,529.79	5,033.11	4,833.84	14.04	27.52	-89.22	174.08	-9,360.52	9,269.56	9,233.66	35.90	258.191		
4,800.00	4,625.08	5,060.72	4,861.44	14.34	27.59	-89.28	173.50	-9,359.78	9,266.57	9,230.28	36.30	255.307		
4,900.00	4,720.36	5,100.00	4,900.71	14.64	27.69	-89.36	172.79	-9,359.08	9,264.41	9,227.68	36.73	252.249		
5,000.00	4,815.65	5,174.79	4,975.49	14.94	27.88	-89.50	171.65	-9,358.08	9,262.82	9,225.55	37.27	248.534		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 020D - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	4,910.94	5,253.21	5,053.88	15.24	28.07	-89.66	170.48	-9,356.98	9,261.32	9,223.49	37.83	244.844		
5,200.00	5,006.23	5,326.11	5,126.77	15.54	28.25	-89.81	169.01	-9,356.13	9,260.19	9,221.83	38.36	241.375		
5,300.00	5,101.52	5,400.00	5,200.63	15.84	28.43	-89.95	167.48	-9,355.34	9,259.31	9,220.40	38.91	237.984		
5,400.00	5,196.80	5,441.93	5,242.56	16.14	28.53	-90.04	166.75	-9,355.08	9,258.94	9,219.60	39.34	235.378		
5,400.75	5,197.52	5,442.20	5,242.83	16.14	28.53	-90.04	166.75	-9,355.08	9,258.94	9,219.60	39.34	235.360		
5,500.00	5,292.09	5,500.00	5,300.62	16.44	28.66	-90.15	166.16	-9,355.29	9,259.36	9,219.55	39.82	232.559		
5,600.00	5,387.38	5,527.06	5,327.68	16.74	28.72	-90.20	166.02	-9,355.56	9,260.33	9,220.14	40.19	230.413		
5,700.00	5,482.67	5,600.00	5,400.62	17.04	28.87	-90.34	165.79	-9,356.45	9,261.78	9,221.08	40.70	227.573		
5,800.00	5,577.96	5,693.90	5,494.51	17.34	29.07	-90.51	165.47	-9,357.71	9,263.46	9,222.19	41.27	224.473		
5,900.00	5,673.24	5,832.72	5,633.31	17.64	29.38	-90.78	163.89	-9,358.89	9,264.83	9,222.84	41.99	220.643		
6,000.00	5,768.53	5,900.00	5,700.59	17.94	29.53	-90.91	163.29	-9,359.54	9,266.42	9,223.93	42.49	218.066		
6,100.00	5,863.82	6,044.94	5,845.52	18.24	29.85	-91.18	163.31	-9,360.79	9,267.87	9,224.65	43.22	214.445		
6,200.00	5,959.11	6,146.19	5,946.77	18.54	30.07	-91.37	163.18	-9,361.47	9,269.29	9,225.47	43.82	211.553		
6,300.00	6,054.40	6,228.07	6,028.65	18.84	30.26	-91.53	163.20	-9,361.93	9,270.71	9,226.35	44.36	209.004		
6,400.00	6,149.68	6,277.74	6,078.31	19.14	30.37	-91.62	163.13	-9,362.42	9,272.62	9,227.82	44.80	206.975		
6,500.00	6,244.97	6,365.72	6,166.28	19.44	30.57	-91.78	163.01	-9,363.63	9,275.00	9,229.64	45.36	204.477		
6,600.00	6,340.26	6,460.00	6,262.82	19.74	31.11	-92.02	163.24	-9,365.03	9,277.15	9,230.82	46.33	200.249		
6,689.41	6,425.45	6,565.75	6,366.30	20.01	31.03	-92.16	163.10	-9,365.69	9,279.07	9,232.55	46.53	199.440		
6,700.00	6,435.54	6,572.28	6,372.83	20.04	31.04	-88.89	163.09	-9,365.77	9,279.23	9,232.65	46.58	199.224		
6,750.00	6,482.96	6,608.32	6,408.87	20.19	31.13	-74.77	163.02	-9,366.21	9,277.42	9,230.59	46.84	198.085		
6,800.00	6,529.78	6,692.39	6,492.93	20.34	31.33	-63.57	162.64	-9,367.05	9,271.28	9,224.03	47.25	196.229		
6,850.00	6,575.63	6,700.00	6,500.54	20.49	31.35	-55.03	162.59	-9,367.11	9,260.91	9,213.49	47.42	195.296		
6,900.00	6,620.18	6,731.93	6,532.47	20.64	31.42	-48.82	162.38	-9,367.44	9,246.48	9,198.82	47.67	193.973		
6,950.00	6,663.07	6,747.93	6,548.47	20.79	31.46	-44.30	162.30	-9,367.68	9,228.20	9,180.33	47.87	192.781		
7,000.00	6,704.00	6,763.28	6,563.82	20.94	31.50	-41.06	162.23	-9,367.95	9,206.15	9,158.09	48.07	191.527		
7,050.00	6,742.63	7,001.34	6,601.85	21.09	32.08	-39.50	162.61	-9,370.56	9,180.34	9,131.37	48.96	187.493		
7,100.00	6,778.69	7,019.01	6,619.52	21.24	32.12	-38.14	162.60	-9,370.55	9,150.34	9,101.17	49.17	186.084		
7,150.00	6,811.89	7,036.30	6,636.81	21.39	32.17	-37.49	162.63	-9,370.57	9,117.16	9,067.78	49.38	184.625		
7,200.00	6,841.98	7,052.08	6,652.59	21.54	32.21	-37.51	162.70	-9,370.63	9,081.02	9,031.43	49.59	183.134		
7,250.00	6,868.74	7,066.22	6,666.73	21.69	32.24	-38.26	162.78	-9,370.71	9,042.19	8,992.40	49.79	181.618		
7,300.00	6,891.96	7,078.60	6,679.11	21.84	32.27	-39.84	162.88	-9,370.80	9,000.93	8,950.95	49.98	180.084		
7,350.00	6,911.46	7,100.00	6,900.51	21.99	32.33	-42.60	163.09	-9,371.00	8,957.57	8,907.37	50.21	178.414		
7,400.00	6,927.10	7,100.00	6,900.51	22.14	32.33	-46.74	163.09	-9,371.00	8,912.38	8,862.02	50.36	176.961		
7,450.00	6,938.75	7,120.04	6,920.55	22.29	32.38	-53.56	163.21	-9,371.18	8,865.72	8,815.14	50.59	175.254		
7,500.00	6,946.33	7,139.97	6,940.48	22.44	32.43	-64.47	163.11	-9,371.29	8,817.92	8,767.10	50.81	173.538		
7,550.00	6,949.78	7,148.83	6,949.33	22.59	32.46	-81.45	162.99	-9,371.31	8,769.34	8,718.34	51.00	171.945		
7,568.05	6,950.00	7,149.45	6,949.95	22.65	32.46	-89.31	162.98	-9,371.31	8,751.69	8,700.63	51.06	171.399		
7,600.00	6,949.92	7,149.39	6,949.89	22.74	32.46	-89.31	162.98	-9,371.31	8,720.40	8,669.24	51.16	170.448		
7,700.00	6,949.66	7,149.20	6,949.70	23.04	32.46	-89.30	162.98	-9,371.31	8,622.52	8,571.04	51.48	167.495		
7,800.00	6,949.40	7,149.03	6,949.53	23.35	32.46	-89.30	162.99	-9,371.31	8,524.69	8,472.89	51.80	164.579		
7,900.00	6,949.14	7,148.87	6,949.37	23.65	32.46	-89.29	162.99	-9,371.31	8,426.91	8,374.80	52.12	161.697		
8,000.00	6,948.88	7,148.72	6,949.22	23.95	32.46	-89.29	162.99	-9,371.31	8,329.18	8,276.75	52.43	158.850		
8,100.00	6,948.62	7,148.58	6,949.09	24.25	32.46	-89.28	162.99	-9,371.31	8,231.51	8,178.76	52.75	156.037		
8,200.00	6,948.36	7,148.45	6,948.96	24.55	32.46	-89.28	163.00	-9,371.31	8,133.90	8,080.82	53.07	153.258		
8,300.00	6,948.11	7,148.34	6,948.84	24.85	32.46	-89.28	163.00	-9,371.31	8,036.34	7,982.94	53.39	150.512		
8,400.00	6,947.85	7,148.23	6,948.73	25.15	32.46	-89.27	163.00	-9,371.31	7,938.84	7,885.13	53.71	147.798		
8,500.00	6,947.59	7,148.12	6,948.63	25.45	32.46	-89.27	163.00	-9,371.31	7,841.41	7,787.37	54.04	145.116		
8,600.00	6,947.33	7,148.02	6,948.53	25.75	32.46	-89.26	163.00	-9,371.31	7,744.04	7,689.68	54.36	142.466		
8,700.00	6,947.07	7,147.93	6,948.44	26.05	32.46	-89.26	163.00	-9,371.31	7,646.74	7,592.06	54.68	139.847		
8,800.00	6,946.81	7,147.85	6,948.35	26.35	32.46	-89.26	163.00	-9,371.31	7,549.51	7,494.51	55.00	137.258		
8,900.00	6,946.55	7,147.76	6,948.27	26.65	32.46	-89.26	163.01	-9,371.31	7,452.36	7,397.03	55.33	134.699		
9,000.00	6,946.29	7,147.69	6,948.19	26.95	32.45	-89.25	163.01	-9,371.31	7,355.28	7,299.63	55.65	132.171		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 020D - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	7,147.61	6,948.12	27.25	32.45	-89.25	163.01	-9,371.31	7,258.27	7,202.30	55.97	129.671	
9,200.00	6,945.78	7,147.54	6,948.05	27.55	32.45	-89.25	163.01	-9,371.31	7,161.36	7,105.06	56.30	127.200	
9,300.00	6,945.52	7,147.48	6,947.98	27.85	32.45	-89.25	163.01	-9,371.31	7,064.52	7,007.90	56.63	124.758	
9,400.00	6,945.26	7,147.42	6,947.92	28.15	32.45	-89.25	163.01	-9,371.31	6,967.78	6,910.83	56.95	122.344	
9,500.00	6,945.00	7,147.36	6,947.86	28.45	32.45	-89.24	163.01	-9,371.31	6,871.13	6,813.85	57.28	119.957	
9,600.00	6,944.74	7,147.30	6,947.80	28.75	32.45	-89.24	163.01	-9,371.31	6,774.58	6,716.97	57.61	117.598	
9,700.00	6,944.48	7,147.25	6,947.75	29.05	32.45	-89.24	163.01	-9,371.31	6,678.13	6,620.19	57.94	115.265	
9,800.00	6,944.22	7,147.19	6,947.70	29.35	32.45	-89.24	163.01	-9,371.31	6,581.79	6,523.52	58.27	112.959	
9,900.00	6,943.96	7,147.14	6,947.65	29.66	32.45	-89.24	163.02	-9,371.31	6,485.55	6,426.95	58.60	110.680	
10,000.00	6,943.70	7,147.10	6,947.60	29.96	32.45	-89.24	163.02	-9,371.31	6,389.43	6,330.50	58.93	108.426	
10,100.00	6,943.45	7,147.05	6,947.56	30.26	32.45	-89.23	163.02	-9,371.31	6,293.44	6,234.17	59.26	106.198	
10,200.00	6,943.19	7,147.01	6,947.51	30.56	32.45	-89.23	163.02	-9,371.31	6,197.56	6,137.97	59.59	103.995	
10,300.00	6,942.93	7,146.97	6,947.47	30.86	32.45	-89.23	163.02	-9,371.31	6,101.83	6,041.90	59.93	101.818	
10,400.00	6,942.67	7,146.93	6,947.43	31.16	32.45	-89.23	163.02	-9,371.31	6,006.23	5,945.96	60.26	99.665	
10,500.00	6,942.41	7,146.89	6,947.39	31.46	32.45	-89.23	163.02	-9,371.31	5,910.77	5,850.17	60.60	97.536	
10,600.00	6,942.15	7,146.85	6,947.35	31.76	32.45	-89.23	163.02	-9,371.31	5,815.47	5,754.53	60.94	95.432	
10,700.00	6,941.89	7,146.81	6,947.32	32.06	32.45	-89.23	163.02	-9,371.31	5,720.33	5,659.05	61.28	93.352	
10,800.00	6,941.63	7,146.78	6,947.28	32.36	32.45	-89.22	163.02	-9,371.31	5,625.36	5,563.74	61.62	91.296	
10,900.00	6,941.37	7,146.75	6,947.25	32.66	32.45	-89.22	163.02	-9,371.31	5,530.56	5,468.61	61.96	89.263	
11,000.00	6,941.11	7,146.71	6,947.22	32.96	32.45	-89.22	163.02	-9,371.31	5,435.96	5,373.66	62.30	87.254	
11,100.00	6,940.86	7,146.68	6,947.19	33.26	32.45	-89.22	163.02	-9,371.31	5,341.55	5,278.90	62.64	85.268	
11,200.00	6,940.60	7,146.65	6,947.16	33.56	32.45	-89.22	163.02	-9,371.31	5,247.34	5,184.35	62.99	83.305	
11,300.00	6,940.34	7,146.62	6,947.13	33.86	32.45	-89.22	163.02	-9,371.31	5,153.35	5,090.02	63.34	81.365	
11,400.00	6,940.08	7,146.60	6,947.10	34.16	32.45	-89.22	163.02	-9,371.31	5,059.60	4,995.91	63.68	79.448	
11,500.00	6,939.82	7,146.57	6,947.07	34.46	32.45	-89.22	163.02	-9,371.31	4,966.09	4,902.05	64.03	77.553	
11,600.00	6,939.56	7,146.54	6,947.05	34.76	32.45	-89.22	163.02	-9,371.31	4,872.83	4,808.45	64.39	75.681	
11,700.00	6,939.30	7,146.52	6,947.02	35.06	32.45	-89.22	163.02	-9,371.31	4,779.85	4,715.11	64.74	73.832	
11,800.00	6,939.04	7,146.49	6,947.00	35.36	32.45	-89.22	163.02	-9,371.31	4,687.16	4,622.06	65.10	72.005	
11,900.00	6,938.78	7,146.47	6,946.97	35.66	32.45	-89.21	163.02	-9,371.31	4,594.77	4,529.32	65.45	70.200	
12,000.00	6,938.53	7,146.45	6,946.95	35.96	32.45	-89.21	163.03	-9,371.31	4,502.71	4,436.90	65.81	68.419	
12,100.00	6,938.27	7,146.42	6,946.93	36.26	32.45	-89.21	163.03	-9,371.31	4,411.00	4,344.82	66.17	66.659	
12,200.00	6,938.01	7,146.40	6,946.91	36.56	32.45	-89.21	163.03	-9,371.31	4,319.65	4,253.11	66.54	64.922	
12,300.00	6,937.75	7,146.38	6,946.89	36.86	32.45	-89.21	163.03	-9,371.31	4,228.69	4,161.79	66.90	63.208	
12,400.00	6,937.49	7,146.36	6,946.87	37.16	32.45	-89.21	163.03	-9,371.31	4,138.15	4,070.88	67.27	61.516	
12,500.00	6,937.23	7,146.34	6,946.85	37.46	32.45	-89.21	163.03	-9,371.31	4,048.06	3,980.42	67.64	59.848	
12,600.00	6,936.97	7,146.32	6,946.83	37.77	32.45	-89.21	163.03	-9,371.31	3,958.44	3,890.43	68.01	58.202	
12,700.00	6,936.71	7,146.30	6,946.81	38.07	32.45	-89.21	163.03	-9,371.31	3,869.33	3,800.95	68.39	56.580	
12,800.00	6,936.45	7,146.28	6,946.79	38.37	32.45	-89.21	163.03	-9,371.31	3,780.77	3,712.01	68.76	54.981	
12,900.00	6,936.20	7,146.27	6,946.77	38.67	32.45	-89.21	163.03	-9,371.31	3,692.79	3,623.65	69.14	53.407	
13,000.00	6,935.94	7,146.25	6,946.75	38.97	32.45	-89.21	163.03	-9,371.31	3,605.44	3,535.91	69.53	51.856	
13,100.00	6,935.68	7,146.23	6,946.74	39.27	32.45	-89.21	163.03	-9,371.31	3,518.76	3,448.84	69.91	50.330	
13,200.00	6,935.42	7,146.22	6,946.72	39.57	32.45	-89.21	163.03	-9,371.31	3,432.80	3,362.50	70.30	48.830	
13,300.00	6,935.16	7,146.20	6,946.70	39.87	32.45	-89.21	163.03	-9,371.31	3,347.63	3,276.93	70.69	47.355	
13,400.00	6,934.90	7,146.18	6,946.69	40.17	32.45	-89.21	163.03	-9,371.31	3,263.29	3,192.21	71.09	45.906	
13,500.00	6,934.64	7,146.17	6,946.67	40.47	32.45	-89.21	163.03	-9,371.31	3,179.87	3,108.39	71.48	44.485	
13,600.00	6,934.38	7,146.15	6,946.66	40.77	32.45	-89.20	163.03	-9,371.31	3,097.43	3,025.54	71.88	43.091	
13,700.00	6,934.12	7,146.14	6,946.64	41.07	32.45	-89.20	163.03	-9,371.31	3,016.04	2,943.76	72.28	41.727	
13,800.00	6,933.87	7,146.12	6,946.63	41.37	32.45	-89.20	163.03	-9,371.31	2,935.81	2,863.13	72.68	40.392	
13,900.00	6,933.61	7,146.11	6,946.61	41.67	32.45	-89.20	163.03	-9,371.31	2,856.83	2,783.74	73.09	39.088	
14,000.00	6,933.35	7,146.10	6,946.60	41.97	32.45	-89.20	163.03	-9,371.31	2,779.20	2,705.71	73.49	37.817	
14,100.00	6,933.09	7,146.08	6,946.59	42.27	32.45	-89.20	163.03	-9,371.31	2,703.04	2,629.15	73.90	36.579	
14,200.00	6,932.83	7,146.07	6,946.58	42.57	32.45	-89.20	163.03	-9,371.31	2,628.48	2,554.18	74.30	35.377	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	7,146.06	6,946.56	42.87	32.45	-89.20	163.03	-9,371.30	2,555.66	2,480.96	74.70	34.211	
14,400.00	6,932.31	7,146.05	6,946.55	43.17	32.45	-89.20	163.03	-9,371.30	2,484.73	2,409.62	75.10	33.084	
14,500.00	6,932.05	7,146.03	6,946.54	43.47	32.45	-89.20	163.03	-9,371.30	2,415.85	2,340.35	75.50	31.999	
14,600.00	6,931.79	7,146.02	6,946.53	43.77	32.45	-89.20	163.03	-9,371.30	2,349.22	2,273.33	75.89	30.956	
14,700.00	6,931.54	7,146.01	6,946.51	44.07	32.45	-89.20	163.03	-9,371.30	2,285.02	2,208.74	76.27	29.959	
14,800.00	6,931.28	7,146.00	6,946.50	44.37	32.45	-89.20	163.03	-9,371.30	2,223.46	2,146.82	76.64	29.011	
14,900.00	6,931.02	7,145.99	6,946.49	44.67	32.45	-89.20	163.03	-9,371.30	2,164.78	2,087.77	77.00	28.113	
15,000.00	6,930.76	7,145.98	6,946.48	44.97	32.45	-89.20	163.03	-9,371.30	2,109.20	2,031.85	77.35	27.270	
15,100.00	6,930.50	7,145.97	6,946.47	45.27	32.45	-89.20	163.03	-9,371.30	2,056.99	1,979.32	77.67	26.483	
15,200.00	6,930.24	7,145.95	6,946.46	45.57	32.45	-89.20	163.03	-9,371.30	2,008.40	1,930.43	77.97	25.757	
15,300.00	6,929.98	7,145.94	6,946.45	45.87	32.45	-89.20	163.03	-9,371.30	1,963.71	1,885.46	78.25	25.095	
15,400.00	6,929.72	7,145.93	6,946.44	46.17	32.45	-89.20	163.03	-9,371.30	1,923.18	1,844.68	78.50	24.499	
15,500.00	6,929.46	7,145.92	6,946.43	46.47	32.45	-89.20	163.03	-9,371.30	1,887.09	1,808.38	78.72	23.973	
15,600.00	6,929.21	7,145.91	6,946.42	46.77	32.45	-89.20	163.03	-9,371.30	1,855.69	1,776.79	78.90	23.520	
15,700.00	6,928.95	7,145.91	6,946.41	47.07	32.45	-89.20	163.03	-9,371.30	1,829.23	1,750.18	79.04	23.142	
15,800.00	6,928.69	7,145.90	6,946.40	47.37	32.45	-89.20	163.03	-9,371.30	1,807.91	1,728.76	79.15	22.841	
15,900.00	6,928.43	7,145.89	6,946.39	47.67	32.45	-89.20	163.03	-9,371.30	1,791.93	1,712.71	79.22	22.619	
16,000.00	6,928.17	7,145.88	6,946.38	47.97	32.45	-89.20	163.03	-9,371.30	1,781.43	1,702.18	79.26	22.476	
16,100.00	6,927.91	7,145.87	6,946.37	48.27	32.45	-89.20	163.03	-9,371.30	1,776.51	1,697.25	79.26	22.414	
16,137.61	6,927.81	7,145.87	6,946.37	48.39	32.45	-89.20	163.03	-9,371.30	1,776.11	1,696.86	79.25	22.410	CC, ES, SF
16,200.00	6,927.65	7,145.86	6,946.37	48.57	32.45	-89.20	163.03	-9,371.30	1,777.21	1,697.97	79.23	22.430	
16,300.00	6,927.39	7,145.85	6,946.36	48.87	32.45	-89.19	163.03	-9,371.30	1,783.52	1,704.33	79.19	22.523	
16,400.00	6,927.13	7,145.84	6,946.35	49.17	32.45	-89.19	163.03	-9,371.30	1,795.39	1,716.27	79.12	22.692	
16,500.00	6,926.88	7,145.84	6,946.34	49.47	32.45	-89.19	163.03	-9,371.30	1,812.70	1,733.66	79.04	22.933	
16,600.00	6,926.62	7,145.83	6,946.33	49.77	32.45	-89.19	163.03	-9,371.30	1,835.31	1,756.35	78.97	23.242	
16,700.00	6,926.36	7,145.82	6,946.32	50.07	32.45	-89.19	163.03	-9,371.30	1,863.02	1,784.13	78.89	23.616	
16,800.00	6,926.10	7,145.81	6,946.32	50.37	32.45	-89.19	163.03	-9,371.30	1,895.61	1,816.78	78.82	24.049	
16,900.00	6,925.84	7,145.80	6,946.31	50.67	32.45	-89.19	163.03	-9,371.30	1,932.82	1,854.05	78.77	24.538	
17,000.00	6,925.58	7,145.80	6,946.30	50.97	32.45	-89.19	163.03	-9,371.30	1,974.41	1,895.67	78.73	25.077	
17,100.00	6,925.32	7,145.79	6,946.29	51.27	32.45	-89.19	163.03	-9,371.30	2,020.09	1,941.37	78.72	25.662	
17,200.00	6,925.06	7,145.78	6,946.29	51.58	32.45	-89.19	163.03	-9,371.30	2,069.60	1,990.87	78.73	26.288	
17,224.45	6,925.00	7,145.78	6,946.28	51.65	32.45	-89.19	163.03	-9,371.30	2,082.25	2,003.52	78.73	26.447	
17,224.92	6,925.00	7,145.78	6,946.28	51.65	32.45	-89.19	163.03	-9,371.30	2,082.50	2,003.77	78.73	26.450	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-MWD, 3901-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	2,961.80	2,785.59	0.00	19.95	-88.24	295.01	-9,577.60	9,966.77				
100.00	100.00	3,000.00	2,822.02	0.23	20.20	-88.27	289.51	-9,567.53	9,939.61	9,925.46	14.15	702.273	
200.00	200.00	3,077.38	2,895.90	0.53	20.70	-88.33	278.31	-9,547.41	9,912.91	9,898.08	14.83	668.458	
300.00	300.00	3,100.00	2,917.47	0.83	20.85	-88.35	274.93	-9,541.51	9,886.42	9,871.18	15.24	648.571	
400.00	400.00	3,100.00	2,917.47	1.13	20.85	-88.35	274.93	-9,541.51	9,860.86	9,845.31	15.55	634.230	
500.00	500.00	3,150.43	2,965.75	1.43	21.15	-88.39	267.74	-9,528.86	9,835.56	9,819.47	16.09	611.458	
600.00	599.98	3,200.00	3,013.57	1.73	21.45	-81.67	261.44	-9,517.44	9,811.33	9,794.71	16.62	590.334	
700.00	699.84	3,200.00	3,013.57	2.03	21.45	-82.17	261.44	-9,517.44	9,786.91	9,769.98	16.93	578.202	
800.00	799.45	3,200.00	3,013.57	2.33	21.45	-82.66	261.44	-9,517.44	9,762.99	9,745.75	17.23	566.480	
900.00	898.70	3,200.00	3,013.57	2.63	21.45	-83.14	261.44	-9,517.44	9,739.60	9,722.06	17.54	555.149	
1,000.00	997.47	3,200.00	3,013.57	2.93	21.45	-83.60	261.44	-9,517.44	9,716.78	9,698.92	17.86	544.194	
1,100.00	1,095.62	3,247.63	3,059.85	3.23	21.70	-84.15	256.07	-9,507.55	9,693.81	9,675.44	18.37	527.657	
1,200.00	1,193.06	3,300.00	3,111.09	3.53	21.96	-84.70	250.85	-9,498.07	9,672.16	9,653.25	18.91	511.480	
1,300.00	1,289.64	3,300.00	3,111.09	3.83	21.96	-85.15	250.85	-9,498.07	9,650.28	9,631.06	19.23	501.882	
1,382.94	1,369.03	3,300.00	3,111.09	4.08	21.96	-85.51	250.85	-9,498.07	9,632.67	9,613.17	19.49	494.149	
1,400.00	1,385.28	3,300.00	3,111.09	4.13	21.96	-85.51	250.85	-9,498.07	9,629.11	9,609.56	19.55	492.585	
1,500.00	1,480.57	3,300.00	3,111.09	4.43	21.96	-85.51	250.85	-9,498.07	9,608.83	9,588.97	19.87	483.633	
1,600.00	1,575.86	3,300.00	3,111.09	4.73	21.96	-85.51	250.85	-9,498.07	9,589.56	9,569.37	20.19	475.037	
1,700.00	1,671.15	3,349.94	3,160.20	5.03	22.17	-85.63	246.49	-9,490.15	9,570.73	9,550.03	20.70	462.308	
1,800.00	1,766.44	3,400.00	3,209.60	5.33	22.39	-85.74	242.64	-9,483.04	9,553.08	9,531.87	21.22	450.249	
1,900.00	1,861.72	3,400.00	3,209.60	5.63	22.39	-85.74	242.64	-9,483.04	9,535.89	9,514.36	21.53	442.814	
2,000.00	1,957.01	3,452.12	3,261.13	5.93	22.59	-85.86	239.05	-9,476.10	9,519.55	9,497.50	22.05	431.784	
2,100.00	2,052.30	3,500.00	3,308.50	6.23	22.78	-85.97	236.01	-9,469.76	9,503.57	9,481.03	22.54	421.573	
2,200.00	2,147.59	3,500.00	3,308.50	6.53	22.78	-85.97	236.01	-9,469.76	9,488.49	9,465.63	22.86	415.092	
2,300.00	2,242.88	3,550.16	3,358.19	6.83	22.96	-86.08	233.04	-9,463.60	9,473.85	9,450.49	23.36	405.629	
2,400.00	2,338.16	3,600.00	3,407.67	7.13	23.14	-86.19	230.27	-9,458.36	9,460.43	9,436.57	23.85	396.636	
2,500.00	2,433.45	3,600.00	3,407.67	7.44	23.14	-86.19	230.27	-9,458.36	9,447.47	9,423.30	24.17	390.953	
2,600.00	2,528.74	3,600.00	3,407.67	7.74	23.14	-86.19	230.27	-9,458.36	9,435.55	9,411.07	24.48	385.477	
2,700.00	2,624.03	3,645.25	3,452.68	8.04	23.28	-86.29	228.03	-9,454.26	9,424.31	9,399.37	24.94	377.804	
2,800.00	2,719.32	3,700.00	3,507.22	8.34	23.45	-86.40	225.90	-9,450.01	9,414.04	9,388.59	25.44	369.986	
2,900.00	2,814.60	3,700.00	3,507.22	8.64	23.45	-86.40	225.90	-9,450.01	9,404.28	9,378.52	25.75	365.154	
3,000.00	2,909.89	3,700.00	3,507.22	8.94	23.45	-86.40	225.90	-9,450.01	9,395.57	9,369.51	26.06	360.494	
3,100.00	3,005.18	3,756.11	3,563.19	9.24	23.61	-86.52	224.11	-9,446.45	9,387.35	9,360.80	26.55	353.514	
3,200.00	3,100.47	3,800.00	3,607.01	9.54	23.73	-86.61	222.83	-9,444.23	9,380.11	9,353.10	27.01	347.344	
3,300.00	3,195.76	3,800.00	3,607.01	9.84	23.73	-86.61	222.83	-9,444.23	9,373.58	9,346.27	27.31	343.212	
3,400.00	3,291.04	3,800.00	3,607.01	10.14	23.73	-86.61	222.83	-9,444.23	9,368.11	9,340.50	27.62	339.226	
3,500.00	3,386.33	3,851.08	3,658.04	10.44	23.85	-86.71	221.62	-9,442.43	9,363.09	9,335.01	28.08	333.466	
3,600.00	3,481.62	4,655.66	4,457.93	10.74	24.67	-88.39	192.72	-9,391.41	9,355.83	9,326.68	29.16	320.879	
3,700.00	3,576.91	4,704.00	4,505.94	11.04	24.75	-88.50	189.76	-9,386.55	9,344.82	9,315.28	29.53	316.429	
3,800.00	3,672.20	4,756.86	4,558.46	11.34	24.83	-88.62	186.70	-9,381.39	9,334.26	9,304.35	29.91	312.039	
3,900.00	3,767.48	4,862.00	4,662.97	11.64	24.99	-88.85	181.73	-9,371.15	9,323.72	9,293.36	30.36	307.116	
4,000.00	3,862.77	4,862.00	4,662.97	11.94	24.99	-88.85	181.73	-9,371.15	9,314.02	9,283.35	30.67	303.651	
4,100.00	3,958.06	4,894.00	4,694.84	12.24	25.04	-88.92	180.68	-9,368.49	9,305.16	9,274.13	31.02	299.925	
4,200.00	4,053.35	4,907.18	4,707.98	12.54	25.05	-88.95	180.27	-9,367.54	9,297.22	9,265.86	31.35	296.533	
4,300.00	4,148.64	4,926.00	4,726.76	12.84	25.08	-88.98	179.74	-9,366.35	9,290.20	9,258.51	31.69	293.186	
4,400.00	4,243.92	4,936.45	4,737.18	13.14	25.09	-89.01	179.44	-9,365.78	9,284.09	9,252.08	32.01	290.037	
4,500.00	4,339.21	4,963.48	4,764.17	13.44	25.12	-89.06	178.63	-9,364.53	9,278.90	9,246.55	32.35	286.807	
4,600.00	4,434.50	5,011.55	4,812.19	13.74	25.17	-89.16	177.50	-9,362.54	9,274.34	9,241.62	32.72	283.449	
4,700.00	4,529.79	5,022.00	4,822.63	14.04	25.18	-89.18	177.33	-9,362.15	9,270.54	9,237.50	33.04	280.588	
4,800.00	4,625.08	5,064.00	4,864.61	14.34	25.21	-89.26	176.65	-9,361.10	9,267.62	9,234.22	33.40	277.503	
4,900.00	4,720.36	5,089.85	4,890.46	14.64	25.24	-89.32	176.20	-9,360.70	9,265.50	9,231.76	33.74	274.632	
5,000.00	4,815.65	5,203.03	5,003.60	14.94	25.35	-89.54	174.05	-9,358.79	9,263.65	9,229.45	34.20	270.870	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-MWD, 3901-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	5,315.98	5,116.51	15.24	25.45	-89.77	171.61	-9,356.63	9,261.72	9,227.06	34.66	267.207	
5,200.00	5,006.23	5,428.70	5,229.17	15.54	25.56	-90.00	168.88	-9,354.21	9,259.72	9,224.60	35.12	263.641	
5,300.00	5,101.52	5,531.34	5,331.74	15.84	25.68	-90.21	166.19	-9,351.82	9,257.69	9,222.10	35.59	260.102	
5,400.00	5,196.80	5,630.74	5,431.08	16.14	25.80	-90.41	163.50	-9,349.44	9,255.73	9,219.66	36.07	256.637	
5,500.00	5,292.09	5,730.08	5,530.35	16.44	25.92	-90.62	160.75	-9,347.00	9,253.83	9,217.29	36.54	253.265	
5,600.00	5,387.38	5,829.37	5,629.57	16.74	26.05	-90.82	157.92	-9,344.49	9,252.00	9,214.98	37.01	249.981	
5,700.00	5,482.67	5,928.60	5,728.72	17.04	26.17	-91.03	155.02	-9,341.92	9,250.23	9,212.75	37.48	246.782	
5,800.00	5,577.96	6,008.55	5,808.61	17.34	26.28	-91.19	152.78	-9,339.93	9,248.67	9,210.72	37.95	243.714	
5,900.00	5,673.24	6,092.68	5,892.69	17.64	26.40	-91.37	150.53	-9,337.93	9,247.32	9,208.90	38.42	240.717	
6,000.00	5,768.53	6,176.92	5,976.88	17.94	26.52	-91.54	148.40	-9,336.05	9,246.19	9,207.31	38.88	237.798	
6,100.00	5,863.82	6,261.26	6,061.18	18.24	26.64	-91.71	146.40	-9,334.28	9,245.28	9,205.94	39.35	234.954	
6,200.00	5,959.11	6,345.70	6,145.58	18.54	26.76	-91.88	144.53	-9,332.61	9,244.60	9,204.78	39.82	232.183	
6,300.00	6,054.40	6,430.24	6,230.09	18.84	26.88	-92.05	142.78	-9,331.06	9,244.13	9,203.85	40.28	229.481	
6,400.00	6,149.68	6,522.39	6,322.20	19.14	27.01	-92.24	140.97	-9,329.46	9,243.85	9,203.07	40.77	226.715	
6,500.00	6,244.97	6,616.98	6,416.77	19.44	27.15	-92.43	139.12	-9,327.81	9,243.68	9,202.41	41.27	223.976	
6,558.15	6,300.38	6,672.00	6,471.76	19.61	27.24	-92.54	138.04	-9,326.86	9,243.64	9,202.08	41.56	222.416	
6,600.00	6,340.26	6,695.99	6,495.75	19.74	27.27	-92.59	137.62	-9,326.49	9,243.68	9,201.94	41.74	221.463	
6,689.41	6,425.45	6,790.16	6,553.59	20.01	27.42	-92.70	136.71	-9,325.68	9,243.97	9,201.77	42.20	219.062	
6,700.00	6,435.54	6,780.12	6,563.63	20.04	27.40	-89.45	136.58	-9,325.56	9,243.93	9,201.71	42.21	218.973	
6,750.00	6,482.96	6,811.04	6,610.78	20.19	27.45	-75.37	135.96	-9,325.01	9,241.16	9,198.72	42.44	217.757	
6,800.00	6,529.78	6,857.55	6,657.28	20.34	27.52	-64.12	135.36	-9,324.48	9,234.15	9,191.46	42.69	216.307	
6,850.00	6,575.63	6,903.05	6,702.77	20.49	27.59	-55.69	134.76	-9,323.95	9,222.96	9,180.02	42.94	214.784	
6,900.00	6,620.18	6,947.20	6,746.91	20.64	27.66	-49.56	134.18	-9,323.44	9,207.66	9,164.47	43.19	213.194	
6,950.00	6,663.07	7,010.34	6,789.37	20.79	27.76	-45.16	133.63	-9,322.95	9,188.39	9,144.91	43.47	211.356	
7,000.00	6,704.00	7,030.11	6,829.81	20.94	27.79	-42.07	133.10	-9,322.48	9,165.28	9,121.60	43.68	209.829	
7,050.00	6,742.63	7,068.24	6,867.94	21.09	27.85	-39.98	132.60	-9,322.04	9,138.51	9,094.59	43.92	208.065	
7,100.00	6,778.69	7,103.76	6,903.45	21.24	27.91	-38.73	132.14	-9,321.63	9,108.29	9,064.13	44.16	206.266	
7,150.00	6,811.89	7,136.40	6,936.09	21.39	27.97	-38.21	131.71	-9,321.25	9,074.85	9,030.46	44.39	204.440	
7,200.00	6,841.98	7,165.92	6,965.60	21.54	28.01	-38.40	131.33	-9,320.91	9,038.43	8,993.82	44.61	202.594	
7,250.00	6,868.74	7,192.08	6,991.76	21.69	28.06	-39.35	130.99	-9,320.60	8,999.32	8,954.49	44.83	200.738	
7,300.00	6,891.96	7,214.69	7,014.37	21.84	28.09	-41.21	130.69	-9,320.34	8,957.81	8,912.77	45.04	198.879	
7,350.00	6,911.46	7,233.57	7,033.25	21.99	28.12	-44.25	130.45	-9,320.12	8,914.20	8,868.96	45.24	197.025	
7,400.00	6,927.10	7,248.59	7,048.27	22.14	28.15	-48.98	130.25	-9,319.95	8,868.83	8,823.40	45.44	195.184	
7,450.00	6,938.75	7,259.87	7,059.54	22.29	28.17	-56.32	130.10	-9,319.82	8,822.04	8,776.42	45.62	193.361	
7,500.00	6,946.33	7,269.42	7,069.09	22.44	28.19	-67.83	129.97	-9,319.70	8,774.18	8,728.37	45.81	191.540	
7,550.00	6,949.78	7,273.29	7,072.95	22.59	28.19	-85.34	129.92	-9,319.66	8,725.61	8,679.63	45.98	189.772	
7,568.05	6,950.00	7,273.29	7,072.96	22.65	28.19	-93.21	129.92	-9,319.66	8,707.98	8,661.94	46.04	189.149	
7,600.00	6,949.92	7,272.64	7,072.31	22.74	28.19	-93.19	129.93	-9,319.67	8,676.72	8,630.59	46.14	188.054	
7,700.00	6,949.66	7,270.64	7,070.31	23.04	28.19	-93.13	129.96	-9,319.69	8,578.95	8,532.50	46.46	184.660	
7,800.00	6,949.40	7,268.66	7,068.33	23.35	28.18	-93.07	129.99	-9,319.71	8,481.23	8,434.46	46.78	181.311	
7,900.00	6,949.14	7,266.70	7,066.37	23.65	28.18	-93.00	130.01	-9,319.74	8,383.57	8,336.47	47.10	178.006	
8,000.00	6,948.88	7,264.76	7,064.43	23.95	28.18	-92.94	130.04	-9,319.76	8,285.96	8,238.54	47.42	174.745	
8,100.00	6,948.62	7,262.84	7,062.51	24.25	28.17	-92.88	130.06	-9,319.78	8,188.41	8,140.67	47.74	171.526	
8,200.00	6,948.36	7,260.95	7,060.62	24.55	28.17	-92.82	130.09	-9,319.80	8,090.91	8,042.85	48.06	168.350	
8,300.00	6,948.11	7,259.07	7,058.74	24.85	28.17	-92.76	130.11	-9,319.83	7,993.48	7,945.10	48.38	165.215	
8,400.00	6,947.85	7,257.63	7,057.30	25.15	28.16	-92.72	130.13	-9,319.84	7,896.11	7,847.41	48.71	162.117	
8,500.00	6,947.59	7,256.21	7,055.88	25.45	28.16	-92.67	130.15	-9,319.86	7,798.81	7,749.78	49.03	159.059	
8,600.00	6,947.33	7,254.79	7,054.46	25.75	28.16	-92.63	130.17	-9,319.88	7,701.58	7,652.22	49.36	156.041	
8,700.00	6,947.07	7,253.36	7,053.04	26.05	28.16	-92.58	130.19	-9,319.89	7,604.42	7,554.73	49.68	153.061	
8,800.00	6,946.81	7,251.94	7,051.61	26.35	28.15	-92.54	130.21	-9,319.91	7,507.33	7,457.32	50.01	150.120	
8,900.00	6,946.55	7,250.52	7,050.19	26.65	28.15	-92.49	130.22	-9,319.93	7,410.32	7,359.98	50.34	147.216	
9,000.00	6,946.29	7,249.10	7,048.77	26.95	28.15	-92.45	130.24	-9,319.94	7,313.39	7,262.72	50.66	144.349	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-MWD, 3901-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	7,247.67	7,047.35	27.25	28.15	-92.40	130.26	-9,319.96	7,216.54	7,165.55	50.99	141.519	
9,200.00	6,945.78	7,246.25	7,045.92	27.55	28.15	-92.36	130.28	-9,319.98	7,119.78	7,068.46	51.32	138.725	
9,300.00	6,945.52	7,244.83	7,044.50	27.85	28.14	-92.31	130.30	-9,319.99	7,023.11	6,971.46	51.65	135.965	
9,400.00	6,945.26	7,243.40	7,043.08	28.15	28.14	-92.27	130.32	-9,320.01	6,926.54	6,874.55	51.99	133.241	
9,500.00	6,945.00	7,241.98	7,041.65	28.45	28.14	-92.22	130.34	-9,320.02	6,830.06	6,777.75	52.32	130.550	
9,600.00	6,944.74	7,240.56	7,040.23	28.75	28.14	-92.18	130.35	-9,320.04	6,733.69	6,681.04	52.65	127.893	
9,700.00	6,944.48	7,239.14	7,038.81	29.05	28.13	-92.13	130.37	-9,320.06	6,637.42	6,584.44	52.99	125.270	
9,800.00	6,944.22	7,237.71	7,037.39	29.35	28.13	-92.09	130.39	-9,320.07	6,541.27	6,487.95	53.32	122.679	
9,900.00	6,943.96	7,236.29	7,035.96	29.66	28.13	-92.04	130.41	-9,320.09	6,445.23	6,391.57	53.66	120.120	
10,000.00	6,943.70	7,234.87	7,034.54	29.96	28.13	-92.00	130.43	-9,320.11	6,349.31	6,295.32	53.99	117.593	
10,100.00	6,943.45	7,233.44	7,033.12	30.26	28.12	-91.95	130.45	-9,320.12	6,253.52	6,199.19	54.33	115.097	
10,200.00	6,943.19	7,232.02	7,031.70	30.56	28.12	-91.91	130.47	-9,320.14	6,157.87	6,103.20	54.67	112.632	
10,300.00	6,942.93	7,230.60	7,030.27	30.86	28.12	-91.86	130.48	-9,320.16	6,062.35	6,007.34	55.01	110.198	
10,400.00	6,942.67	7,229.18	7,028.85	31.16	28.12	-91.82	130.50	-9,320.17	5,966.99	5,911.63	55.36	107.794	
10,500.00	6,942.41	7,227.75	7,027.43	31.46	28.11	-91.77	130.52	-9,320.19	5,871.77	5,816.07	55.70	105.420	
10,600.00	6,942.15	7,226.33	7,026.01	31.76	28.11	-91.73	130.54	-9,320.21	5,776.72	5,720.67	56.04	103.075	
10,700.00	6,941.89	7,224.91	7,024.58	32.06	28.11	-91.68	130.56	-9,320.22	5,681.83	5,625.44	56.39	100.759	
10,800.00	6,941.63	7,223.48	7,023.16	32.36	28.11	-91.64	130.58	-9,320.24	5,587.13	5,530.39	56.74	98.472	
10,900.00	6,941.37	7,222.06	7,021.74	32.66	28.11	-91.59	130.60	-9,320.26	5,492.61	5,435.52	57.09	96.214	
11,000.00	6,941.11	7,220.64	7,020.31	32.96	28.10	-91.55	130.61	-9,320.27	5,398.29	5,340.85	57.44	93.984	
11,100.00	6,940.86	7,219.22	7,018.89	33.26	28.10	-91.50	130.63	-9,320.29	5,304.17	5,246.38	57.79	91.782	
11,200.00	6,940.60	7,217.79	7,017.47	33.56	28.10	-91.46	130.65	-9,320.30	5,210.28	5,152.13	58.15	89.607	
11,300.00	6,940.34	7,216.37	7,016.05	33.86	28.10	-91.41	130.67	-9,320.32	5,116.61	5,058.11	58.50	87.460	
11,400.00	6,940.08	7,214.95	7,014.62	34.16	28.09	-91.37	130.69	-9,320.34	5,023.19	4,964.33	58.86	85.341	
11,500.00	6,939.82	7,213.52	7,013.20	34.46	28.09	-91.32	130.71	-9,320.35	4,930.03	4,870.81	59.22	83.249	
11,600.00	6,939.56	7,212.10	7,011.78	34.76	28.09	-91.28	130.73	-9,320.37	4,837.14	4,777.56	59.58	81.184	
11,700.00	6,939.30	7,210.68	7,010.36	35.06	28.09	-91.23	130.74	-9,320.39	4,744.54	4,684.59	59.95	79.146	
11,800.00	6,939.04	7,209.26	7,008.93	35.36	28.08	-91.19	130.76	-9,320.40	4,652.25	4,591.93	60.31	77.134	
11,900.00	6,938.78	7,207.83	7,007.51	35.66	28.08	-91.14	130.78	-9,320.42	4,560.28	4,499.59	60.68	75.150	
12,000.00	6,938.53	7,206.41	7,006.09	35.96	28.08	-91.10	130.80	-9,320.44	4,468.65	4,407.60	61.05	73.192	
12,100.00	6,938.27	7,204.99	7,004.67	36.26	28.08	-91.05	130.82	-9,320.45	4,377.39	4,315.96	61.43	71.261	
12,200.00	6,938.01	7,203.56	7,003.24	36.56	28.08	-91.01	130.84	-9,320.47	4,286.52	4,224.72	61.80	69.357	
12,300.00	6,937.75	7,202.14	7,001.82	36.86	28.07	-90.96	130.86	-9,320.49	4,196.06	4,133.88	62.18	67.480	
12,400.00	6,937.49	7,200.72	7,000.40	37.16	28.07	-90.92	130.87	-9,320.50	4,106.05	4,043.49	62.56	65.630	
12,500.00	6,937.23	7,199.29	6,998.97	37.46	28.07	-90.87	130.89	-9,320.52	4,016.51	3,953.56	62.95	63.807	
12,600.00	6,936.97	7,197.87	6,997.55	37.77	28.07	-90.83	130.91	-9,320.54	3,927.47	3,864.14	63.34	62.011	
12,700.00	6,936.71	7,196.45	6,996.13	38.07	28.06	-90.78	130.93	-9,320.55	3,838.97	3,775.25	63.73	60.243	
12,800.00	6,936.45	7,195.03	6,994.71	38.37	28.06	-90.74	130.95	-9,320.57	3,751.05	3,686.93	64.12	58.502	
12,900.00	6,936.20	7,193.60	6,993.28	38.67	28.06	-90.69	130.97	-9,320.58	3,663.75	3,599.24	64.51	56.790	
13,000.00	6,935.94	7,192.18	6,991.86	38.97	28.06	-90.65	130.99	-9,320.60	3,577.11	3,512.20	64.91	55.106	
13,100.00	6,935.68	7,190.76	6,990.44	39.27	28.05	-90.60	131.00	-9,320.62	3,491.19	3,425.88	65.31	53.452	
13,200.00	6,935.42	7,189.33	6,989.02	39.57	28.05	-90.56	131.02	-9,320.63	3,406.03	3,340.32	65.72	51.827	
13,300.00	6,935.16	7,187.91	6,987.59	39.87	28.05	-90.51	131.04	-9,320.65	3,321.71	3,255.58	66.13	50.232	
13,400.00	6,934.90	7,186.49	6,986.17	40.17	28.05	-90.47	131.06	-9,320.67	3,238.27	3,171.73	66.54	48.669	
13,500.00	6,934.64	7,185.07	6,984.75	40.47	28.05	-90.42	131.08	-9,320.68	3,155.80	3,088.85	66.95	47.137	
13,600.00	6,934.38	7,183.64	6,983.33	40.77	28.04	-90.38	131.10	-9,320.70	3,074.36	3,007.00	67.37	45.637	
13,700.00	6,934.12	7,182.22	6,981.90	41.07	28.04	-90.33	131.12	-9,320.72	2,994.05	2,926.27	67.78	44.172	
13,800.00	6,933.87	7,180.80	6,980.48	41.37	28.04	-90.29	131.13	-9,320.73	2,914.96	2,846.76	68.20	42.741	
13,900.00	6,933.61	7,179.37	6,979.06	41.67	28.04	-90.24	131.15	-9,320.75	2,837.18	2,768.57	68.62	41.347	
14,000.00	6,933.35	7,177.95	6,977.63	41.97	28.03	-90.20	131.17	-9,320.77	2,760.84	2,691.80	69.04	39.990	
14,100.00	6,933.09	7,176.53	6,976.21	42.27	28.03	-90.15	131.19	-9,320.78	2,686.05	2,616.59	69.46	38.672	
14,200.00	6,932.83	7,175.11	6,974.79	42.57	28.03	-90.11	131.21	-9,320.80	2,612.95	2,543.07	69.87	37.395	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-MWD, 3901-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	7,173.68	6,973.37	42.87	28.03	-90.06	131.23	-9,320.82	2,541.68	2,471.39	70.29	36.161	
14,400.00	6,932.31	7,172.26	6,971.94	43.17	28.02	-90.02	131.25	-9,320.83	2,472.40	2,401.70	70.70	34.972	
14,500.00	6,932.05	7,170.84	6,970.52	43.47	28.02	-89.97	131.26	-9,320.85	2,405.28	2,334.18	71.10	33.830	
14,600.00	6,931.79	7,169.41	6,969.10	43.77	28.02	-89.93	131.28	-9,320.86	2,340.50	2,269.01	71.49	32.737	
14,700.00	6,931.54	7,167.99	6,967.68	44.07	28.02	-89.88	131.30	-9,320.88	2,278.28	2,206.40	71.88	31.697	
14,800.00	6,931.28	7,166.57	6,966.25	44.37	28.01	-89.84	131.32	-9,320.90	2,218.82	2,146.58	72.25	30.712	
14,900.00	6,931.02	7,165.15	6,964.83	44.67	28.01	-89.79	131.34	-9,320.91	2,162.35	2,089.75	72.60	29.786	
15,000.00	6,930.76	7,163.72	6,963.41	44.97	28.01	-89.75	131.36	-9,320.93	2,109.11	2,036.18	72.93	28.920	
15,100.00	6,930.50	7,162.30	6,961.99	45.27	28.01	-89.70	131.38	-9,320.95	2,059.35	1,986.12	73.24	28.120	
15,200.00	6,930.24	7,160.88	6,960.56	45.57	28.01	-89.66	131.39	-9,320.96	2,013.34	1,939.82	73.51	27.387	
15,300.00	6,929.98	7,159.45	6,959.14	45.87	28.00	-89.61	131.41	-9,320.98	1,971.32	1,897.56	73.76	26.726	
15,400.00	6,929.72	7,158.03	6,957.72	46.17	28.00	-89.56	131.43	-9,321.00	1,933.57	1,859.59	73.97	26.139	
15,500.00	6,929.46	7,156.61	6,956.30	46.47	28.00	-89.52	131.45	-9,321.01	1,900.33	1,826.18	74.15	25.630	
15,600.00	6,929.21	7,155.19	6,954.87	46.77	28.00	-89.47	131.47	-9,321.03	1,871.85	1,797.57	74.28	25.201	
15,700.00	6,928.95	7,153.76	6,953.45	47.07	27.99	-89.43	131.49	-9,321.05	1,848.35	1,773.98	74.37	24.855	
15,800.00	6,928.69	7,152.34	6,952.03	47.37	27.99	-89.38	131.51	-9,321.06	1,830.01	1,755.60	74.41	24.594	
15,900.00	6,928.43	7,150.92	6,950.60	47.67	27.99	-89.34	131.52	-9,321.08	1,817.00	1,742.59	74.41	24.418	
16,000.00	6,928.17	7,149.49	6,949.18	47.97	27.99	-89.29	131.54	-9,321.10	1,809.43	1,735.06	74.37	24.329	
16,087.27	6,927.94	7,148.25	6,947.94	48.23	27.98	-89.25	131.56	-9,321.11	1,807.33	1,733.02	74.31	24.322	CC, ES, SF
16,100.00	6,927.91	7,148.07	6,947.76	48.27	27.98	-89.25	131.56	-9,321.11	1,807.37	1,733.08	74.30	24.326	
16,200.00	6,927.65	7,146.65	6,946.34	48.57	27.98	-89.20	131.58	-9,321.13	1,810.84	1,736.65	74.19	24.408	
16,300.00	6,927.39	7,145.23	6,944.91	48.87	27.98	-89.16	131.60	-9,321.14	1,819.80	1,745.75	74.06	24.573	
16,400.00	6,927.13	7,143.80	6,943.49	49.17	27.98	-89.11	131.62	-9,321.16	1,834.18	1,760.27	73.91	24.817	
16,500.00	6,926.88	7,142.38	6,942.07	49.47	27.98	-89.07	131.64	-9,321.18	1,853.85	1,780.10	73.75	25.138	
16,600.00	6,926.62	7,140.96	6,940.65	49.77	27.97	-89.02	131.65	-9,321.19	1,878.64	1,805.06	73.58	25.532	
16,700.00	6,926.36	7,139.53	6,939.22	50.07	27.97	-88.98	131.67	-9,321.21	1,908.35	1,834.93	73.42	25.992	
16,800.00	6,926.10	7,138.11	6,937.80	50.37	27.97	-88.93	131.69	-9,321.23	1,942.76	1,869.49	73.27	26.515	
16,900.00	6,925.84	7,136.69	6,936.38	50.67	27.97	-88.89	131.71	-9,321.24	1,981.63	1,908.49	73.14	27.095	
17,000.00	6,925.58	7,135.27	6,934.96	50.97	27.96	-88.84	131.73	-9,321.26	2,024.69	1,951.66	73.02	27.727	
17,100.00	6,925.32	7,133.84	6,933.53	51.27	27.96	-88.80	131.75	-9,321.28	2,071.68	1,998.75	72.93	28.405	
17,200.00	6,925.06	7,132.42	6,932.11	51.58	27.96	-88.75	131.77	-9,321.29	2,122.35	2,049.48	72.87	29.125	
17,224.45	6,925.00	7,132.07	6,931.76	51.65	27.96	-88.74	131.77	-9,321.30	2,135.26	2,062.40	72.86	29.307	
17,224.92	6,925.00	7,132.07	6,931.76	51.65	27.96	-88.74	131.77	-9,321.30	2,135.52	2,062.66	72.86	29.310	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 022B - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 300-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	133.02	133.02	0.00	0.24	-59.08	1,117.96	-1,866.87	2,176.03					
100.00	100.00	227.70	227.70	0.23	0.41	-59.08	1,118.29	-1,867.18	2,176.49	2,175.86	0.63	3,429.358		
200.00	200.00	322.34	322.34	0.53	0.62	-59.08	1,118.79	-1,867.67	2,177.20	2,176.06	1.14	1,902.571		
300.00	300.00	416.48	416.47	0.83	0.96	-59.07	1,119.48	-1,868.31	2,178.16	2,176.38	1.78	1,222.503		
400.00	400.00	485.72	485.70	1.13	1.20	-59.06	1,120.32	-1,869.04	2,179.77	2,177.44	2.33	935.778		
500.00	500.00	530.00	529.95	1.43	1.36	-59.08	1,120.61	-1,870.65	2,183.42	2,180.63	2.79	783.449		
600.00	599.98	574.44	574.28	1.73	1.53	-51.78	1,120.73	-1,873.66	2,188.51	2,185.26	3.24	674.514		
700.00	699.84	621.00	620.57	2.03	1.71	-51.82	1,120.55	-1,878.70	2,194.23	2,190.52	3.71	591.430		
800.00	799.45	663.93	663.08	2.33	1.87	-51.89	1,120.23	-1,884.64	2,200.31	2,196.14	4.16	528.433		
900.00	898.70	712.00	710.48	2.63	2.05	-52.03	1,119.52	-1,892.60	2,206.54	2,201.90	4.64	475.678		
1,000.00	997.47	760.78	758.38	2.93	2.26	-52.21	1,118.95	-1,901.85	2,213.03	2,207.91	5.12	432.305		
1,100.00	1,095.62	811.53	807.98	3.23	2.48	-52.45	1,118.73	-1,912.52	2,219.75	2,214.14	5.61	395.607		
1,200.00	1,193.06	863.00	858.04	3.53	2.73	-52.73	1,118.63	-1,924.51	2,226.70	2,220.59	6.11	364.553		
1,300.00	1,289.64	910.03	903.52	3.83	2.96	-53.01	1,118.56	-1,936.47	2,233.86	2,227.27	6.59	338.997		
1,382.94	1,369.03	954.00	945.84	4.08	3.19	-53.31	1,118.84	-1,948.40	2,240.07	2,233.06	7.01	319.508		
1,400.00	1,385.28	958.82	950.46	4.13	3.22	-53.36	1,118.88	-1,949.75	2,241.39	2,234.31	7.08	316.591		
1,500.00	1,480.57	1,017.00	1,006.07	4.43	3.55	-53.92	1,118.97	-1,966.86	2,250.47	2,242.86	7.62	295.530		
1,600.00	1,575.86	1,061.31	1,048.13	4.73	3.81	-54.35	1,118.95	-1,980.79	2,261.86	2,253.77	8.09	279.529		
1,700.00	1,671.15	1,113.00	1,096.88	5.03	4.14	-54.87	1,118.98	-1,998.00	2,275.63	2,267.03	8.60	264.523		
1,800.00	1,766.44	1,164.70	1,145.25	5.33	4.48	-55.40	1,118.91	-2,016.22	2,291.69	2,282.58	9.12	251.383		
1,900.00	1,861.72	1,253.61	1,228.07	5.63	5.11	-56.31	1,118.33	-2,048.59	2,309.37	2,299.56	9.82	235.267		
2,000.00	1,957.01	1,382.88	1,348.95	5.93	6.03	-57.60	1,117.41	-2,094.39	2,326.88	2,316.17	10.71	217.229		
2,100.00	2,052.30	1,455.04	1,416.57	6.23	6.55	-58.32	1,116.58	-2,119.54	2,344.39	2,333.07	11.33	207.005		
2,200.00	2,147.59	1,562.72	1,517.27	6.53	7.33	-59.40	1,114.60	-2,157.61	2,362.82	2,350.71	12.12	195.025		
2,300.00	2,242.88	1,661.52	1,610.06	6.83	8.04	-60.34	1,113.71	-2,191.53	2,381.18	2,368.33	12.85	185.296		
2,400.00	2,338.16	1,726.36	1,670.91	7.13	8.51	-60.94	1,113.90	-2,213.91	2,400.61	2,387.20	13.42	178.946		
2,500.00	2,433.45	1,794.71	1,734.91	7.44	9.02	-61.56	1,114.56	-2,237.92	2,421.39	2,407.40	13.99	173.028		
2,600.00	2,528.74	1,870.34	1,805.52	7.74	9.59	-62.23	1,115.57	-2,265.01	2,443.43	2,428.83	14.61	167.281		
2,700.00	2,624.03	1,981.54	1,909.40	8.04	10.42	-63.21	1,116.59	-2,304.66	2,465.69	2,450.30	15.39	160.223		
2,800.00	2,719.32	2,084.49	2,005.73	8.34	11.19	-64.09	1,117.91	-2,340.95	2,488.21	2,472.08	16.13	154.298		
2,900.00	2,814.60	2,169.82	2,085.58	8.64	11.83	-64.79	1,119.85	-2,370.96	2,511.31	2,494.54	16.77	149.709		
3,000.00	2,909.89	2,261.94	2,171.83	8.94	12.52	-65.53	1,121.78	-2,403.26	2,534.75	2,517.30	17.45	145.223		
3,100.00	3,005.18	2,370.77	2,274.00	9.24	13.22	-66.41	1,123.17	-2,440.74	2,557.83	2,539.62	18.21	140.458		
3,200.00	3,100.47	2,458.04	2,355.91	9.54	13.97	-67.13	1,123.40	-2,470.86	2,581.34	2,562.47	18.87	136.807		
3,300.00	3,195.76	2,551.34	2,443.35	9.84	14.66	-67.89	1,123.24	-2,503.39	2,605.57	2,586.02	19.56	133.239		
3,400.00	3,291.04	2,630.69	2,517.73	10.14	15.26	-68.53	1,122.81	-2,531.03	2,630.21	2,610.03	20.18	130.350		
3,500.00	3,386.33	2,744.48	2,624.40	10.44	16.11	-69.43	1,122.51	-2,570.62	2,655.29	2,634.33	20.96	126.689		
3,600.00	3,481.62	2,820.94	2,696.13	10.74	16.67	-70.03	1,121.82	-2,597.10	2,680.57	2,659.00	21.57	124.285		
3,700.00	3,576.91	2,910.87	2,780.41	11.04	17.35	-70.73	1,121.04	-2,628.47	2,706.52	2,684.28	22.24	121.696		
3,800.00	3,672.20	3,027.46	2,889.86	11.34	18.21	-71.59	1,121.14	-2,668.63	2,732.58	2,709.55	23.03	118.646		
3,900.00	3,767.48	3,900.00	3,351.01	11.64	23.09	-75.00	1,117.86	-2,802.16	2,754.98	2,728.22	26.76	102.965		
4,000.00	3,862.77	4,070.00	3,908.49	11.94	23.18	-78.65	1,114.56	-2,864.49	2,755.47	2,728.34	27.13	101.570		
4,100.00	3,958.06	4,165.67	4,004.09	12.24	23.46	-79.26	1,113.86	-2,867.83	2,752.98	2,725.25	27.73	99.267		
4,200.00	4,053.35	4,261.34	4,099.71	12.54	23.73	-79.87	1,113.18	-2,871.15	2,750.81	2,722.47	28.34	97.064		
4,300.00	4,148.64	4,357.03	4,195.34	12.84	24.01	-80.48	1,112.51	-2,874.45	2,748.97	2,720.02	28.95	94.956		
4,400.00	4,243.92	4,452.73	4,290.97	13.14	24.29	-81.10	1,111.85	-2,877.73	2,747.45	2,717.88	29.56	92.938		
4,500.00	4,339.21	4,548.43	4,386.62	13.44	24.56	-81.71	1,111.21	-2,880.99	2,746.25	2,716.07	30.18	91.004		
4,600.00	4,434.50	4,644.15	4,482.28	13.74	24.84	-82.32	1,110.59	-2,884.24	2,745.38	2,714.58	30.79	89.152		
4,700.00	4,529.79	4,739.87	4,577.95	14.04	25.11	-82.93	1,109.98	-2,887.46	2,744.83	2,713.42	31.41	87.376		
4,800.00	4,625.08	4,835.61	4,673.63	14.34	25.39	-83.55	1,109.38	-2,890.67	2,744.61	2,712.57	32.04	85.673		
4,818.94	4,643.13	4,853.74	4,691.75	14.39	25.44	-83.66	1,109.27	-2,891.28	2,744.60	2,712.45	32.15	85.358		
4,900.00	4,720.36	4,931.35	4,769.31	14.64	25.67	-84.16	1,108.80	-2,893.86	2,744.71	2,712.05	32.66	84.038		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 022B - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 300-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.00	4,815.65	5,027.10	4,865.01	14.94	25.94	-84.77	1,108.24	-2,897.03	2,745.13	2,711.85	33.29	82.470		
5,100.00	4,910.94	5,122.86	4,960.72	15.24	26.22	-85.39	1,107.69	-2,900.18	2,745.88	2,711.96	33.91	80.964		
5,200.00	5,006.23	5,218.64	5,056.44	15.54	26.49	-86.00	1,107.15	-2,903.31	2,746.95	2,712.40	34.55	79.517		
5,300.00	5,101.52	5,314.42	5,152.17	15.84	26.77	-86.61	1,106.64	-2,906.42	2,748.33	2,713.16	35.18	78.128		
5,400.00	5,196.80	5,410.21	5,247.91	16.14	27.05	-87.22	1,106.13	-2,909.51	2,750.04	2,714.23	35.81	76.792		
5,500.00	5,292.09	5,506.01	5,343.66	16.44	27.32	-87.83	1,105.64	-2,912.58	2,752.07	2,715.62	36.45	75.508		
5,600.00	5,387.38	5,601.82	5,439.42	16.74	27.60	-88.44	1,105.17	-2,915.64	2,754.41	2,717.33	37.08	74.273		
5,700.00	5,482.67	5,697.64	5,535.19	17.04	27.88	-89.04	1,104.71	-2,918.67	2,757.07	2,719.35	37.72	73.085		
5,800.00	5,577.96	5,793.47	5,630.97	17.34	28.15	-89.65	1,104.27	-2,921.69	2,760.05	2,721.68	38.36	71.942		
5,900.00	5,673.24	5,889.31	5,726.76	17.64	28.43	-90.25	1,103.84	-2,924.68	2,763.33	2,724.33	39.01	70.842		
6,000.00	5,768.53	5,985.15	5,822.56	17.94	28.71	-90.86	1,103.43	-2,927.66	2,766.93	2,727.28	39.65	69.784		
6,100.00	5,863.82	6,081.01	5,918.37	18.24	28.98	-91.46	1,103.03	-2,930.62	2,770.84	2,730.55	40.29	68.764		
6,200.00	5,959.11	6,176.88	6,014.20	18.54	29.26	-92.06	1,102.65	-2,933.56	2,775.06	2,734.12	40.94	67.782		
6,300.00	6,054.40	6,272.75	6,110.03	18.84	29.53	-92.65	1,102.28	-2,936.48	2,779.58	2,738.00	41.59	66.837		
6,400.00	6,149.68	6,368.64	6,205.87	19.14	29.81	-93.25	1,101.93	-2,939.38	2,784.41	2,742.18	42.24	65.925		
6,500.00	6,244.97	6,464.53	6,301.72	19.44	30.09	-93.84	1,101.59	-2,942.26	2,789.54	2,746.66	42.88	65.047		
6,600.00	6,340.26	6,560.44	6,397.58	19.74	30.36	-94.43	1,101.27	-2,945.13	2,794.97	2,751.44	43.53	64.201		
6,689.41	6,425.45	6,646.19	6,483.29	20.01	30.61	-94.96	1,100.99	-2,947.67	2,800.08	2,755.96	44.12	63.470		
6,700.00	6,435.54	6,656.35	6,493.45	20.04	30.64	-91.74	1,100.96	-2,947.97	2,800.61	2,756.42	44.19	63.383		
6,750.00	6,482.96	6,704.18	6,541.25	20.19	30.78	-77.82	1,100.81	-2,949.38	2,800.55	2,756.04	44.51	62.918		
6,800.00	6,529.78	6,751.52	6,588.58	20.34	30.92	-66.76	1,100.67	-2,950.78	2,796.33	2,751.49	44.84	62.368		
6,850.00	6,575.63	6,798.03	6,635.07	20.49	31.05	-58.55	1,100.54	-2,952.14	2,787.99	2,742.83	45.16	61.736		
6,900.00	6,620.18	6,843.34	6,680.36	20.64	31.18	-52.67	1,100.41	-2,953.46	2,775.60	2,730.12	45.48	61.029		
6,950.00	6,663.07	6,887.11	6,724.11	20.79	31.31	-48.56	1,100.29	-2,954.74	2,759.28	2,713.48	45.80	60.251		
7,000.00	6,704.00	6,929.01	6,765.99	20.94	31.43	-45.79	1,100.17	-2,955.95	2,739.16	2,693.05	46.11	59.407		
7,050.00	6,742.63	6,968.71	6,805.67	21.09	31.54	-44.08	1,100.07	-2,957.10	2,715.41	2,668.99	46.41	58.504		
7,100.00	6,778.69	7,005.91	6,842.86	21.24	31.65	-43.25	1,099.97	-2,958.17	2,688.21	2,641.49	46.71	57.548		
7,150.00	6,811.89	7,040.33	6,877.26	21.39	31.75	-43.21	1,099.89	-2,959.16	2,657.77	2,610.77	47.00	56.545		
7,200.00	6,841.98	7,071.71	6,908.63	21.54	31.84	-43.92	1,099.81	-2,960.07	2,624.35	2,577.06	47.28	55.502		
7,250.00	6,868.74	7,099.80	6,936.71	21.69	31.92	-45.43	1,099.74	-2,960.87	2,588.19	2,540.63	47.56	54.425		
7,300.00	6,891.96	7,124.40	6,961.29	21.84	31.99	-47.83	1,099.69	-2,961.57	2,549.56	2,501.75	47.82	53.320		
7,350.00	6,911.46	7,145.31	6,982.20	21.99	32.05	-51.28	1,099.64	-2,962.17	2,508.77	2,460.71	48.07	52.195		
7,400.00	6,927.10	7,162.38	6,999.26	22.14	32.10	-56.04	1,099.60	-2,962.66	2,466.12	2,417.82	48.30	51.055		
7,450.00	6,938.75	7,175.48	7,012.36	22.29	32.14	-62.44	1,099.57	-2,963.03	2,421.92	2,373.39	48.53	49.908		
7,500.00	6,946.33	7,184.51	7,021.38	22.44	32.16	-70.86	1,099.55	-2,963.29	2,376.50	2,327.76	48.74	48.759		
7,550.00	6,949.78	7,189.40	7,026.27	22.59	32.18	-81.53	1,099.54	-2,963.43	2,330.19	2,281.25	48.94	47.615		
7,568.05	6,950.00	7,190.14	7,027.01	22.65	32.18	-85.91	1,099.54	-2,963.45	2,313.32	2,264.32	49.01	47.205		
7,600.00	6,949.92	7,190.97	7,027.84	22.74	32.18	-85.97	1,099.53	-2,963.47	2,283.43	2,234.30	49.13	46.481		
7,700.00	6,949.66	7,193.57	7,030.44	23.04	32.19	-86.15	1,099.53	-2,963.54	2,190.25	2,140.74	49.50	44.243		
7,800.00	6,949.40	7,196.16	7,033.03	23.35	32.20	-86.34	1,099.52	-2,963.62	2,097.70	2,047.80	49.89	42.043		
7,900.00	6,949.14	7,198.76	7,035.63	23.65	32.21	-86.52	1,099.52	-2,963.69	2,005.85	1,955.56	50.29	39.883		
8,000.00	6,948.88	7,201.35	7,038.22	23.95	32.21	-86.70	1,099.51	-2,963.77	1,914.82	1,864.12	50.70	37.764		
8,100.00	6,948.62	7,203.95	7,040.81	24.25	32.22	-86.88	1,099.50	-2,963.84	1,824.73	1,773.60	51.13	35.687		
8,200.00	6,948.36	7,206.54	7,043.40	24.55	32.23	-87.07	1,099.50	-2,963.91	1,735.72	1,684.14	51.58	33.654		
8,300.00	6,948.11	7,209.13	7,045.99	24.85	32.24	-87.25	1,099.49	-2,963.99	1,647.96	1,595.93	52.04	31.668		
8,400.00	6,947.85	7,211.72	7,048.58	25.15	32.24	-87.43	1,099.49	-2,964.06	1,561.68	1,509.15	52.53	29.731		
8,500.00	6,947.59	7,214.31	7,051.17	25.45	32.25	-87.62	1,099.48	-2,964.13	1,477.12	1,424.08	53.04	27.848		
8,600.00	6,947.33	7,216.89	7,053.75	25.75	32.26	-87.80	1,099.48	-2,964.21	1,394.60	1,341.01	53.59	26.024		
8,700.00	6,947.07	7,219.48	7,056.34	26.05	32.27	-87.98	1,099.47	-2,964.28	1,314.50	1,260.33	54.17	24.264		
8,800.00	6,946.81	7,222.07	7,058.92	26.35	32.27	-88.16	1,099.47	-2,964.35	1,237.30	1,182.50	54.80	22.578		
8,900.00	6,946.55	7,224.65	7,061.51	26.65	32.28	-88.35	1,099.46	-2,964.43	1,163.57	1,108.10	55.47	20.976		
9,000.00	6,946.29	7,227.23	7,064.09	26.95	32.29	-88.53	1,099.45	-2,964.50	1,094.02	1,037.83	56.19	19.470		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 022B - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 300-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,100.00	6,946.03	7,229.82	7,066.67	27.25	32.29	-88.71	1,099.45	-2,964.57	1,029.48	972.53	56.96	18.075		
9,200.00	6,945.78	7,232.40	7,069.25	27.55	32.30	-88.89	1,099.44	-2,964.65	970.97	913.21	57.76	16.811		
9,300.00	6,945.52	7,234.98	7,071.83	27.85	32.31	-89.08	1,099.44	-2,964.72	919.63	861.05	58.58	15.699		
9,400.00	6,945.26	7,237.56	7,074.41	28.15	32.32	-89.26	1,099.43	-2,964.79	876.72	817.33	59.39	14.762		
9,500.00	6,945.00	7,240.13	7,076.98	28.45	32.32	-89.44	1,099.43	-2,964.87	843.53	783.38	60.15	14.024		
9,600.00	6,944.74	7,242.71	7,079.56	28.75	32.33	-89.62	1,099.42	-2,964.94	821.24	760.43	60.81	13.505		
9,700.00	6,944.48	7,245.28	7,082.13	29.05	32.34	-89.81	1,099.42	-2,965.01	810.75	749.42	61.33	13.220		
9,735.66	6,944.39	7,246.20	7,083.05	29.16	32.34	-89.87	1,099.41	-2,965.04	809.96	748.49	61.47	13.177 CC, ES		
9,800.00	6,944.22	7,247.86	7,084.71	29.35	32.35	-89.99	1,099.41	-2,965.08	812.51	750.84	61.67	13.175 SF		
9,900.00	6,943.96	7,250.43	7,087.28	29.66	32.35	-90.17	1,099.40	-2,965.16	826.45	764.61	61.85	13.363		
10,000.00	6,943.70	7,253.01	7,089.85	29.96	32.36	-90.35	1,099.40	-2,965.23	851.98	790.10	61.88	13.769		
10,100.00	6,943.45	7,255.58	7,092.42	30.26	32.37	-90.53	1,099.39	-2,965.30	888.08	826.28	61.80	14.370		
10,200.00	6,943.19	7,258.15	7,094.99	30.56	32.38	-90.71	1,099.39	-2,965.38	933.55	871.88	61.67	15.139		
10,300.00	6,942.93	7,260.72	7,097.56	30.86	32.38	-90.90	1,099.38	-2,965.45	987.07	925.56	61.51	16.046		
10,400.00	6,942.67	7,263.28	7,100.12	31.16	32.39	-91.08	1,099.38	-2,965.52	1,047.42	986.05	61.37	17.067		
10,500.00	6,942.41	7,265.85	7,102.69	31.46	32.40	-91.26	1,099.37	-2,965.59	1,113.49	1,052.24	61.25	18.178		
10,600.00	6,942.15	7,268.42	7,105.26	31.76	32.41	-91.44	1,099.37	-2,965.67	1,184.33	1,123.15	61.17	19.360		
10,700.00	6,941.89	7,270.98	7,107.82	32.06	32.41	-91.62	1,099.36	-2,965.74	1,259.12	1,197.98	61.13	20.596		
10,800.00	6,941.63	7,273.54	7,110.38	32.36	32.42	-91.80	1,099.36	-2,965.81	1,337.20	1,276.07	61.13	21.874		
10,900.00	6,941.37	7,276.11	7,112.94	32.66	32.43	-91.98	1,099.35	-2,965.88	1,418.04	1,356.87	61.17	23.183		
11,000.00	6,941.11	7,278.67	7,115.50	32.96	32.44	-92.16	1,099.34	-2,965.96	1,501.18	1,439.94	61.24	24.515		
11,100.00	6,940.86	7,281.23	7,118.06	33.26	32.44	-92.35	1,099.34	-2,966.03	1,586.26	1,524.93	61.33	25.863		
11,200.00	6,940.60	7,283.79	7,120.62	33.56	32.45	-92.53	1,099.33	-2,966.10	1,673.00	1,611.54	61.46	27.222		
11,300.00	6,940.34	7,286.35	7,123.18	33.86	32.46	-92.71	1,099.33	-2,966.17	1,761.13	1,699.53	61.60	28.589		
11,400.00	6,940.08	7,288.90	7,125.74	34.16	32.47	-92.89	1,099.32	-2,966.24	1,850.47	1,788.70	61.77	29.959		
11,500.00	6,939.82	7,291.46	7,128.29	34.46	32.47	-93.07	1,099.32	-2,966.32	1,940.85	1,878.90	61.95	31.330		
11,600.00	6,939.56	7,294.02	7,130.84	34.76	32.48	-93.25	1,099.31	-2,966.39	2,032.12	1,969.97	62.15	32.699		
11,700.00	6,939.30	7,296.57	7,133.40	35.06	32.49	-93.43	1,099.31	-2,966.46	2,124.18	2,061.82	62.35	34.066		
11,800.00	6,939.04	7,299.12	7,135.95	35.36	32.49	-93.61	1,099.30	-2,966.53	2,216.92	2,154.35	62.57	35.429		
11,900.00	6,938.78	7,301.67	7,138.50	35.66	32.50	-93.79	1,099.30	-2,966.60	2,310.26	2,247.46	62.80	36.786		
12,000.00	6,938.53	7,304.23	7,141.05	35.96	32.51	-93.97	1,099.29	-2,966.68	2,404.14	2,341.10	63.04	38.137		
12,100.00	6,938.27	7,306.78	7,143.60	36.26	32.52	-94.15	1,099.29	-2,966.75	2,498.49	2,435.21	63.28	39.481		
12,200.00	6,938.01	7,309.32	7,146.15	36.56	32.52	-94.32	1,099.28	-2,966.82	2,593.26	2,529.73	63.53	40.817		
12,300.00	6,937.75	7,311.87	7,148.69	36.86	32.53	-94.50	1,099.28	-2,966.89	2,688.41	2,624.62	63.79	42.145		
12,400.00	6,937.49	7,314.42	7,151.24	37.16	32.54	-94.68	1,099.27	-2,966.96	2,783.90	2,719.85	64.05	43.465		
12,500.00	6,937.23	7,316.96	7,153.78	37.46	32.55	-94.86	1,099.27	-2,967.04	2,879.69	2,815.37	64.31	44.775		
12,600.00	6,936.97	7,319.51	7,156.33	37.77	32.55	-95.04	1,099.26	-2,967.11	2,975.75	2,911.17	64.58	46.076		
12,700.00	6,936.71	7,322.05	7,158.87	38.07	32.56	-95.22	1,099.26	-2,967.18	3,072.06	3,007.21	64.86	47.368		
12,800.00	6,936.45	7,324.59	7,161.41	38.37	32.57	-95.40	1,099.25	-2,967.25	3,168.60	3,103.47	65.13	48.650		
12,900.00	6,936.20	7,327.14	7,163.95	38.67	32.58	-95.57	1,099.25	-2,967.32	3,265.35	3,199.94	65.41	49.922		
13,000.00	6,935.94	7,329.68	7,166.49	38.97	32.58	-95.75	1,099.24	-2,967.39	3,362.28	3,296.59	65.69	51.185		
13,100.00	6,935.68	7,332.21	7,169.03	39.27	32.59	-95.93	1,099.24	-2,967.46	3,459.39	3,393.42	65.97	52.438		
13,200.00	6,935.42	7,334.75	7,171.57	39.57	32.60	-96.11	1,099.23	-2,967.53	3,556.66	3,490.40	66.26	53.681		
13,300.00	6,935.16	7,337.29	7,174.10	39.87	32.60	-96.28	1,099.23	-2,967.61	3,654.07	3,587.53	66.54	54.914		
13,400.00	6,934.90	7,339.83	7,176.64	40.17	32.61	-96.46	1,099.22	-2,967.68	3,751.61	3,684.78	66.83	56.137		
13,500.00	6,934.64	7,342.36	7,179.17	40.47	32.62	-96.64	1,099.22	-2,967.75	3,849.28	3,782.17	67.12	57.350		
13,600.00	6,934.38	7,344.89	7,181.70	40.77	32.63	-96.81	1,099.21	-2,967.82	3,947.07	3,879.66	67.41	58.554		
13,700.00	6,934.12	7,347.43	7,184.23	41.07	32.63	-96.99	1,099.21	-2,967.89	4,044.96	3,977.26	67.70	59.748		
13,800.00	6,933.87	7,349.96	7,186.77	41.37	32.64	-97.17	1,099.20	-2,967.96	4,142.95	4,074.96	67.99	60.931		
13,900.00	6,933.61	7,352.49	7,189.29	41.67	32.65	-97.34	1,099.20	-2,968.03	4,241.04	4,172.75	68.29	62.106		
14,000.00	6,933.35	7,355.02	7,191.82	41.97	32.66	-97.52	1,099.19	-2,968.11	4,339.21	4,270.62	68.58	63.270		
14,100.00	6,933.09	7,357.55	7,194.35	42.27	32.66	-97.69	1,099.19	-2,968.18	4,437.46	4,368.58	68.88	64.425		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 022B - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 300-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,200.00	6,932.83	7,360.07	7,196.88	42.57	32.67	-97.87	1,099.18	-2,968.25	4,535.78	4,466.61	69.17	65.571		
14,300.00	6,932.57	7,362.60	7,199.40	42.87	32.68	-98.05	1,099.18	-2,968.32	4,634.18	4,564.70	69.47	66.707		
14,400.00	6,932.31	7,365.13	7,201.93	43.17	32.69	-98.22	1,099.17	-2,968.39	4,732.64	4,662.87	69.77	67.833		
14,500.00	6,932.05	7,367.65	7,204.45	43.47	32.69	-98.39	1,099.17	-2,968.46	4,831.16	4,761.09	70.07	68.950		
14,600.00	6,931.79	7,370.17	7,206.97	43.77	32.70	-98.57	1,099.16	-2,968.53	4,929.74	4,859.37	70.37	70.059		
14,700.00	6,931.54	7,372.70	7,209.49	44.07	32.71	-98.74	1,099.16	-2,968.60	5,028.38	4,957.71	70.67	71.158		
14,800.00	6,931.28	7,375.22	7,212.01	44.37	32.71	-98.92	1,099.15	-2,968.67	5,127.06	5,056.10	70.97	72.247		
14,900.00	6,931.02	7,377.74	7,214.53	44.67	32.72	-99.09	1,099.15	-2,968.74	5,225.80	5,154.53	71.27	73.328		
15,000.00	6,930.76	7,380.26	7,217.05	44.97	32.73	-99.26	1,099.14	-2,968.81	5,324.58	5,253.02	71.57	74.401		
15,100.00	6,930.50	7,382.78	7,219.57	45.27	32.74	-99.44	1,099.14	-2,968.88	5,423.41	5,351.54	71.87	75.464		
15,200.00	6,930.24	7,385.29	7,222.08	45.57	32.74	-99.61	1,099.13	-2,968.95	5,522.27	5,450.11	72.17	76.519		
15,300.00	6,929.98	7,387.81	7,224.60	45.87	32.75	-99.78	1,099.13	-2,969.02	5,621.18	5,548.71	72.47	77.565		
15,400.00	6,929.72	7,390.32	7,227.11	46.17	32.76	-99.96	1,099.12	-2,969.10	5,720.12	5,647.35	72.77	78.602		
15,500.00	6,929.46	7,392.84	7,229.63	46.47	32.77	-100.13	1,099.12	-2,969.17	5,819.10	5,746.02	73.08	79.631		
15,600.00	6,929.21	7,395.35	7,232.14	46.77	32.77	-100.30	1,099.11	-2,969.24	5,918.11	5,844.73	73.38	80.652		
15,700.00	6,928.95	7,397.86	7,234.65	47.07	32.78	-100.47	1,099.11	-2,969.31	6,017.15	5,943.47	73.68	81.665		
15,800.00	6,928.69	7,400.37	7,237.16	47.37	32.79	-100.64	1,099.10	-2,969.38	6,116.23	6,042.24	73.98	82.669		
15,900.00	6,928.43	7,402.88	7,239.67	47.67	32.79	-100.81	1,099.10	-2,969.45	6,215.33	6,141.04	74.29	83.665		
16,000.00	6,928.17	7,405.39	7,242.18	47.97	32.80	-100.99	1,099.09	-2,969.52	6,314.46	6,239.86	74.59	84.654		
16,100.00	6,927.91	7,407.90	7,244.68	48.27	32.81	-101.16	1,099.09	-2,969.59	6,413.61	6,338.72	74.90	85.634		
16,200.00	6,927.65	7,410.40	7,247.19	48.57	32.82	-101.33	1,099.08	-2,969.66	6,512.79	6,437.59	75.20	86.607		
16,300.00	6,927.39	7,412.91	7,249.69	48.87	32.82	-101.50	1,099.08	-2,969.73	6,611.99	6,536.49	75.50	87.572		
16,400.00	6,927.13	7,415.41	7,252.20	49.17	32.83	-101.67	1,099.08	-2,969.80	6,711.22	6,635.41	75.81	88.529		
16,500.00	6,926.88	7,417.92	7,254.70	49.47	32.84	-101.84	1,099.07	-2,969.87	6,810.47	6,734.36	76.11	89.478		
16,600.00	6,926.62	7,420.42	7,257.20	49.77	32.84	-102.01	1,099.07	-2,969.94	6,909.74	6,833.32	76.42	90.421		
16,700.00	6,926.36	7,422.92	7,259.70	50.07	32.85	-102.17	1,099.06	-2,970.01	7,009.03	6,932.30	76.72	91.355		
16,800.00	6,926.10	7,425.42	7,262.20	50.37	32.86	-102.34	1,099.06	-2,970.08	7,108.33	7,031.30	77.03	92.283		
16,900.00	6,925.84	7,427.92	7,264.70	50.67	32.87	-102.51	1,099.05	-2,970.15	7,207.66	7,130.33	77.33	93.203		
17,000.00	6,925.58	7,430.42	7,267.19	50.97	32.87	-102.68	1,099.05	-2,970.22	7,307.00	7,229.36	77.64	94.116		
17,100.00	6,925.32	7,432.92	7,269.69	51.27	32.88	-102.85	1,099.04	-2,970.29	7,406.36	7,328.42	77.94	95.022		
17,200.00	6,925.06	7,435.41	7,272.19	51.58	32.89	-103.02	1,099.04	-2,970.36	7,505.74	7,427.49	78.25	95.921		
17,224.45	6,925.00	7,436.02	7,272.80	51.65	32.89	-103.06	1,099.04	-2,970.37	7,530.03	7,451.71	78.32	96.140		
17,224.92	6,925.00	7,436.04	7,272.81	51.65	32.89	-103.06	1,099.04	-2,970.37	7,530.51	7,452.18	78.33	96.144		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 530-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	161.50	161.50	0.00	1.49	-71.40	2,182.29	-6,483.96	6,841.35					
100.00	100.00	261.50	261.50	0.23	2.42	-71.40	2,182.29	-6,483.96	6,841.35	6,838.71	2.64	2,587.923		
200.00	200.00	361.50	361.50	0.53	3.34	-71.40	2,182.29	-6,483.96	6,841.35	6,837.48	3.87	1,768.796		
300.00	300.00	461.50	461.50	0.83	4.27	-71.40	2,182.29	-6,483.96	6,841.35	6,836.26	5.09	1,343.540		
400.00	400.00	561.51	561.50	1.13	5.50	-71.40	2,182.29	-6,483.96	6,841.35	6,834.73	6.62	1,032.741		
500.00	500.00	661.51	661.50	1.43	7.40	-71.40	2,182.29	-6,483.96	6,841.35	6,832.52	8.83	775.078		
600.00	599.98	761.49	761.48	1.73	9.30	-64.16	2,182.29	-6,483.96	6,840.59	6,829.56	11.03	620.265		
700.00	699.84	865.40	865.39	2.03	11.28	-64.24	2,182.71	-6,483.96	6,838.44	6,825.14	13.31	513.967		
800.00	799.45	1,039.01	960.95	2.33	14.61	-64.38	2,182.29	-6,483.96	6,834.52	6,817.59	16.93	403.646		
900.00	898.70	1,060.24	1,060.20	2.63	15.02	-64.56	2,182.29	-6,483.96	6,829.23	6,811.59	17.65	386.948		
1,000.00	997.47	1,159.00	1,158.97	2.93	16.96	-64.80	2,182.29	-6,483.96	6,822.48	6,802.59	19.89	343.024		
1,100.00	1,095.62	1,257.89	1,257.85	3.23	18.91	-65.09	2,183.09	-6,483.96	6,814.52	6,792.39	22.13	307.905		
1,200.00	1,193.06	1,361.11	1,361.06	3.53	20.93	-65.45	2,182.92	-6,483.96	6,804.85	6,780.39	24.46	278.207		
1,300.00	1,289.64	1,528.78	1,451.14	3.83	24.31	-65.83	2,182.29	-6,483.96	6,793.67	6,765.54	28.14	241.463		
1,382.94	1,369.03	1,547.13	1,547.08	4.08	24.59	-66.24	2,181.88	-6,483.96	6,783.44	6,754.78	28.66	236.661		
1,400.00	1,385.28	1,546.86	1,546.78	4.13	24.70	-66.24	2,182.29	-6,483.96	6,781.38	6,752.55	28.83	235.228		
1,500.00	1,480.57	1,642.15	1,642.07	4.43	26.77	-66.46	2,182.29	-6,483.96	6,768.71	6,737.51	31.20	216.934		
1,600.00	1,575.86	1,737.44	1,737.36	4.73	28.85	-66.69	2,182.29	-6,483.96	6,756.16	6,722.58	33.57	201.229		
1,700.00	1,671.15	1,837.73	1,837.65	5.03	31.03	-66.92	2,182.99	-6,483.96	6,743.92	6,707.86	36.06	187.039		
1,800.00	1,766.44	1,938.00	1,937.91	5.33	33.21	-67.17	2,182.60	-6,483.96	6,731.48	6,692.94	38.54	174.674		
1,900.00	1,861.72	2,038.11	2,038.02	5.63	35.39	-67.41	2,181.95	-6,483.96	6,719.09	6,678.08	41.01	163.820		
2,000.00	1,957.01	2,118.69	2,118.51	5.93	37.48	-67.60	2,182.29	-6,483.96	6,707.07	6,663.66	43.41	154.505		
2,100.00	2,052.30	2,213.98	2,213.80	6.23	39.81	-67.83	2,182.29	-6,483.96	6,695.09	6,649.05	46.04	145.431		
2,200.00	2,147.59	2,314.96	2,314.76	6.53	42.27	-68.07	2,183.91	-6,483.95	6,683.66	6,634.86	48.80	136.956		
2,300.00	2,242.88	2,419.46	2,419.24	6.83	44.83	-68.33	2,183.31	-6,483.96	6,671.76	6,620.11	51.65	129.166		
2,400.00	2,338.16	2,527.98	2,499.66	7.13	47.48	-68.53	2,182.29	-6,483.96	6,659.84	6,605.23	54.61	121.960		
2,500.00	2,433.45	2,595.31	2,594.95	7.44	49.15	-68.76	2,182.29	-6,483.96	6,648.32	6,591.75	56.57	117.514		
2,600.00	2,528.74	2,690.60	2,690.24	7.74	51.51	-69.00	2,182.29	-6,483.96	6,636.93	6,577.69	59.23	112.044		
2,700.00	2,624.03	2,789.95	2,789.57	8.04	53.97	-69.23	2,183.76	-6,483.95	6,626.02	6,564.02	62.00	106.878		
2,800.00	2,719.32	2,894.78	2,894.39	8.34	56.57	-69.49	2,183.20	-6,483.96	6,614.73	6,549.84	64.89	101.933		
2,900.00	2,814.60	2,999.24	2,998.83	8.64	59.15	-69.76	2,182.02	-6,483.96	6,603.43	6,535.65	67.78	97.425		
3,000.00	2,909.89	3,071.91	3,071.39	8.94	60.80	-69.94	2,182.29	-6,483.96	6,592.54	6,522.82	69.72	94.552		
3,100.00	3,005.18	3,167.20	3,166.68	9.24	63.00	-70.18	2,182.29	-6,483.96	6,581.75	6,509.53	72.22	91.130		
3,200.00	3,100.47	3,265.46	3,264.92	9.54	65.26	-70.41	2,183.89	-6,483.95	6,571.44	6,496.65	74.79	87.862		
3,300.00	3,195.76	3,368.72	3,368.17	9.84	67.65	-70.67	2,183.40	-6,483.96	6,560.79	6,483.31	77.48	84.681		
3,400.00	3,291.04	3,500.82	3,452.54	10.14	70.66	-70.90	2,182.29	-6,483.96	6,550.10	6,469.32	80.78	81.083		
3,500.00	3,386.33	3,548.47	3,547.83	10.44	71.67	-71.14	2,182.29	-6,483.96	6,539.80	6,457.71	82.10	79.660		
3,600.00	3,481.62	3,643.76	3,643.12	10.74	73.70	-71.38	2,182.29	-6,483.96	6,529.63	6,445.20	84.42	77.344		
3,700.00	3,576.91	3,932.90	3,738.41	11.04	80.21	-71.62	2,182.29	-6,483.96	6,519.58	6,428.34	91.24	71.455		
3,800.00	3,672.20	3,846.58	3,845.92	11.34	78.01	-71.89	2,182.20	-6,483.96	6,509.64	6,420.31	89.34	72.866		
3,900.00	3,767.48	3,929.67	3,928.98	11.64	80.13	-72.11	2,182.29	-6,483.96	6,499.85	6,408.09	91.76	70.836		
4,000.00	3,862.77	4,024.96	4,024.27	11.94	82.52	-72.35	2,182.29	-6,483.96	6,490.18	6,395.74	94.45	68.718		
4,100.00	3,958.06	4,120.25	4,119.56	12.24	84.91	-72.59	2,182.29	-6,483.96	6,480.64	6,383.50	97.13	66.719		
4,200.00	4,053.35	4,215.54	4,214.85	12.54	87.29	-72.84	2,182.29	-6,483.96	6,471.22	6,371.40	99.82	64.828		
4,300.00	4,148.64	4,310.83	4,310.14	12.84	89.68	-73.09	2,182.29	-6,483.96	6,461.93	6,359.43	102.51	63.038		
4,400.00	4,243.92	4,406.11	4,405.42	13.14	92.07	-73.33	2,182.29	-6,483.96	6,452.78	6,347.58	105.20	61.341		
4,500.00	4,339.21	4,501.40	4,500.71	13.44	94.46	-73.58	2,182.29	-6,483.96	6,443.75	6,335.87	107.88	59.729		
4,600.00	4,434.50	4,596.69	4,596.00	13.74	96.84	-73.83	2,182.29	-6,483.96	6,434.85	6,324.28	110.57	58.197		
4,700.00	4,529.79	4,691.98	4,691.29	14.04	99.23	-74.08	2,182.29	-6,483.96	6,426.08	6,312.83	113.26	56.739		
4,800.00	4,625.08	4,787.27	4,786.58	14.34	101.62	-74.32	2,182.29	-6,483.96	6,417.45	6,301.50	115.94	55.350		
4,900.00	4,720.36	4,882.95	4,882.22	14.64	104.01	-74.54	2,186.66	-6,483.95	6,409.62	6,290.98	118.64	54.025		
5,000.00	4,815.65	4,979.05	4,978.31	14.94	106.42	-74.79	2,186.58	-6,483.95	6,401.22	6,279.87	121.35	52.751		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 530-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	5,075.09	5,074.36	15.24	108.83	-75.05	2,186.42	-6,483.95	6,392.94	6,268.88	124.05	51.533	
5,200.00	5,006.23	5,171.09	5,170.35	15.54	111.23	-75.30	2,186.18	-6,483.95	6,384.78	6,258.02	126.76	50.369	
5,300.00	5,101.52	5,267.04	5,266.29	15.84	113.64	-75.56	2,185.86	-6,483.95	6,376.75	6,247.28	129.46	49.255	
5,400.00	5,196.80	5,362.94	5,362.19	16.14	116.04	-75.81	2,185.46	-6,483.95	6,368.84	6,236.68	132.17	48.188	
5,500.00	5,292.09	5,458.79	5,458.03	16.44	118.44	-76.07	2,184.98	-6,483.95	6,361.07	6,226.20	134.87	47.166	
5,600.00	5,387.38	5,554.59	5,553.83	16.74	120.84	-76.33	2,184.43	-6,483.95	6,353.42	6,215.85	137.57	46.184	
5,700.00	5,482.67	5,650.39	5,649.63	17.04	123.24	-76.59	2,183.98	-6,483.96	6,345.73	6,195.82	140.27	45.202	
5,800.00	5,577.96	5,746.18	5,745.42	17.34	125.64	-76.85	2,183.53	-6,483.96	6,338.04	6,185.81	142.97	44.220	
5,900.00	5,673.24	5,841.97	5,841.21	17.64	128.04	-77.10	2,183.08	-6,483.96	6,330.35	6,175.80	145.67	43.238	
6,000.00	5,768.53	5,937.76	5,936.99	17.94	130.43	-77.38	2,182.63	-6,483.96	6,322.66	6,165.79	148.37	42.256	
6,100.00	5,863.82	6,033.55	6,032.78	18.24	132.82	-77.65	2,182.18	-6,483.96	6,314.97	6,155.78	151.07	41.274	
6,200.00	5,959.11	6,129.34	6,128.57	18.54	135.22	-77.91	2,181.73	-6,483.96	6,307.28	6,145.77	153.77	40.292	
6,300.00	6,054.40	6,225.13	6,224.36	18.84	137.62	-78.17	2,181.28	-6,483.96	6,299.59	6,135.76	156.47	39.310	
6,400.00	6,149.68	6,320.92	6,320.15	19.14	139.99	-78.43	2,180.83	-6,483.96	6,291.90	6,125.75	159.17	38.328	
6,500.00	6,244.97	6,416.71	6,415.94	19.44	142.39	-78.69	2,180.38	-6,483.96	6,284.21	6,115.74	161.87	37.346	
6,600.00	6,340.26	6,512.50	6,511.73	19.74	144.78	-78.95	2,179.93	-6,483.96	6,276.52	6,105.73	164.57	36.364	
6,689.41	6,425.45	6,598.09	6,597.32	20.01	146.83	-79.14	2,179.48	-6,483.96	6,268.83	6,095.72	167.27	35.382	
6,700.00	6,435.54	6,598.45	6,597.04	20.04	147.08	-75.89	2,182.29	-6,483.96	6,278.91	6,111.81	167.11	37.574	
6,750.00	6,482.96	6,645.86	6,644.46	20.19	148.28	-61.76	2,182.29	-6,483.96	6,272.86	6,104.41	168.45	37.238	
6,800.00	6,529.78	6,692.68	6,691.28	20.34	149.45	-50.34	2,182.29	-6,483.96	6,262.54	6,092.76	169.78	36.886	
6,850.00	6,575.63	6,738.53	6,737.13	20.49	150.61	-41.63	2,182.29	-6,483.96	6,248.04	6,076.96	171.09	36.520	
6,900.00	6,620.18	6,783.08	6,781.68	20.64	151.73	-35.10	2,182.29	-6,483.96	6,229.46	6,057.11	172.36	36.143	
6,950.00	6,663.07	6,825.98	6,824.57	20.79	152.81	-30.15	2,182.29	-6,483.96	6,206.94	6,033.36	173.59	35.757	
7,000.00	6,704.00	6,866.90	6,865.50	20.94	153.84	-26.33	2,182.29	-6,483.96	6,180.65	6,005.88	174.77	35.365	
7,050.00	6,742.63	6,905.53	6,904.13	21.09	154.81	-23.32	2,182.29	-6,483.96	6,150.77	5,974.88	175.89	34.969	
7,100.00	6,778.69	6,941.59	6,940.19	21.24	155.72	-20.88	2,182.29	-6,483.96	6,117.54	5,940.59	176.95	34.572	
7,150.00	6,811.89	6,974.79	6,973.39	21.39	156.56	-18.83	2,182.29	-6,483.96	6,081.21	5,903.27	177.94	34.176	
7,200.00	6,841.98	7,004.89	7,003.48	21.54	157.31	-17.06	2,182.29	-6,483.96	6,042.03	5,863.19	178.84	33.784	
7,250.00	6,868.74	7,031.64	7,030.24	21.69	157.99	-15.42	2,182.29	-6,483.96	6,000.32	5,820.65	179.67	33.397	
7,300.00	6,891.96	7,054.86	7,053.46	21.84	158.57	-13.78	2,182.29	-6,483.96	5,956.37	5,775.97	180.40	33.017	
7,350.00	6,911.46	7,074.36	7,072.96	21.99	159.06	-11.93	2,182.29	-6,483.96	5,910.53	5,729.49	181.05	32.647	
7,400.00	6,927.10	7,090.00	7,088.60	22.14	159.46	-9.47	2,182.29	-6,483.96	5,863.14	5,681.55	181.59	32.288	
7,450.00	6,938.75	7,101.65	7,100.25	22.29	159.75	-5.34	2,182.29	-6,483.96	5,814.56	5,632.52	182.03	31.942	
7,500.00	6,946.33	7,109.23	7,107.83	22.44	159.94	4.59	2,182.29	-6,483.96	5,765.15	5,582.78	182.37	31.612	
7,550.00	6,949.78	7,112.68	7,111.28	22.59	160.03	52.27	2,182.29	-6,483.96	5,715.30	5,532.69	182.61	31.297	
7,568.05	6,950.00	7,112.90	7,111.50	22.65	160.03	93.29	2,182.29	-6,483.96	5,697.27	5,514.60	182.67	31.188	
7,600.00	6,949.92	7,112.82	7,111.42	22.74	160.03	93.27	2,182.29	-6,483.96	5,665.35	5,482.58	182.77	30.998	
7,700.00	6,949.66	7,112.56	7,111.16	23.04	160.02	93.21	2,182.29	-6,483.96	5,565.45	5,382.39	183.06	30.402	
7,800.00	6,949.40	7,112.30	7,110.90	23.35	160.02	93.15	2,182.29	-6,483.96	5,465.56	5,282.21	183.36	29.809	
7,900.00	6,949.14	7,112.04	7,110.64	23.65	160.01	93.09	2,182.29	-6,483.96	5,365.68	5,182.03	183.65	29.217	
8,000.00	6,948.88	7,111.78	7,110.38	23.95	160.01	93.04	2,182.29	-6,483.96	5,265.79	5,081.85	183.94	28.627	
8,100.00	6,948.62	7,111.53	7,110.12	24.25	160.00	92.98	2,182.29	-6,483.96	5,165.91	4,981.68	184.24	28.039	
8,200.00	6,948.36	7,111.27	7,109.86	24.55	159.99	92.92	2,182.29	-6,483.96	5,066.04	4,881.51	184.53	27.453	
8,300.00	6,948.11	7,111.01	7,109.61	24.85	159.99	92.86	2,182.29	-6,483.96	4,966.17	4,781.34	184.83	26.869	
8,400.00	6,947.85	7,110.75	7,109.35	25.15	159.98	92.81	2,182.29	-6,483.96	4,866.31	4,681.19	185.12	26.287	
8,500.00	6,947.59	7,110.49	7,109.09	25.45	159.97	92.75	2,182.29	-6,483.96	4,766.45	4,581.04	185.41	25.707	
8,600.00	6,947.33	7,110.23	7,108.83	25.75	159.97	92.69	2,182.29	-6,483.96	4,666.60	4,480.89	185.71	25.129	
8,700.00	6,947.07	7,109.97	7,108.57	26.05	159.96	92.63	2,182.29	-6,483.96	4,566.75	4,380.75	186.00	24.552	
8,800.00	6,946.81	7,109.71	7,108.31	26.35	159.95	92.58	2,182.29	-6,483.96	4,466.92	4,280.62	186.30	23.977	
8,900.00	6,946.55	7,109.45	7,108.05	26.65	159.95	92.52	2,182.29	-6,483.96	4,367.08	4,180.49	186.59	23.404	
9,000.00	6,946.29	7,109.20	7,107.79	26.95	159.94	92.46	2,182.29	-6,483.96	4,267.26	4,080.38	186.89	22.834	
9,100.00	6,946.03	7,108.94	7,107.53	27.25	159.93	92.40	2,182.29	-6,483.96	4,167.45	3,980.27	187.18	22.264	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 530-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	7,108.68	7,107.28	27.55	159.93	92.35	2,182.29	-6,483.96	4,067.64	3,880.17	187.47	21.697	
9,300.00	6,945.52	7,108.42	7,107.02	27.85	159.92	92.29	2,182.29	-6,483.96	3,967.85	3,780.08	187.77	21.132	
9,400.00	6,945.26	7,108.16	7,106.76	28.15	159.91	92.23	2,182.29	-6,483.96	3,868.06	3,680.00	188.06	20.568	
9,500.00	6,945.00	7,107.90	7,106.50	28.45	159.91	92.17	2,182.29	-6,483.96	3,768.29	3,579.93	188.36	20.006	
9,600.00	6,944.74	7,107.64	7,106.24	28.75	159.90	92.11	2,182.29	-6,483.96	3,668.53	3,479.88	188.65	19.446	
9,700.00	6,944.48	7,107.38	7,105.98	29.05	159.89	92.06	2,182.29	-6,483.96	3,568.78	3,379.84	188.94	18.888	
9,800.00	6,944.22	7,107.12	7,105.72	29.35	159.89	92.00	2,182.29	-6,483.96	3,469.05	3,279.81	189.24	18.332	
9,900.00	6,943.96	7,106.87	7,105.46	29.66	159.88	91.94	2,182.29	-6,483.96	3,369.33	3,179.80	189.53	17.777	
10,000.00	6,943.70	7,106.61	7,105.20	29.96	159.87	91.88	2,182.29	-6,483.96	3,269.63	3,079.80	189.83	17.224	
10,100.00	6,943.45	7,106.35	7,104.95	30.26	159.87	91.83	2,182.29	-6,483.96	3,169.95	2,979.83	190.12	16.673	
10,200.00	6,943.19	7,106.09	7,104.69	30.56	159.86	91.77	2,182.29	-6,483.96	3,070.29	2,879.87	190.41	16.124	
10,300.00	6,942.93	7,105.83	7,104.43	30.86	159.86	91.71	2,182.29	-6,483.96	2,970.65	2,779.94	190.71	15.577	
10,400.00	6,942.67	7,105.57	7,104.17	31.16	159.85	91.65	2,182.29	-6,483.96	2,871.04	2,680.03	191.00	15.031	
10,500.00	6,942.41	7,105.31	7,103.91	31.46	159.84	91.59	2,182.29	-6,483.96	2,771.45	2,580.15	191.30	14.488	
10,600.00	6,942.15	7,105.05	7,103.65	31.76	159.84	91.54	2,182.29	-6,483.96	2,671.90	2,480.31	191.59	13.946	
10,700.00	6,941.89	7,104.79	7,103.39	32.06	159.83	91.48	2,182.29	-6,483.96	2,572.38	2,380.49	191.88	13.406	
10,800.00	6,941.63	7,104.54	7,103.13	32.36	159.82	91.42	2,182.29	-6,483.96	2,472.90	2,280.72	192.18	12.868	
10,900.00	6,941.37	7,104.28	7,102.87	32.66	159.82	91.36	2,182.29	-6,483.96	2,373.46	2,180.99	192.47	12.331	
11,000.00	6,941.11	7,104.02	7,102.61	32.96	159.81	91.31	2,182.29	-6,483.96	2,274.07	2,081.31	192.77	11.797	
11,100.00	6,940.86	7,103.76	7,102.36	33.26	159.80	91.25	2,182.29	-6,483.96	2,174.74	1,981.68	193.06	11.265	
11,200.00	6,940.60	7,103.50	7,102.10	33.56	159.80	91.19	2,182.29	-6,483.96	2,075.47	1,882.12	193.35	10.734	
11,300.00	6,940.34	7,103.24	7,101.84	33.86	159.79	91.13	2,182.29	-6,483.96	1,976.28	1,782.63	193.65	10.205	
11,400.00	6,940.08	7,102.98	7,101.58	34.16	159.78	91.07	2,182.29	-6,483.96	1,877.17	1,683.23	193.94	9.679	
11,500.00	6,939.82	7,102.72	7,101.32	34.46	159.78	91.02	2,182.29	-6,483.96	1,778.16	1,583.93	194.24	9.155	
11,600.00	6,939.56	7,102.46	7,101.06	34.76	159.77	90.96	2,182.29	-6,483.96	1,679.27	1,484.74	194.53	8.632	
11,700.00	6,939.30	7,102.21	7,100.80	35.06	159.76	90.90	2,182.29	-6,483.96	1,580.52	1,385.70	194.82	8.113	
11,800.00	6,939.04	7,101.95	7,100.54	35.36	159.76	90.84	2,182.29	-6,483.96	1,481.94	1,286.82	195.12	7.595	
11,900.00	6,938.78	7,101.69	7,100.28	35.66	159.75	90.79	2,182.29	-6,483.96	1,383.56	1,188.15	195.41	7.080	
12,000.00	6,938.53	7,101.43	7,100.03	35.96	159.74	90.73	2,182.29	-6,483.96	1,285.43	1,089.72	195.71	6.568	
12,100.00	6,938.27	7,101.17	7,099.77	36.26	159.74	90.67	2,182.29	-6,483.96	1,187.61	991.61	196.00	6.059	
12,200.00	6,938.01	7,100.91	7,099.51	36.56	159.73	90.61	2,182.29	-6,483.96	1,090.19	893.89	196.29	5.554	
12,300.00	6,937.75	7,100.65	7,099.25	36.86	159.72	90.55	2,182.29	-6,483.96	993.28	796.69	196.59	5.053	
12,400.00	6,937.49	7,100.39	7,098.99	37.16	159.72	90.50	2,182.29	-6,483.96	897.05	700.16	196.88	4.556	
12,500.00	6,937.23	7,100.13	7,098.73	37.46	159.71	90.44	2,182.29	-6,483.96	801.74	604.56	197.18	4.066	
12,600.00	6,936.97	7,099.88	7,098.47	37.77	159.71	90.38	2,182.29	-6,483.96	707.72	510.25	197.47	3.584	
12,700.00	6,936.71	7,099.62	7,098.21	38.07	159.70	90.32	2,182.29	-6,483.96	615.60	417.84	197.76	3.113	
12,800.00	6,936.45	7,099.36	7,097.95	38.37	159.69	90.27	2,182.29	-6,483.96	526.36	328.30	198.06	2.658	
12,900.00	6,936.20	7,099.10	7,097.70	38.67	159.69	90.21	2,182.29	-6,483.96	441.75	243.40	198.35	2.227	
13,000.00	6,935.94	7,098.84	7,097.44	38.97	159.68	90.15	2,182.29	-6,483.96	365.01	166.38	198.64	1.838	
13,100.00	6,935.68	7,098.58	7,097.18	39.27	159.67	90.09	2,182.29	-6,483.96	302.20	103.28	198.92	1.519	
13,200.00	6,935.42	7,098.32	7,096.92	39.57	159.67	90.03	2,182.29	-6,483.96	263.47	64.26	199.20	1.323 Level 3	
13,259.55	6,935.27	7,098.17	7,096.77	39.75	159.66	90.00	2,182.29	-6,483.96	256.65	57.28	199.37	1.287 Level 3, CC, ES, SF	
13,300.00	6,935.16	7,098.06	7,096.66	39.87	159.66	89.98	2,182.29	-6,483.96	259.82	60.33	199.49	1.302 Level 3	
13,400.00	6,934.90	7,097.80	7,096.40	40.17	159.65	89.92	2,182.29	-6,483.96	292.56	92.78	199.78	1.464 Level 3	
13,500.00	6,934.64	7,097.55	7,096.14	40.47	159.65	89.86	2,182.29	-6,483.96	351.69	151.60	200.08	1.758	
13,600.00	6,934.38	7,097.29	7,095.88	40.77	159.64	89.80	2,182.29	-6,483.96	426.35	225.97	200.38	2.128	
13,700.00	6,934.12	7,097.03	7,095.62	41.07	159.63	89.75	2,182.29	-6,483.96	509.77	309.09	200.68	2.540	
13,800.00	6,933.87	7,096.77	7,095.37	41.37	159.63	89.69	2,182.29	-6,483.96	598.29	397.31	200.98	2.977	
13,900.00	6,933.61	7,096.51	7,095.11	41.67	159.62	89.63	2,182.29	-6,483.96	689.96	488.68	201.27	3.428	
14,000.00	6,933.35	7,096.25	7,094.85	41.97	159.61	89.57	2,182.29	-6,483.96	783.66	582.09	201.57	3.888	
14,100.00	6,933.09	7,095.99	7,094.59	42.27	159.61	89.51	2,182.29	-6,483.96	878.76	676.90	201.86	4.353	
14,200.00	6,932.83	7,095.73	7,094.33	42.57	159.60	89.46	2,182.29	-6,483.96	974.84	772.68	202.16	4.822	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 530-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	7,095.47	7,094.07	42.87	159.59	89.40	2,182.29	-6,483.96	1,071.63	869.18	202.45	5.293	
14,400.00	6,932.31	7,095.22	7,093.81	43.17	159.59	89.34	2,182.29	-6,483.96	1,168.97	966.22	202.75	5.766	
14,500.00	6,932.05	7,094.96	7,093.55	43.47	159.58	89.28	2,182.29	-6,483.96	1,266.72	1,063.67	203.04	6.239	
14,600.00	6,931.79	7,094.70	7,093.29	43.77	159.57	89.23	2,182.29	-6,483.96	1,364.79	1,161.46	203.34	6.712	
14,700.00	6,931.54	7,094.44	7,093.04	44.07	159.57	89.17	2,182.29	-6,483.96	1,463.13	1,259.50	203.63	7.185	
14,800.00	6,931.28	7,094.18	7,092.78	44.37	159.56	89.11	2,182.29	-6,483.96	1,561.68	1,357.75	203.92	7.658	
14,900.00	6,931.02	7,093.92	7,092.52	44.67	159.56	89.05	2,182.29	-6,483.96	1,660.40	1,456.18	204.22	8.131	
15,000.00	6,930.76	7,093.66	7,092.26	44.97	159.55	88.99	2,182.29	-6,483.96	1,759.26	1,554.75	204.51	8.602	
15,100.00	6,930.50	7,093.40	7,092.00	45.27	159.54	88.94	2,182.29	-6,483.96	1,858.25	1,653.44	204.81	9.073	
15,200.00	6,930.24	7,093.14	7,091.74	45.57	159.54	88.88	2,182.29	-6,483.96	1,957.34	1,752.24	205.10	9.543	
15,300.00	6,929.98	7,092.89	7,091.48	45.87	159.53	88.82	2,182.29	-6,483.96	2,056.52	1,851.12	205.39	10.013	
15,400.00	6,929.72	7,092.63	7,091.22	46.17	159.52	88.76	2,182.29	-6,483.96	2,155.77	1,950.09	205.69	10.481	
15,500.00	6,929.46	7,092.37	7,090.96	46.47	159.52	88.71	2,182.29	-6,483.96	2,255.09	2,049.11	205.98	10.948	
15,600.00	6,929.21	7,092.11	7,090.71	46.77	159.51	88.65	2,182.29	-6,483.96	2,354.47	2,148.19	206.28	11.414	
15,700.00	6,928.95	7,091.85	7,090.45	47.07	159.50	88.59	2,182.29	-6,483.96	2,453.90	2,247.33	206.57	11.879	
15,800.00	6,928.69	7,091.59	7,090.19	47.37	159.50	88.53	2,182.29	-6,483.96	2,553.37	2,346.51	206.86	12.343	
15,900.00	6,928.43	7,091.33	7,089.93	47.67	159.49	88.47	2,182.29	-6,483.96	2,652.88	2,445.73	207.16	12.806	
16,000.00	6,928.17	7,091.07	7,089.67	47.97	159.48	88.42	2,182.29	-6,483.96	2,752.43	2,544.98	207.45	13.268	
16,100.00	6,927.91	7,090.81	7,089.41	48.27	159.48	88.36	2,182.29	-6,483.96	2,852.01	2,644.27	207.74	13.728	
16,200.00	6,927.65	7,090.56	7,089.15	48.57	159.47	88.30	2,182.29	-6,483.96	2,951.62	2,743.58	208.04	14.188	
16,300.00	6,927.39	7,090.30	7,088.89	48.87	159.46	88.24	2,182.29	-6,483.96	3,051.25	2,842.92	208.33	14.646	
16,400.00	6,927.13	7,090.04	7,088.63	49.17	159.46	88.19	2,182.29	-6,483.96	3,150.91	2,942.28	208.63	15.103	
16,500.00	6,926.88	7,089.78	7,088.38	49.47	159.45	88.13	2,182.29	-6,483.96	3,250.59	3,041.67	208.92	15.559	
16,600.00	6,926.62	7,089.52	7,088.12	49.77	159.44	88.07	2,182.29	-6,483.96	3,350.28	3,141.07	209.21	16.014	
16,700.00	6,926.36	7,089.26	7,087.86	50.07	159.44	88.01	2,182.29	-6,483.96	3,450.00	3,240.49	209.51	16.467	
16,800.00	6,926.10	7,089.00	7,087.60	50.37	159.43	87.95	2,182.29	-6,483.96	3,549.73	3,339.93	209.80	16.920	
16,900.00	6,925.84	7,088.74	7,087.34	50.67	159.43	87.90	2,182.29	-6,483.96	3,649.47	3,439.38	210.09	17.371	
17,000.00	6,925.58	7,088.48	7,087.08	50.97	159.42	87.84	2,182.29	-6,483.96	3,749.23	3,538.84	210.39	17.821	
17,100.00	6,925.32	7,088.23	7,086.82	51.27	159.41	87.78	2,182.29	-6,483.96	3,849.00	3,638.32	210.68	18.269	
17,200.00	6,925.06	7,087.97	7,086.56	51.58	159.41	87.72	2,182.29	-6,483.96	3,948.78	3,737.81	210.98	18.717	
17,224.45	6,925.00	7,087.90	7,086.50	51.65	159.40	87.71	2,182.29	-6,483.96	3,973.18	3,762.13	211.05	18.826	
17,224.92	6,925.00	7,087.90	7,086.50	51.65	159.40	87.71	2,182.29	-6,483.96	3,973.66	3,762.61	211.05	18.828	

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 515-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference				Offset				Semi Major Axis				Distance	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	9.50	-9.50	0.00	0.13	-0.82	1,532.97	-21.93	1,533.13				
100.00	100.00	90.50	90.50	0.23	1.25	-0.82	1,532.97	-21.93	1,533.13	1,531.66	1.47	1,040.667	
200.00	200.00	190.50	190.50	0.53	2.62	-0.82	1,532.97	-21.93	1,533.13	1,529.98	3.15	486.617	
300.00	300.00	290.50	290.50	0.83	4.00	-0.82	1,532.97	-21.93	1,533.13	1,528.30	4.83	317.553	
400.00	400.00	390.50	390.50	1.13	5.38	-0.82	1,532.97	-21.93	1,533.13	1,526.62	6.51	235.673	
500.00	500.00	539.42	490.50	1.43	7.68	-0.82	1,532.97	-21.93	1,533.13	1,524.02	9.11	168.304	
600.00	599.98	590.56	590.48	1.73	8.92	6.45	1,532.97	-21.93	1,531.39	1,520.75	10.64	143.887	
700.00	699.84	690.42	690.34	2.03	11.33	6.49	1,532.97	-21.93	1,526.19	1,512.84	13.35	114.303	
800.00	799.45	792.11	792.00	2.33	13.78	6.55	1,534.90	-21.93	1,519.46	1,503.36	16.11	94.344	
900.00	898.70	901.27	901.15	2.63	16.41	6.63	1,534.39	-21.93	1,506.90	1,487.86	19.04	79.146	
1,000.00	997.47	1,059.80	987.97	2.93	20.16	6.73	1,532.97	-21.93	1,489.89	1,466.80	23.09	64.525	
1,100.00	1,095.62	1,086.35	1,086.12	3.23	20.75	6.87	1,532.97	-21.93	1,470.94	1,446.96	23.98	61.351	
1,200.00	1,193.06	1,183.79	1,183.56	3.53	22.89	7.03	1,532.97	-21.93	1,448.60	1,422.18	26.42	54.821	
1,300.00	1,289.64	1,281.63	1,281.39	3.83	25.05	7.22	1,533.98	-21.93	1,423.92	1,395.04	28.88	49.301	
1,382.94	1,369.03	1,365.39	1,365.14	4.08	26.90	7.42	1,533.78	-21.93	1,399.89	1,368.91	30.98	45.190	
1,400.00	1,385.28	1,382.52	1,382.27	4.13	27.28	7.45	1,533.70	-21.93	1,394.69	1,363.28	31.41	44.407	
1,500.00	1,480.57	1,512.61	1,471.07	4.43	30.17	7.60	1,532.97	-21.93	1,363.84	1,329.24	34.60	39.420	
1,600.00	1,575.86	1,566.68	1,566.36	4.73	31.42	7.77	1,532.97	-21.93	1,333.75	1,297.60	36.15	36.896	
1,700.00	1,671.15	1,661.97	1,661.65	5.03	33.62	7.95	1,532.97	-21.93	1,303.68	1,265.02	38.66	33.726	
1,800.00	1,766.44	1,757.91	1,757.58	5.33	35.84	8.14	1,534.35	-21.93	1,275.00	1,233.82	41.18	30.964	
1,900.00	1,861.72	1,858.60	1,858.25	5.63	38.17	8.35	1,534.08	-21.93	1,244.69	1,200.88	43.81	28.413	
2,000.00	1,957.01	1,959.02	1,958.66	5.93	40.50	8.57	1,533.38	-21.93	1,213.99	1,167.56	46.43	26.146	
2,100.00	2,052.30	2,059.17	2,058.80	6.23	42.82	8.80	1,532.25	-21.93	1,182.90	1,133.85	49.05	24.117	
2,200.00	2,147.59	2,138.53	2,138.09	6.53	44.80	9.00	1,532.97	-21.93	1,153.50	1,102.17	51.33	22.472	
2,300.00	2,242.88	2,233.82	2,233.38	6.83	47.10	9.24	1,532.97	-21.93	1,123.52	1,069.58	53.94	20.830	
2,400.00	2,338.16	2,333.44	2,332.98	7.13	49.51	9.50	1,534.13	-21.93	1,094.72	1,038.07	56.65	19.326	
2,500.00	2,433.45	2,433.38	2,432.91	7.44	51.93	9.79	1,533.52	-21.93	1,064.19	1,004.83	59.36	17.927	
2,600.00	2,528.74	2,533.05	2,532.56	7.74	54.34	10.09	1,532.46	-21.93	1,033.26	971.19	62.07	16.646	
2,700.00	2,624.03	2,615.11	2,614.53	8.04	56.45	10.35	1,532.97	-21.93	1,003.78	939.29	64.49	15.565	
2,800.00	2,719.32	2,710.40	2,709.82	8.34	58.86	10.67	1,532.97	-21.93	973.91	906.72	67.19	14.494	
2,900.00	2,814.60	2,808.19	2,807.58	8.64	61.33	11.01	1,534.64	-21.93	945.73	875.77	69.96	13.518	
3,000.00	2,909.89	2,907.95	2,907.32	8.94	63.84	11.39	1,534.13	-21.93	915.44	842.66	72.78	12.578	
3,100.00	3,005.18	3,043.56	2,995.68	9.24	67.22	11.76	1,532.97	-21.93	884.48	808.03	76.45	11.569	
3,200.00	3,100.47	3,091.73	3,090.97	9.54	68.33	12.17	1,532.97	-21.93	854.75	776.88	77.87	10.977	
3,300.00	3,195.76	3,187.02	3,186.26	9.84	70.54	12.61	1,532.97	-21.93	825.06	744.69	80.37	10.265	
3,400.00	3,291.04	3,282.31	3,281.54	10.14	72.74	13.09	1,532.97	-21.93	795.41	712.54	82.88	9.597	
3,500.00	3,386.33	3,378.72	3,377.92	10.44	74.97	13.59	1,535.06	-21.93	767.90	682.50	85.41	8.991	
3,600.00	3,481.62	3,476.92	3,476.11	10.74	77.25	14.16	1,534.72	-21.93	738.05	650.07	87.98	8.389	
3,700.00	3,576.91	3,763.67	3,567.41	11.04	83.68	14.75	1,532.97	-21.93	706.84	612.12	94.72	7.462	
3,800.00	3,672.20	3,672.62	3,671.78	11.34	81.77	15.47	1,532.88	-21.93	677.43	584.33	93.10	7.276	
3,900.00	3,767.48	3,758.90	3,757.98	11.64	83.58	16.12	1,532.97	-21.93	648.16	552.94	95.22	6.807	
4,000.00	3,862.77	3,854.19	3,853.27	11.94	85.60	16.89	1,532.97	-21.93	618.97	521.44	97.53	6.346	
4,100.00	3,958.06	3,949.48	3,948.56	12.24	87.61	17.74	1,532.97	-21.93	589.89	490.04	99.85	5.908	
4,200.00	4,053.35	4,044.77	4,043.85	12.54	89.62	18.68	1,532.97	-21.93	560.94	458.78	102.16	5.491	
4,300.00	4,148.64	4,140.06	4,139.14	12.84	91.64	19.73	1,532.97	-21.93	532.15	427.68	104.47	5.094	
4,400.00	4,243.92	4,235.34	4,234.42	13.14	93.65	20.88	1,532.97	-21.93	503.54	396.76	106.79	4.715	
4,500.00	4,339.21	4,330.63	4,329.71	13.44	95.66	22.18	1,532.97	-21.93	475.15	366.05	109.10	4.355	
4,600.00	4,434.50	4,425.92	4,425.00	13.74	97.68	23.64	1,532.97	-21.93	447.00	335.59	111.41	4.012	
4,700.00	4,529.79	4,521.31	4,520.36	14.04	99.69	25.14	1,536.60	-21.93	422.64	308.91	113.73	3.716	
4,800.00	4,625.08	4,616.98	4,616.02	14.34	101.71	27.00	1,536.53	-21.93	395.08	279.03	116.05	3.404	
4,900.00	4,720.36	4,712.59	4,711.63	14.64	103.73	29.14	1,536.36	-21.93	367.87	249.50	118.37	3.108	
5,000.00	4,815.65	4,808.14	4,807.18	14.94	105.75	31.61	1,536.10	-21.93	341.13	220.44	120.69	2.827	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 515-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,903.64	4,902.67	15.24	107.77	34.50	1,535.74	-21.93	315.01	192.01	123.00	2.561	
5,200.00	5,006.23	4,999.07	4,998.10	15.54	109.79	37.89	1,535.29	-21.93	289.70	164.38	125.32	2.312	
5,300.00	5,101.52	5,094.45	5,093.47	15.84	111.80	41.90	1,534.74	-21.93	265.47	137.84	127.63	2.080	
5,400.00	5,196.80	5,473.52	5,187.30	16.14	119.42	46.74	1,532.97	-21.93	241.79	106.24	135.56	1.784	
5,500.00	5,292.09	5,378.23	5,282.59	16.44	117.67	52.30	1,532.97	-21.93	221.53	87.43	134.10	1.652	
5,600.00	5,387.38	5,380.23	5,379.22	16.74	117.84	59.02	1,532.53	-21.93	203.51	68.95	134.57	1.512	
5,700.00	5,482.67	5,475.37	5,474.35	17.04	119.85	66.84	1,531.60	-21.93	188.56	51.68	136.87	1.378	Level 3
5,800.00	5,577.96	5,569.63	5,568.46	17.34	121.20	74.95	1,532.97	-21.93	178.77	40.25	138.52	1.291	Level 3
5,900.00	5,673.24	5,664.92	5,663.74	17.64	122.95	84.24	1,532.97	-21.93	173.01	32.43	140.58	1.231	Level 2
5,960.05	5,730.46	5,722.14	5,720.96	17.82	124.01	90.00	1,532.97	-21.93	172.05	30.24	141.81	1.213	Level 2, CC
6,000.00	5,768.53	5,760.21	5,759.03	17.94	124.71	93.84	1,532.97	-21.93	172.48	29.84	142.63	1.209	Level 2, ES, SF
6,100.00	5,863.82	5,855.49	5,854.32	18.24	126.46	103.23	1,532.97	-21.93	177.21	32.52	144.69	1.225	Level 2
6,200.00	5,959.11	5,950.78	5,949.61	18.54	128.22	111.96	1,532.97	-21.93	186.81	40.07	146.75	1.273	Level 3
6,300.00	6,054.40	6,046.07	6,044.90	18.84	129.98	119.73	1,532.97	-21.93	200.59	51.78	148.80	1.348	Level 3
6,400.00	6,149.68	6,141.36	6,140.18	19.14	131.73	126.47	1,532.97	-21.93	217.74	66.88	150.86	1.443	Level 3
6,500.00	6,244.97	6,236.65	6,235.47	19.44	133.49	132.21	1,532.97	-21.93	237.55	84.63	152.92	1.553	
6,600.00	6,340.26	6,331.93	6,330.76	19.74	135.24	137.07	1,532.97	-21.93	259.40	104.42	154.98	1.674	
6,689.41	6,425.45	6,417.13	6,415.95	20.01	136.81	140.78	1,532.97	-21.93	280.27	123.46	156.82	1.787	
6,700.00	6,435.54	6,427.22	6,426.04	20.04	137.00	144.63	1,532.97	-21.93	282.88	125.85	157.03	1.801	
6,750.00	6,482.96	6,474.64	6,473.46	20.19	137.87	161.30	1,532.97	-21.93	297.14	139.09	158.06	1.880	
6,800.00	6,529.78	6,521.45	6,520.28	20.34	138.74	174.80	1,532.97	-21.93	314.34	155.27	159.07	1.976	
6,850.00	6,575.63	6,567.31	6,566.13	20.49	139.58	-174.83	1,532.97	-21.93	334.24	174.17	160.07	2.088	
6,900.00	6,620.18	6,611.85	6,610.68	20.64	140.40	-166.95	1,532.97	-21.93	356.67	195.63	161.04	2.215	
6,950.00	6,663.07	6,654.75	6,653.57	20.79	141.19	-160.86	1,532.97	-21.93	381.57	219.59	161.98	2.356	
7,000.00	6,704.00	6,695.67	6,694.50	20.94	141.95	-156.00	1,532.97	-21.93	408.86	245.98	162.89	2.510	
7,050.00	6,742.63	6,734.31	6,733.13	21.09	142.66	-151.91	1,532.97	-21.93	438.53	274.78	163.75	2.678	
7,100.00	6,778.69	6,770.36	6,769.19	21.24	143.32	-148.25	1,532.97	-21.93	470.50	305.93	164.56	2.859	
7,150.00	6,811.89	6,803.56	6,802.39	21.39	143.94	-144.71	1,532.97	-21.93	504.70	339.38	165.33	3.053	
7,200.00	6,841.98	6,833.66	6,832.48	21.54	144.49	-141.05	1,532.97	-21.93	541.03	375.00	166.03	3.259	
7,250.00	6,868.74	6,860.42	6,859.24	21.69	144.98	-137.01	1,532.97	-21.93	579.34	412.66	166.67	3.476	
7,300.00	6,891.96	6,883.63	6,882.46	21.84	145.41	-132.36	1,532.97	-21.93	619.43	452.18	167.25	3.704	
7,350.00	6,911.46	6,903.13	6,901.96	21.99	145.77	-126.84	1,532.97	-21.93	661.09	493.33	167.76	3.941	
7,400.00	6,927.10	6,918.77	6,917.60	22.14	146.06	-120.22	1,532.97	-21.93	704.07	535.87	168.20	4.186	
7,450.00	6,938.75	6,930.42	6,929.25	22.29	146.27	-112.35	1,532.97	-21.93	748.09	579.52	168.57	4.438	
7,500.00	6,946.33	6,938.00	6,936.83	22.44	146.41	-103.28	1,532.97	-21.93	792.83	623.98	168.85	4.695	
7,550.00	6,949.78	6,941.45	6,940.28	22.59	146.48	-93.35	1,532.97	-21.93	838.00	668.93	169.07	4.957	
7,568.05	6,950.00	6,941.67	6,940.50	22.65	146.48	-89.68	1,532.97	-21.93	854.33	685.21	169.13	5.051	
7,600.00	6,949.92	6,941.59	6,940.42	22.74	146.48	-89.67	1,532.97	-21.93	883.37	714.15	169.22	5.220	
7,700.00	6,949.66	6,941.33	6,940.16	23.04	146.47	-89.63	1,532.97	-21.93	975.41	805.89	169.52	5.754	
7,800.00	6,949.40	6,941.07	6,939.90	23.35	146.47	-89.59	1,532.97	-21.93	1,068.88	899.07	169.81	6.295	
7,900.00	6,949.14	6,940.81	6,939.64	23.65	146.46	-89.55	1,532.97	-21.93	1,163.44	993.33	170.11	6.839	
8,000.00	6,948.88	6,940.56	6,939.38	23.95	146.46	-89.51	1,532.97	-21.93	1,258.84	1,088.44	170.40	7.387	
8,100.00	6,948.62	6,940.30	6,939.12	24.25	146.46	-89.47	1,532.97	-21.93	1,354.90	1,184.20	170.70	7.937	
8,200.00	6,948.36	6,940.04	6,938.86	24.55	146.45	-89.43	1,532.97	-21.93	1,451.50	1,280.50	170.99	8.489	
8,300.00	6,948.11	6,939.78	6,938.61	24.85	146.45	-89.38	1,532.97	-21.93	1,548.52	1,377.23	171.29	9.040	
8,400.00	6,947.85	6,939.52	6,938.35	25.15	146.44	-89.34	1,532.97	-21.93	1,645.91	1,474.32	171.59	9.592	
8,500.00	6,947.59	6,939.26	6,938.09	25.45	146.44	-89.30	1,532.97	-21.93	1,743.59	1,571.71	171.88	10.144	
8,600.00	6,947.33	6,939.00	6,937.83	25.75	146.43	-89.26	1,532.97	-21.93	1,841.52	1,669.34	172.18	10.695	
8,700.00	6,947.07	6,938.74	6,937.57	26.05	146.43	-89.22	1,532.97	-21.93	1,939.66	1,767.18	172.47	11.246	
8,800.00	6,946.81	6,938.48	6,937.31	26.35	146.42	-89.18	1,532.97	-21.93	2,037.98	1,865.21	172.77	11.796	
8,900.00	6,946.55	6,938.23	6,937.05	26.65	146.42	-89.14	1,532.97	-21.93	2,136.45	1,963.39	173.06	12.345	
9,000.00	6,946.29	6,937.97	6,936.79	26.95	146.41	-89.10	1,532.97	-21.93	2,235.06	2,061.70	173.36	12.893	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 515-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference				Offset			Semi Major Axis		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	6,937.71	6,936.53	27.25	146.41	-89.06	1,532.97	-21.93	2,333.79	2,160.14	173.66	13.439	
9,200.00	6,945.78	6,937.45	6,936.28	27.55	146.40	-89.02	1,532.97	-21.93	2,432.63	2,258.68	173.95	13.985	
9,300.00	6,945.52	6,937.19	6,936.02	27.85	146.40	-88.98	1,532.97	-21.93	2,531.55	2,357.31	174.25	14.529	
9,400.00	6,945.26	6,936.93	6,935.76	28.15	146.39	-88.93	1,532.97	-21.93	2,630.56	2,456.02	174.54	15.071	
9,500.00	6,945.00	6,936.67	6,935.50	28.45	146.39	-88.89	1,532.97	-21.93	2,729.64	2,554.80	174.84	15.612	
9,600.00	6,944.74	6,936.41	6,935.24	28.75	146.38	-88.85	1,532.97	-21.93	2,828.78	2,653.65	175.13	16.152	
9,700.00	6,944.48	6,936.15	6,934.98	29.05	146.38	-88.81	1,532.97	-21.93	2,927.98	2,752.55	175.43	16.690	
9,800.00	6,944.22	6,935.90	6,934.72	29.35	146.37	-88.77	1,532.97	-21.93	3,027.24	2,851.51	175.73	17.227	
9,900.00	6,943.96	6,935.64	6,934.46	29.66	146.37	-88.73	1,532.97	-21.93	3,126.54	2,950.52	176.02	17.762	
10,000.00	6,943.70	6,935.38	6,934.20	29.96	146.36	-88.69	1,532.97	-21.93	3,225.88	3,049.57	176.32	18.296	
10,100.00	6,943.45	6,935.12	6,933.95	30.26	146.36	-88.65	1,532.97	-21.93	3,325.27	3,148.66	176.61	18.828	
10,200.00	6,943.19	6,934.86	6,933.69	30.56	146.35	-88.61	1,532.97	-21.93	3,424.69	3,247.78	176.91	19.359	
10,300.00	6,942.93	6,934.60	6,933.43	30.86	146.35	-88.57	1,532.97	-21.93	3,524.14	3,346.94	177.20	19.887	
10,400.00	6,942.67	6,934.34	6,933.17	31.16	146.35	-88.53	1,532.97	-21.93	3,623.62	3,446.13	177.50	20.415	
10,500.00	6,942.41	6,934.08	6,932.91	31.46	146.34	-88.49	1,532.97	-21.93	3,723.14	3,545.34	177.80	20.941	
10,600.00	6,942.15	6,933.82	6,932.65	31.76	146.34	-88.44	1,532.97	-21.93	3,822.67	3,644.58	178.09	21.465	
10,700.00	6,941.89	6,933.57	6,932.39	32.06	146.33	-88.40	1,532.97	-21.93	3,922.23	3,743.84	178.39	21.987	
10,800.00	6,941.63	6,933.31	6,932.13	32.36	146.33	-88.36	1,532.97	-21.93	4,021.81	3,843.13	178.68	22.508	
10,900.00	6,941.37	6,933.05	6,931.87	32.66	146.32	-88.32	1,532.97	-21.93	4,121.41	3,942.44	178.98	23.027	
11,000.00	6,941.11	6,932.79	6,931.61	32.96	146.32	-88.28	1,532.97	-21.93	4,221.04	4,041.76	179.27	23.545	
11,100.00	6,940.86	6,932.53	6,931.36	33.26	146.31	-88.24	1,532.97	-21.93	4,320.67	4,141.10	179.57	24.061	
11,200.00	6,940.60	6,932.27	6,931.10	33.56	146.31	-88.20	1,532.97	-21.93	4,420.33	4,240.46	179.86	24.576	
11,300.00	6,940.34	6,932.01	6,930.84	33.86	146.30	-88.16	1,532.97	-21.93	4,520.00	4,339.84	180.16	25.089	
11,400.00	6,940.08	6,931.75	6,930.58	34.16	146.30	-88.12	1,532.97	-21.93	4,619.68	4,439.23	180.46	25.600	
11,500.00	6,939.82	6,931.49	6,930.32	34.46	146.29	-88.08	1,532.97	-21.93	4,719.38	4,538.63	180.75	26.110	
11,600.00	6,939.56	6,931.24	6,930.06	34.76	146.29	-88.04	1,532.97	-21.93	4,819.09	4,638.04	181.05	26.618	
11,700.00	6,939.30	6,930.98	6,929.80	35.06	146.28	-88.00	1,532.97	-21.93	4,918.81	4,737.47	181.34	27.124	
11,800.00	6,939.04	6,930.72	6,929.54	35.36	146.28	-87.95	1,532.97	-21.93	5,018.54	4,836.91	181.64	27.629	
11,900.00	6,938.78	6,930.46	6,929.28	35.66	146.27	-87.91	1,532.97	-21.93	5,118.29	4,936.35	181.93	28.133	
12,000.00	6,938.53	6,930.20	6,929.03	35.96	146.27	-87.87	1,532.97	-21.93	5,218.04	5,035.81	182.23	28.634	
12,100.00	6,938.27	6,929.94	6,928.77	36.26	146.26	-87.83	1,532.97	-21.93	5,317.80	5,135.28	182.53	29.135	
12,200.00	6,938.01	6,929.68	6,928.51	36.56	146.26	-87.79	1,532.97	-21.93	5,417.57	5,234.75	182.82	29.633	
12,300.00	6,937.75	6,929.42	6,928.25	36.86	146.25	-87.75	1,532.97	-21.93	5,517.35	5,334.24	183.12	30.130	
12,400.00	6,937.49	6,929.16	6,927.99	37.16	146.25	-87.71	1,532.97	-21.93	5,617.14	5,433.73	183.41	30.626	
12,500.00	6,937.23	6,928.91	6,927.73	37.46	146.25	-87.67	1,532.97	-21.93	5,716.93	5,533.23	183.71	31.120	
12,600.00	6,936.97	6,928.65	6,927.47	37.77	146.24	-87.63	1,532.97	-21.93	5,816.74	5,632.73	184.00	31.612	
12,700.00	6,936.71	6,928.39	6,927.21	38.07	146.24	-87.59	1,532.97	-21.93	5,916.54	5,732.25	184.30	32.103	
12,800.00	6,936.45	6,928.13	6,926.95	38.37	146.23	-87.55	1,532.97	-21.93	6,016.36	5,831.76	184.59	32.592	
12,900.00	6,936.20	6,927.87	6,926.70	38.67	146.23	-87.51	1,532.97	-21.93	6,116.18	5,931.29	184.89	33.080	
13,000.00	6,935.94	6,927.61	6,926.44	38.97	146.22	-87.46	1,532.97	-21.93	6,216.01	6,030.82	185.18	33.566	
13,100.00	6,935.68	6,927.35	6,926.18	39.27	146.22	-87.42	1,532.97	-21.93	6,315.84	6,130.36	185.48	34.051	
13,200.00	6,935.42	6,927.09	6,925.92	39.57	146.21	-87.38	1,532.97	-21.93	6,415.67	6,229.90	185.78	34.534	
13,300.00	6,935.16	6,926.83	6,925.66	39.87	146.21	-87.34	1,532.97	-21.93	6,515.52	6,329.44	186.07	35.016	
13,400.00	6,934.90	6,926.58	6,925.40	40.17	146.20	-87.30	1,532.97	-21.93	6,615.36	6,429.00	186.37	35.496	
13,500.00	6,934.64	6,926.32	6,925.14	40.47	146.20	-87.26	1,532.97	-21.93	6,715.21	6,528.55	186.66	35.975	
13,600.00	6,934.38	6,926.06	6,924.88	40.77	146.19	-87.22	1,532.97	-21.93	6,815.07	6,628.11	186.96	36.452	
13,700.00	6,934.12	6,925.80	6,924.62	41.07	146.19	-87.18	1,532.97	-21.93	6,914.93	6,727.68	187.25	36.928	
13,800.00	6,933.87	6,925.54	6,924.37	41.37	146.18	-87.14	1,532.97	-21.93	7,014.79	6,827.25	187.55	37.402	
13,900.00	6,933.61	6,925.28	6,924.11	41.67	146.18	-87.10	1,532.97	-21.93	7,114.66	6,926.82	187.84	37.875	
14,000.00	6,933.35	6,925.02	6,923.85	41.97	146.17	-87.06	1,532.97	-21.93	7,214.53	7,026.39	188.14	38.347	
14,100.00	6,933.09	6,924.76	6,923.59	42.27	146.17	-87.02	1,532.97	-21.93	7,314.41	7,125.97	188.44	38.817	
14,200.00	6,932.83	6,924.50	6,923.33	42.57	146.16	-86.98	1,532.97	-21.93	7,414.29	7,225.56	188.73	39.285	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 515-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	6,924.25	6,923.07	42.87	146.16	-86.93	1,532.97	-21.93	7,514.17	7,325.14	189.03	39.752	
14,400.00	6,932.31	6,923.99	6,922.81	43.17	146.15	-86.89	1,532.97	-21.93	7,614.05	7,424.73	189.32	40.218	
14,500.00	6,932.05	6,923.73	6,922.55	43.47	146.15	-86.85	1,532.97	-21.93	7,713.94	7,524.32	189.62	40.682	
14,600.00	6,931.79	6,923.47	6,922.29	43.77	146.14	-86.81	1,532.97	-21.93	7,813.83	7,623.92	189.91	41.144	
14,700.00	6,931.54	6,923.21	6,922.04	44.07	146.14	-86.77	1,532.97	-21.93	7,913.72	7,723.52	190.21	41.606	
14,800.00	6,931.28	6,922.95	6,921.78	44.37	146.14	-86.73	1,532.97	-21.93	8,013.62	7,823.12	190.50	42.065	
14,900.00	6,931.02	6,922.69	6,921.52	44.67	146.13	-86.69	1,532.97	-21.93	8,113.52	7,922.72	190.80	42.524	
15,000.00	6,930.76	6,922.43	6,921.26	44.97	146.13	-86.65	1,532.97	-21.93	8,213.42	8,022.32	191.09	42.981	
15,100.00	6,930.50	6,922.17	6,921.00	45.27	146.12	-86.61	1,532.97	-21.93	8,313.32	8,121.93	191.39	43.437	
15,200.00	6,930.24	6,921.92	6,920.74	45.57	146.12	-86.57	1,532.97	-21.93	8,413.23	8,221.54	191.69	43.891	
15,300.00	6,929.98	6,921.66	6,920.48	45.87	146.11	-86.53	1,532.97	-21.93	8,513.13	8,321.15	191.98	44.344	
15,400.00	6,929.72	6,921.40	6,920.22	46.17	146.11	-86.49	1,532.97	-21.93	8,613.04	8,420.77	192.28	44.795	
15,500.00	6,929.46	6,921.14	6,919.96	46.47	146.10	-86.45	1,532.97	-21.93	8,712.96	8,520.39	192.57	45.245	
15,600.00	6,929.21	6,920.88	6,919.71	46.77	146.10	-86.40	1,532.97	-21.93	8,812.87	8,620.00	192.87	45.694	
15,700.00	6,928.95	6,920.62	6,919.45	47.07	146.09	-86.36	1,532.97	-21.93	8,912.79	8,719.62	193.16	46.141	
15,800.00	6,928.69	6,920.36	6,919.19	47.37	146.09	-86.32	1,532.97	-21.93	9,012.70	8,819.25	193.46	46.587	
15,900.00	6,928.43	6,920.10	6,918.93	47.67	146.08	-86.28	1,532.97	-21.93	9,112.62	8,918.87	193.75	47.032	
16,000.00	6,928.17	6,919.84	6,918.67	47.97	146.08	-86.24	1,532.97	-21.93	9,212.54	9,018.50	194.05	47.475	
16,100.00	6,927.91	6,919.59	6,918.41	48.27	146.07	-86.20	1,532.97	-21.93	9,312.47	9,118.12	194.34	47.917	
16,200.00	6,927.65	6,919.33	6,918.15	48.57	146.07	-86.16	1,532.97	-21.93	9,412.39	9,217.75	194.64	48.358	
16,300.00	6,927.39	6,919.07	6,917.89	48.87	146.06	-86.12	1,532.97	-21.93	9,512.32	9,317.38	194.93	48.797	
16,400.00	6,927.13	6,918.81	6,917.63	49.17	146.06	-86.08	1,532.97	-21.93	9,612.25	9,417.02	195.23	49.235	
16,500.00	6,926.88	6,918.55	6,917.38	49.47	146.05	-86.04	1,532.97	-21.93	9,712.18	9,516.65	195.53	49.672	
16,600.00	6,926.62	6,918.29	6,917.12	49.77	146.05	-86.00	1,532.97	-21.93	9,812.11	9,616.28	195.82	50.107	
16,700.00	6,926.36	6,918.03	6,916.86	50.07	146.04	-85.96	1,532.97	-21.93	9,912.04	9,715.92	196.12	50.542	
16,800.00	6,926.10	6,917.77	6,916.60	50.37	146.04	-85.92	1,532.97	-21.93	10,011.97	9,815.56	196.41	50.974	
16,900.00	6,925.84	6,917.51	6,916.34	50.67	146.04	-85.88	1,532.97	-21.93	10,111.91	9,915.20	196.71	51.406	
17,000.00	6,925.58	6,917.26	6,916.08	50.97	146.03	-85.83	1,532.97	-21.93	10,211.84	10,014.84	197.00	51.836	
17,100.00	6,925.32	6,917.00	6,915.82	51.27	146.03	-85.79	1,532.97	-21.93	10,311.78	10,114.48	197.30	52.265	
17,200.00	6,925.06	6,916.74	6,915.56	51.58	146.02	-85.75	1,532.97	-21.93	10,411.72	10,214.12	197.59	52.693	
17,224.45	6,925.00	6,916.67	6,915.50	51.65	146.02	-85.74	1,532.97	-21.93	10,436.15	10,238.48	197.67	52.797	
17,224.92	6,925.00	6,916.67	6,915.50	51.65	146.02	-85.74	1,532.97	-21.93	10,436.63	10,238.96	197.67	52.799	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 74-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	11.21	11.21	0.00	0.02	-93.54	-402.26	-6,493.48	6,505.93				
100.00	100.00	87.15	87.14	0.23	0.18	-93.54	-401.66	-6,493.73	6,506.20	6,505.80	0.41	N/A	
200.00	200.00	187.14	187.13	0.53	0.54	-93.53	-400.46	-6,494.24	6,506.64	6,505.57	1.06	6,109.989	
300.00	300.00	276.79	276.76	0.83	0.86	-93.52	-399.19	-6,494.78	6,507.15	6,505.46	1.69	3,858.108	
400.00	400.00	369.71	369.66	1.13	1.19	-93.50	-397.46	-6,495.51	6,507.82	6,505.50	2.32	2,805.010	
500.00	500.00	477.27	477.20	1.43	1.58	-93.48	-395.54	-6,496.33	6,508.47	6,505.46	3.01	2,165.094	
600.00	599.98	584.84	584.77	1.73	1.97	-86.22	-393.97	-6,496.99	6,508.89	6,505.19	3.69	1,762.894	
700.00	699.84	687.03	686.94	2.03	2.33	-86.25	-392.72	-6,497.52	6,508.98	6,504.62	4.36	1,493.345	
800.00	799.45	786.74	786.65	2.33	2.69	-86.32	-391.52	-6,498.03	6,508.85	6,503.84	5.02	1,297.563	
900.00	898.70	886.14	886.04	2.63	3.05	-86.42	-390.32	-6,498.54	6,508.51	6,502.84	5.67	1,147.356	
1,000.00	997.47	985.09	984.98	2.93	3.40	-86.56	-389.13	-6,499.05	6,507.98	6,501.65	6.33	1,028.531	
1,100.00	1,095.62	1,083.48	1,083.36	3.23	3.76	-86.72	-387.95	-6,499.55	6,507.28	6,500.30	6.98	932.238	
1,200.00	1,193.06	1,179.78	1,179.65	3.53	4.10	-86.92	-386.76	-6,500.05	6,506.44	6,498.81	7.63	853.223	
1,300.00	1,289.64	1,274.97	1,274.84	3.83	4.44	-87.14	-385.52	-6,500.58	6,505.52	6,497.26	8.27	786.905	
1,382.94	1,369.03	1,353.28	1,353.14	4.08	4.72	-87.35	-384.44	-6,501.04	6,504.73	6,495.93	8.80	739.427	
1,400.00	1,385.28	1,369.33	1,369.18	4.13	4.78	-87.39	-384.22	-6,501.13	6,504.57	6,495.66	8.91	730.380	
1,500.00	1,480.57	1,463.39	1,463.23	4.43	5.12	-87.63	-382.85	-6,501.71	6,503.71	6,494.16	9.54	681.501	
1,600.00	1,575.86	1,557.50	1,557.33	4.73	5.46	-87.87	-381.40	-6,502.32	6,503.00	6,492.82	10.18	638.749	
1,700.00	1,671.15	1,653.36	1,653.17	5.03	5.80	-88.11	-379.88	-6,502.97	6,502.43	6,491.61	10.82	600.701	
1,800.00	1,766.44	1,750.78	1,750.58	5.33	6.15	-88.36	-378.39	-6,503.60	6,501.97	6,490.50	11.47	566.658	
1,900.00	1,861.72	1,848.15	1,847.94	5.63	6.50	-88.61	-376.98	-6,504.20	6,501.62	6,489.50	12.12	536.278	
2,000.00	1,957.01	1,945.48	1,945.25	5.93	6.85	-88.86	-375.65	-6,504.77	6,501.37	6,488.60	12.77	509.002	
2,100.00	2,052.30	2,042.75	2,042.52	6.23	7.20	-89.11	-374.39	-6,505.30	6,501.23	6,487.81	13.42	484.379	
2,183.07	2,131.45	2,123.52	2,123.28	6.48	7.49	-89.31	-373.41	-6,505.72	6,501.19	6,487.23	13.96	465.676	
2,200.00	2,147.59	2,139.98	2,139.74	6.53	7.55	-89.35	-373.21	-6,505.80	6,501.19	6,487.12	14.07	462.040	
2,300.00	2,242.88	2,233.12	2,232.87	6.83	7.88	-89.59	-372.02	-6,506.31	6,501.31	6,486.60	14.70	442.122	
2,400.00	2,338.16	2,327.43	2,327.17	7.13	8.22	-89.83	-370.76	-6,506.84	6,501.57	6,486.23	15.34	423.744	
2,500.00	2,433.45	2,421.78	2,421.51	7.44	8.56	-90.07	-369.42	-6,507.41	6,501.98	6,486.00	15.98	406.839	
2,600.00	2,528.74	2,516.18	2,515.89	7.74	8.90	-90.31	-368.02	-6,508.00	6,502.54	6,485.92	16.62	391.239	
2,700.00	2,624.03	2,610.61	2,610.32	8.04	9.24	-90.55	-366.55	-6,508.62	6,503.24	6,485.98	17.26	376.798	
2,800.00	2,719.32	2,707.23	2,706.92	8.34	9.58	-90.80	-365.03	-6,509.27	6,504.08	6,486.18	17.91	363.237	
2,900.00	2,814.60	2,804.39	2,804.07	8.64	9.93	-91.05	-363.56	-6,509.89	6,505.03	6,486.48	18.55	350.590	
3,000.00	2,909.89	2,901.50	2,901.17	8.94	10.28	-91.29	-362.18	-6,510.48	6,506.09	6,486.88	19.20	338.806	
3,100.00	3,005.18	2,998.57	2,998.22	9.24	10.63	-91.54	-360.87	-6,511.03	6,507.25	6,487.40	19.85	327.801	
3,200.00	3,100.47	3,095.59	3,095.23	9.54	10.98	-91.79	-359.64	-6,511.56	6,508.52	6,488.02	20.50	317.499	
3,300.00	3,195.76	3,191.68	3,191.31	9.84	11.32	-92.03	-358.48	-6,512.05	6,509.91	6,488.76	21.14	307.884	
3,400.00	3,291.04	3,287.34	3,286.97	10.14	11.67	-92.28	-357.32	-6,512.54	6,511.43	6,489.64	21.79	298.865	
3,500.00	3,386.33	3,383.00	3,382.62	10.44	12.01	-92.52	-356.17	-6,513.03	6,513.07	6,490.64	22.43	290.370	
3,600.00	3,481.62	3,478.66	3,478.28	10.74	12.35	-92.77	-355.02	-6,513.52	6,514.85	6,491.77	23.07	282.353	
3,700.00	3,576.91	3,574.33	3,573.93	11.04	12.69	-93.01	-353.87	-6,514.01	6,516.75	6,493.04	23.72	274.777	
3,800.00	3,672.20	3,597.00	3,596.60	11.34	12.78	-93.07	-353.59	-6,514.12	6,519.20	6,495.10	24.10	270.537	
3,900.00	3,767.48	3,597.00	3,596.60	11.64	12.78	-93.07	-353.59	-6,514.12	6,523.14	6,498.74	24.39	267.402	
4,000.00	3,862.77	3,774.10	3,773.52	11.94	13.52	-93.48	-346.78	-6,517.16	6,525.02	6,499.57	25.44	256.467	
4,100.00	3,958.06	3,839.44	3,838.64	12.24	13.79	-93.61	-341.91	-6,519.36	6,528.91	6,502.89	26.02	250.941	
4,200.00	4,053.35	3,905.36	3,904.20	12.54	14.07	-93.73	-335.71	-6,522.16	6,533.36	6,506.76	26.60	245.647	
4,300.00	4,148.64	3,971.80	3,970.13	12.84	14.36	-93.84	-328.15	-6,525.57	6,538.33	6,511.16	27.18	240.573	
4,400.00	4,243.92	4,038.72	4,036.32	13.14	14.64	-93.93	-319.22	-6,529.62	6,543.84	6,516.07	27.76	235.708	
4,500.00	4,339.21	4,106.04	4,102.68	13.44	14.93	-94.02	-308.91	-6,534.29	6,549.85	6,521.50	28.35	231.043	
4,600.00	4,434.50	4,173.70	4,169.11	13.74	15.22	-94.09	-297.20	-6,539.60	6,556.36	6,527.42	28.94	226.568	
4,700.00	4,529.79	4,241.65	4,235.51	14.04	15.52	-94.15	-284.10	-6,545.55	6,563.37	6,533.84	29.53	222.276	
4,800.00	4,625.08	4,309.81	4,301.79	14.34	15.82	-94.19	-269.60	-6,552.13	6,570.86	6,540.74	30.12	218.158	
4,900.00	4,720.36	4,378.12	4,367.84	14.64	16.11	-94.23	-253.73	-6,559.34	6,578.83	6,548.12	30.71	214.207	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 74-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,815.65	4,446.51	4,433.55	14.94	16.41	-94.25	-236.49	-6,567.17	6,587.28	6,555.97	31.31	210.416	
5,100.00	4,910.94	4,514.91	4,498.83	15.24	16.71	-94.25	-217.91	-6,575.61	6,596.19	6,564.29	31.90	206.779	
5,200.00	5,006.23	4,583.25	4,563.59	15.54	17.02	-94.25	-198.03	-6,584.65	6,605.58	6,573.09	32.49	203.290	
5,300.00	5,101.52	4,651.46	4,627.72	15.84	17.32	-94.23	-176.86	-6,594.27	6,615.45	6,582.36	33.09	199.943	
5,400.00	5,196.80	4,719.48	4,691.13	16.14	17.62	-94.20	-154.47	-6,604.46	6,625.78	6,592.10	33.68	196.733	
5,500.00	5,292.09	4,787.24	4,753.74	16.44	17.92	-94.15	-130.88	-6,615.18	6,636.59	6,602.32	34.27	193.655	
5,600.00	5,387.38	4,854.67	4,815.46	16.74	18.22	-94.09	-106.16	-6,626.43	6,647.88	6,613.02	34.86	190.703	
5,700.00	5,482.67	4,921.72	4,876.21	17.04	18.52	-94.03	-80.35	-6,638.17	6,659.65	6,624.21	35.45	187.874	
5,800.00	5,577.96	4,988.31	4,935.92	17.34	18.82	-93.94	-53.52	-6,650.37	6,671.92	6,635.89	36.03	185.163	
5,900.00	5,673.24	5,147.00	5,075.51	17.64	19.54	-93.70	15.15	-6,681.61	6,685.64	6,648.60	37.04	180.519	
6,000.00	5,768.53	5,147.00	5,075.51	17.94	19.54	-93.70	15.15	-6,681.61	6,698.04	6,660.73	37.32	179.485	
6,100.00	5,863.82	5,147.00	5,075.51	18.24	19.54	-93.70	15.15	-6,681.61	6,711.92	6,674.32	37.60	178.521	
6,200.00	5,959.11	5,147.00	5,075.51	18.54	19.54	-93.70	15.15	-6,681.61	6,727.25	6,689.37	37.87	177.625	
6,300.00	6,054.40	5,287.76	5,195.77	18.84	20.70	-93.44	81.57	-6,712.22	6,741.41	6,702.08	39.33	171.423	
6,400.00	6,149.68	5,341.20	5,240.44	19.14	21.15	-93.32	108.11	-6,724.64	6,757.24	6,717.19	40.05	168.722	
6,500.00	6,244.97	5,394.00	5,284.04	19.44	21.60	-93.20	135.06	-6,737.35	6,773.77	6,733.00	40.77	166.158	
6,600.00	6,340.26	5,446.16	5,326.55	19.74	22.04	-93.07	162.36	-6,750.32	6,791.00	6,749.52	41.48	163.723	
6,689.41	6,425.45	5,492.22	5,363.63	20.01	22.43	-92.95	187.02	-6,762.11	6,807.00	6,764.89	42.11	161.650	
6,700.00	6,435.54	5,497.66	5,367.97	20.04	22.48	-89.63	189.96	-6,763.52	6,808.84	6,766.66	42.18	161.409	
6,750.00	6,482.96	5,523.47	5,388.52	20.19	22.70	-75.23	204.04	-6,770.29	6,815.06	6,772.52	42.54	160.221	
6,800.00	6,529.78	5,549.44	5,409.05	20.34	22.92	-63.65	218.37	-6,777.19	6,817.18	6,774.29	42.89	158.952	
6,850.00	6,575.63	5,575.39	5,429.42	20.49	23.15	-54.88	232.85	-6,784.19	6,815.18	6,771.94	43.24	157.611	
6,900.00	6,620.18	5,601.16	5,449.50	20.64	23.37	-48.38	247.38	-6,791.24	6,809.09	6,765.50	43.59	156.202	
6,950.00	6,663.07	5,626.58	5,469.16	20.79	23.59	-43.58	261.87	-6,798.29	6,798.94	6,755.00	43.94	154.734	
7,000.00	6,704.00	5,651.49	5,488.28	20.94	23.80	-40.03	276.22	-6,805.29	6,784.79	6,740.51	44.28	153.212	
7,050.00	6,742.63	5,675.74	5,506.76	21.09	24.01	-37.42	290.32	-6,812.18	6,766.74	6,722.12	44.62	151.644	
7,100.00	6,778.69	5,699.16	5,524.49	21.24	24.22	-35.54	304.07	-6,818.92	6,744.92	6,699.97	44.96	150.037	
7,150.00	6,811.89	5,721.63	5,541.37	21.39	24.41	-34.27	317.37	-6,825.46	6,719.47	6,674.19	45.28	148.397	
7,200.00	6,841.98	5,742.99	5,557.31	21.54	24.60	-33.51	330.13	-6,831.74	6,690.56	6,644.96	45.60	146.732	
7,250.00	6,868.74	5,763.50	5,573.51	21.69	24.79	-32.75	342.88	-6,837.92	6,666.29	6,620.02	45.92	145.067	
7,300.00	6,891.96	5,786.00	5,596.38	21.84	24.97	-32.00	355.63	-6,844.10	6,641.30	6,595.85	46.24	143.402	
7,350.00	6,911.46	5,809.00	5,619.25	21.99	25.15	-31.25	368.38	-6,850.28	6,616.30	6,571.85	46.56	141.737	
7,400.00	6,927.10	5,831.00	5,642.12	22.14	25.33	-30.50	381.13	-6,856.46	6,591.30	6,547.85	46.88	140.072	
7,450.00	6,938.75	5,853.00	5,665.00	22.29	25.51	-29.75	393.88	-6,862.64	6,566.30	6,523.85	47.20	138.407	
7,500.00	6,946.33	5,875.00	5,687.87	22.44	25.69	-29.00	406.63	-6,868.82	6,541.30	6,500.00	47.52	136.742	
7,550.00	6,949.78	5,897.00	5,710.75	22.59	25.87	-28.25	419.38	-6,875.00	6,516.30	6,476.00	47.84	135.077	
7,568.05	6,950.00	5,900.00	5,715.00	22.65	25.93	-28.13	423.88	-6,876.88	6,511.30	6,471.00	47.92	134.842	
7,600.00	6,949.92	5,900.00	5,715.00	22.74	26.00	-28.06	428.38	-6,878.76	6,506.30	6,466.00	48.00	134.607	
7,700.00	6,949.66	5,900.00	5,715.00	23.04	26.30	-27.76	444.13	-6,884.51	6,481.30	6,441.00	48.32	132.942	
7,800.00	6,949.40	5,900.00	5,715.00	23.35	26.60	-27.46	459.88	-6,890.26	6,456.30	6,416.00	48.64	131.277	
7,900.00	6,949.14	5,900.00	5,715.00	23.65	26.90	-27.16	475.63	-6,896.01	6,431.30	6,391.00	48.96	129.612	
8,000.00	6,948.88	5,900.00	5,715.00	23.95	27.20	-26.86	491.38	-6,901.76	6,406.30	6,366.00	49.28	127.947	
8,100.00	6,948.62	5,900.00	5,715.00	24.25	27.50	-26.56	507.13	-6,907.51	6,381.30	6,341.00	49.60	126.282	
8,200.00	6,948.36	5,900.00	5,715.00	24.55	27.80	-26.26	522.88	-6,913.26	6,356.30	6,316.00	49.92	124.617	
8,300.00	6,948.11	5,900.00	5,715.00	24.85	28.10	-25.96	538.63	-6,919.01	6,331.30	6,291.00	50.24	122.952	
8,400.00	6,947.85	5,900.00	5,715.00	25.15	28.40	-25.66	554.38	-6,924.76	6,306.30	6,266.00	50.56	121.287	
8,500.00	6,947.59	5,900.00	5,715.00	25.45	28.70	-25.36	570.13	-6,930.51	6,281.30	6,241.00	50.88	119.622	
8,600.00	6,947.33	5,900.00	5,715.00	25.75	29.00	-25.06	585.88	-6,936.26	6,256.30	6,216.00	51.20	117.957	
8,700.00	6,947.07	5,900.00	5,715.00	26.05	29.30	-24.76	601.63	-6,942.01	6,231.30	6,191.00	51.52	116.292	
8,800.00	6,946.81	5,900.00	5,715.00	26.35	29.60	-24.46	617.38	-6,947.76	6,206.30	6,166.00	51.84	114.627	
8,900.00	6,946.55	5,900.00	5,715.00	26.65	29.90	-24.16	633.13	-6,953.51	6,181.30	6,141.00	52.16	112.962	
9,000.00	6,946.29	5,900.00	5,715.00	26.95	30.20	-23.86	648.88	-6,959.26	6,156.30	6,116.00	52.48	111.297	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 74-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	7,769.00	7,386.38	27.25	37.47	-114.83	983.45	-7,071.06	4,852.97	4,788.89	64.08	75.736	
9,200.00	6,945.78	7,693.09	7,313.10	27.55	37.18	-110.67	963.73	-7,073.09	4,755.21	4,691.06	64.15	74.125	
9,300.00	6,945.52	7,682.08	7,302.43	27.85	37.14	-110.06	961.06	-7,073.35	4,657.64	4,593.21	64.43	72.290	
9,400.00	6,945.26	7,671.79	7,292.43	28.15	37.10	-109.49	958.61	-7,073.58	4,560.16	4,495.45	64.71	70.469	
9,500.00	6,945.00	7,662.13	7,283.04	28.45	37.06	-108.95	956.35	-7,073.79	4,462.80	4,397.80	65.00	68.663	
9,600.00	6,944.74	7,653.05	7,274.21	28.75	37.02	-108.45	954.26	-7,073.98	4,365.54	4,300.26	65.28	66.872	
9,700.00	6,944.48	7,644.51	7,265.89	29.05	36.99	-107.97	952.33	-7,074.15	4,268.41	4,202.84	65.57	65.097	
9,800.00	6,944.22	7,636.45	7,258.04	29.35	36.96	-107.53	950.53	-7,074.31	4,171.41	4,105.55	65.86	63.337	
9,900.00	6,943.96	7,628.84	7,250.62	29.66	36.93	-107.10	948.86	-7,074.45	4,074.55	4,008.40	66.15	61.593	
10,000.00	6,943.70	7,621.64	7,243.59	29.96	36.90	-106.70	947.29	-7,074.59	3,977.84	3,911.40	66.45	59.865	
10,100.00	6,943.45	7,614.82	7,236.93	30.26	36.88	-106.32	945.83	-7,074.71	3,881.30	3,814.56	66.74	58.154	
10,200.00	6,943.19	7,608.35	7,230.61	30.56	36.85	-105.96	944.46	-7,074.82	3,784.93	3,717.89	67.04	56.459	
10,300.00	6,942.93	7,602.20	7,224.59	30.86	36.83	-105.61	943.18	-7,074.93	3,688.75	3,621.42	67.34	54.781	
10,400.00	6,942.67	7,596.35	7,218.87	31.16	36.80	-105.29	941.97	-7,075.02	3,592.78	3,525.14	67.64	53.119	
10,500.00	6,942.41	7,590.78	7,213.42	31.46	36.78	-104.98	940.84	-7,075.11	3,497.03	3,429.09	67.94	51.475	
10,600.00	6,942.15	7,585.47	7,208.21	31.76	36.76	-104.68	939.76	-7,075.19	3,401.52	3,333.29	68.24	49.849	
10,700.00	6,941.89	7,580.39	7,203.25	32.06	36.74	-104.39	938.75	-7,075.27	3,306.28	3,237.74	68.54	48.240	
10,800.00	6,941.63	7,575.55	7,198.50	32.36	36.72	-104.12	937.79	-7,075.34	3,211.32	3,142.48	68.84	46.649	
10,900.00	6,941.37	7,570.91	7,193.95	32.66	36.70	-103.86	936.88	-7,075.41	3,116.67	3,047.53	69.14	45.076	
11,000.00	6,941.11	7,566.48	7,189.60	32.96	36.69	-103.62	936.02	-7,075.47	3,022.37	2,952.93	69.45	43.522	
11,100.00	6,940.86	7,562.22	7,185.42	33.26	36.67	-103.38	935.21	-7,075.53	2,928.44	2,858.70	69.75	41.987	
11,200.00	6,940.60	7,558.14	7,181.42	33.56	36.66	-103.15	934.43	-7,075.59	2,834.93	2,764.88	70.05	40.471	
11,300.00	6,940.34	7,554.23	7,177.58	33.86	36.64	-102.93	933.69	-7,075.64	2,741.87	2,671.52	70.35	38.976	
11,400.00	6,940.08	7,550.47	7,173.88	34.16	36.63	-102.72	932.99	-7,075.68	2,649.32	2,578.67	70.65	37.501	
11,500.00	6,939.82	7,546.85	7,170.33	34.46	36.61	-102.51	932.31	-7,075.73	2,557.32	2,486.38	70.94	36.048	
11,600.00	6,939.56	7,543.37	7,166.90	34.76	36.60	-102.32	931.67	-7,075.77	2,465.95	2,394.71	71.23	34.617	
11,700.00	6,939.30	7,540.02	7,163.61	35.06	36.58	-102.13	931.06	-7,075.81	2,375.27	2,303.74	71.52	33.210	
11,800.00	6,939.04	7,536.79	7,160.43	35.36	36.57	-101.95	930.47	-7,075.85	2,285.36	2,213.55	71.81	31.827	
11,900.00	6,938.78	7,533.67	7,157.37	35.66	36.56	-101.77	929.91	-7,075.89	2,196.33	2,124.24	72.08	30.469	
12,000.00	6,938.53	7,530.67	7,154.41	35.96	36.55	-101.61	929.37	-7,075.92	2,108.27	2,035.92	72.35	29.139	
12,100.00	6,938.27	7,527.77	7,151.56	36.26	36.54	-101.44	928.86	-7,075.95	2,021.33	1,948.72	72.61	27.839	
12,200.00	6,938.01	7,524.96	7,148.80	36.56	36.53	-101.29	928.36	-7,075.98	1,935.64	1,862.79	72.85	26.570	
12,300.00	6,937.75	7,522.25	7,146.13	36.86	36.52	-101.13	927.89	-7,076.01	1,851.39	1,778.32	73.08	25.334	
12,400.00	6,937.49	7,519.63	7,143.56	37.16	36.51	-100.99	927.43	-7,076.04	1,768.79	1,695.50	73.28	24.136	
12,500.00	6,937.23	7,517.10	7,141.06	37.46	36.50	-100.84	926.99	-7,076.06	1,688.06	1,614.59	73.46	22.978	
12,600.00	6,936.97	7,514.64	7,138.64	37.77	36.49	-100.71	926.57	-7,076.09	1,609.49	1,535.88	73.61	21.864	
12,700.00	6,936.71	7,512.27	7,136.30	38.07	36.48	-100.57	926.16	-7,076.11	1,533.42	1,459.70	73.72	20.800	
12,800.00	6,936.45	7,509.96	7,134.03	38.37	36.47	-100.44	925.77	-7,076.13	1,460.24	1,386.46	73.78	19.791	
12,900.00	6,936.20	7,507.73	7,131.82	38.67	36.46	-100.32	925.39	-7,076.15	1,390.40	1,316.61	73.78	18.844	
13,000.00	6,935.94	7,505.56	7,129.69	38.97	36.45	-100.20	925.03	-7,076.17	1,324.43	1,250.71	73.72	17.966	
13,100.00	6,935.68	7,503.45	7,127.61	39.27	36.44	-100.08	924.67	-7,076.19	1,262.94	1,189.37	73.57	17.167	
13,200.00	6,935.42	7,501.41	7,125.60	39.57	36.44	-99.96	924.33	-7,076.21	1,206.61	1,133.28	73.33	16.454	
13,300.00	6,935.16	7,499.43	7,123.64	39.87	36.43	-99.85	924.00	-7,076.23	1,156.20	1,083.20	73.00	15.839	
13,400.00	6,934.90	7,497.50	7,121.74	40.17	36.42	-99.74	923.68	-7,076.24	1,112.51	1,039.95	72.56	15.332	
13,500.00	6,934.64	7,495.62	7,119.89	40.47	36.41	-99.64	923.38	-7,076.26	1,076.37	1,004.33	72.04	14.942	
13,600.00	6,934.38	7,493.80	7,118.09	40.77	36.41	-99.53	923.08	-7,076.27	1,048.55	977.10	71.45	14.676	
13,700.00	6,934.12	7,492.03	7,116.34	41.07	36.40	-99.43	922.79	-7,076.29	1,029.72	958.89	70.83	14.538	
13,800.00	6,933.87	7,490.30	7,114.64	41.37	36.39	-99.34	922.51	-7,076.30	1,020.39	950.15	70.24	14.527 SF	
13,845.65	6,933.75	7,489.53	7,113.88	41.51	36.39	-99.29	922.38	-7,076.31	1,019.37	949.37	69.99	14.564 CC, ES	
13,900.00	6,933.61	7,488.62	7,112.98	41.67	36.39	-99.24	922.24	-7,076.32	1,020.82	951.08	69.73	14.639	
14,000.00	6,933.35	7,486.98	7,111.36	41.97	36.38	-99.15	921.97	-7,076.33	1,030.99	961.62	69.36	14.864	
14,100.00	6,933.09	7,485.39	7,109.79	42.27	36.37	-99.06	921.72	-7,076.34	1,050.62	981.45	69.17	15.190	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 066M - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 74-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,200.00	6,932.83	7,483.83	7,108.25	42.57	36.37	-98.97	921.47	-7,076.35	1,079.19	1,010.03	69.16	15.604	
14,300.00	6,932.57	7,482.32	7,106.76	42.87	36.36	-98.89	921.23	-7,076.36	1,116.03	1,046.68	69.34	16.095	
14,400.00	6,932.31	7,480.84	7,105.30	43.17	36.36	-98.81	921.00	-7,076.37	1,160.33	1,090.65	69.68	16.653	
14,500.00	6,932.05	7,479.40	7,103.87	43.47	36.35	-98.72	920.77	-7,076.38	1,211.29	1,141.16	70.13	17.271	
14,600.00	6,931.79	7,477.99	7,102.48	43.77	36.34	-98.65	920.55	-7,076.39	1,268.10	1,197.42	70.68	17.942	
14,700.00	6,931.54	7,476.61	7,101.13	44.07	36.34	-98.57	920.33	-7,076.40	1,330.01	1,258.73	71.28	18.659	
14,800.00	6,931.28	7,475.27	7,099.80	44.37	36.33	-98.49	920.12	-7,076.41	1,396.34	1,324.43	71.91	19.418	
14,900.00	6,931.02	7,473.96	7,098.51	44.67	36.33	-98.42	919.92	-7,076.42	1,466.49	1,393.94	72.55	20.213	
15,000.00	6,930.76	7,472.68	7,097.24	44.97	36.32	-98.35	919.72	-7,076.43	1,539.95	1,466.76	73.19	21.040	
15,100.00	6,930.50	7,471.43	7,096.01	45.27	36.32	-98.28	919.53	-7,076.44	1,616.26	1,542.43	73.82	21.893	
15,200.00	6,930.24	7,470.21	7,094.80	45.57	36.31	-98.21	919.34	-7,076.45	1,695.03	1,620.59	74.44	22.770	
15,300.00	6,929.98	7,469.01	7,093.62	45.87	36.31	-98.14	919.16	-7,076.45	1,775.94	1,700.90	75.04	23.667	
15,400.00	6,929.72	7,467.84	7,092.46	46.17	36.31	-98.08	918.98	-7,076.46	1,858.70	1,783.08	75.62	24.579	
15,500.00	6,929.46	7,466.70	7,091.33	46.47	36.30	-98.01	918.81	-7,076.47	1,943.09	1,866.91	76.18	25.506	
15,600.00	6,929.21	7,465.58	7,090.23	46.77	36.30	-97.95	918.64	-7,076.47	2,028.90	1,952.18	76.72	26.444	
15,700.00	6,928.95	7,464.49	7,089.14	47.07	36.29	-97.89	918.47	-7,076.48	2,115.96	2,038.71	77.25	27.391	
15,800.00	6,928.69	7,463.41	7,088.08	47.37	36.29	-97.83	918.31	-7,076.49	2,204.11	2,126.35	77.76	28.346	
15,900.00	6,928.43	7,462.37	7,087.05	47.67	36.28	-97.77	918.15	-7,076.49	2,293.23	2,214.98	78.25	29.306	
16,000.00	6,928.17	7,461.34	7,086.03	47.97	36.28	-97.71	918.00	-7,076.50	2,383.22	2,304.49	78.73	30.271	
16,100.00	6,927.91	7,460.33	7,085.03	48.27	36.28	-97.65	917.85	-7,076.51	2,473.98	2,394.78	79.20	31.239	
16,200.00	6,927.65	7,459.34	7,084.06	48.57	36.27	-97.60	917.70	-7,076.51	2,565.42	2,485.77	79.65	32.209	
16,300.00	6,927.39	7,458.38	7,083.10	48.87	36.27	-97.54	917.55	-7,076.52	2,657.48	2,577.39	80.09	33.180	
16,400.00	6,927.13	16,400.00	7,613.97	49.17	107.79	-129.48	1,121.44	-7,086.74	2,750.73	2,606.18	144.55	19.030	
16,500.00	6,926.88	16,500.00	7,619.00	49.47	108.61	-129.80	1,124.49	-7,087.09	2,843.47	2,697.40	146.07	19.467	
16,600.00	6,926.62	16,600.00	7,624.04	49.77	109.43	-130.12	1,127.55	-7,087.44	2,936.68	2,789.12	147.56	19.902	
16,700.00	6,926.36	16,700.00	7,629.08	50.07	110.24	-130.44	1,130.60	-7,087.79	3,030.31	2,881.29	149.02	20.335	
16,800.00	6,926.10	16,800.00	7,634.11	50.37	111.06	-130.75	1,133.65	-7,088.13	3,124.32	2,973.87	150.46	20.766	
16,900.00	6,925.84	8,600.00	8,048.55	50.67	44.98	-156.70	1,455.28	-7,144.71	3,216.92	3,125.86	91.07	35.325	
17,000.00	6,925.58	8,600.00	8,048.55	50.97	44.98	-156.70	1,455.28	-7,144.71	3,309.95	3,218.44	91.51	36.169	
17,100.00	6,925.32	8,600.00	8,048.55	51.27	44.98	-156.70	1,455.28	-7,144.71	3,403.38	3,311.43	91.95	37.014	
17,200.00	6,925.06	8,600.00	8,048.55	51.58	44.98	-156.70	1,455.28	-7,144.71	3,497.16	3,404.79	92.37	37.858	
17,224.45	6,925.00	8,600.00	8,048.55	51.65	44.98	-156.70	1,455.28	-7,144.71	3,520.14	3,427.66	92.48	38.065	
17,224.92	6,925.00	8,600.00	8,048.55	51.65	44.98	-156.70	1,455.28	-7,144.71	3,520.59	3,428.11	92.48	38.069	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 067 - OH - OH - inc only													Offset Site Error:	0.00 usft
Survey Program: 328-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	40.50	40.50	0.00	0.40	-86.29	671.05	-10,352.38	10,374.10					
100.00	100.00	140.50	140.50	0.23	1.38	-86.29	671.05	-10,352.38	10,374.10	10,372.49	1.61	6,441.503		
200.00	200.00	240.50	240.50	0.53	2.37	-86.29	671.05	-10,352.38	10,374.10	10,371.21	2.90	3,582.927		
300.00	300.00	340.51	340.50	0.83	3.48	-86.29	671.05	-10,352.38	10,374.10	10,369.80	4.30	2,410.531		
400.00	400.00	440.51	440.50	1.13	5.45	-86.29	671.05	-10,352.38	10,374.10	10,367.53	6.57	1,578.142		
500.00	500.00	540.51	540.50	1.43	7.42	-86.29	671.05	-10,352.38	10,374.10	10,365.26	8.84	1,173.067		
600.00	599.98	641.67	641.66	1.73	9.41	-79.04	671.79	-10,352.38	10,373.82	10,362.68	11.14	931.521		
700.00	699.84	743.31	743.29	2.03	11.41	-79.09	671.48	-10,352.38	10,372.81	10,359.37	13.44	771.859		
800.00	799.45	844.66	844.63	2.33	13.41	-79.18	670.89	-10,352.38	10,371.12	10,355.38	15.74	659.104		
900.00	898.70	939.25	939.20	2.63	15.19	-79.28	671.05	-10,352.38	10,368.83	10,351.01	17.82	581.921		
1,000.00	997.47	1,038.02	1,037.97	2.93	17.07	-79.42	671.05	-10,352.38	10,365.91	10,345.91	20.00	518.395		
1,100.00	1,095.62	1,137.20	1,137.15	3.23	18.96	-79.59	671.81	-10,352.38	10,362.42	10,340.23	22.18	467.152		
1,200.00	1,193.06	1,236.12	1,236.06	3.53	20.84	-79.80	671.52	-10,352.38	10,358.27	10,333.91	24.36	425.166		
1,300.00	1,289.64	1,334.04	1,333.97	3.83	22.70	-80.03	670.97	-10,352.38	10,353.55	10,327.03	26.52	390.336		
1,382.94	1,369.03	1,409.61	1,409.53	4.08	24.00	-80.23	671.05	-10,352.38	10,349.26	10,321.10	28.16	367.556		
1,400.00	1,385.28	1,425.87	1,425.78	4.13	24.38	-80.26	671.05	-10,352.38	10,348.34	10,319.83	28.51	363.008		
1,500.00	1,480.57	1,521.15	1,521.07	4.43	26.13	-80.42	671.05	-10,352.38	10,343.01	10,312.45	30.56	338.447		
1,600.00	1,575.86	1,616.80	1,616.72	4.73	27.89	-80.58	671.57	-10,352.38	10,337.78	10,305.16	32.62	316.917		
1,700.00	1,671.15	1,712.81	1,712.72	5.03	29.66	-80.74	671.42	-10,352.38	10,332.61	10,297.93	34.69	297.890		
1,800.00	1,766.44	1,838.96	1,806.94	5.33	31.98	-80.89	671.05	-10,352.38	10,327.52	10,290.22	37.31	276.822		
1,900.00	1,861.72	1,902.32	1,902.22	5.63	33.15	-81.05	671.05	-10,352.38	10,322.54	10,283.76	38.78	266.211		
2,000.00	1,957.01	1,997.61	1,997.51	5.93	34.91	-81.21	671.05	-10,352.38	10,317.63	10,276.80	40.83	252.682		
2,100.00	2,052.30	2,092.95	2,092.85	6.23	36.66	-81.37	671.61	-10,352.38	10,312.84	10,269.95	42.89	240.447		
2,200.00	2,147.59	2,188.70	2,188.60	6.53	38.43	-81.53	671.52	-10,352.38	10,308.11	10,263.15	44.96	229.295		
2,300.00	2,242.88	2,284.35	2,284.25	6.83	40.19	-81.69	671.28	-10,352.38	10,303.46	10,256.44	47.02	219.133		
2,400.00	2,338.16	2,379.91	2,379.80	7.13	41.95	-81.85	670.88	-10,352.38	10,298.90	10,249.82	49.08	209.834		
2,500.00	2,433.45	2,474.07	2,473.95	7.44	43.69	-82.01	671.05	-10,352.38	10,294.43	10,243.32	51.12	201.380		
2,600.00	2,528.74	2,569.36	2,569.24	7.74	45.45	-82.17	671.05	-10,352.38	10,290.06	10,236.88	53.18	193.502		
2,700.00	2,624.03	2,664.81	2,664.69	8.04	47.21	-82.32	671.56	-10,352.38	10,285.77	10,230.53	55.24	186.203		
2,800.00	2,719.32	2,760.25	2,760.12	8.34	48.97	-82.49	671.37	-10,352.38	10,281.57	10,224.27	57.30	179.431		
2,900.00	2,814.60	2,855.58	2,855.46	8.64	50.73	-82.65	671.02	-10,352.38	10,277.45	10,218.09	59.36	173.137		
3,000.00	2,909.89	2,950.53	2,950.39	8.94	52.54	-82.81	671.05	-10,352.38	10,273.42	10,211.95	61.47	167.126		
3,100.00	3,005.18	3,045.82	3,045.68	9.24	54.36	-82.97	671.05	-10,352.38	10,269.48	10,205.90	63.58	161.508		
3,200.00	3,100.47	3,141.10	3,140.96	9.54	56.17	-83.12	671.56	-10,352.38	10,265.63	10,199.93	65.70	156.253		
3,300.00	3,195.76	3,236.29	3,236.15	9.84	57.98	-83.29	671.40	-10,352.38	10,261.87	10,194.06	67.81	151.331		
3,400.00	3,291.04	3,331.39	3,331.24	10.14	59.79	-83.45	671.07	-10,352.38	10,258.19	10,188.27	69.92	146.711		
3,500.00	3,386.33	3,427.00	3,426.83	10.44	61.72	-83.61	671.05	-10,352.38	10,254.61	10,182.46	72.15	142.134		
3,600.00	3,481.62	3,522.29	3,522.12	10.74	63.65	-83.77	671.05	-10,352.38	10,251.11	10,176.74	74.37	137.830		
3,700.00	3,576.91	3,617.12	3,616.94	11.04	65.57	-83.93	671.56	-10,352.38	10,247.69	10,171.10	76.59	133.794		
3,800.00	3,672.20	3,711.72	3,711.54	11.34	67.48	-84.09	671.14	-10,352.38	10,244.38	10,165.57	78.81	129.994		
3,900.00	3,767.48	3,808.20	3,807.98	11.64	69.49	-84.25	671.05	-10,352.38	10,241.15	10,160.04	81.11	126.256		
4,000.00	3,862.77	3,903.49	3,903.27	11.94	71.48	-84.41	671.05	-10,352.38	10,238.01	10,154.60	83.41	122.747		
4,100.00	3,958.06	3,998.64	3,998.41	12.24	73.47	-84.57	672.16	-10,352.38	10,234.92	10,149.23	85.70	119.431		
4,200.00	4,053.35	4,092.92	4,092.69	12.54	75.44	-84.73	671.97	-10,352.38	10,231.96	10,143.99	87.97	116.312		
4,300.00	4,148.64	4,187.02	4,186.79	12.84	77.41	-84.89	671.47	-10,352.38	10,229.10	10,138.86	90.24	113.357		
4,400.00	4,243.92	4,284.72	4,284.42	13.14	79.46	-85.06	671.05	-10,352.38	10,226.33	10,133.74	92.59	110.453		
4,500.00	4,339.21	4,380.01	4,379.71	13.44	81.46	-85.22	671.05	-10,352.38	10,223.63	10,128.75	94.89	107.745		
4,600.00	4,434.50	4,475.29	4,475.00	13.74	83.46	-85.38	671.05	-10,352.38	10,221.02	10,123.84	97.19	105.166		
4,700.00	4,529.79	4,569.58	4,569.28	14.04	85.44	-85.53	672.12	-10,352.38	10,218.46	10,118.99	99.47	102.729		
4,800.00	4,625.08	4,663.29	4,662.98	14.34	87.41	-85.70	671.77	-10,352.38	10,216.04	10,114.30	101.74	100.415		
4,900.00	4,720.36	4,756.82	4,756.50	14.64	89.38	-85.86	671.13	-10,352.38	10,213.74	10,109.73	104.00	98.206		
5,000.00	4,815.65	4,856.53	4,856.15	14.94	91.48	-86.03	671.05	-10,352.38	10,211.49	10,105.09	106.40	95.970		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 328-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,951.81	4,951.44	15.24	93.48	-86.19	671.05	-10,352.38	10,209.33	10,100.62	108.71	93.912	
5,200.00	5,006.23	5,047.10	5,046.73	15.54	95.49	-86.35	671.05	-10,352.38	10,207.26	10,096.24	111.02	91.942	
5,300.00	5,101.52	5,140.77	5,140.38	15.84	97.47	-86.50	672.20	-10,352.38	10,205.21	10,091.91	113.29	90.078	
5,400.00	5,196.80	5,234.10	5,233.71	16.14	99.43	-86.67	671.83	-10,352.38	10,203.34	10,087.78	115.56	88.295	
5,500.00	5,292.09	5,327.27	5,326.87	16.44	101.40	-86.83	671.20	-10,352.38	10,201.58	10,083.75	117.82	86.584	
5,600.00	5,387.38	5,428.34	5,427.88	16.74	103.53	-87.00	671.05	-10,352.38	10,199.88	10,079.62	120.26	84.818	
5,700.00	5,482.67	5,523.63	5,523.17	17.04	105.54	-87.16	671.05	-10,352.38	10,198.25	10,075.69	122.57	83.205	
5,800.00	5,577.96	5,618.32	5,617.84	17.34	107.54	-87.32	672.13	-10,352.38	10,196.64	10,071.77	124.87	81.660	
5,900.00	5,673.24	5,710.94	5,710.46	17.64	109.50	-87.48	671.91	-10,352.38	10,195.21	10,068.09	127.12	80.200	
6,000.00	5,768.53	5,803.37	5,802.89	17.94	111.45	-87.64	671.39	-10,352.38	10,193.90	10,064.53	129.37	78.794	
6,100.00	5,863.82	5,904.86	5,904.32	18.24	113.59	-87.81	671.05	-10,352.38	10,192.67	10,060.85	131.82	77.323	
6,200.00	5,959.11	6,000.15	5,999.61	18.54	115.61	-87.97	671.05	-10,352.38	10,191.50	10,057.36	134.14	75.979	
6,300.00	6,054.40	6,095.43	6,094.90	18.84	117.63	-88.14	671.05	-10,352.38	10,190.42	10,053.97	136.45	74.681	
6,400.00	6,149.68	6,190.72	6,190.18	19.14	119.64	-88.30	671.05	-10,352.38	10,189.43	10,050.66	138.77	73.427	
6,500.00	6,244.97	6,286.01	6,285.47	19.44	121.66	-88.46	671.05	-10,352.38	10,188.53	10,047.44	141.09	72.215	
6,600.00	6,340.26	6,381.30	6,380.76	19.74	123.68	-88.62	671.05	-10,352.38	10,187.72	10,044.31	143.40	71.042	
6,689.41	6,425.45	6,466.49	6,465.95	20.01	125.48	-88.77	671.05	-10,352.38	10,187.07	10,041.59	145.48	70.026	
6,700.00	6,435.54	6,476.58	6,476.04	20.04	125.69	-85.52	671.05	-10,352.38	10,186.90	10,041.18	145.72	69.907	
6,750.00	6,482.96	6,524.00	6,523.46	20.19	126.70	-71.41	671.05	-10,352.38	10,183.49	10,036.62	146.87	69.335	
6,800.00	6,529.78	6,570.81	6,570.28	20.34	127.69	-60.10	671.05	-10,352.38	10,175.79	10,027.78	148.02	68.748	
6,850.00	6,575.63	6,616.67	6,616.13	20.49	128.66	-51.59	671.05	-10,352.38	10,163.87	10,014.74	149.14	68.152	
6,900.00	6,620.18	6,661.21	6,660.68	20.64	129.60	-45.33	671.05	-10,352.38	10,147.82	9,997.59	150.23	67.549	
6,950.00	6,663.07	6,704.11	6,703.57	20.79	130.51	-40.77	671.05	-10,352.38	10,127.75	9,976.47	151.29	66.944	
7,000.00	6,704.00	6,745.03	6,744.50	20.94	131.38	-37.47	671.05	-10,352.38	10,103.83	9,951.52	152.30	66.340	
7,050.00	6,742.63	6,783.67	6,783.13	21.09	132.19	-35.13	671.05	-10,352.38	10,076.22	9,922.95	153.27	65.741	
7,100.00	6,778.69	6,819.73	6,819.19	21.24	132.96	-33.55	671.05	-10,352.38	10,045.15	9,890.97	154.18	65.150	
7,150.00	6,811.89	6,852.93	6,852.39	21.39	133.66	-32.62	671.05	-10,352.38	10,010.84	9,855.81	155.04	64.570	
7,200.00	6,841.98	6,883.02	6,882.48	21.54	134.30	-32.31	671.05	-10,352.38	9,973.56	9,817.74	155.83	64.005	
7,250.00	6,868.74	6,909.78	6,909.24	21.69	134.86	-32.63	671.05	-10,352.38	9,933.58	9,777.04	156.54	63.456	
7,300.00	6,891.96	6,933.00	6,932.46	21.84	135.35	-33.69	671.05	-10,352.38	9,891.21	9,734.03	157.18	62.928	
7,350.00	6,911.46	6,952.50	6,951.96	21.99	135.77	-35.75	671.05	-10,352.38	9,846.77	9,689.02	157.75	62.421	
7,400.00	6,927.10	6,968.13	6,967.60	22.14	136.10	-39.30	671.05	-10,352.38	9,800.58	9,642.36	158.23	61.939	
7,450.00	6,938.75	6,979.79	6,979.25	22.29	136.35	-45.46	671.05	-10,352.38	9,753.01	9,594.38	158.63	61.484	
7,500.00	6,946.33	6,987.37	6,986.83	22.44	136.51	-56.82	671.05	-10,352.38	9,704.40	9,545.47	158.94	61.058	
7,550.00	6,949.78	6,990.81	6,990.28	22.59	136.58	-79.11	671.05	-10,352.38	9,655.13	9,495.97	159.16	60.663	
7,568.05	6,950.00	6,991.04	6,990.50	22.65	136.58	-91.11	671.05	-10,352.38	9,637.26	9,478.04	159.22	60.528	
7,600.00	6,949.92	6,990.96	6,990.42	22.74	136.58	-91.11	671.05	-10,352.38	9,605.58	9,446.27	159.31	60.294	
7,700.00	6,949.66	6,990.70	6,990.16	23.04	136.58	-91.10	671.05	-10,352.38	9,506.48	9,346.87	159.61	59.561	
7,800.00	6,949.40	6,990.44	6,989.90	23.35	136.57	-91.09	671.05	-10,352.38	9,407.38	9,247.48	159.90	58.831	
7,900.00	6,949.14	6,990.18	6,989.64	23.65	136.57	-91.07	671.05	-10,352.38	9,308.31	9,148.11	160.20	58.105	
8,000.00	6,948.88	6,989.92	6,989.38	23.95	136.56	-91.06	671.05	-10,352.38	9,209.26	9,048.77	160.49	57.380	
8,100.00	6,948.62	6,989.66	6,989.12	24.25	136.55	-91.05	671.05	-10,352.38	9,110.23	8,949.44	160.79	56.659	
8,200.00	6,948.36	6,989.40	6,988.86	24.55	136.55	-91.04	671.05	-10,352.38	9,011.22	8,850.14	161.09	55.941	
8,300.00	6,948.11	6,989.14	6,988.61	24.85	136.54	-91.03	671.05	-10,352.38	8,912.24	8,750.86	161.38	55.225	
8,400.00	6,947.85	6,988.88	6,988.35	25.15	136.54	-91.02	671.05	-10,352.38	8,813.27	8,651.60	161.68	54.512	
8,500.00	6,947.59	6,988.63	6,988.09	25.45	136.53	-91.00	671.05	-10,352.38	8,714.33	8,552.36	161.97	53.802	
8,600.00	6,947.33	6,988.37	6,987.83	25.75	136.53	-90.99	671.05	-10,352.38	8,615.42	8,453.15	162.27	53.094	
8,700.00	6,947.07	6,988.11	6,987.57	26.05	136.52	-90.98	671.05	-10,352.38	8,516.53	8,353.97	162.56	52.390	
8,800.00	6,946.81	6,987.85	6,987.31	26.35	136.52	-90.97	671.05	-10,352.38	8,417.67	8,254.81	162.86	51.688	
8,900.00	6,946.55	6,987.59	6,987.05	26.65	136.51	-90.96	671.05	-10,352.38	8,318.83	8,155.68	163.15	50.988	
9,000.00	6,946.29	6,987.33	6,986.79	26.95	136.51	-90.95	671.05	-10,352.38	8,220.02	8,056.57	163.45	50.292	
9,100.00	6,946.03	6,987.07	6,986.53	27.25	136.50	-90.93	671.05	-10,352.38	8,121.24	7,957.50	163.74	49.598	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 328-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	6,986.81	6,986.28	27.55	136.49	-90.92	671.05	-10,352.38	8,022.49	7,858.45	164.04	48.907	
9,300.00	6,945.52	6,986.55	6,986.02	27.85	136.49	-90.91	671.05	-10,352.38	7,923.77	7,759.44	164.33	48.218	
9,400.00	6,945.26	6,986.30	6,985.76	28.15	136.48	-90.90	671.05	-10,352.38	7,825.09	7,660.46	164.63	47.532	
9,500.00	6,945.00	6,986.04	6,985.50	28.45	136.48	-90.89	671.05	-10,352.38	7,726.44	7,561.51	164.92	46.849	
9,600.00	6,944.74	6,985.78	6,985.24	28.75	136.47	-90.88	671.05	-10,352.38	7,627.82	7,462.60	165.22	46.169	
9,700.00	6,944.48	6,985.52	6,984.98	29.05	136.47	-90.87	671.05	-10,352.38	7,529.24	7,363.73	165.51	45.491	
9,800.00	6,944.22	6,985.26	6,984.72	29.35	136.46	-90.85	671.05	-10,352.38	7,430.70	7,264.89	165.81	44.815	
9,900.00	6,943.96	6,985.00	6,984.46	29.66	136.46	-90.84	671.05	-10,352.38	7,332.20	7,166.09	166.10	44.143	
10,000.00	6,943.70	6,984.74	6,984.20	29.96	136.45	-90.83	671.05	-10,352.38	7,233.73	7,067.34	166.40	43.473	
10,100.00	6,943.45	6,984.48	6,983.95	30.26	136.44	-90.82	671.05	-10,352.38	7,135.32	6,968.62	166.69	42.805	
10,200.00	6,943.19	6,984.22	6,983.69	30.56	136.44	-90.81	671.05	-10,352.38	7,036.94	6,869.95	166.99	42.141	
10,300.00	6,942.93	6,983.97	6,983.43	30.86	136.43	-90.80	671.05	-10,352.38	6,938.61	6,771.33	167.28	41.479	
10,400.00	6,942.67	6,983.71	6,983.17	31.16	136.43	-90.78	671.05	-10,352.38	6,840.33	6,672.76	167.58	40.819	
10,500.00	6,942.41	6,983.45	6,982.91	31.46	136.42	-90.77	671.05	-10,352.38	6,742.11	6,574.23	167.87	40.162	
10,600.00	6,942.15	6,983.19	6,982.65	31.76	136.42	-90.76	671.05	-10,352.38	6,643.93	6,475.76	168.17	39.508	
10,700.00	6,941.89	6,982.93	6,982.39	32.06	136.41	-90.75	671.05	-10,352.38	6,545.81	6,377.35	168.46	38.857	
10,800.00	6,941.63	6,982.67	6,982.13	32.36	136.41	-90.74	671.05	-10,352.38	6,447.75	6,278.99	168.76	38.208	
10,900.00	6,941.37	6,982.41	6,981.87	32.66	136.40	-90.73	671.05	-10,352.38	6,349.74	6,180.69	169.05	37.561	
11,000.00	6,941.11	6,982.15	6,981.61	32.96	136.40	-90.71	671.05	-10,352.38	6,251.81	6,082.46	169.35	36.917	
11,100.00	6,940.86	6,981.89	6,981.36	33.26	136.39	-90.70	671.05	-10,352.38	6,153.93	5,984.29	169.64	36.276	
11,200.00	6,940.60	6,981.64	6,981.10	33.56	136.38	-90.69	671.05	-10,352.38	6,056.13	5,886.19	169.94	35.638	
11,300.00	6,940.34	6,981.38	6,980.84	33.86	136.38	-90.68	671.05	-10,352.38	5,958.40	5,788.17	170.23	35.002	
11,400.00	6,940.08	6,981.12	6,980.58	34.16	136.37	-90.67	671.05	-10,352.38	5,860.75	5,690.22	170.52	34.369	
11,500.00	6,939.82	6,980.86	6,980.32	34.46	136.37	-90.66	671.05	-10,352.38	5,763.17	5,592.35	170.82	33.738	
11,600.00	6,939.56	6,980.60	6,980.06	34.76	136.36	-90.64	671.05	-10,352.38	5,665.68	5,494.57	171.11	33.111	
11,700.00	6,939.30	6,980.34	6,979.80	35.06	136.36	-90.63	671.05	-10,352.38	5,568.28	5,396.87	171.41	32.485	
11,800.00	6,939.04	6,980.08	6,979.54	35.36	136.35	-90.62	671.05	-10,352.38	5,470.98	5,299.27	171.70	31.863	
11,900.00	6,938.78	6,979.82	6,979.28	35.66	136.35	-90.61	671.05	-10,352.38	5,373.77	5,201.77	172.00	31.243	
12,000.00	6,938.53	6,979.56	6,979.03	35.96	136.34	-90.60	671.05	-10,352.38	5,276.67	5,104.37	172.29	30.626	
12,100.00	6,938.27	6,979.31	6,978.77	36.26	136.34	-90.59	671.05	-10,352.38	5,179.68	5,007.09	172.59	30.012	
12,200.00	6,938.01	6,979.05	6,978.51	36.56	136.33	-90.57	671.05	-10,352.38	5,082.80	4,909.92	172.88	29.400	
12,300.00	6,937.75	6,978.79	6,978.25	36.86	136.32	-90.56	671.05	-10,352.38	4,986.05	4,812.87	173.18	28.792	
12,400.00	6,937.49	6,978.53	6,977.99	37.16	136.32	-90.55	671.05	-10,352.38	4,889.43	4,715.95	173.47	28.186	
12,500.00	6,937.23	6,978.27	6,977.73	37.46	136.31	-90.54	671.05	-10,352.38	4,792.94	4,619.18	173.77	27.583	
12,600.00	6,936.97	6,978.01	6,977.47	37.77	136.31	-90.53	671.05	-10,352.38	4,696.61	4,522.55	174.06	26.983	
12,700.00	6,936.71	6,977.75	6,977.21	38.07	136.30	-90.52	671.05	-10,352.38	4,600.43	4,426.07	174.36	26.385	
12,800.00	6,936.45	6,977.49	6,976.95	38.37	136.30	-90.50	671.05	-10,352.38	4,504.41	4,329.76	174.65	25.791	
12,900.00	6,936.20	6,977.23	6,976.70	38.67	136.29	-90.49	671.05	-10,352.38	4,408.58	4,233.63	174.94	25.200	
13,000.00	6,935.94	6,976.98	6,976.44	38.97	136.29	-90.48	671.05	-10,352.38	4,312.93	4,137.69	175.24	24.612	
13,100.00	6,935.68	6,976.72	6,976.18	39.27	136.28	-90.47	671.05	-10,352.38	4,217.48	4,041.95	175.53	24.027	
13,200.00	6,935.42	6,976.46	6,975.92	39.57	136.27	-90.46	671.05	-10,352.38	4,122.26	3,946.43	175.83	23.445	
13,300.00	6,935.16	6,976.20	6,975.66	39.87	136.27	-90.45	671.05	-10,352.38	4,027.26	3,851.13	176.12	22.866	
13,400.00	6,934.90	6,975.94	6,975.40	40.17	136.26	-90.43	671.05	-10,352.38	3,932.51	3,756.09	176.42	22.291	
13,500.00	6,934.64	6,975.68	6,975.14	40.47	136.26	-90.42	671.05	-10,352.38	3,838.02	3,661.31	176.71	21.719	
13,600.00	6,934.38	6,975.42	6,974.88	40.77	136.25	-90.41	671.05	-10,352.38	3,743.83	3,566.82	177.01	21.151	
13,700.00	6,934.12	6,975.16	6,974.62	41.07	136.25	-90.40	671.05	-10,352.38	3,649.94	3,472.64	177.30	20.586	
13,800.00	6,933.87	6,974.90	6,974.37	41.37	136.24	-90.39	671.05	-10,352.38	3,556.38	3,378.79	177.60	20.025	
13,900.00	6,933.61	6,974.65	6,974.11	41.67	136.24	-90.38	671.05	-10,352.38	3,463.19	3,285.30	177.89	19.468	
14,000.00	6,933.35	6,974.39	6,973.85	41.97	136.23	-90.36	671.05	-10,352.38	3,370.38	3,192.20	178.18	18.915	
14,100.00	6,933.09	6,974.13	6,973.59	42.27	136.23	-90.35	671.05	-10,352.38	3,278.00	3,099.53	178.48	18.366	
14,200.00	6,932.83	6,973.87	6,973.33	42.57	136.22	-90.34	671.05	-10,352.38	3,186.08	3,007.31	178.77	17.822	
14,300.00	6,932.57	6,973.61	6,973.07	42.87	136.21	-90.33	671.05	-10,352.38	3,094.66	2,915.59	179.07	17.282	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 067 - OH - OH - inc only													Offset Site Error:	0.00 usft
Survey Program: 328-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,400.00	6,932.31	6,973.35	6,972.81	43.17	136.21	-90.32	671.05	-10,352.38	3,003.79	2,824.43	179.36	16.747		
14,500.00	6,932.05	6,973.09	6,972.55	43.47	136.20	-90.31	671.05	-10,352.38	2,913.51	2,733.86	179.65	16.217		
14,600.00	6,931.79	6,972.83	6,972.29	43.77	136.20	-90.29	671.05	-10,352.38	2,823.89	2,643.94	179.95	15.693		
14,700.00	6,931.54	6,972.57	6,972.04	44.07	136.19	-90.28	671.05	-10,352.38	2,734.99	2,554.75	180.24	15.174		
14,800.00	6,931.28	6,972.31	6,971.78	44.37	136.19	-90.27	671.05	-10,352.38	2,646.88	2,466.35	180.54	14.661		
14,900.00	6,931.02	6,972.06	6,971.52	44.67	136.18	-90.26	671.05	-10,352.38	2,559.65	2,378.82	180.83	14.155		
15,000.00	6,930.76	6,971.80	6,971.26	44.97	136.18	-90.25	671.05	-10,352.38	2,473.38	2,292.26	181.12	13.656		
15,100.00	6,930.50	6,971.54	6,971.00	45.27	136.17	-90.24	671.05	-10,352.38	2,388.18	2,206.76	181.42	13.164		
15,200.00	6,930.24	6,971.28	6,970.74	45.57	136.17	-90.22	671.05	-10,352.38	2,304.18	2,122.46	181.71	12.680		
15,300.00	6,929.98	6,971.02	6,970.48	45.87	136.16	-90.21	671.05	-10,352.38	2,221.49	2,039.49	182.01	12.206		
15,400.00	6,929.72	6,970.76	6,970.22	46.17	136.15	-90.20	671.05	-10,352.38	2,140.29	1,957.99	182.30	11.741		
15,500.00	6,929.46	6,970.50	6,969.96	46.47	136.15	-90.19	671.05	-10,352.38	2,060.74	1,878.15	182.59	11.286		
15,600.00	6,929.21	6,970.24	6,969.71	46.77	136.14	-90.18	671.05	-10,352.38	1,983.04	1,800.16	182.89	10.843		
15,700.00	6,928.95	6,969.98	6,969.45	47.07	136.14	-90.17	671.05	-10,352.38	1,907.43	1,724.25	183.18	10.413		
15,800.00	6,928.69	6,969.73	6,969.19	47.37	136.13	-90.15	671.05	-10,352.38	1,834.14	1,650.67	183.47	9.997		
15,900.00	6,928.43	6,969.47	6,968.93	47.67	136.13	-90.14	671.05	-10,352.38	1,763.49	1,579.73	183.76	9.596		
16,000.00	6,928.17	6,969.21	6,968.67	47.97	136.12	-90.13	671.05	-10,352.38	1,695.79	1,511.73	184.06	9.213		
16,100.00	6,927.91	6,968.95	6,968.41	48.27	136.12	-90.12	671.05	-10,352.38	1,631.41	1,447.06	184.35	8.850		
16,200.00	6,927.65	6,968.69	6,968.15	48.57	136.11	-90.11	671.05	-10,352.38	1,570.77	1,386.13	184.64	8.507		
16,300.00	6,927.39	6,968.43	6,967.89	48.87	136.10	-90.10	671.05	-10,352.38	1,514.31	1,329.37	184.94	8.188		
16,400.00	6,927.13	6,968.17	6,967.63	49.17	136.10	-90.08	671.05	-10,352.38	1,462.51	1,277.28	185.23	7.896		
16,500.00	6,926.88	6,967.91	6,967.38	49.47	136.09	-90.07	671.05	-10,352.38	1,415.89	1,230.37	185.52	7.632		
16,600.00	6,926.62	6,967.65	6,967.12	49.77	136.09	-90.06	671.05	-10,352.38	1,374.98	1,189.16	185.82	7.400		
16,700.00	6,926.36	6,967.40	6,966.86	50.07	136.08	-90.05	671.05	-10,352.38	1,340.29	1,154.18	186.11	7.202		
16,800.00	6,926.10	6,967.14	6,966.60	50.37	136.08	-90.04	671.05	-10,352.38	1,312.32	1,125.91	186.40	7.040		
16,900.00	6,925.84	6,966.88	6,966.34	50.67	136.07	-90.03	671.05	-10,352.38	1,291.50	1,104.81	186.70	6.918		
17,000.00	6,925.58	6,966.62	6,966.08	50.97	136.07	-90.01	671.05	-10,352.38	1,278.20	1,091.20	186.99	6.836		
17,100.00	6,925.32	6,966.36	6,965.82	51.27	136.06	-90.00	671.05	-10,352.38	1,272.64	1,085.35	187.29	6.795		
17,120.96	6,925.27	6,966.31	6,965.77	51.34	136.06	-90.00	671.05	-10,352.38	1,272.46	1,085.11	187.35	6.792 CC, ES, SF		
17,200.00	6,925.06	6,966.10	6,965.56	51.58	136.06	-89.99	671.05	-10,352.38	1,274.91	1,087.33	187.59	6.796		
17,224.45	6,925.00	6,966.04	6,965.50	51.65	136.05	-89.99	671.05	-10,352.38	1,276.66	1,089.01	187.66	6.803		
17,224.92	6,925.00	6,966.04	6,965.50	51.65	136.05	-89.99	671.05	-10,352.38	1,276.70	1,089.04	187.66	6.803		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 173-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	179.50	166.50	0.00	1.72	-77.98	1,180.50	-5,545.07	5,669.33				
100.00	100.00	266.50	266.50	0.23	3.38	-77.98	1,180.50	-5,545.07	5,669.33	5,665.73	3.60	1,572.815	
200.00	200.00	369.80	369.80	0.53	5.34	-77.98	1,180.66	-5,545.07	5,669.37	5,663.50	5.87	965.811	
300.00	300.00	466.52	466.50	0.83	7.22	-77.98	1,180.50	-5,545.07	5,669.33	5,661.29	8.04	704.800	
400.00	400.00	568.28	568.26	1.13	9.22	-77.98	1,180.89	-5,545.07	5,669.41	5,659.07	10.34	548.089	
500.00	500.00	674.79	674.77	1.43	11.31	-77.98	1,180.44	-5,545.07	5,669.33	5,656.59	12.74	445.088	
600.00	599.98	766.52	766.48	1.73	13.12	-70.75	1,180.50	-5,545.07	5,668.76	5,653.91	14.84	381.899	
700.00	699.84	866.38	866.34	2.03	15.08	-70.83	1,180.50	-5,545.07	5,667.03	5,649.92	17.11	331.221	
800.00	799.45	966.96	966.92	2.33	17.06	-70.96	1,181.36	-5,545.07	5,664.35	5,644.96	19.39	292.130	
900.00	898.70	1,069.10	1,069.05	2.63	19.07	-71.16	1,181.15	-5,545.07	5,660.32	5,638.62	21.70	260.837	
1,000.00	997.47	1,235.95	1,163.97	2.93	22.44	-71.40	1,180.50	-5,545.07	5,655.11	5,629.75	25.36	222.959	
1,100.00	1,095.62	1,262.21	1,262.12	3.23	23.01	-71.70	1,180.50	-5,545.07	5,648.97	5,622.73	26.24	215.296	
1,200.00	1,193.06	1,359.64	1,359.56	3.53	25.14	-72.05	1,180.50	-5,545.07	5,641.81	5,613.14	28.67	196.792	
1,300.00	1,289.64	1,456.38	1,456.29	3.83	27.26	-72.44	1,181.32	-5,545.07	5,633.82	5,602.73	31.08	181.241	
1,382.94	1,369.03	1,537.99	1,537.90	4.08	29.04	-72.81	1,181.22	-5,545.07	5,626.34	5,593.22	33.12	169.886	
1,400.00	1,385.28	1,554.69	1,554.60	4.13	29.41	-72.86	1,181.18	-5,545.07	5,624.73	5,591.20	33.53	167.728	
1,500.00	1,480.57	1,652.49	1,652.40	4.43	31.55	-73.16	1,180.79	-5,545.07	5,615.39	5,579.42	35.97	156.098	
1,600.00	1,575.86	1,750.14	1,750.04	4.73	33.68	-73.45	1,180.15	-5,545.07	5,606.17	5,567.76	38.41	145.960	
1,700.00	1,671.15	1,853.33	1,853.13	5.03	36.20	-73.76	1,180.26	-5,545.07	5,597.23	5,556.01	41.22	135.779	
1,800.00	1,766.44	1,933.16	1,932.94	5.33	37.86	-74.00	1,180.50	-5,545.07	5,588.44	5,545.25	43.18	129.416	
1,900.00	1,861.72	2,028.45	2,028.22	5.63	39.88	-74.28	1,180.50	-5,545.07	5,579.77	5,534.26	45.51	122.613	
2,000.00	1,957.01	2,126.09	2,125.85	5.93	41.96	-74.57	1,181.69	-5,545.07	5,571.44	5,523.56	47.88	116.357	
2,100.00	2,052.30	2,225.21	2,224.96	6.23	44.06	-74.87	1,181.18	-5,545.07	5,563.00	5,512.71	50.29	110.621	
2,200.00	2,147.59	2,324.04	2,323.78	6.53	46.16	-75.18	1,180.22	-5,545.07	5,554.65	5,501.96	52.69	105.423	
2,300.00	2,242.88	2,409.67	2,409.38	6.83	47.98	-75.44	1,180.50	-5,545.07	5,546.63	5,491.82	54.81	101.197	
2,400.00	2,338.16	2,504.96	2,504.66	7.13	50.01	-75.73	1,180.50	-5,545.07	5,538.73	5,481.59	57.14	96.939	
2,500.00	2,433.45	2,601.20	2,600.90	7.44	52.06	-76.01	1,181.28	-5,545.07	5,531.08	5,471.60	59.48	92.986	
2,600.00	2,528.74	2,698.19	2,697.88	7.74	54.12	-76.31	1,181.03	-5,545.07	5,523.46	5,461.61	61.85	89.311	
2,700.00	2,624.03	2,809.10	2,790.53	8.04	56.52	-76.60	1,180.50	-5,545.07	5,515.96	5,451.41	64.54	85.462	
2,800.00	2,719.32	2,886.19	2,885.82	8.34	58.49	-76.90	1,180.50	-5,545.07	5,508.68	5,441.86	66.81	82.448	
2,900.00	2,814.60	2,981.48	2,981.10	8.64	60.92	-77.19	1,180.50	-5,545.07	5,501.56	5,432.01	69.55	79.102	
3,000.00	2,909.89	3,077.44	3,077.05	8.94	63.38	-77.47	1,181.85	-5,545.07	5,494.73	5,422.43	72.30	75.995	
3,100.00	3,005.18	3,174.98	3,174.58	9.24	65.87	-77.78	1,181.52	-5,545.07	5,487.89	5,412.80	75.10	73.077	
3,200.00	3,100.47	3,332.45	3,266.97	9.54	70.16	-78.08	1,180.50	-5,545.07	5,481.15	5,401.47	79.69	68.785	
3,300.00	3,195.76	3,362.83	3,362.26	9.84	71.18	-78.37	1,180.50	-5,545.07	5,474.67	5,393.66	81.01	67.583	
3,400.00	3,291.04	3,458.12	3,457.54	10.14	74.38	-78.67	1,180.50	-5,545.07	5,468.35	5,383.84	84.51	64.706	
3,500.00	3,386.33	3,553.41	3,552.83	10.44	77.59	-78.97	1,180.50	-5,545.07	5,462.19	5,374.17	88.02	62.060	
3,600.00	3,481.62	3,650.25	3,649.62	10.74	80.85	-79.25	1,182.86	-5,545.07	5,456.35	5,364.78	91.57	59.586	
3,700.00	3,576.91	3,747.59	3,746.93	11.04	84.12	-79.56	1,182.18	-5,545.07	5,450.46	5,355.31	95.14	57.286	
3,800.00	3,672.20	3,844.58	3,843.89	11.34	87.38	-79.88	1,180.93	-5,545.07	5,444.70	5,346.00	98.71	55.161	
3,900.00	3,767.48	3,935.17	3,933.98	11.64	90.88	-80.17	1,180.50	-5,545.07	5,439.16	5,336.66	102.50	53.063	
4,000.00	3,862.77	4,036.19	4,034.92	11.94	94.99	-80.48	1,181.06	-5,545.07	5,433.85	5,326.93	106.91	50.825	
4,100.00	3,958.06	4,126.07	4,124.56	12.24	98.62	-80.77	1,180.50	-5,545.07	5,428.63	5,317.79	110.84	48.976	
4,200.00	4,053.35	4,222.97	4,221.37	12.54	102.52	-81.06	1,182.37	-5,545.07	5,423.68	5,308.64	115.05	47.143	
4,300.00	4,148.64	4,324.93	4,315.14	12.84	106.62	-81.37	1,180.50	-5,545.07	5,418.76	5,299.31	119.45	45.365	
4,400.00	4,243.92	4,414.24	4,412.27	13.14	110.06	-81.67	1,181.10	-5,545.07	5,414.09	5,290.90	123.19	43.951	
4,500.00	4,339.21	4,507.82	4,505.71	13.44	113.67	-81.98	1,180.50	-5,545.07	5,409.55	5,282.45	127.10	42.562	
4,600.00	4,434.50	4,605.50	4,603.32	13.74	117.45	-82.29	1,180.32	-5,545.07	5,405.19	5,274.02	131.18	41.205	
4,700.00	4,529.79	4,698.61	4,696.29	14.04	121.08	-82.59	1,180.50	-5,545.07	5,401.01	5,265.90	135.11	39.975	
4,800.00	4,625.08	4,793.89	4,791.58	14.34	124.80	-82.89	1,180.50	-5,545.07	5,396.99	5,257.86	139.13	38.792	
4,900.00	4,720.36	4,889.20	4,886.77	14.64	128.52	-83.17	1,183.00	-5,545.07	5,393.13	5,249.99	143.14	37.677	
5,000.00	4,815.65	4,983.95	4,981.48	14.94	132.21	-83.49	1,181.61	-5,545.07	5,389.44	5,242.30	147.14	36.629	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 173-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	5,080.35	5,077.44	15.24	135.98	-83.81	1,180.50	-5,545.07	5,385.93	5,234.72	151.21	35.619	
5,200.00	5,006.23	5,175.15	5,172.19	15.54	139.71	-84.09	1,182.01	-5,545.07	5,382.55	5,227.32	155.23	34.674	
5,300.00	5,101.52	5,267.82	5,264.80	15.84	143.35	-84.41	1,180.60	-5,545.07	5,379.40	5,220.23	159.17	33.796	
5,400.00	5,196.80	5,366.54	5,363.30	16.14	147.24	-84.73	1,180.50	-5,545.07	5,376.39	5,213.03	163.37	32.910	
5,500.00	5,292.09	5,461.68	5,458.37	16.44	150.99	-85.01	1,182.90	-5,545.07	5,373.47	5,206.05	167.42	32.096	
5,600.00	5,387.38	5,554.18	5,550.83	16.74	154.64	-85.31	1,182.22	-5,545.07	5,370.81	5,199.44	171.37	31.340	
5,700.00	5,482.67	5,652.91	5,649.17	17.04	158.53	-85.65	1,180.50	-5,545.07	5,368.38	5,192.83	175.55	30.580	
5,800.00	5,577.96	5,748.20	5,744.46	17.34	162.19	-85.95	1,180.50	-5,545.07	5,366.05	5,186.54	179.51	29.892	
5,900.00	5,673.24	5,843.49	5,839.74	17.64	165.85	-86.26	1,180.50	-5,545.07	5,363.89	5,180.41	183.48	29.235	
6,000.00	5,768.53	5,937.02	5,933.17	17.94	169.45	-86.53	1,183.59	-5,545.07	5,361.70	5,174.33	187.37	28.615	
6,100.00	5,863.82	6,028.71	6,024.82	18.24	172.97	-86.84	1,182.66	-5,545.07	5,359.94	5,168.74	191.20	28.034	
6,200.00	5,959.11	6,119.89	6,115.94	18.54	176.48	-87.15	1,180.85	-5,545.07	5,358.42	5,163.42	195.00	27.479	
6,300.00	6,054.40	6,225.26	6,220.90	18.84	180.54	-87.50	1,180.50	-5,545.07	5,356.96	5,157.60	199.36	26.870	
6,400.00	6,149.68	6,320.55	6,316.18	19.14	184.21	-87.81	1,180.50	-5,545.07	5,355.66	5,152.32	203.34	26.339	
6,500.00	6,244.97	6,414.99	6,410.54	19.44	187.86	-88.08	1,183.62	-5,545.07	5,354.24	5,146.96	207.28	25.831	
6,600.00	6,340.26	6,505.99	6,501.51	19.74	191.37	-88.38	1,183.08	-5,545.07	5,353.31	5,142.22	211.09	25.360	
6,689.41	6,425.45	6,586.99	6,582.47	20.01	194.49	-88.66	1,181.96	-5,545.07	5,352.71	5,138.22	214.48	24.956	
6,700.00	6,435.54	6,596.56	6,592.04	20.04	194.86	-85.42	1,181.79	-5,545.07	5,352.55	5,137.67	214.88	24.909	
6,750.00	6,482.96	6,641.47	6,636.92	20.19	196.59	-71.39	1,180.87	-5,545.07	5,349.24	5,132.47	216.77	24.677	
6,800.00	6,529.78	6,701.30	6,696.28	20.34	198.85	-60.20	1,180.50	-5,545.07	5,341.58	5,122.41	219.17	24.371	
6,850.00	6,575.63	6,747.16	6,742.13	20.49	200.57	-51.77	1,180.50	-5,545.07	5,329.70	5,108.66	221.04	24.112	
6,900.00	6,620.18	6,791.70	6,786.68	20.64	202.23	-45.60	1,180.50	-5,545.07	5,313.71	5,090.85	222.86	23.844	
6,950.00	6,663.07	6,834.60	6,829.57	20.79	203.84	-41.14	1,180.50	-5,545.07	5,293.73	5,069.12	224.61	23.568	
7,000.00	6,704.00	6,875.52	6,870.50	20.94	205.37	-37.94	1,180.50	-5,545.07	5,269.91	5,043.62	226.29	23.288	
7,050.00	6,742.63	6,913.56	6,908.45	21.09	206.79	-35.67	1,183.73	-5,545.07	5,242.04	5,014.17	227.87	23.005	
7,100.00	6,778.69	6,947.29	6,942.16	21.24	208.05	-34.22	1,183.63	-5,545.07	5,211.12	4,981.84	229.28	22.728	
7,150.00	6,811.89	6,978.28	6,973.14	21.39	209.21	-33.44	1,183.44	-5,545.07	5,177.00	4,946.41	230.59	22.451	
7,200.00	6,841.98	7,006.33	7,001.18	21.54	210.26	-33.29	1,183.18	-5,545.07	5,139.93	4,908.14	231.79	22.175	
7,250.00	6,868.74	7,031.22	7,026.06	21.69	211.20	-33.81	1,182.88	-5,545.07	5,100.19	4,867.32	232.87	21.901	
7,300.00	6,891.96	7,052.79	7,047.61	21.84	212.00	-35.12	1,182.57	-5,545.07	5,058.06	4,824.23	233.83	21.631	
7,350.00	6,911.46	7,070.88	7,065.70	21.99	212.68	-37.48	1,182.27	-5,545.07	5,013.86	4,779.21	234.66	21.367	
7,400.00	6,927.10	7,085.38	7,080.18	22.14	213.22	-41.38	1,182.00	-5,545.07	4,967.92	4,732.57	235.35	21.109	
7,450.00	6,938.75	7,096.16	7,090.96	22.29	213.63	-47.88	1,181.79	-5,545.07	4,920.58	4,684.68	235.90	20.858	
7,500.00	6,946.33	7,103.18	7,097.96	22.44	213.89	-59.18	1,181.64	-5,545.07	4,872.19	4,635.87	236.32	20.617	
7,550.00	6,949.78	7,106.36	7,101.15	22.59	214.01	-79.48	1,181.58	-5,545.07	4,823.10	4,586.51	236.59	20.386	
7,568.05	6,950.00	7,106.57	7,101.35	22.65	214.01	-89.78	1,181.57	-5,545.07	4,805.28	4,568.64	236.65	20.306	
7,600.00	6,949.92	7,106.49	7,101.27	22.74	214.01	-89.77	1,181.57	-5,545.07	4,773.71	4,536.97	236.74	20.164	
7,700.00	6,949.66	7,106.24	7,101.02	23.04	214.00	-89.75	1,181.58	-5,545.07	4,674.95	4,437.92	237.03	19.723	
7,800.00	6,949.40	7,105.99	7,100.77	23.35	213.99	-89.73	1,181.58	-5,545.07	4,576.23	4,338.91	237.32	19.283	
7,900.00	6,949.14	7,105.74	7,100.52	23.65	213.98	-89.71	1,181.59	-5,545.07	4,477.58	4,239.96	237.61	18.844	
8,000.00	6,948.88	7,105.49	7,100.27	23.95	213.97	-89.70	1,181.59	-5,545.07	4,378.98	4,141.08	237.91	18.406	
8,100.00	6,948.62	7,105.24	7,100.02	24.25	213.97	-89.68	1,181.60	-5,545.07	4,280.45	4,042.26	238.20	17.970	
8,200.00	6,948.36	7,104.99	7,099.77	24.55	213.96	-89.66	1,181.61	-5,545.07	4,181.99	3,943.51	238.49	17.535	
8,300.00	6,948.11	7,104.74	7,099.53	24.85	213.95	-89.64	1,181.61	-5,545.07	4,083.61	3,844.83	238.78	17.102	
8,400.00	6,947.85	7,104.49	7,099.28	25.15	213.94	-89.62	1,181.62	-5,545.07	3,985.30	3,746.23	239.07	16.670	
8,500.00	6,947.59	7,104.24	7,099.03	25.45	213.93	-89.60	1,181.62	-5,545.07	3,887.09	3,647.72	239.36	16.239	
8,600.00	6,947.33	7,103.99	7,098.78	25.75	213.92	-89.58	1,181.63	-5,545.07	3,788.96	3,549.31	239.65	15.810	
8,700.00	6,947.07	7,103.74	7,098.53	26.05	213.91	-89.56	1,181.63	-5,545.07	3,690.94	3,450.99	239.94	15.382	
8,800.00	6,946.81	7,103.49	7,098.28	26.35	213.90	-89.54	1,181.64	-5,545.07	3,593.02	3,352.79	240.24	14.956	
8,900.00	6,946.55	7,103.24	7,098.03	26.65	213.89	-89.52	1,181.64	-5,545.07	3,495.22	3,254.70	240.53	14.532	
9,000.00	6,946.29	7,102.99	7,097.78	26.95	213.88	-89.50	1,181.65	-5,545.07	3,397.56	3,156.74	240.82	14.108	
9,100.00	6,946.03	7,102.74	7,097.53	27.25	213.87	-89.48	1,181.65	-5,545.07	3,300.03	3,058.92	241.11	13.687	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 173-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	7,102.49	7,097.28	27.55	213.86	-89.46	1,181.66	-5,545.07	3,202.65	2,961.25	241.40	13.267	
9,300.00	6,945.52	7,102.24	7,097.03	27.85	213.85	-89.44	1,181.66	-5,545.07	3,105.44	2,863.75	241.69	12.849	
9,400.00	6,945.26	7,101.99	7,096.78	28.15	213.84	-89.42	1,181.67	-5,545.07	3,008.41	2,766.43	241.98	12.432	
9,500.00	6,945.00	7,101.74	7,096.53	28.45	213.83	-89.41	1,181.67	-5,545.07	2,911.58	2,669.31	242.27	12.018	
9,600.00	6,944.74	7,101.49	7,096.28	28.75	213.82	-89.39	1,181.68	-5,545.07	2,814.98	2,572.42	242.56	11.605	
9,700.00	6,944.48	7,101.24	7,096.03	29.05	213.82	-89.37	1,181.68	-5,545.07	2,718.62	2,475.77	242.85	11.194	
9,800.00	6,944.22	7,100.99	7,095.78	29.35	213.81	-89.35	1,181.69	-5,545.07	2,622.53	2,379.39	243.14	10.786	
9,900.00	6,943.96	7,100.74	7,095.53	29.66	213.80	-89.33	1,181.69	-5,545.07	2,526.75	2,283.32	243.43	10.380	
10,000.00	6,943.70	7,100.49	7,095.28	29.96	213.79	-89.31	1,181.70	-5,545.07	2,431.31	2,187.58	243.73	9.976	
10,100.00	6,943.45	7,100.24	7,095.04	30.26	213.78	-89.29	1,181.70	-5,545.07	2,336.24	2,092.23	244.02	9.574	
10,200.00	6,943.19	7,100.00	7,094.79	30.56	213.77	-89.27	1,181.71	-5,545.07	2,241.61	1,997.31	244.31	9.175	
10,300.00	6,942.93	7,099.75	7,094.54	30.86	213.76	-89.25	1,181.72	-5,545.07	2,147.47	1,902.87	244.60	8.780	
10,400.00	6,942.67	7,099.50	7,094.29	31.16	213.75	-89.23	1,181.72	-5,545.07	2,053.87	1,808.99	244.89	8.387	
10,500.00	6,942.41	7,099.25	7,094.04	31.46	213.74	-89.21	1,181.73	-5,545.07	1,960.91	1,715.74	245.18	7.998	
10,600.00	6,942.15	7,099.00	7,093.79	31.76	213.73	-89.19	1,181.73	-5,545.07	1,868.68	1,623.21	245.47	7.613	
10,700.00	6,941.89	7,098.75	7,093.54	32.06	213.72	-89.17	1,181.74	-5,545.07	1,777.29	1,531.53	245.76	7.232	
10,800.00	6,941.63	7,098.50	7,093.29	32.36	213.71	-89.15	1,181.74	-5,545.07	1,686.87	1,440.83	246.05	6.856	
10,900.00	6,941.37	7,098.25	7,093.04	32.66	213.70	-89.13	1,181.75	-5,545.07	1,597.60	1,351.26	246.33	6.485	
11,000.00	6,941.11	7,098.00	7,092.79	32.96	213.69	-89.12	1,181.75	-5,545.07	1,509.67	1,263.05	246.62	6.121	
11,100.00	6,940.86	7,097.75	7,092.54	33.26	213.68	-89.10	1,181.76	-5,545.07	1,423.34	1,176.43	246.91	5.765	
11,200.00	6,940.60	7,097.50	7,092.29	33.56	213.68	-89.08	1,181.76	-5,545.07	1,338.91	1,091.71	247.20	5.416	
11,300.00	6,940.34	7,097.25	7,092.05	33.86	213.67	-89.06	1,181.77	-5,545.07	1,256.77	1,009.28	247.49	5.078	
11,400.00	6,940.08	7,097.00	7,091.80	34.16	213.66	-89.04	1,181.77	-5,545.07	1,177.39	929.61	247.78	4.752	
11,500.00	6,939.82	7,096.75	7,091.55	34.46	213.65	-89.02	1,181.78	-5,545.07	1,101.38	853.31	248.06	4.440	
11,600.00	6,939.56	7,096.51	7,091.30	34.76	213.64	-89.00	1,181.78	-5,545.07	1,029.47	781.12	248.35	4.145	
11,700.00	6,939.30	7,096.26	7,091.05	35.06	213.63	-88.98	1,181.79	-5,545.07	962.60	713.97	248.64	3.872	
11,800.00	6,939.04	7,096.01	7,090.80	35.36	213.62	-88.96	1,181.79	-5,545.07	901.88	652.96	248.92	3.623	
11,900.00	6,938.78	7,095.76	7,090.55	35.66	213.61	-88.94	1,181.80	-5,545.07	848.63	599.42	249.21	3.405	
12,000.00	6,938.53	7,095.51	7,090.30	35.96	213.60	-88.92	1,181.80	-5,545.07	804.33	554.84	249.49	3.224	
12,100.00	6,938.27	7,095.26	7,090.05	36.26	213.59	-88.90	1,181.81	-5,545.07	770.54	520.76	249.78	3.085	
12,200.00	6,938.01	7,095.01	7,089.81	36.56	213.58	-88.88	1,181.81	-5,545.07	748.68	498.61	250.07	2.994	
12,300.00	6,937.75	7,094.76	7,089.56	36.86	213.57	-88.86	1,181.82	-5,545.07	739.80	489.44	250.36	2.955	
12,316.08	6,937.71	7,094.72	7,089.52	36.91	213.57	-88.86	1,181.82	-5,545.07	739.63	489.22	250.41	2.954 CC, ES, SF	
12,400.00	6,937.49	7,094.51	7,089.31	37.16	213.56	-88.85	1,181.82	-5,545.07	744.37	493.71	250.66	2.970	
12,500.00	6,937.23	7,094.26	7,089.06	37.46	213.55	-88.83	1,181.83	-5,545.07	762.15	511.19	250.95	3.037	
12,600.00	6,936.97	7,094.02	7,088.81	37.77	213.55	-88.81	1,181.83	-5,545.07	792.25	540.99	251.25	3.153	
12,700.00	6,936.71	7,093.77	7,088.56	38.07	213.54	-88.79	1,181.84	-5,545.07	833.33	581.78	251.55	3.313	
12,800.00	6,936.45	7,093.52	7,088.31	38.37	213.53	-88.77	1,181.84	-5,545.07	883.87	632.02	251.85	3.510	
12,900.00	6,936.20	7,093.27	7,088.06	38.67	213.52	-88.75	1,181.85	-5,545.07	942.34	690.19	252.15	3.737	
13,000.00	6,935.94	7,093.02	7,087.82	38.97	213.51	-88.73	1,181.85	-5,545.07	1,007.36	754.92	252.44	3.990	
13,100.00	6,935.68	7,092.77	7,087.57	39.27	213.50	-88.71	1,181.86	-5,545.07	1,077.76	825.02	252.74	4.264	
13,200.00	6,935.42	7,092.52	7,087.32	39.57	213.49	-88.69	1,181.86	-5,545.07	1,152.54	899.51	253.03	4.555	
13,300.00	6,935.16	7,092.27	7,087.07	39.87	213.48	-88.67	1,181.87	-5,545.07	1,230.91	977.58	253.33	4.859	
13,400.00	6,934.90	7,092.03	7,086.82	40.17	213.47	-88.65	1,181.87	-5,545.07	1,312.22	1,058.60	253.62	5.174	
13,500.00	6,934.64	7,091.78	7,086.57	40.47	213.46	-88.63	1,181.88	-5,545.07	1,395.96	1,142.04	253.91	5.498	
13,600.00	6,934.38	7,091.53	7,086.32	40.77	213.45	-88.61	1,181.88	-5,545.07	1,481.71	1,227.51	254.21	5.829	
13,700.00	6,934.12	7,091.28	7,086.08	41.07	213.44	-88.60	1,181.89	-5,545.07	1,569.16	1,314.66	254.50	6.166	
13,800.00	6,933.87	7,091.03	7,085.83	41.37	213.43	-88.58	1,181.89	-5,545.07	1,658.02	1,403.23	254.79	6.507	
13,900.00	6,933.61	7,090.78	7,085.58	41.67	213.42	-88.56	1,181.90	-5,545.07	1,748.09	1,493.01	255.08	6.853	
14,000.00	6,933.35	7,090.53	7,085.33	41.97	213.41	-88.54	1,181.90	-5,545.07	1,839.19	1,583.81	255.37	7.202	
14,100.00	6,933.09	7,090.28	7,085.08	42.27	213.41	-88.52	1,181.91	-5,545.07	1,931.16	1,675.49	255.67	7.553	
14,200.00	6,932.83	7,090.04	7,084.83	42.57	213.40	-88.50	1,181.91	-5,545.07	2,023.90	1,767.94	255.96	7.907	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 173-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference				Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,300.00	6,932.57	7,089.79	7,084.59	42.87	213.39	-88.48	1,181.92	-5,545.07	2,117.30	1,861.05	256.25	8.263	
14,400.00	6,932.31	7,089.54	7,084.34	43.17	213.38	-88.46	1,181.92	-5,545.07	2,211.27	1,954.73	256.54	8.620	
14,500.00	6,932.05	7,089.29	7,084.09	43.47	213.37	-88.44	1,181.93	-5,545.07	2,305.75	2,048.92	256.83	8.978	
14,600.00	6,931.79	7,089.04	7,083.84	43.77	213.36	-88.42	1,181.93	-5,545.07	2,400.68	2,143.56	257.12	9.337	
14,700.00	6,931.54	7,088.79	7,083.59	44.07	213.35	-88.40	1,181.93	-5,545.07	2,496.01	2,238.59	257.42	9.696	
14,800.00	6,931.28	7,088.55	7,083.34	44.37	213.34	-88.38	1,181.94	-5,545.07	2,591.69	2,333.98	257.71	10.057	
14,900.00	6,931.02	7,088.30	7,083.10	44.67	213.33	-88.36	1,181.94	-5,545.07	2,687.68	2,429.68	258.00	10.417	
15,000.00	6,930.76	7,088.05	7,082.85	44.97	213.32	-88.35	1,181.95	-5,545.07	2,783.96	2,525.67	258.29	10.778	
15,100.00	6,930.50	7,087.80	7,082.60	45.27	213.31	-88.33	1,181.95	-5,545.07	2,880.48	2,621.90	258.58	11.140	
15,200.00	6,930.24	7,087.55	7,082.35	45.57	213.30	-88.31	1,181.96	-5,545.07	2,977.24	2,718.37	258.87	11.501	
15,300.00	6,929.98	7,087.30	7,082.10	45.87	213.29	-88.29	1,181.96	-5,545.07	3,074.21	2,815.04	259.16	11.862	
15,400.00	6,929.72	7,087.06	7,081.86	46.17	213.28	-88.27	1,181.97	-5,545.07	3,171.36	2,911.91	259.45	12.223	
15,500.00	6,929.46	7,086.81	7,081.61	46.47	213.28	-88.25	1,181.97	-5,545.07	3,268.69	3,008.94	259.74	12.584	
15,600.00	6,929.21	7,086.56	7,081.36	46.77	213.27	-88.23	1,181.98	-5,545.07	3,366.17	3,106.13	260.03	12.945	
15,700.00	6,928.95	7,086.31	7,081.11	47.07	213.26	-88.21	1,181.98	-5,545.07	3,463.79	3,203.47	260.33	13.306	
15,800.00	6,928.69	7,086.06	7,080.86	47.37	213.25	-88.19	1,181.99	-5,545.07	3,561.55	3,300.93	260.62	13.666	
15,900.00	6,928.43	7,085.81	7,080.62	47.67	213.24	-88.17	1,181.99	-5,545.07	3,659.43	3,398.52	260.91	14.026	
16,000.00	6,928.17	7,085.57	7,080.37	47.97	213.23	-88.15	1,182.00	-5,545.07	3,757.42	3,496.22	261.20	14.385	
16,100.00	6,927.91	7,085.32	7,080.12	48.27	213.22	-88.13	1,182.00	-5,545.07	3,855.51	3,594.02	261.49	14.744	
16,200.00	6,927.65	7,085.07	7,079.87	48.57	213.21	-88.11	1,182.01	-5,545.07	3,953.70	3,691.92	261.78	15.103	
16,300.00	6,927.39	7,084.82	7,079.62	48.87	213.20	-88.10	1,182.01	-5,545.07	4,051.98	3,789.91	262.07	15.461	
16,400.00	6,927.13	7,084.57	7,079.38	49.17	213.19	-88.08	1,182.02	-5,545.07	4,150.34	3,887.98	262.36	15.819	
16,500.00	6,926.88	7,084.33	7,079.13	49.47	213.18	-88.06	1,182.02	-5,545.07	4,248.77	3,986.12	262.65	16.176	
16,600.00	6,926.62	7,084.08	7,078.88	49.77	213.17	-88.04	1,182.03	-5,545.07	4,347.28	4,084.34	262.94	16.533	
16,700.00	6,926.36	7,083.83	7,078.63	50.07	213.16	-88.02	1,182.03	-5,545.07	4,445.86	4,182.62	263.24	16.889	
16,800.00	6,926.10	7,083.58	7,078.38	50.37	213.15	-88.00	1,182.04	-5,545.07	4,544.49	4,280.97	263.53	17.245	
16,900.00	6,925.84	7,083.33	7,078.14	50.67	213.15	-87.98	1,182.04	-5,545.07	4,643.19	4,379.37	263.82	17.600	
17,000.00	6,925.58	7,083.09	7,077.89	50.97	213.14	-87.96	1,182.04	-5,545.07	4,741.94	4,477.83	264.11	17.955	
17,100.00	6,925.32	7,082.84	7,077.64	51.27	213.13	-87.94	1,182.05	-5,545.07	4,840.74	4,576.34	264.40	18.308	
17,200.00	6,925.06	7,082.59	7,077.39	51.58	213.12	-87.92	1,182.05	-5,545.07	4,939.59	4,674.90	264.69	18.662	
17,224.45	6,925.00	7,082.53	7,077.33	51.65	213.12	-87.92	1,182.05	-5,545.07	4,963.76	4,699.00	264.76	18.748	
17,224.92	6,925.00	7,082.53	7,077.33	51.65	213.12	-87.92	1,182.05	-5,545.07	4,964.23	4,699.47	264.76	18.750	

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 343-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	8.50	-8.50	0.00	0.08	-10.09	762.18	-135.70	774.17				
100.00	100.00	91.50	91.50	0.23	0.85	-10.09	762.18	-135.70	774.17	773.09	1.07	721.927	
200.00	200.00	191.50	191.50	0.53	1.77	-10.09	762.18	-135.70	774.17	771.87	2.30	337.095	
300.00	300.00	291.50	291.50	0.83	2.69	-10.09	762.18	-135.70	774.17	770.64	3.52	219.884	
400.00	400.00	391.50	391.50	1.13	4.16	-10.09	762.18	-135.70	774.17	768.88	5.28	146.529	
500.00	500.00	491.50	491.50	1.43	6.19	-10.09	762.18	-135.70	774.17	766.55	7.62	101.632	
600.00	599.98	591.48	591.48	1.73	8.22	-2.83	762.72	-135.70	772.96	763.00	9.95	77.676	
700.00	699.84	692.69	692.68	2.03	10.28	-2.86	762.63	-135.70	767.64	755.33	12.31	62.361	
800.00	799.45	793.62	793.61	2.33	12.34	-2.91	762.36	-135.70	758.68	744.01	14.66	51.741	
900.00	898.70	890.27	890.20	2.63	14.47	-2.97	762.18	-135.70	746.32	729.22	17.10	43.646	
1,000.00	997.47	989.03	988.97	2.93	16.82	-3.05	762.18	-135.70	730.70	710.96	19.74	37.010	
1,100.00	1,095.62	1,087.43	1,087.35	3.23	19.15	-3.13	763.49	-135.70	712.93	690.55	22.38	31.857	
1,200.00	1,193.06	1,187.98	1,187.90	3.53	21.54	-3.27	763.22	-135.70	690.22	665.15	25.07	27.536	
1,300.00	1,289.64	1,358.65	1,281.14	3.83	25.53	-3.44	762.18	-135.70	663.35	633.99	29.36	22.596	
1,382.94	1,369.03	1,368.97	1,368.86	4.08	25.83	-3.62	761.59	-135.70	638.85	608.94	29.91	21.359	
1,400.00	1,385.28	1,376.99	1,376.78	4.13	25.93	-3.63	762.18	-135.70	634.21	604.15	30.06	21.095	
1,500.00	1,480.57	1,472.28	1,472.07	4.43	28.05	-3.81	762.18	-135.70	603.93	571.46	32.48	18.595	
1,600.00	1,575.86	1,567.56	1,567.36	4.73	30.16	-4.01	762.18	-135.70	573.66	538.77	34.89	16.441	
1,700.00	1,671.15	1,665.56	1,665.33	5.03	32.33	-4.21	763.58	-135.70	544.78	507.41	37.36	14.580	
1,800.00	1,766.44	1,763.33	1,763.08	5.33	34.50	-4.48	762.84	-135.70	513.81	473.98	39.83	12.899	
1,900.00	1,861.72	1,860.80	1,860.53	5.63	36.66	-4.80	761.60	-135.70	482.39	440.10	42.29	11.406	
2,000.00	1,957.01	1,948.82	1,948.51	5.93	38.16	-5.09	762.18	-135.70	452.67	408.57	44.10	10.265	
2,100.00	2,052.30	2,044.10	2,043.80	6.23	39.94	-5.45	762.18	-135.70	422.45	376.27	46.18	9.149	
2,200.00	2,147.59	2,139.65	2,139.34	6.53	41.73	-5.84	763.12	-135.70	393.16	344.90	48.26	8.147	
2,300.00	2,242.88	2,235.69	2,235.38	6.83	43.52	-6.34	762.95	-135.70	362.82	312.47	50.35	7.205	
2,400.00	2,338.16	2,331.61	2,331.29	7.13	45.31	-6.94	762.57	-135.70	332.31	279.86	52.45	6.336	
2,500.00	2,433.45	2,427.40	2,427.07	7.44	47.10	-7.66	761.99	-135.70	301.63	247.10	54.53	5.531	
2,600.00	2,528.74	2,520.58	2,520.24	7.74	49.15	-8.49	762.18	-135.70	271.74	214.85	56.89	4.777	
2,700.00	2,624.03	2,615.87	2,615.53	8.04	51.18	-9.55	762.18	-135.70	241.75	182.53	59.22	4.082	
2,800.00	2,719.32	2,711.16	2,710.82	8.34	53.21	-10.90	762.18	-135.70	211.85	150.31	61.54	3.442	
2,900.00	2,814.60	2,806.44	2,806.10	8.64	55.24	-12.71	762.18	-135.70	182.10	118.22	63.87	2.851	
2,941.16	2,853.83	2,845.67	2,845.33	8.76	56.07	-13.63	762.18	-135.70	169.91	105.08	64.83	2.621	CC, ES, SF
3,000.00	2,909.89	2,809.00	2,808.59	8.94	55.29	-12.76	762.18	-135.70	178.58	122.21	56.36	3.168	
3,100.00	3,005.18	2,809.00	2,808.59	9.24	55.29	-12.76	762.18	-135.70	224.98	184.57	40.41	5.567	
3,200.00	3,100.47	2,809.00	2,808.59	9.54	55.29	-12.76	762.18	-135.70	298.90	269.93	28.96	10.320	
3,300.00	3,195.76	2,809.00	2,808.59	9.84	55.29	-12.76	762.18	-135.70	384.79	361.88	22.91	16.796	
3,400.00	3,291.04	2,809.00	2,808.59	10.14	55.29	-12.76	762.18	-135.70	476.22	455.81	20.41	23.332	
3,500.00	3,386.33	2,809.00	2,808.59	10.44	55.29	-12.76	762.18	-135.70	570.54	550.56	19.97	28.564	
3,600.00	3,481.62	2,809.00	2,808.59	10.74	55.29	-12.76	762.18	-135.70	666.51	646.01	20.50	32.517	
3,700.00	3,576.91	2,809.00	2,808.59	11.04	55.29	-12.76	762.18	-135.70	763.52	742.16	21.36	35.752	
3,800.00	3,672.20	2,809.00	2,808.59	11.34	55.29	-12.76	762.18	-135.70	861.21	838.93	22.28	38.648	
3,900.00	3,767.48	2,809.00	2,808.59	11.64	55.29	-12.76	762.18	-135.70	959.38	936.20	23.18	41.381	
4,000.00	3,862.77	2,809.00	2,808.59	11.94	55.29	-12.76	762.18	-135.70	1,057.89	1,033.86	24.03	44.027	
4,100.00	3,958.06	2,809.00	2,808.59	12.24	55.29	-12.76	762.18	-135.70	1,156.66	1,131.85	24.81	46.617	
4,200.00	4,053.35	2,809.00	2,808.59	12.54	55.29	-12.76	762.18	-135.70	1,255.62	1,230.08	25.54	49.164	
4,300.00	4,148.64	2,809.00	2,808.59	12.84	55.29	-12.76	762.18	-135.70	1,354.73	1,328.52	26.22	51.673	
4,400.00	4,243.92	2,809.00	2,808.59	13.14	55.29	-12.76	762.18	-135.70	1,453.97	1,427.12	26.85	54.147	
4,500.00	4,339.21	2,809.00	2,808.59	13.44	55.29	-12.76	762.18	-135.70	1,553.30	1,525.85	27.45	56.586	
4,600.00	4,434.50	2,809.00	2,808.59	13.74	55.29	-12.76	762.18	-135.70	1,652.72	1,624.70	28.02	58.990	
4,700.00	4,529.79	2,809.00	2,808.59	14.04	55.29	-12.76	762.18	-135.70	1,752.20	1,723.64	28.56	61.359	
4,800.00	4,625.08	2,809.00	2,808.59	14.34	55.29	-12.76	762.18	-135.70	1,851.74	1,822.66	29.07	63.694	
4,900.00	4,720.36	2,809.00	2,808.59	14.64	55.29	-12.76	762.18	-135.70	1,951.32	1,921.75	29.57	65.995	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 343-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,815.65	2,809.00	2,808.59	14.94	55.29	-12.76	762.18	-135.70	2,050.95	2,020.90	30.05	68.261	
5,100.00	4,910.94	2,809.00	2,808.59	15.24	55.29	-12.76	762.18	-135.70	2,150.60	2,120.10	30.51	70.492	
5,200.00	5,006.23	2,809.00	2,808.59	15.54	55.29	-12.76	762.18	-135.70	2,250.29	2,219.34	30.96	72.690	
5,300.00	5,101.52	2,809.00	2,808.59	15.84	55.29	-12.76	762.18	-135.70	2,350.01	2,318.62	31.39	74.854	
5,400.00	5,196.80	2,809.00	2,808.59	16.14	55.29	-12.76	762.18	-135.70	2,449.75	2,417.93	31.82	76.986	
5,500.00	5,292.09	2,809.00	2,808.59	16.44	55.29	-12.76	762.18	-135.70	2,549.51	2,517.27	32.24	79.084	
5,600.00	5,387.38	2,809.00	2,808.59	16.74	55.29	-12.76	762.18	-135.70	2,649.29	2,616.64	32.65	81.151	
5,700.00	5,482.67	2,809.00	2,808.59	17.04	55.29	-12.76	762.18	-135.70	2,749.08	2,716.03	33.05	83.186	
5,800.00	5,577.96	2,809.00	2,808.59	17.34	55.29	-12.76	762.18	-135.70	2,848.89	2,815.45	33.44	85.190	
5,900.00	5,673.24	2,809.00	2,808.59	17.64	55.29	-12.76	762.18	-135.70	2,948.71	2,914.88	33.83	87.164	
6,000.00	5,768.53	2,809.00	2,808.59	17.94	55.29	-12.76	762.18	-135.70	3,048.54	3,014.33	34.21	89.107	
6,100.00	5,863.82	2,809.00	2,808.59	18.24	55.29	-12.76	762.18	-135.70	3,148.39	3,113.80	34.59	91.022	
6,200.00	5,959.11	2,809.00	2,808.59	18.54	55.29	-12.76	762.18	-135.70	3,248.24	3,213.28	34.96	92.907	
6,300.00	6,054.40	2,809.00	2,808.59	18.84	55.29	-12.76	762.18	-135.70	3,348.10	3,312.77	35.33	94.765	
6,400.00	6,149.68	2,809.00	2,808.59	19.14	55.29	-12.76	762.18	-135.70	3,447.97	3,412.28	35.70	96.594	
6,500.00	6,244.97	2,809.00	2,808.59	19.44	55.29	-12.76	762.18	-135.70	3,547.85	3,511.79	36.06	98.397	
6,600.00	6,340.26	2,809.00	2,808.59	19.74	55.29	-12.76	762.18	-135.70	3,647.73	3,611.32	36.41	100.173	
6,689.41	6,425.45	2,809.00	2,808.59	20.01	55.29	-12.76	762.18	-135.70	3,737.04	3,700.31	36.73	101.739	
6,700.00	6,435.54	2,809.00	2,808.59	20.04	55.29	-27.75	762.18	-135.70	3,747.62	3,710.85	36.77	101.922	
6,750.00	6,482.96	2,809.00	2,808.59	20.19	55.29	-45.65	762.18	-135.70	3,797.41	3,760.46	36.95	102.776	
6,800.00	6,529.78	2,809.00	2,808.59	20.34	55.29	-42.09	762.18	-135.70	3,846.69	3,809.56	37.13	103.598	
6,850.00	6,575.63	2,809.00	2,808.59	20.49	55.29	-36.74	762.18	-135.70	3,895.10	3,857.79	37.32	104.377	
6,900.00	6,620.18	2,809.00	2,808.59	20.64	55.29	-32.05	762.18	-135.70	3,942.33	3,904.82	37.51	105.101	
6,950.00	6,663.07	2,809.00	2,808.59	20.79	55.29	-28.30	762.18	-135.70	3,988.05	3,950.34	37.71	105.758	
7,000.00	6,704.00	2,809.00	2,808.59	20.94	55.29	-25.34	762.18	-135.70	4,031.98	3,994.07	37.92	106.337	
7,050.00	6,742.63	2,809.00	2,808.59	21.09	55.29	-23.00	762.18	-135.70	4,073.85	4,035.72	38.14	106.827	
7,100.00	6,778.69	2,809.00	2,808.59	21.24	55.29	-21.16	762.18	-135.70	4,113.40	4,075.04	38.37	107.217	
7,150.00	6,811.89	2,809.00	2,808.59	21.39	55.29	-19.69	762.18	-135.70	4,150.41	4,111.80	38.61	107.497	
7,200.00	6,841.98	2,809.00	2,808.59	21.54	55.29	-18.52	762.18	-135.70	4,184.66	4,145.79	38.87	107.661	
7,250.00	6,868.74	2,809.00	2,808.59	21.69	55.29	-17.59	762.18	-135.70	4,215.97	4,176.82	39.15	107.701	
7,300.00	6,891.96	2,809.00	2,808.59	21.84	55.29	-16.85	762.18	-135.70	4,244.16	4,204.72	39.44	107.612	
7,350.00	6,911.46	2,809.00	2,808.59	21.99	55.29	-16.29	762.18	-135.70	4,269.08	4,229.33	39.75	107.393	
7,400.00	6,927.10	2,809.00	2,808.59	22.14	55.29	-15.86	762.18	-135.70	4,290.60	4,250.52	40.08	107.043	
7,450.00	6,938.75	2,809.00	2,808.59	22.29	55.29	-15.57	762.18	-135.70	4,308.61	4,268.18	40.43	106.562	
7,500.00	6,946.33	2,809.00	2,808.59	22.44	55.29	-15.40	762.18	-135.70	4,323.02	4,282.22	40.80	105.954	
7,550.00	6,949.78	2,809.00	2,808.59	22.59	55.29	-15.33	762.18	-135.70	4,333.75	4,292.56	41.19	105.222	
7,568.05	6,950.00	2,809.00	2,808.59	22.65	55.29	-15.34	762.18	-135.70	4,336.71	4,295.38	41.33	104.926	
7,600.00	6,949.92	2,809.00	2,808.59	22.74	55.29	-15.34	762.18	-135.70	4,341.63	4,300.04	41.59	104.382	
7,700.00	6,949.66	2,809.00	2,808.59	23.04	55.29	-15.34	762.18	-135.70	4,358.52	4,316.07	42.45	102.678	
7,800.00	6,949.40	2,809.00	2,808.59	23.35	55.29	-15.34	762.18	-135.70	4,377.62	4,334.27	43.35	100.985	
7,900.00	6,949.14	2,809.00	2,808.59	23.65	55.29	-15.34	762.18	-135.70	4,398.92	4,354.63	44.29	99.325	
8,000.00	6,948.88	2,809.00	2,808.59	23.95	55.29	-15.34	762.18	-135.70	4,422.37	4,377.12	45.26	97.713	
8,100.00	6,948.62	2,809.00	2,808.59	24.25	55.29	-15.34	762.18	-135.70	4,447.95	4,401.70	46.25	96.162	
8,200.00	6,948.36	2,809.00	2,808.59	24.55	55.29	-15.34	762.18	-135.70	4,475.62	4,428.35	47.27	94.681	
8,300.00	6,948.11	2,809.00	2,808.59	24.85	55.29	-15.34	762.18	-135.70	4,505.34	4,457.04	48.30	93.278	
8,400.00	6,947.85	2,809.00	2,808.59	25.15	55.29	-15.34	762.18	-135.70	4,537.07	4,487.73	49.34	91.956	
8,500.00	6,947.59	2,809.00	2,808.59	25.45	55.29	-15.34	762.18	-135.70	4,570.77	4,520.38	50.38	90.718	
8,600.00	6,947.33	2,809.00	2,808.59	25.75	55.29	-15.34	762.18	-135.70	4,606.39	4,554.96	51.43	89.564	
8,700.00	6,947.07	2,809.00	2,808.59	26.05	55.29	-15.34	762.18	-135.70	4,643.89	4,591.41	52.48	88.495	
8,800.00	6,946.81	2,809.00	2,808.59	26.35	55.29	-15.34	762.18	-135.70	4,683.23	4,629.71	53.52	87.508	
8,900.00	6,946.55	2,809.00	2,808.59	26.65	55.29	-15.34	762.18	-135.70	4,724.36	4,669.80	54.55	86.602	
9,000.00	6,946.29	2,809.00	2,808.59	26.95	55.29	-15.34	762.18	-135.70	4,767.23	4,711.65	55.58	85.775	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 343-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	2,809.00	2,808.59	27.25	55.29	-15.34	762.18	-135.70	4,811.79	4,755.20	56.59	85.022	
9,200.00	6,945.78	2,809.00	2,808.59	27.55	55.29	-15.34	762.18	-135.70	4,858.01	4,800.41	57.60	84.342	
9,300.00	6,945.52	2,809.00	2,808.59	27.85	55.29	-15.34	762.18	-135.70	4,905.83	4,847.24	58.59	83.731	
9,400.00	6,945.26	2,809.00	2,808.59	28.15	55.29	-15.34	762.18	-135.70	4,955.20	4,895.64	59.57	83.185	
9,500.00	6,945.00	2,809.00	2,808.59	28.45	55.29	-15.34	762.18	-135.70	5,006.09	4,945.56	60.53	82.702	
9,600.00	6,944.74	2,809.00	2,808.59	28.75	55.29	-15.34	762.18	-135.70	5,058.44	4,996.97	61.48	82.279	
9,700.00	6,944.48	2,809.00	2,808.59	29.05	55.29	-15.34	762.18	-135.70	5,112.22	5,049.81	62.41	81.911	
9,800.00	6,944.22	2,809.00	2,808.59	29.35	55.29	-15.34	762.18	-135.70	5,167.37	5,104.04	63.33	81.597	
9,900.00	6,943.96	2,809.00	2,808.59	29.66	55.29	-15.34	762.18	-135.70	5,223.85	5,159.62	64.23	81.332	
10,000.00	6,943.70	2,809.00	2,808.59	29.96	55.29	-15.34	762.18	-135.70	5,281.62	5,216.50	65.11	81.115	
10,100.00	6,943.45	2,809.00	2,808.59	30.26	55.29	-15.34	762.18	-135.70	5,340.64	5,274.66	65.98	80.943	
10,200.00	6,943.19	2,809.00	2,808.59	30.56	55.29	-15.34	762.18	-135.70	5,400.86	5,334.03	66.83	80.813	
10,300.00	6,942.93	2,809.00	2,808.59	30.86	55.29	-15.34	762.18	-135.70	5,462.25	5,394.58	67.67	80.723	
10,400.00	6,942.67	2,809.00	2,808.59	31.16	55.29	-15.34	762.18	-135.70	5,524.77	5,456.29	68.49	80.670	
10,500.00	6,942.41	2,809.00	2,808.59	31.46	55.29	-15.34	762.18	-135.70	5,588.38	5,519.09	69.29	80.653	
10,600.00	6,942.15	2,809.00	2,808.59	31.76	55.29	-15.34	762.18	-135.70	5,653.04	5,582.97	70.08	80.668	
10,700.00	6,941.89	2,809.00	2,808.59	32.06	55.29	-15.34	762.18	-135.70	5,718.72	5,647.87	70.85	80.715	
10,800.00	6,941.63	2,809.00	2,808.59	32.36	55.29	-15.34	762.18	-135.70	5,785.39	5,713.78	71.61	80.792	
10,900.00	6,941.37	2,809.00	2,808.59	32.66	55.29	-15.34	762.18	-135.70	5,853.00	5,780.65	72.35	80.896	
11,000.00	6,941.11	2,809.00	2,808.59	32.96	55.29	-15.34	762.18	-135.70	5,921.53	5,848.45	73.08	81.027	
11,100.00	6,940.86	2,809.00	2,808.59	33.26	55.29	-15.34	762.18	-135.70	5,990.95	5,917.15	73.80	81.182	
11,200.00	6,940.60	2,809.00	2,808.59	33.56	55.29	-15.34	762.18	-135.70	6,061.22	5,986.72	74.50	81.360	
11,300.00	6,940.34	2,809.00	2,808.59	33.86	55.29	-15.34	762.18	-135.70	6,132.31	6,057.12	75.19	81.560	
11,400.00	6,940.08	2,809.00	2,808.59	34.16	55.29	-15.34	762.18	-135.70	6,204.20	6,128.34	75.86	81.781	
11,500.00	6,939.82	2,809.00	2,808.59	34.46	55.29	-15.34	762.18	-135.70	6,276.87	6,200.34	76.53	82.021	
11,600.00	6,939.56	2,809.00	2,808.59	34.76	55.29	-15.34	762.18	-135.70	6,350.27	6,273.09	77.18	82.279	
11,700.00	6,939.30	2,809.00	2,808.59	35.06	55.29	-15.34	762.18	-135.70	6,424.39	6,346.57	77.82	82.554	
11,800.00	6,939.04	2,809.00	2,808.59	35.36	55.29	-15.34	762.18	-135.70	6,499.21	6,420.76	78.45	82.846	
11,900.00	6,938.78	2,809.00	2,808.59	35.66	55.29	-15.34	762.18	-135.70	6,574.70	6,495.63	79.07	83.152	
12,000.00	6,938.53	2,809.00	2,808.59	35.96	55.29	-15.34	762.18	-135.70	6,650.83	6,571.16	79.68	83.473	
12,100.00	6,938.27	2,809.00	2,808.59	36.26	55.29	-15.34	762.18	-135.70	6,727.59	6,647.32	80.27	83.808	
12,200.00	6,938.01	2,809.00	2,808.59	36.56	55.29	-15.34	762.18	-135.70	6,804.95	6,724.09	80.86	84.155	
12,300.00	6,937.75	2,809.00	2,808.59	36.86	55.29	-15.34	762.18	-135.70	6,882.90	6,801.46	81.44	84.514	
12,400.00	6,937.49	2,809.00	2,808.59	37.16	55.29	-15.34	762.18	-135.70	6,961.41	6,879.40	82.01	84.884	
12,500.00	6,937.23	2,809.00	2,808.59	37.46	55.29	-15.34	762.18	-135.70	7,040.46	6,957.89	82.57	85.265	
12,600.00	6,936.97	2,809.00	2,808.59	37.77	55.29	-15.34	762.18	-135.70	7,120.04	7,036.92	83.12	85.656	
12,700.00	6,936.71	2,809.00	2,808.59	38.07	55.29	-15.34	762.18	-135.70	7,200.13	7,116.46	83.67	86.055	
12,800.00	6,936.45	2,809.00	2,808.59	38.37	55.29	-15.34	762.18	-135.70	7,280.71	7,196.51	84.20	86.464	
12,900.00	6,936.20	2,809.00	2,808.59	38.67	55.29	-15.34	762.18	-135.70	7,361.77	7,277.04	84.73	86.881	
13,000.00	6,935.94	2,809.00	2,808.59	38.97	55.29	-15.34	762.18	-135.70	7,443.29	7,358.04	85.26	87.306	
13,100.00	6,935.68	2,809.00	2,808.59	39.27	55.29	-15.34	762.18	-135.70	7,525.26	7,439.49	85.77	87.738	
13,200.00	6,935.42	2,809.00	2,808.59	39.57	55.29	-15.34	762.18	-135.70	7,607.65	7,521.38	86.28	88.176	
13,300.00	6,935.16	2,809.00	2,808.59	39.87	55.29	-15.34	762.18	-135.70	7,690.47	7,603.69	86.78	88.621	
13,400.00	6,934.90	2,809.00	2,808.59	40.17	55.29	-15.34	762.18	-135.70	7,773.69	7,686.41	87.27	89.072	
13,500.00	6,934.64	2,809.00	2,808.59	40.47	55.29	-15.34	762.18	-135.70	7,857.30	7,769.53	87.76	89.528	
13,600.00	6,934.38	2,809.00	2,808.59	40.77	55.29	-15.34	762.18	-135.70	7,941.29	7,853.04	88.25	89.990	
13,700.00	6,934.12	2,809.00	2,808.59	41.07	55.29	-15.34	762.18	-135.70	8,025.64	7,936.92	88.72	90.457	
13,800.00	6,933.87	2,809.00	2,808.59	41.37	55.29	-15.34	762.18	-135.70	8,110.35	8,021.16	89.20	90.928	
13,900.00	6,933.61	2,809.00	2,808.59	41.67	55.29	-15.34	762.18	-135.70	8,195.41	8,105.75	89.66	91.403	
14,000.00	6,933.35	2,809.00	2,808.59	41.97	55.29	-15.34	762.18	-135.70	8,280.80	8,190.68	90.12	91.882	
14,100.00	6,933.09	2,809.00	2,808.59	42.27	55.29	-15.34	762.18	-135.70	8,366.51	8,275.93	90.58	92.365	
14,200.00	6,932.83	2,809.00	2,808.59	42.57	55.29	-15.34	762.18	-135.70	8,452.54	8,361.51	91.03	92.851	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - (Offset) RU 207A - OH - OH - inc only												Offset Site Error:	0.00 usft
Survey Program: 343-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	6,932.57	2,809.00	2,808.59	42.87	55.29	-15.34	762.18	-135.70	8,538.87	8,447.39	91.48	93.341	
14,400.00	6,932.31	2,809.00	2,808.59	43.17	55.29	-15.34	762.18	-135.70	8,625.50	8,533.58	91.92	93.833	
14,500.00	6,932.05	2,809.00	2,808.59	43.47	55.29	-15.34	762.18	-135.70	8,712.41	8,620.05	92.36	94.328	
14,600.00	6,931.79	2,809.00	2,808.59	43.77	55.29	-15.34	762.18	-135.70	8,799.61	8,706.81	92.80	94.826	
14,700.00	6,931.54	2,809.00	2,808.59	44.07	55.29	-15.34	762.18	-135.70	8,887.07	8,793.84	93.23	95.325	
14,800.00	6,931.28	2,809.00	2,808.59	44.37	55.29	-15.34	762.18	-135.70	8,974.79	8,881.14	93.66	95.827	
14,900.00	6,931.02	2,809.00	2,808.59	44.67	55.29	-15.34	762.18	-135.70	9,062.77	8,968.69	94.08	96.331	
15,000.00	6,930.76	2,809.00	2,808.59	44.97	55.29	-15.34	762.18	-135.70	9,150.99	9,056.49	94.50	96.836	
15,100.00	6,930.50	2,809.00	2,808.59	45.27	55.29	-15.34	762.18	-135.70	9,239.46	9,144.54	94.92	97.343	
15,200.00	6,930.24	2,809.00	2,808.59	45.57	55.29	-15.34	762.18	-135.70	9,328.16	9,232.83	95.33	97.851	
15,300.00	6,929.98	2,809.00	2,808.59	45.87	55.29	-15.34	762.18	-135.70	9,417.08	9,321.34	95.74	98.361	
15,400.00	6,929.72	2,809.00	2,808.59	46.17	55.29	-15.34	762.18	-135.70	9,506.22	9,410.08	96.15	98.871	
15,500.00	6,929.46	2,809.00	2,808.59	46.47	55.29	-15.34	762.18	-135.70	9,595.58	9,499.03	96.55	99.383	
15,600.00	6,929.21	2,809.00	2,808.59	46.77	55.29	-15.34	762.18	-135.70	9,685.15	9,588.20	96.95	99.895	
15,700.00	6,928.95	2,809.00	2,808.59	47.07	55.29	-15.34	762.18	-135.70	9,774.92	9,677.57	97.35	100.408	
15,800.00	6,928.69	2,809.00	2,808.59	47.37	55.29	-15.34	762.18	-135.70	9,864.88	9,767.14	97.75	100.922	
15,900.00	6,928.43	2,809.00	2,808.59	47.67	55.29	-15.34	762.18	-135.70	9,955.04	9,856.90	98.14	101.436	
16,000.00	6,928.17	2,809.00	2,808.59	47.97	55.29	-15.34	762.18	-135.70	10,045.38	9,946.85	98.53	101.950	
16,100.00	6,927.91	2,809.00	2,808.59	48.27	55.29	-15.34	762.18	-135.70	10,135.91	10,036.99	98.92	102.465	
16,200.00	6,927.65	2,809.00	2,808.59	48.57	55.29	-15.34	762.18	-135.70	10,226.61	10,127.30	99.31	102.980	
16,300.00	6,927.39	2,809.00	2,808.59	48.87	55.29	-15.34	762.18	-135.70	10,317.48	10,217.79	99.69	103.495	
16,400.00	6,927.13	2,809.00	2,808.59	49.17	55.29	-15.34	762.18	-135.70	10,408.52	10,308.45	100.07	104.009	
16,500.00	6,926.88	2,809.00	2,808.59	49.47	55.29	-15.34	762.18	-135.70	10,499.73	10,399.27	100.45	104.524	
16,600.00	6,926.62	2,809.00	2,808.59	49.77	55.29	-15.34	762.18	-135.70	10,591.09	10,490.26	100.83	105.039	
16,700.00	6,926.36	2,809.00	2,808.59	50.07	55.29	-15.34	762.18	-135.70	10,682.61	10,581.40	101.21	105.553	
16,800.00	6,926.10	2,809.00	2,808.59	50.37	55.29	-15.34	762.18	-135.70	10,774.27	10,672.69	101.58	106.067	
16,900.00	6,925.84	2,809.00	2,808.59	50.67	55.29	-15.34	762.18	-135.70	10,866.09	10,764.14	101.95	106.581	
17,000.00	6,925.58	2,809.00	2,808.59	50.97	55.29	-15.34	762.18	-135.70	10,958.05	10,855.72	102.32	107.094	
17,100.00	6,925.32	2,809.00	2,808.59	51.27	55.29	-15.34	762.18	-135.70	11,050.14	10,947.45	102.69	107.607	
17,200.00	6,925.06	2,809.00	2,808.59	51.58	55.29	-15.34	762.18	-135.70	11,142.38	11,039.32	103.06	108.119	
17,224.45	6,925.00	2,809.00	2,808.59	51.65	55.29	-15.34	762.18	-135.70	11,164.95	11,061.80	103.15	108.244	
17,224.92	6,925.00	2,809.00	2,808.59	51.65	55.29	-15.34	762.18	-135.70	11,165.39	11,062.24	103.15	108.246	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	165.00	-14.20	3.81	14.70				
100.00	100.00	100.00	100.00	0.23	0.23	165.00	-14.20	3.81	14.70	14.25	0.45	32.454	
200.00	200.00	200.00	200.00	0.53	0.53	165.00	-14.20	3.81	14.70	13.65	1.05	13.962	
300.00	300.00	300.00	300.00	0.83	0.83	165.00	-14.20	3.81	14.70	13.05	1.65	8.894	
400.00	400.00	400.00	400.00	1.13	1.13	165.00	-14.20	3.81	14.70	12.45	2.25	6.525	
500.00	500.00	500.00	500.00	1.43	1.43	165.00	-14.20	3.81	14.70	11.85	2.85	5.153	
600.00	599.98	600.51	600.49	1.73	1.73	173.59	-12.53	3.25	14.68	11.23	3.45	4.251	
665.47	665.38	666.32	666.22	1.92	1.93	175.92	-9.62	2.28	14.67	10.82	3.85	3.813	CC
700.00	699.84	701.02	700.85	2.03	2.03	177.60	-7.51	1.58	14.68	10.62	4.05	3.620	
800.00	799.45	801.51	800.95	2.33	2.33	-175.78	0.84	-1.21	14.83	10.17	4.66	3.185	ES
900.00	898.70	901.55	900.39	2.63	2.63	-168.73	11.28	-4.69	16.50	11.25	5.26	3.141	SF
1,000.00	997.47	1,001.41	999.63	2.93	2.93	-165.67	21.74	-8.18	21.71	15.85	5.86	3.707	
1,100.00	1,095.62	1,101.03	1,098.65	3.23	3.23	-165.61	32.18	-11.65	30.31	23.85	6.45	4.696	
1,200.00	1,193.06	1,200.30	1,197.31	3.53	3.53	-166.72	42.58	-15.12	42.28	35.23	7.05	5.995	
1,300.00	1,289.64	1,300.90	1,295.51	3.83	3.83	-168.08	52.93	-18.57	57.64	49.98	7.65	7.530	
1,382.94	1,369.03	1,380.60	1,376.51	4.08	4.07	-169.14	61.47	-21.42	72.95	64.81	8.14	8.959	
1,400.00	1,385.28	1,402.68	1,393.13	4.13	4.14	-169.35	63.22	-22.00	76.35	68.09	8.26	9.242	
1,500.00	1,480.57	1,504.69	1,490.52	4.43	4.44	-170.28	73.48	-25.42	96.24	87.37	8.87	10.854	
1,600.00	1,575.86	1,606.69	1,587.91	4.73	4.75	-170.89	83.75	-28.85	116.15	106.68	9.47	12.260	
1,700.00	1,671.15	1,708.70	1,685.30	5.03	5.05	-171.32	94.02	-32.27	136.07	125.99	10.08	13.499	
1,800.00	1,766.44	1,789.29	1,782.70	5.33	5.30	-171.64	104.28	-35.69	155.99	145.37	10.62	14.685	
1,900.00	1,861.72	1,887.28	1,880.09	5.63	5.59	-171.89	114.55	-39.11	175.92	164.71	11.22	15.684	
2,000.00	1,957.01	1,985.27	1,977.48	5.93	5.88	-172.09	124.82	-42.54	195.85	184.04	11.81	16.582	
2,100.00	2,052.30	2,083.26	2,074.87	6.23	6.18	-172.25	135.08	-45.96	215.79	203.38	12.41	17.394	
2,200.00	2,147.59	2,181.26	2,172.26	6.53	6.47	-172.39	145.35	-49.38	235.72	222.72	13.00	18.133	
2,300.00	2,242.88	2,279.25	2,269.66	6.83	6.77	-172.50	155.61	-52.80	255.66	242.06	13.59	18.807	
2,400.00	2,338.16	2,377.24	2,367.05	7.13	7.06	-172.60	165.88	-56.22	275.59	261.40	14.19	19.424	
2,500.00	2,433.45	2,475.23	2,464.44	7.44	7.35	-172.68	176.15	-59.65	295.53	280.75	14.78	19.992	
2,600.00	2,528.74	2,573.22	2,561.83	7.74	7.65	-172.75	186.41	-63.07	315.46	300.09	15.38	20.516	
2,700.00	2,624.03	2,671.21	2,659.23	8.04	7.94	-172.82	196.68	-66.49	335.40	319.43	15.97	21.001	
2,800.00	2,719.32	2,769.20	2,756.62	8.34	8.24	-172.88	206.95	-69.91	355.34	338.78	16.56	21.452	
2,900.00	2,814.60	2,867.20	2,854.01	8.64	8.53	-172.93	217.21	-73.34	375.28	358.12	17.16	21.871	
3,000.00	2,909.89	2,965.19	2,951.40	8.94	8.82	-172.97	227.48	-76.76	395.22	377.46	17.75	22.262	
3,100.00	3,005.18	3,063.18	3,048.79	9.24	9.12	-173.01	237.74	-80.18	415.16	396.81	18.35	22.628	
3,200.00	3,100.47	3,161.17	3,146.19	9.54	9.41	-173.05	248.01	-83.60	435.10	416.15	18.94	22.971	
3,300.00	3,195.76	3,259.16	3,243.58	9.84	9.71	-173.09	258.28	-87.02	455.03	435.50	19.54	23.293	
3,400.00	3,291.04	3,357.15	3,340.97	10.14	10.00	-173.12	268.54	-90.45	474.97	454.84	20.13	23.596	
3,500.00	3,386.33	3,455.15	3,438.36	10.44	10.29	-173.15	278.81	-93.87	494.91	474.19	20.72	23.882	
3,600.00	3,481.62	3,553.14	3,535.76	10.74	10.59	-173.17	289.07	-97.29	514.85	493.53	21.32	24.151	
3,700.00	3,576.91	3,651.13	3,633.15	11.04	10.88	-173.20	299.34	-100.71	534.79	512.88	21.91	24.407	
3,800.00	3,672.20	3,749.12	3,730.54	11.34	11.18	-173.22	309.61	-104.13	554.73	532.23	22.51	24.648	
3,900.00	3,767.48	3,847.11	3,827.93	11.64	11.47	-173.24	319.87	-107.56	574.67	551.57	23.10	24.878	
4,000.00	3,862.77	3,945.10	3,925.33	11.94	11.76	-173.26	330.14	-110.98	594.61	570.92	23.69	25.095	
4,100.00	3,958.06	4,043.10	4,022.72	12.24	12.06	-173.28	340.41	-114.40	614.55	590.26	24.29	25.303	
4,200.00	4,053.35	4,141.09	4,120.11	12.54	12.35	-173.30	350.67	-117.82	634.49	609.61	24.88	25.500	
4,300.00	4,148.64	4,239.08	4,217.50	12.84	12.65	-173.32	360.94	-121.25	654.43	628.96	25.48	25.688	
4,400.00	4,243.92	4,337.07	4,314.89	13.14	12.94	-173.33	371.20	-124.67	674.37	648.30	26.07	25.868	
4,500.00	4,339.21	4,435.06	4,412.29	13.44	13.23	-173.35	381.47	-128.09	694.31	667.65	26.66	26.039	
4,600.00	4,434.50	4,533.05	4,509.68	13.74	13.53	-173.36	391.74	-131.51	714.25	686.99	27.26	26.203	
4,700.00	4,529.79	4,631.05	4,607.07	14.04	13.82	-173.37	402.00	-134.93	734.19	706.34	27.85	26.360	
4,800.00	4,625.08	4,729.04	4,704.46	14.34	14.12	-173.39	412.27	-138.36	754.13	725.69	28.45	26.511	
4,900.00	4,720.36	4,827.03	4,801.86	14.64	14.41	-173.40	422.53	-141.78	774.07	745.03	29.04	26.655	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,815.65	4,925.02	4,899.25	14.94	14.70	-173.41	432.80	-145.20	794.01	764.38	29.63	26.794	
5,100.00	4,910.94	5,023.01	4,996.64	15.24	15.00	-173.42	443.07	-148.62	813.95	783.72	30.23	26.927	
5,200.00	5,006.23	5,121.00	5,094.03	15.54	15.29	-173.43	453.33	-152.05	833.89	803.07	30.82	27.055	
5,300.00	5,101.52	5,219.00	5,191.42	15.84	15.59	-173.44	463.60	-155.47	853.83	822.42	31.42	27.178	
5,400.00	5,196.80	5,316.99	5,288.82	16.14	15.88	-173.45	473.87	-158.89	873.77	841.76	32.01	27.297	
5,500.00	5,292.09	5,414.98	5,386.21	16.44	16.17	-173.46	484.13	-162.31	893.71	861.11	32.60	27.411	
5,600.00	5,387.38	5,512.97	5,483.60	16.74	16.47	-173.46	494.40	-165.73	913.65	880.46	33.20	27.521	
5,700.00	5,482.67	5,610.96	5,580.99	17.04	16.76	-173.47	504.66	-169.16	933.60	899.80	33.79	27.627	
5,800.00	5,577.96	5,708.95	5,678.39	17.34	17.05	-173.48	514.93	-172.58	953.54	919.15	34.39	27.730	
5,900.00	5,673.24	5,806.95	5,775.78	17.64	17.35	-173.49	525.20	-176.00	973.48	938.50	34.98	27.829	
6,000.00	5,768.53	5,904.94	5,873.17	17.94	17.64	-173.49	535.46	-179.42	993.42	957.84	35.57	27.925	
6,100.00	5,863.82	6,002.93	5,970.56	18.24	17.94	-173.50	545.73	-182.85	1,013.36	977.19	36.17	28.018	
6,200.00	5,959.11	6,100.92	6,067.96	18.54	18.23	-173.51	555.99	-186.27	1,033.30	996.54	36.76	28.107	
6,300.00	6,054.40	6,198.91	6,165.35	18.84	18.52	-173.51	566.26	-189.69	1,053.24	1,015.88	37.36	28.194	
6,400.00	6,149.68	6,303.10	6,262.74	19.14	18.84	-173.52	576.53	-193.11	1,073.18	1,035.21	37.97	28.264	
6,500.00	6,244.97	6,394.90	6,360.13	19.44	19.11	-173.53	586.79	-196.53	1,093.12	1,054.57	38.54	28.360	
6,600.00	6,340.26	6,495.03	6,459.44	19.74	19.41	-173.37	597.28	-203.13	1,113.00	1,073.86	39.14	28.433	
6,689.41	6,425.45	6,583.22	6,545.01	20.01	19.68	-172.56	606.37	-222.01	1,130.66	1,090.98	39.68	28.496	
6,700.00	6,435.54	6,593.32	6,554.60	20.04	19.71	-168.94	607.40	-225.01	1,132.77	1,093.03	39.74	28.504	
6,750.00	6,482.96	6,640.46	6,598.60	20.19	19.85	-153.11	612.11	-241.24	1,142.73	1,102.70	40.03	28.546	
6,800.00	6,529.78	6,686.77	6,640.37	20.34	19.99	-140.06	616.60	-260.68	1,152.69	1,112.37	40.32	28.588	
6,850.00	6,575.63	6,732.31	6,679.80	20.49	20.13	-129.80	620.86	-283.04	1,162.56	1,121.95	40.61	28.629	
6,900.00	6,620.18	6,777.19	6,716.81	20.64	20.26	-121.79	624.87	-308.09	1,172.24	1,131.35	40.89	28.667	
6,950.00	6,663.07	6,821.46	6,751.29	20.79	20.40	-115.48	628.64	-335.58	1,181.65	1,140.48	41.18	28.698	
7,000.00	6,704.00	6,865.19	6,783.18	20.94	20.53	-110.41	632.14	-365.28	1,190.71	1,149.25	41.46	28.722	
7,050.00	6,742.63	6,908.45	6,812.42	21.09	20.66	-106.27	635.37	-396.99	1,199.32	1,157.59	41.74	28.736	
7,100.00	6,778.69	6,951.29	6,838.95	21.24	20.79	-102.86	638.33	-430.48	1,207.43	1,165.41	42.02	28.738	
7,150.00	6,811.89	6,993.76	6,862.72	21.39	20.91	-100.02	641.00	-465.56	1,214.94	1,172.65	42.29	28.727	
7,200.00	6,841.98	7,035.89	6,883.68	21.54	21.04	-97.64	643.39	-502.02	1,221.81	1,179.24	42.57	28.702	
7,250.00	6,868.74	7,077.74	6,901.81	21.69	21.17	-95.66	645.48	-539.67	1,227.97	1,185.12	42.84	28.661	
7,300.00	6,891.96	7,119.33	6,917.07	21.84	21.29	-94.02	647.27	-578.31	1,233.36	1,190.24	43.12	28.604	
7,350.00	6,911.46	7,160.70	6,929.44	21.99	21.42	-92.69	648.77	-617.74	1,237.94	1,194.55	43.39	28.529	
7,400.00	6,927.10	7,201.87	6,938.91	22.14	21.54	-91.64	649.96	-657.78	1,241.67	1,198.00	43.67	28.436	
7,450.00	6,938.75	7,242.87	6,945.48	22.29	21.66	-90.86	650.85	-698.24	1,244.52	1,200.58	43.94	28.324	
7,500.00	6,946.33	7,283.73	6,949.15	22.44	21.79	-90.32	651.44	-738.92	1,246.45	1,202.24	44.21	28.193	
7,550.00	6,949.78	7,326.26	6,949.97	22.59	21.92	-90.02	651.73	-781.43	1,247.46	1,202.97	44.49	28.040	
7,568.05	6,950.00	7,344.30	6,949.93	22.65	21.97	-90.00	651.81	-799.47	1,247.55	1,202.95	44.60	27.974	
7,600.00	6,949.92	7,376.26	6,949.84	22.74	22.07	-90.00	651.96	-831.43	1,247.55	1,202.76	44.79	27.854	
7,700.00	6,949.66	7,476.26	6,949.57	23.04	22.37	-90.00	652.42	-931.43	1,247.55	1,202.16	45.39	27.486	
7,800.00	6,949.40	7,576.26	6,949.31	23.35	22.67	-90.00	652.88	-1,031.42	1,247.55	1,201.56	45.99	27.128	
7,900.00	6,949.14	7,676.26	6,949.04	23.65	22.97	-90.00	653.35	-1,131.42	1,247.55	1,200.96	46.59	26.778	
8,000.00	6,948.88	7,776.26	6,948.78	23.95	23.27	-90.00	653.81	-1,231.42	1,247.55	1,200.36	47.19	26.438	
8,100.00	6,948.62	7,876.26	6,948.51	24.25	23.57	-89.99	654.27	-1,331.42	1,247.55	1,199.76	47.79	26.106	
8,200.00	6,948.36	7,976.26	6,948.24	24.55	23.87	-89.99	654.73	-1,431.42	1,247.55	1,199.16	48.39	25.782	
8,300.00	6,948.11	8,076.26	6,947.98	24.85	24.17	-89.99	655.19	-1,531.42	1,247.55	1,198.56	48.99	25.467	
8,400.00	6,947.85	8,176.26	6,947.71	25.15	24.47	-89.99	655.65	-1,631.42	1,247.55	1,197.96	49.59	25.159	
8,500.00	6,947.59	8,276.26	6,947.44	25.45	24.77	-89.99	656.12	-1,731.41	1,247.55	1,197.36	50.19	24.858	
8,600.00	6,947.33	8,376.26	6,947.18	25.75	25.07	-89.99	656.58	-1,831.41	1,247.55	1,196.76	50.79	24.564	
8,700.00	6,947.07	8,476.26	6,946.91	26.05	25.37	-89.99	657.04	-1,931.41	1,247.55	1,196.16	51.39	24.277	
8,800.00	6,946.81	8,576.26	6,946.64	26.35	25.67	-89.99	657.50	-2,031.41	1,247.55	1,195.56	51.99	23.997	
8,900.00	6,946.55	8,676.26	6,946.38	26.65	25.97	-89.99	657.96	-2,131.41	1,247.55	1,194.97	52.59	23.724	
9,000.00	6,946.29	8,776.26	6,946.11	26.95	26.28	-89.99	658.42	-2,231.41	1,247.55	1,194.37	53.19	23.456	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,100.00	6,946.03	8,876.26	6,945.85	27.25	26.58	-89.99	658.89	-2,331.41	1,247.55	1,193.77	53.79	23.194	
9,200.00	6,945.78	8,976.26	6,945.58	27.55	26.88	-89.99	659.35	-2,431.40	1,247.55	1,193.17	54.39	22.939	
9,300.00	6,945.52	9,076.26	6,945.31	27.85	27.18	-89.99	659.81	-2,531.40	1,247.55	1,192.57	54.99	22.688	
9,400.00	6,945.26	9,176.26	6,945.05	28.15	27.48	-89.99	660.27	-2,631.40	1,247.56	1,191.97	55.59	22.443	
9,500.00	6,945.00	9,276.26	6,944.78	28.45	27.78	-89.99	660.73	-2,731.40	1,247.56	1,191.37	56.19	22.204	
9,600.00	6,944.74	9,376.26	6,944.51	28.75	28.08	-89.99	661.19	-2,831.40	1,247.56	1,190.77	56.79	21.969	
9,700.00	6,944.48	9,476.26	6,944.25	29.05	28.38	-89.99	661.66	-2,931.40	1,247.56	1,190.17	57.39	21.740	
9,800.00	6,944.22	9,576.26	6,943.98	29.35	28.68	-89.99	662.12	-3,031.40	1,247.56	1,189.57	57.99	21.515	
9,900.00	6,943.96	9,676.26	6,943.71	29.66	28.98	-89.99	662.58	-3,131.40	1,247.56	1,188.97	58.59	21.294	
10,000.00	6,943.70	9,776.26	6,943.45	29.96	29.28	-89.99	663.04	-3,231.39	1,247.56	1,188.37	59.19	21.078	
10,100.00	6,943.45	9,876.26	6,943.18	30.26	29.58	-89.99	663.50	-3,331.39	1,247.56	1,187.77	59.79	20.867	
10,200.00	6,943.19	9,976.26	6,942.92	30.56	29.88	-89.99	663.96	-3,431.39	1,247.56	1,187.17	60.39	20.660	
10,300.00	6,942.93	10,076.26	6,942.65	30.86	30.18	-89.99	664.43	-3,531.39	1,247.56	1,186.57	60.99	20.456	
10,400.00	6,942.67	10,176.26	6,942.38	31.16	30.48	-89.99	664.89	-3,631.39	1,247.56	1,185.97	61.59	20.257	
10,500.00	6,942.41	10,276.26	6,942.12	31.46	30.78	-89.99	665.35	-3,731.39	1,247.56	1,185.37	62.19	20.062	
10,600.00	6,942.15	10,376.26	6,941.85	31.76	31.08	-89.99	665.81	-3,831.39	1,247.56	1,184.78	62.79	19.870	
10,700.00	6,941.89	10,476.26	6,941.58	32.06	31.38	-89.99	666.27	-3,931.38	1,247.56	1,184.18	63.39	19.682	
10,800.00	6,941.63	10,576.26	6,941.32	32.36	31.68	-89.99	666.73	-4,031.38	1,247.56	1,183.58	63.99	19.497	
10,900.00	6,941.37	10,676.26	6,941.05	32.66	31.98	-89.99	667.19	-4,131.38	1,247.56	1,182.98	64.59	19.316	
11,000.00	6,941.11	10,776.26	6,940.78	32.96	32.29	-89.98	667.66	-4,231.38	1,247.56	1,182.38	65.19	19.139	
11,100.00	6,940.86	10,876.26	6,940.52	33.26	32.59	-89.98	668.12	-4,331.38	1,247.56	1,181.78	65.79	18.964	
11,200.00	6,940.60	10,976.26	6,940.25	33.56	32.89	-89.98	668.58	-4,431.38	1,247.56	1,181.18	66.39	18.793	
11,300.00	6,940.34	11,076.26	6,939.99	33.86	33.19	-89.98	669.04	-4,531.38	1,247.57	1,180.58	66.99	18.624	
11,400.00	6,940.08	11,176.26	6,939.72	34.16	33.49	-89.98	669.50	-4,631.37	1,247.57	1,179.98	67.59	18.459	
11,500.00	6,939.82	11,276.26	6,939.45	34.46	33.79	-89.98	669.96	-4,731.37	1,247.57	1,179.38	68.19	18.297	
11,600.00	6,939.56	11,376.26	6,939.19	34.76	34.09	-89.98	670.43	-4,831.37	1,247.57	1,178.78	68.79	18.137	
11,700.00	6,939.30	11,476.26	6,938.92	35.06	34.39	-89.98	670.89	-4,931.37	1,247.57	1,178.18	69.39	17.980	
11,800.00	6,939.04	11,576.26	6,938.65	35.36	34.69	-89.98	671.35	-5,031.37	1,247.57	1,177.58	69.99	17.826	
11,900.00	6,938.78	11,676.26	6,938.39	35.66	34.99	-89.98	671.81	-5,131.37	1,247.57	1,176.98	70.59	17.675	
12,000.00	6,938.53	11,776.26	6,938.12	35.96	35.29	-89.98	672.27	-5,231.37	1,247.57	1,176.38	71.19	17.526	
12,100.00	6,938.27	11,876.26	6,937.85	36.26	35.59	-89.98	672.73	-5,331.36	1,247.57	1,175.78	71.79	17.379	
12,200.00	6,938.01	11,976.26	6,937.59	36.56	35.89	-89.98	673.20	-5,431.36	1,247.57	1,175.18	72.39	17.235	
12,300.00	6,937.75	12,076.26	6,937.32	36.86	36.19	-89.98	673.66	-5,531.36	1,247.57	1,174.59	72.99	17.093	
12,400.00	6,937.49	12,176.26	6,937.05	37.16	36.49	-89.98	674.12	-5,631.36	1,247.57	1,173.99	73.59	16.954	
12,500.00	6,937.23	12,276.26	6,936.79	37.46	36.79	-89.98	674.58	-5,731.36	1,247.57	1,173.39	74.19	16.817	
12,600.00	6,936.97	12,376.26	6,936.52	37.77	37.09	-89.98	675.04	-5,831.36	1,247.57	1,172.79	74.79	16.682	
12,700.00	6,936.71	12,476.26	6,936.26	38.07	37.39	-89.98	675.50	-5,931.36	1,247.57	1,172.19	75.39	16.549	
12,800.00	6,936.45	12,576.26	6,935.99	38.37	37.69	-89.98	675.97	-6,031.35	1,247.57	1,171.59	75.99	16.419	
12,900.00	6,936.20	12,676.26	6,935.72	38.67	37.99	-89.98	676.43	-6,131.35	1,247.57	1,170.99	76.59	16.290	
13,000.00	6,935.94	12,776.26	6,935.46	38.97	38.29	-89.98	676.89	-6,231.35	1,247.57	1,170.39	77.19	16.163	
13,100.00	6,935.68	12,876.26	6,935.19	39.27	38.59	-89.98	677.35	-6,331.35	1,247.58	1,169.79	77.79	16.039	
13,200.00	6,935.42	12,976.26	6,934.92	39.57	38.89	-89.98	677.81	-6,431.35	1,247.58	1,169.19	78.39	15.916	
13,300.00	6,935.16	13,076.26	6,934.66	39.87	39.19	-89.98	678.27	-6,531.35	1,247.58	1,168.59	78.99	15.795	
13,400.00	6,934.90	13,176.26	6,934.39	40.17	39.49	-89.98	678.73	-6,631.35	1,247.58	1,167.99	79.59	15.676	
13,500.00	6,934.64	13,276.26	6,934.12	40.47	39.79	-89.98	679.20	-6,731.34	1,247.58	1,167.39	80.19	15.559	
13,600.00	6,934.38	13,376.26	6,933.86	40.77	40.09	-89.98	679.66	-6,831.34	1,247.58	1,166.79	80.79	15.443	
13,700.00	6,934.12	13,476.26	6,933.59	41.07	40.39	-89.98	680.12	-6,931.34	1,247.58	1,166.19	81.39	15.329	
13,800.00	6,933.87	13,576.26	6,933.33	41.37	40.69	-89.98	680.58	-7,031.34	1,247.58	1,165.59	81.99	15.217	
13,900.00	6,933.61	13,676.26	6,933.06	41.67	40.99	-89.97	681.04	-7,131.34	1,247.58	1,164.99	82.59	15.107	
14,000.00	6,933.35	13,776.26	6,932.79	41.97	41.30	-89.97	681.50	-7,231.34	1,247.58	1,164.39	83.19	14.998	
14,100.00	6,933.09	13,876.26	6,932.53	42.27	41.60	-89.97	681.97	-7,331.34	1,247.58	1,163.80	83.79	14.890	
14,200.00	6,932.83	13,976.26	6,932.26	42.57	41.90	-89.97	682.43	-7,431.33	1,247.58	1,163.20	84.39	14.784	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #712H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,300.00	6,932.57	14,076.26	6,931.99	42.87	42.20	-89.97	682.89	-7,531.33	1,247.58	1,162.60	84.99	14.680		
14,400.00	6,932.31	14,176.26	6,931.73	43.17	42.50	-89.97	683.35	-7,631.33	1,247.58	1,162.00	85.59	14.577		
14,500.00	6,932.05	14,276.26	6,931.46	43.47	42.80	-89.97	683.81	-7,731.33	1,247.58	1,161.40	86.18	14.476		
14,600.00	6,931.79	14,376.26	6,931.19	43.77	43.10	-89.97	684.27	-7,831.33	1,247.58	1,160.80	86.78	14.376		
14,700.00	6,931.54	14,476.26	6,930.93	44.07	43.40	-89.97	684.74	-7,931.33	1,247.58	1,160.20	87.38	14.277		
14,800.00	6,931.28	14,576.26	6,930.66	44.37	43.70	-89.97	685.20	-8,031.33	1,247.58	1,159.60	87.98	14.180		
14,900.00	6,931.02	14,676.26	6,930.40	44.67	44.00	-89.97	685.66	-8,131.32	1,247.58	1,159.00	88.58	14.083		
15,000.00	6,930.76	14,776.26	6,930.13	44.97	44.30	-89.97	686.12	-8,231.32	1,247.59	1,158.40	89.18	13.989		
15,100.00	6,930.50	14,876.26	6,929.86	45.27	44.60	-89.97	686.58	-8,331.32	1,247.59	1,157.80	89.78	13.895		
15,200.00	6,930.24	14,976.26	6,929.60	45.57	44.90	-89.97	687.04	-8,431.32	1,247.59	1,157.20	90.38	13.803		
15,300.00	6,929.98	15,076.26	6,929.33	45.87	45.20	-89.97	687.51	-8,531.32	1,247.59	1,156.60	90.98	13.712		
15,400.00	6,929.72	15,176.26	6,929.06	46.17	45.50	-89.97	687.97	-8,631.32	1,247.59	1,156.00	91.58	13.622		
15,500.00	6,929.46	15,276.26	6,928.80	46.47	45.80	-89.97	688.43	-8,731.32	1,247.59	1,155.40	92.18	13.534		
15,600.00	6,929.21	15,376.26	6,928.53	46.77	46.10	-89.97	688.89	-8,831.31	1,247.59	1,154.80	92.78	13.446		
15,700.00	6,928.95	15,476.26	6,928.26	47.07	46.40	-89.97	689.35	-8,931.31	1,247.59	1,154.20	93.38	13.360		
15,800.00	6,928.69	15,576.26	6,928.00	47.37	46.70	-89.97	689.81	-9,031.31	1,247.59	1,153.61	93.98	13.274		
15,900.00	6,928.43	15,676.26	6,927.73	47.67	47.00	-89.97	690.27	-9,131.31	1,247.59	1,153.01	94.58	13.190		
16,000.00	6,928.17	15,776.26	6,927.47	47.97	47.30	-89.97	690.74	-9,231.31	1,247.59	1,152.41	95.18	13.107		
16,100.00	6,927.91	15,876.26	6,927.20	48.27	47.60	-89.97	691.20	-9,331.31	1,247.59	1,151.81	95.78	13.025		
16,200.00	6,927.65	15,976.26	6,926.93	48.57	47.90	-89.97	691.66	-9,431.31	1,247.59	1,151.21	96.38	12.944		
16,300.00	6,927.39	16,076.26	6,926.67	48.87	48.20	-89.97	692.12	-9,531.30	1,247.59	1,150.61	96.98	12.864		
16,400.00	6,927.13	16,176.26	6,926.40	49.17	48.50	-89.97	692.58	-9,631.30	1,247.59	1,150.01	97.58	12.785		
16,500.00	6,926.88	16,276.26	6,926.13	49.47	48.80	-89.97	693.04	-9,731.30	1,247.59	1,149.41	98.18	12.707		
16,600.00	6,926.62	16,376.26	6,925.87	49.77	49.10	-89.97	693.51	-9,831.30	1,247.59	1,148.81	98.78	12.629		
16,700.00	6,926.36	16,476.26	6,925.60	50.07	49.40	-89.97	693.97	-9,931.30	1,247.59	1,148.21	99.38	12.553		
16,800.00	6,926.10	16,576.26	6,925.33	50.37	49.70	-89.96	694.43	-10,031.30	1,247.60	1,147.61	99.98	12.478		
16,900.00	6,925.84	16,676.26	6,925.07	50.67	50.00	-89.96	694.89	-10,131.30	1,247.60	1,147.01	100.58	12.403		
17,000.00	6,925.58	16,701.58	6,925.00	50.97	50.08	-89.96	695.01	-10,156.62	1,249.83	1,148.87	100.96	12.379		
17,100.00	6,925.32	16,701.58	6,925.00	51.27	50.08	-89.96	695.01	-10,156.62	1,259.77	1,158.50	101.27	12.440		
17,200.00	6,925.06	16,701.58	6,925.00	51.58	50.08	-89.96	695.01	-10,156.62	1,277.48	1,175.91	101.57	12.577		
17,224.45	6,925.00	16,701.58	6,925.00	51.65	50.08	-89.96	695.01	-10,156.62	1,282.95	1,181.31	101.65	12.622		
17,224.92	6,925.00	16,701.58	6,925.00	51.65	50.08	-89.96	695.01	-10,156.62	1,283.07	1,181.42	101.65	12.623		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #714H - OH - Prelim #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	165.19	-28.76	7.61	29.75				
100.00	100.00	100.00	100.00	0.23	0.23	165.19	-28.76	7.61	29.75	29.29	0.45	65.667	
200.00	200.00	200.00	200.00	0.53	0.53	165.19	-28.76	7.61	29.75	28.69	1.05	28.250	
300.00	300.00	300.00	300.00	0.83	0.83	165.19	-28.76	7.61	29.75	28.09	1.65	17.996	
400.00	400.00	400.00	400.00	1.13	1.13	165.19	-28.76	7.61	29.75	27.49	2.25	13.203	
500.00	500.00	500.00	500.00	1.43	1.43	165.19	-28.76	7.61	29.75	26.89	2.85	10.427	CC
600.00	599.98	600.99	600.97	1.73	1.73	171.78	-26.98	7.73	29.81	26.36	3.46	8.627	
700.00	699.84	701.97	701.80	2.03	2.03	169.80	-21.66	8.12	30.03	25.97	4.06	7.401	
800.00	799.45	802.94	802.37	2.33	2.34	166.58	-12.80	8.76	30.47	25.81	4.66	6.540	ES
900.00	898.70	903.88	902.54	2.63	2.64	162.24	-0.41	9.66	31.25	25.98	5.26	5.939	
1,000.00	997.47	1,004.78	1,002.17	2.93	2.94	157.02	15.48	10.81	32.48	26.62	5.86	5.540	
1,100.00	1,095.62	1,105.64	1,101.14	3.23	3.25	151.21	34.86	12.21	34.32	27.86	6.46	5.309	
1,200.00	1,193.06	1,206.46	1,199.32	3.53	3.55	145.18	57.68	13.87	36.88	29.82	7.07	5.220	SF
1,300.00	1,289.64	1,306.53	1,296.19	3.83	3.85	140.43	82.74	15.68	40.91	33.24	7.67	5.335	
1,382.94	1,369.03	1,389.28	1,376.27	4.08	4.10	139.28	103.54	17.19	46.34	38.18	8.16	5.676	
1,400.00	1,385.28	1,406.30	1,392.73	4.13	4.15	139.29	107.82	17.50	47.65	39.38	8.27	5.764	
1,500.00	1,480.57	1,506.00	1,489.22	4.43	4.45	139.30	132.88	19.32	55.31	46.44	8.87	6.238	
1,600.00	1,575.86	1,605.71	1,585.71	4.73	4.75	139.31	157.95	21.13	62.97	53.50	9.47	6.652	
1,700.00	1,671.15	1,705.41	1,682.19	5.03	5.05	139.32	183.01	22.95	70.63	60.56	10.07	7.017	
1,800.00	1,766.44	1,805.12	1,778.68	5.33	5.35	139.33	208.07	24.76	78.29	67.62	10.67	7.340	
1,900.00	1,861.72	1,904.83	1,875.17	5.63	5.65	139.34	233.13	26.58	85.95	74.68	11.26	7.630	
2,000.00	1,957.01	2,004.53	1,971.66	5.93	5.95	139.34	258.19	28.40	93.61	81.74	11.86	7.890	
2,100.00	2,052.30	2,104.24	2,068.15	6.23	6.24	139.35	283.26	30.21	101.26	88.80	12.46	8.125	
2,200.00	2,147.59	2,203.95	2,164.63	6.53	6.54	139.35	308.32	32.03	108.92	95.86	13.06	8.338	
2,300.00	2,242.88	2,303.65	2,261.12	6.83	6.84	139.35	333.38	33.84	116.58	102.92	13.66	8.533	
2,400.00	2,338.16	2,403.36	2,357.61	7.13	7.14	139.36	358.44	35.66	124.24	109.98	14.26	8.712	
2,500.00	2,433.45	2,503.06	2,454.10	7.44	7.44	139.36	383.51	37.47	131.90	117.04	14.86	8.876	
2,600.00	2,528.74	2,602.77	2,550.59	7.74	7.74	139.36	408.57	39.29	139.56	124.10	15.46	9.027	
2,700.00	2,624.03	2,702.48	2,647.07	8.04	8.04	139.36	433.63	41.11	147.22	131.16	16.06	9.167	
2,800.00	2,719.32	2,802.18	2,743.56	8.34	8.34	139.36	458.69	42.92	154.88	138.22	16.66	9.297	
2,900.00	2,814.60	2,901.89	2,840.05	8.64	8.64	139.37	483.76	44.74	162.54	145.28	17.26	9.418	
3,000.00	2,909.89	3,001.60	2,936.54	8.94	8.94	139.37	508.82	46.55	170.20	152.34	17.86	9.531	
3,100.00	3,005.18	3,101.30	3,033.02	9.24	9.24	139.37	533.88	48.37	177.85	159.40	18.46	9.637	
3,200.00	3,100.47	3,201.01	3,129.51	9.54	9.54	139.37	558.94	50.18	185.51	166.46	19.06	9.735	
3,300.00	3,195.76	3,300.71	3,226.00	9.84	9.84	139.37	584.01	52.00	193.17	173.52	19.65	9.828	
3,400.00	3,291.04	3,400.42	3,322.49	10.14	10.13	139.37	609.07	53.82	200.83	180.58	20.25	9.916	
3,500.00	3,386.33	3,500.13	3,418.98	10.44	10.43	139.37	634.13	55.63	208.49	187.64	20.85	9.998	
3,600.00	3,481.62	3,600.17	3,515.46	10.74	10.73	139.37	659.19	57.45	216.15	194.70	21.45	10.075	
3,700.00	3,576.91	3,699.54	3,611.95	11.04	11.03	139.38	684.26	59.26	223.81	201.76	22.05	10.149	
3,800.00	3,672.20	3,800.75	3,708.44	11.34	11.34	139.38	709.32	61.08	231.47	208.81	22.66	10.217	
3,900.00	3,767.48	3,898.95	3,804.93	11.64	11.63	139.38	734.38	62.89	239.13	215.88	23.25	10.285	
4,000.00	3,862.77	4,001.34	3,901.42	11.94	11.94	139.38	759.44	64.71	246.79	222.93	23.86	10.344	
4,100.00	3,958.06	4,101.64	3,997.90	12.24	12.24	139.38	784.51	66.53	254.45	229.99	24.46	10.403	
4,200.00	4,053.35	4,198.07	4,094.39	12.54	12.53	139.38	809.57	68.34	262.10	237.06	25.05	10.464	
4,300.00	4,148.64	4,302.22	4,190.88	12.84	12.84	139.38	834.63	70.16	269.76	244.10	25.66	10.513	
4,400.00	4,243.92	4,402.52	4,287.37	13.14	13.14	139.38	859.69	71.97	277.42	251.16	26.26	10.564	
4,500.00	4,339.21	4,502.81	4,383.86	13.44	13.44	139.38	884.76	73.79	285.08	258.22	26.86	10.613	
4,600.00	4,434.50	4,603.10	4,480.34	13.74	13.74	139.38	909.82	75.60	292.74	265.28	27.46	10.660	
4,700.00	4,529.79	4,703.40	4,576.83	14.04	14.04	139.38	934.88	77.42	300.40	272.34	28.06	10.704	
4,800.00	4,625.08	4,803.69	4,673.32	14.34	14.35	139.38	959.94	79.24	308.06	279.39	28.66	10.747	
4,900.00	4,720.36	4,903.99	4,769.81	14.64	14.65	139.38	985.00	81.05	315.72	286.45	29.27	10.788	
5,000.00	4,815.65	5,004.28	4,866.30	14.94	14.95	139.38	1,010.07	82.87	323.38	293.51	29.87	10.827	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	5,104.57	4,962.78	15.24	15.25	139.38	1,035.13	84.68	331.04	300.57	30.47	10.865	
5,200.00	5,006.23	5,204.87	5,059.27	15.54	15.55	139.38	1,060.19	86.50	338.70	307.63	31.07	10.902	
5,300.00	5,101.52	5,305.16	5,155.76	15.84	15.85	139.38	1,085.25	88.32	346.35	314.68	31.67	10.937	
5,400.00	5,196.80	5,394.55	5,252.25	16.14	16.12	139.38	1,110.32	90.13	354.01	321.78	32.24	10.981	
5,500.00	5,292.09	5,505.75	5,348.73	16.44	16.45	139.39	1,135.38	91.95	361.67	328.80	32.87	11.003	
5,600.00	5,387.38	5,606.04	5,445.22	16.74	16.75	139.39	1,160.44	93.76	369.33	335.86	33.47	11.034	
5,700.00	5,482.67	5,706.34	5,541.71	17.04	17.05	139.39	1,185.50	95.58	376.99	342.92	34.07	11.064	
5,800.00	5,577.96	5,806.63	5,638.20	17.34	17.35	139.39	1,210.57	97.39	384.65	349.98	34.67	11.093	
5,900.00	5,673.24	5,906.92	5,734.69	17.64	17.66	139.39	1,235.63	99.21	392.31	357.03	35.27	11.122	
6,000.00	5,768.53	6,007.22	5,831.17	17.94	17.96	139.39	1,260.69	101.03	399.97	364.09	35.88	11.149	
6,100.00	5,863.82	6,107.51	5,927.66	18.24	18.26	139.39	1,285.75	102.84	407.63	371.15	36.48	11.175	
6,200.00	5,959.11	6,207.80	6,024.15	18.54	18.56	139.39	1,310.82	104.66	415.29	378.21	37.08	11.201	
6,300.00	6,054.40	6,291.90	6,120.64	18.84	18.81	139.39	1,335.88	106.47	422.94	385.32	37.63	11.240	
6,400.00	6,149.68	6,391.61	6,217.13	19.14	19.11	139.39	1,360.94	108.29	430.60	392.38	38.23	11.264	
6,500.00	6,244.97	6,491.31	6,313.61	19.44	19.41	139.39	1,386.00	110.10	438.26	399.43	38.83	11.287	
6,600.00	6,340.26	6,591.02	6,410.10	19.74	19.71	139.39	1,411.07	111.92	445.92	406.49	39.43	11.310	
6,689.41	6,425.45	6,650.00	6,466.99	20.01	19.88	139.08	1,425.83	116.60	456.45	416.58	39.88	11.447	
6,700.00	6,435.54	6,650.00	6,466.99	20.04	19.88	142.47	1,425.83	116.60	458.16	418.25	39.91	11.480	
6,750.00	6,482.96	6,681.59	6,497.18	20.19	19.98	156.94	1,433.65	121.57	469.50	429.34	40.16	11.692	
6,800.00	6,529.78	6,709.71	6,523.80	20.34	20.06	168.80	1,440.54	127.43	485.92	445.53	40.39	12.030	
6,850.00	6,575.63	6,735.38	6,547.83	20.49	20.14	178.13	1,446.76	133.95	507.25	466.63	40.62	12.487	
6,900.00	6,620.18	6,758.21	6,568.95	20.64	20.21	-174.37	1,452.22	140.69	533.21	492.37	40.84	13.055	
6,950.00	6,663.07	6,777.99	6,587.03	20.79	20.27	-167.97	1,456.89	147.22	563.46	522.40	41.05	13.725	
7,000.00	6,704.00	6,800.00	6,606.88	20.94	20.34	-162.45	1,462.01	155.24	597.60	556.33	41.27	14.480	
7,050.00	6,742.63	6,800.00	6,606.88	21.09	20.34	-155.22	1,462.01	155.24	635.11	593.68	41.42	15.332	
7,100.00	6,778.69	6,819.01	6,623.77	21.24	20.39	-149.39	1,466.36	162.80	675.26	633.63	41.63	16.220	
7,150.00	6,811.89	6,827.01	6,630.80	21.39	20.42	-141.67	1,468.18	166.15	717.80	676.00	41.81	17.170	
7,200.00	6,841.98	6,832.51	6,635.61	21.54	20.43	-132.36	1,469.41	168.51	762.10	720.13	41.97	18.157	
7,250.00	6,868.74	6,835.72	6,638.41	21.69	20.44	-121.14	1,470.14	169.92	807.64	765.51	42.13	19.169	
7,300.00	6,891.96	6,836.88	6,639.41	21.84	20.45	-108.20	1,470.40	170.42	853.97	811.68	42.29	20.196	
7,350.00	6,911.46	6,836.18	6,638.81	21.99	20.44	-94.49	1,470.24	170.12	900.65	858.22	42.43	21.225	
7,400.00	6,927.10	6,833.83	6,636.76	22.14	20.44	-81.48	1,469.71	169.09	947.30	904.73	42.57	22.250	
7,450.00	6,938.75	6,830.00	6,633.42	22.29	20.43	-70.30	1,468.85	167.43	993.56	950.85	42.71	23.261	
7,500.00	6,946.33	6,824.85	6,628.91	22.44	20.41	-61.33	1,467.69	165.24	1,039.11	996.27	42.85	24.252	
7,550.00	6,949.78	6,818.53	6,623.35	22.59	20.39	-54.40	1,466.25	162.60	1,083.67	1,040.69	42.98	25.215	
7,568.05	6,950.00	6,815.99	6,621.10	22.65	20.38	-52.33	1,465.67	161.56	1,099.45	1,056.43	43.02	25.555	
7,600.00	6,949.92	6,800.00	6,606.88	22.74	20.34	-51.40	1,462.01	155.24	1,127.50	1,084.43	43.07	26.177	
7,700.00	6,949.66	6,800.00	6,606.88	23.04	20.34	-51.40	1,462.01	155.24	1,215.59	1,172.22	43.37	28.027	
7,800.00	6,949.40	6,800.00	6,606.88	23.35	20.34	-51.40	1,462.01	155.24	1,305.40	1,261.73	43.67	29.891	
7,900.00	6,949.14	6,775.61	6,584.87	23.65	20.26	-50.04	1,456.33	146.40	1,395.88	1,351.98	43.90	31.797	
8,000.00	6,948.88	6,750.00	6,561.39	23.95	20.19	-48.68	1,450.26	138.17	1,487.84	1,443.71	44.12	33.719	
8,100.00	6,948.62	6,750.00	6,561.39	24.25	20.19	-48.68	1,450.26	138.17	1,580.07	1,535.65	44.42	35.568	
8,200.00	6,948.36	6,750.00	6,561.39	24.55	20.19	-48.68	1,450.26	138.17	1,673.20	1,628.48	44.72	37.412	
8,300.00	6,948.11	6,750.00	6,561.39	24.85	20.19	-48.68	1,450.26	138.17	1,767.09	1,722.06	45.02	39.247	
8,400.00	6,947.85	6,750.00	6,561.39	25.15	20.19	-48.68	1,450.26	138.17	1,861.60	1,816.28	45.32	41.073	
8,500.00	6,947.59	6,728.28	6,541.22	25.45	20.12	-47.58	1,445.05	132.04	1,956.14	1,910.58	45.56	42.935	
8,600.00	6,947.33	6,722.43	6,535.74	25.75	20.10	-47.29	1,443.63	130.52	2,051.36	2,005.52	45.84	44.747	
8,700.00	6,947.07	6,700.00	6,514.64	26.05	20.04	-46.23	1,438.17	125.25	2,147.26	2,101.19	46.08	46.602	
8,800.00	6,946.81	6,700.00	6,514.64	26.35	20.04	-46.23	1,438.17	125.25	2,243.02	2,196.64	46.38	48.365	
8,900.00	6,946.55	6,700.00	6,514.64	26.65	20.04	-46.23	1,438.17	125.25	2,339.13	2,292.45	46.68	50.113	
9,000.00	6,946.29	6,700.00	6,514.64	26.95	20.04	-46.23	1,438.17	125.25	2,435.55	2,388.57	46.98	51.845	
9,100.00	6,946.03	6,700.00	6,514.64	27.25	20.04	-46.23	1,438.17	125.25	2,532.25	2,484.97	47.28	53.561	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	6,700.00	6,514.64	27.55	20.04	-46.23	1,438.17	125.25	2,629.19	2,581.61	47.58	55.261	
9,300.00	6,945.52	6,700.00	6,514.64	27.85	20.04	-46.23	1,438.17	125.25	2,726.36	2,678.48	47.88	56.943	
9,400.00	6,945.26	6,700.00	6,514.64	28.15	20.04	-46.23	1,438.17	125.25	2,823.72	2,775.55	48.18	58.609	
9,500.00	6,945.00	6,700.00	6,514.64	28.45	20.04	-46.23	1,438.17	125.25	2,921.27	2,872.79	48.48	60.258	
9,600.00	6,944.74	6,700.00	6,514.64	28.75	20.04	-46.23	1,438.17	125.25	3,018.97	2,970.19	48.78	61.890	
9,700.00	6,944.48	6,678.55	6,494.29	29.05	19.97	-45.26	1,432.90	121.01	3,116.35	3,067.33	49.02	63.578	
9,800.00	6,944.22	6,675.81	6,491.67	29.35	19.96	-45.14	1,432.22	120.53	3,214.20	3,164.90	49.31	65.186	
9,900.00	6,943.96	6,673.20	6,489.19	29.66	19.95	-45.02	1,431.58	120.08	3,312.17	3,262.57	49.60	66.777	
10,000.00	6,943.70	6,670.72	6,486.83	29.96	19.95	-44.91	1,430.97	119.66	3,410.25	3,360.35	49.89	68.351	
10,100.00	6,943.45	6,650.00	6,466.99	30.26	19.88	-44.04	1,425.83	116.60	3,508.76	3,458.63	50.13	69.991	
10,200.00	6,943.19	6,650.00	6,466.99	30.56	19.88	-44.04	1,425.83	116.60	3,606.94	3,556.51	50.43	71.521	
10,300.00	6,942.93	6,650.00	6,466.99	30.86	19.88	-44.04	1,425.83	116.60	3,705.22	3,654.49	50.73	73.035	
10,400.00	6,942.67	6,650.00	6,466.99	31.16	19.88	-44.04	1,425.83	116.60	3,803.59	3,752.56	51.03	74.532	
10,500.00	6,942.41	6,650.00	6,466.99	31.46	19.88	-44.04	1,425.83	116.60	3,902.04	3,850.71	51.33	76.014	
10,600.00	6,942.15	6,650.00	6,466.99	31.76	19.88	-44.04	1,425.83	116.60	4,000.57	3,948.94	51.63	77.480	
10,700.00	6,941.89	6,650.00	6,466.99	32.06	19.88	-44.04	1,425.83	116.60	4,099.17	4,047.24	51.93	78.931	
10,800.00	6,941.63	6,650.00	6,466.99	32.36	19.88	-44.04	1,425.83	116.60	4,197.84	4,145.61	52.23	80.366	
10,900.00	6,941.37	6,650.00	6,466.99	32.66	19.88	-44.04	1,425.83	116.60	4,296.57	4,244.03	52.53	81.786	
11,000.00	6,941.11	6,650.00	6,466.99	32.96	19.88	-44.04	1,425.83	116.60	4,395.35	4,342.52	52.83	83.191	
11,100.00	6,940.86	6,650.00	6,466.99	33.26	19.88	-44.04	1,425.83	116.60	4,494.19	4,441.06	53.13	84.581	
11,200.00	6,940.60	6,650.00	6,466.99	33.56	19.88	-44.04	1,425.83	116.60	4,593.08	4,539.65	53.44	85.956	
11,300.00	6,940.34	6,650.00	6,466.99	33.86	19.88	-44.04	1,425.83	116.60	4,692.02	4,638.28	53.74	87.317	
11,400.00	6,940.08	6,650.00	6,466.99	34.16	19.88	-44.04	1,425.83	116.60	4,791.00	4,736.97	54.04	88.664	
11,500.00	6,939.82	6,650.00	6,466.99	34.46	19.88	-44.04	1,425.83	116.60	4,890.02	4,835.69	54.34	89.996	
11,600.00	6,939.56	6,650.00	6,466.99	34.76	19.88	-44.04	1,425.83	116.60	4,989.08	4,934.45	54.64	91.314	
11,700.00	6,939.30	6,650.00	6,466.99	35.06	19.88	-44.04	1,425.83	116.60	5,088.18	5,033.25	54.94	92.619	
11,800.00	6,939.04	6,650.00	6,466.99	35.36	19.88	-44.04	1,425.83	116.60	5,187.32	5,132.08	55.24	93.910	
11,900.00	6,938.78	6,650.00	6,466.99	35.66	19.88	-44.04	1,425.83	116.60	5,286.48	5,230.94	55.54	95.188	
12,000.00	6,938.53	6,650.00	6,466.99	35.96	19.88	-44.04	1,425.83	116.60	5,385.68	5,329.84	55.84	96.453	
12,100.00	6,938.27	6,650.00	6,466.99	36.26	19.88	-44.04	1,425.83	116.60	5,484.90	5,428.76	56.14	97.704	
12,200.00	6,938.01	6,650.00	6,466.99	36.56	19.88	-44.04	1,425.83	116.60	5,584.16	5,527.72	56.44	98.943	
12,300.00	6,937.75	6,650.00	6,466.99	36.86	19.88	-44.04	1,425.83	116.60	5,683.43	5,626.70	56.74	100.169	
12,400.00	6,937.49	6,650.00	6,466.99	37.16	19.88	-44.04	1,425.83	116.60	5,782.74	5,725.70	57.04	101.383	
12,500.00	6,937.23	6,650.00	6,466.99	37.46	19.88	-44.04	1,425.83	116.60	5,882.07	5,824.73	57.34	102.584	
12,600.00	6,936.97	6,650.00	6,466.99	37.77	19.88	-44.04	1,425.83	116.60	5,981.42	5,923.78	57.64	103.774	
12,700.00	6,936.71	6,650.00	6,466.99	38.07	19.88	-44.04	1,425.83	116.60	6,080.79	6,022.85	57.94	104.951	
12,800.00	6,936.45	6,650.00	6,466.99	38.37	19.88	-44.04	1,425.83	116.60	6,180.18	6,121.94	58.24	106.116	
12,900.00	6,936.20	6,650.00	6,466.99	38.67	19.88	-44.04	1,425.83	116.60	6,279.59	6,221.05	58.54	107.270	
13,000.00	6,935.94	6,650.00	6,466.99	38.97	19.88	-44.04	1,425.83	116.60	6,379.02	6,320.18	58.84	108.413	
13,100.00	6,935.68	6,650.00	6,466.99	39.27	19.88	-44.04	1,425.83	116.60	6,478.47	6,419.33	59.14	109.544	
13,200.00	6,935.42	6,650.00	6,466.99	39.57	19.88	-44.04	1,425.83	116.60	6,577.93	6,518.49	59.44	110.664	
13,300.00	6,935.16	6,627.03	6,444.89	39.87	19.82	-43.11	1,420.10	114.07	6,676.91	6,617.24	59.67	111.893	
13,400.00	6,934.90	6,626.32	6,444.20	40.17	19.81	-43.08	1,419.92	114.00	6,776.38	6,716.41	59.97	112.996	
13,500.00	6,934.64	6,625.62	6,443.53	40.47	19.81	-43.06	1,419.74	113.94	6,875.85	6,815.59	60.27	114.087	
13,600.00	6,934.38	6,624.95	6,442.88	40.77	19.81	-43.03	1,419.57	113.88	6,975.35	6,914.78	60.57	115.168	
13,700.00	6,934.12	6,624.29	6,442.24	41.07	19.81	-43.00	1,419.41	113.82	7,074.85	7,013.99	60.86	116.239	
13,800.00	6,933.87	6,623.64	6,441.62	41.37	19.81	-42.98	1,419.25	113.77	7,174.37	7,113.21	61.16	117.299	
13,900.00	6,933.61	6,623.02	6,441.02	41.67	19.80	-42.95	1,419.09	113.72	7,273.90	7,212.44	61.46	118.349	
14,000.00	6,933.35	6,600.00	6,418.79	41.97	19.73	-42.08	1,413.32	112.26	7,373.92	7,312.23	61.69	119.526	
14,100.00	6,933.09	6,600.00	6,418.79	42.27	19.73	-42.08	1,413.32	112.26	7,473.45	7,411.46	61.99	120.553	
14,200.00	6,932.83	6,600.00	6,418.79	42.57	19.73	-42.08	1,413.32	112.26	7,572.99	7,510.70	62.29	121.570	
14,300.00	6,932.57	6,600.00	6,418.79	42.87	19.73	-42.08	1,413.32	112.26	7,672.55	7,609.95	62.59	122.577	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,400.00	6,932.31	6,600.00	6,418.79	43.17	19.73	-42.08	1,413.32	112.26	7,772.11	7,709.22	62.89	123.575	
14,500.00	6,932.05	6,600.00	6,418.79	43.47	19.73	-42.08	1,413.32	112.26	7,871.69	7,808.49	63.19	124.564	
14,600.00	6,931.79	6,600.00	6,418.79	43.77	19.73	-42.08	1,413.32	112.26	7,971.28	7,907.78	63.49	125.544	
14,700.00	6,931.54	6,600.00	6,418.79	44.07	19.73	-42.08	1,413.32	112.26	8,070.87	8,007.08	63.79	126.514	
14,800.00	6,931.28	6,600.00	6,418.79	44.37	19.73	-42.08	1,413.32	112.26	8,170.48	8,106.39	64.09	127.475	
14,900.00	6,931.02	6,600.00	6,418.79	44.67	19.73	-42.08	1,413.32	112.26	8,270.10	8,205.70	64.39	128.428	
15,000.00	6,930.76	6,600.00	6,418.79	44.97	19.73	-42.08	1,413.32	112.26	8,369.72	8,305.03	64.69	129.372	
15,100.00	6,930.50	6,600.00	6,418.79	45.27	19.73	-42.08	1,413.32	112.26	8,469.36	8,404.36	65.00	130.308	
15,200.00	6,930.24	6,600.00	6,418.79	45.57	19.73	-42.08	1,413.32	112.26	8,569.00	8,503.71	65.30	131.235	
15,300.00	6,929.98	6,600.00	6,418.79	45.87	19.73	-42.08	1,413.32	112.26	8,668.65	8,603.06	65.60	132.153	
15,400.00	6,929.72	6,600.00	6,418.79	46.17	19.73	-42.08	1,413.32	112.26	8,768.31	8,702.42	65.90	133.063	
15,500.00	6,929.46	6,600.00	6,418.79	46.47	19.73	-42.08	1,413.32	112.26	8,867.98	8,801.78	66.20	133.966	
15,600.00	6,929.21	6,600.00	6,418.79	46.77	19.73	-42.08	1,413.32	112.26	8,967.65	8,901.16	66.50	134.860	
15,700.00	6,928.95	6,600.00	6,418.79	47.07	19.73	-42.08	1,413.32	112.26	9,067.34	9,000.54	66.80	135.746	
15,800.00	6,928.69	6,600.00	6,418.79	47.37	19.73	-42.08	1,413.32	112.26	9,167.02	9,099.93	67.10	136.625	
15,900.00	6,928.43	6,600.00	6,418.79	47.67	19.73	-42.08	1,413.32	112.26	9,266.72	9,199.32	67.40	137.495	
16,000.00	6,928.17	6,600.00	6,418.79	47.97	19.73	-42.08	1,413.32	112.26	9,366.42	9,298.72	67.70	138.358	
16,100.00	6,927.91	6,600.00	6,418.79	48.27	19.73	-42.08	1,413.32	112.26	9,466.13	9,398.13	68.00	139.214	
16,200.00	6,927.65	6,600.00	6,418.79	48.57	19.73	-42.08	1,413.32	112.26	9,565.84	9,497.55	68.30	140.062	
16,300.00	6,927.39	6,600.00	6,418.79	48.87	19.73	-42.08	1,413.32	112.26	9,665.56	9,596.97	68.60	140.903	
16,400.00	6,927.13	6,600.00	6,418.79	49.17	19.73	-42.08	1,413.32	112.26	9,765.29	9,696.39	68.90	141.736	
16,500.00	6,926.88	6,600.00	6,418.79	49.47	19.73	-42.08	1,413.32	112.26	9,865.02	9,795.82	69.20	142.563	
16,600.00	6,926.62	6,600.00	6,418.79	49.77	19.73	-42.08	1,413.32	112.26	9,964.76	9,895.26	69.50	143.382	
16,700.00	6,926.36	6,600.00	6,418.79	50.07	19.73	-42.08	1,413.32	112.26	10,064.50	9,994.70	69.80	144.195	
16,800.00	6,926.10	6,600.00	6,418.79	50.37	19.73	-42.08	1,413.32	112.26	10,164.25	10,094.15	70.10	145.000	
16,900.00	6,925.84	6,600.00	6,418.79	50.67	19.73	-42.08	1,413.32	112.26	10,264.00	10,193.60	70.40	145.799	
17,000.00	6,925.58	6,600.00	6,418.79	50.97	19.73	-42.08	1,413.32	112.26	10,363.76	10,293.06	70.70	146.591	
17,100.00	6,925.32	6,600.00	6,418.79	51.27	19.73	-42.08	1,413.32	112.26	10,463.52	10,392.52	71.00	147.376	
17,200.00	6,925.06	6,600.00	6,418.79	51.58	19.73	-42.08	1,413.32	112.26	10,563.28	10,491.98	71.30	148.155	
17,224.45	6,925.00	6,600.00	6,418.79	51.65	19.73	-42.08	1,413.32	112.26	10,587.67	10,516.30	71.37	148.344	
17,224.92	6,925.00	6,600.00	6,418.79	51.65	19.73	-42.08	1,413.32	112.26	10,588.15	10,516.77	71.37	148.348	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #710H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	164.89	-43.33	11.70	44.88					
100.00	100.00	100.00	100.00	0.23	0.23	164.89	-43.33	11.70	44.88	44.43	0.45	99.070		
200.00	200.00	200.00	200.00	0.53	0.53	164.89	-43.33	11.70	44.88	43.83	1.05	42.620		
300.00	300.00	300.00	300.00	0.83	0.83	164.89	-43.33	11.70	44.88	43.23	1.65	27.150		
400.00	400.00	400.00	400.00	1.13	1.13	164.89	-43.33	11.70	44.88	42.63	2.25	19.920		
500.00	500.00	500.00	500.00	1.43	1.43	164.89	-43.33	11.70	44.88	42.03	2.85	15.730 CC		
600.00	599.98	601.31	601.29	1.73	1.73	171.18	-41.63	12.28	45.15	41.69	3.46	13.062 ES		
700.00	699.84	701.81	701.68	2.03	2.03	168.83	-37.18	13.82	46.52	42.47	4.06	11.465		
800.00	799.45	801.69	801.44	2.33	2.33	167.31	-32.47	15.44	51.14	46.48	4.66	10.979 SF		
900.00	898.70	901.37	900.98	2.63	2.63	166.83	-27.76	17.06	59.16	53.91	5.26	11.255		
1,000.00	997.47	1,000.71	1,000.20	2.93	2.93	167.11	-23.08	18.68	70.58	64.72	5.86	12.054		
1,100.00	1,095.62	1,100.40	1,098.97	3.23	3.23	167.80	-18.41	20.28	85.37	78.92	6.45	13.226		
1,200.00	1,193.06	1,202.09	1,197.16	3.53	3.53	168.65	-13.77	21.88	103.55	96.49	7.06	14.666		
1,300.00	1,289.64	1,304.46	1,294.67	3.83	3.84	169.53	-9.17	23.47	125.11	117.44	7.67	16.315		
1,382.94	1,369.03	1,375.90	1,374.93	4.08	4.05	170.21	-5.38	24.78	145.55	137.42	8.13	17.898		
1,400.00	1,385.28	1,407.63	1,391.37	4.13	4.15	170.36	-4.60	25.04	149.99	141.71	8.28	18.118		
1,500.00	1,480.57	1,488.89	1,487.78	4.43	4.39	171.07	-0.05	26.61	176.05	167.22	8.82	19.953		
1,600.00	1,575.86	1,585.42	1,584.19	4.73	4.68	171.59	4.51	28.18	202.12	192.71	9.41	21.472		
1,700.00	1,671.15	1,681.95	1,680.59	5.03	4.97	172.00	9.06	29.75	228.21	218.20	10.00	22.813		
1,800.00	1,766.44	1,778.47	1,777.00	5.33	5.26	172.32	13.62	31.32	254.30	243.71	10.59	24.006		
1,900.00	1,861.72	1,875.00	1,873.40	5.63	5.55	172.59	18.17	32.89	280.40	269.22	11.18	25.073		
2,000.00	1,957.01	1,971.53	1,969.81	5.93	5.84	172.81	22.73	34.46	306.50	294.73	11.77	26.034		
2,100.00	2,052.30	2,068.05	2,066.22	6.23	6.13	172.99	27.28	36.03	332.61	320.25	12.36	26.904		
2,200.00	2,147.59	2,164.58	2,162.62	6.53	6.42	173.15	31.83	37.60	358.72	345.77	12.95	27.695		
2,300.00	2,242.88	2,261.11	2,259.03	6.83	6.71	173.28	36.39	39.17	384.84	371.29	13.54	28.417		
2,400.00	2,338.16	2,357.63	2,355.44	7.13	7.00	173.40	40.94	40.74	410.95	396.82	14.13	29.079		
2,500.00	2,433.45	2,454.16	2,451.84	7.44	7.29	173.51	45.50	42.31	437.07	422.35	14.72	29.688		
2,600.00	2,528.74	2,550.69	2,548.25	7.74	7.58	173.60	50.05	43.88	463.18	447.87	15.31	30.250		
2,700.00	2,624.03	2,647.21	2,644.66	8.04	7.87	173.68	54.60	45.45	489.30	473.40	15.90	30.770		
2,800.00	2,719.32	2,743.74	2,741.06	8.34	8.16	173.76	59.16	47.01	515.42	498.93	16.49	31.254		
2,900.00	2,814.60	2,840.27	2,837.47	8.64	8.45	173.82	63.71	48.58	541.54	524.46	17.08	31.704		
3,000.00	2,909.89	2,936.79	2,933.87	8.94	8.74	173.88	68.27	50.15	567.66	549.99	17.67	32.124		
3,100.00	3,005.18	3,033.32	3,030.28	9.24	9.03	173.94	72.82	51.72	593.78	575.52	18.26	32.517		
3,200.00	3,100.47	3,129.85	3,126.69	9.54	9.32	173.99	77.37	53.29	619.91	601.06	18.85	32.886		
3,300.00	3,195.76	3,226.37	3,223.09	9.84	9.61	174.04	81.93	54.86	646.03	626.59	19.44	33.232		
3,400.00	3,291.04	3,322.90	3,319.50	10.14	9.90	174.08	86.48	56.43	672.15	652.12	20.03	33.558		
3,500.00	3,386.33	3,419.43	3,415.91	10.44	10.19	174.12	91.04	58.00	698.27	677.65	20.62	33.865		
3,600.00	3,481.62	3,515.95	3,512.31	10.74	10.47	174.16	95.59	59.57	724.40	703.19	21.21	34.155		
3,700.00	3,576.91	3,612.48	3,608.72	11.04	10.76	174.19	100.14	61.14	750.52	728.72	21.80	34.429		
3,800.00	3,672.20	3,709.00	3,705.13	11.34	11.05	174.22	104.70	62.71	776.64	754.25	22.39	34.689		
3,900.00	3,767.48	3,805.53	3,801.53	11.64	11.34	174.25	109.25	64.28	802.77	779.79	22.98	34.936		
4,000.00	3,862.77	3,902.06	3,897.94	11.94	11.63	174.28	113.81	65.85	828.89	805.32	23.57	35.170		
4,100.00	3,958.06	4,001.42	3,994.34	12.24	11.93	174.31	118.36	67.42	855.01	830.85	24.17	35.381		
4,200.00	4,053.35	4,104.89	4,090.75	12.54	12.24	174.33	122.91	68.99	881.14	856.36	24.78	35.564		
4,300.00	4,148.64	4,208.36	4,187.16	12.84	12.55	174.36	127.47	70.56	907.26	881.88	25.39	35.737		
4,400.00	4,243.92	4,288.16	4,283.56	13.14	12.79	174.38	132.02	72.12	933.39	907.46	25.93	36.001		
4,500.00	4,339.21	4,384.69	4,379.97	13.44	13.08	174.40	136.58	73.69	959.51	933.00	26.52	36.186		
4,600.00	4,434.50	4,481.22	4,476.38	13.74	13.37	174.42	141.13	75.26	985.64	958.53	27.11	36.363		
4,700.00	4,529.79	4,577.74	4,572.78	14.04	13.66	174.44	145.68	76.83	1,011.76	984.07	27.70	36.532		
4,800.00	4,625.08	4,674.27	4,669.19	14.34	13.95	174.46	150.24	78.40	1,037.89	1,009.60	28.28	36.694		
4,900.00	4,720.36	4,770.80	4,765.60	14.64	14.24	174.47	154.79	79.97	1,064.01	1,035.14	28.87	36.849		
5,000.00	4,815.65	4,867.32	4,862.00	14.94	14.53	174.49	159.35	81.54	1,090.14	1,060.67	29.46	36.999		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #710H - OH - Prelim #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,963.85	4,958.41	15.24	14.82	174.51	163.90	83.11	1,116.26	1,086.21	30.05	37.142	
5,200.00	5,006.23	5,060.38	5,054.81	15.54	15.11	174.52	168.45	84.68	1,142.39	1,111.75	30.64	37.280	
5,300.00	5,101.52	5,156.90	5,151.22	15.84	15.40	174.53	173.01	86.25	1,168.51	1,137.28	31.23	37.413	
5,400.00	5,196.80	5,253.43	5,247.63	16.14	15.69	174.55	177.56	87.82	1,194.64	1,162.82	31.82	37.540	
5,500.00	5,292.09	5,349.96	5,344.03	16.44	15.98	174.56	182.12	89.39	1,220.77	1,188.35	32.41	37.664	
5,600.00	5,387.38	5,446.48	5,440.44	16.74	16.27	174.57	186.67	90.96	1,246.89	1,213.89	33.00	37.782	
5,700.00	5,482.67	5,543.01	5,536.85	17.04	16.56	174.59	191.23	92.53	1,273.02	1,239.42	33.59	37.897	
5,800.00	5,577.96	5,639.54	5,633.25	17.34	16.85	174.60	195.78	94.10	1,299.14	1,264.96	34.18	38.008	
5,900.00	5,673.24	5,736.06	5,729.66	17.64	17.13	174.61	200.33	95.66	1,325.27	1,290.50	34.77	38.114	
6,000.00	5,768.53	5,832.59	5,826.07	17.94	17.42	174.62	204.89	97.23	1,351.39	1,316.03	35.36	38.218	
6,100.00	5,863.82	5,929.12	5,922.47	18.24	17.71	174.63	209.44	98.80	1,377.52	1,341.57	35.95	38.318	
6,200.00	5,959.11	6,025.64	6,018.88	18.54	18.00	174.64	214.00	100.37	1,403.65	1,367.11	36.54	38.414	
6,300.00	6,054.40	6,122.17	6,115.28	18.84	18.29	174.65	218.55	101.94	1,429.77	1,392.64	37.13	38.508	
6,400.00	6,149.68	6,218.70	6,211.69	19.14	18.58	174.66	223.10	103.51	1,455.90	1,418.18	37.72	38.599	
6,500.00	6,244.97	6,315.22	6,308.10	19.44	18.87	174.66	227.66	105.08	1,482.02	1,443.71	38.31	38.687	
6,600.00	6,340.26	6,400.00	6,392.77	19.74	19.13	174.67	231.66	106.49	1,508.20	1,469.34	38.86	38.808	
6,689.41	6,425.45	6,459.37	6,451.87	20.01	19.31	174.54	234.43	111.14	1,532.82	1,493.51	39.31	38.993	
6,700.00	6,435.54	6,465.68	6,458.10	20.04	19.32	178.09	234.72	111.99	1,535.88	1,496.52	39.36	39.020	
6,750.00	6,482.96	6,500.00	6,491.89	20.19	19.43	-166.40	236.30	117.83	1,551.21	1,511.60	39.61	39.157	
6,800.00	6,529.78	6,521.67	6,513.01	20.34	19.49	-153.47	237.27	122.56	1,567.93	1,528.10	39.83	39.365	
6,850.00	6,575.63	6,550.00	6,540.33	20.49	19.58	-143.33	238.53	129.95	1,586.05	1,545.98	40.07	39.585	
6,900.00	6,620.18	6,568.30	6,557.77	20.64	19.63	-135.10	239.33	135.43	1,605.49	1,565.22	40.27	39.866	
6,950.00	6,663.07	6,587.28	6,575.67	20.79	19.69	-128.41	240.15	141.70	1,626.25	1,585.77	40.48	40.174	
7,000.00	6,704.00	6,600.00	6,587.53	20.94	19.73	-122.58	240.69	146.24	1,648.26	1,607.59	40.67	40.529	
7,050.00	6,742.63	6,616.30	6,602.60	21.09	19.78	-117.59	241.38	152.43	1,671.41	1,630.54	40.87	40.897	
7,100.00	6,778.69	6,626.52	6,611.95	21.24	19.81	-112.90	241.80	156.54	1,695.61	1,654.56	41.05	41.306	
7,150.00	6,811.89	6,634.11	6,618.84	21.39	19.83	-108.49	242.11	159.69	1,720.71	1,679.49	41.22	41.742	
7,200.00	6,841.98	6,650.00	6,633.14	21.54	19.88	-104.66	242.76	166.59	1,746.62	1,705.20	41.42	42.168	
7,250.00	6,868.74	6,650.00	6,633.14	21.69	19.88	-100.46	242.76	166.59	1,772.97	1,731.40	41.57	42.649	
7,300.00	6,891.96	6,650.00	6,633.14	21.84	19.88	-96.47	242.76	166.59	1,799.70	1,757.98	41.72	43.137	
7,350.00	6,911.46	6,650.00	6,633.14	21.99	19.88	-92.68	242.76	166.59	1,826.60	1,784.73	41.87	43.625	
7,400.00	6,927.10	6,650.00	6,633.14	22.14	19.88	-89.13	242.76	166.59	1,853.45	1,811.43	42.02	44.108	
7,450.00	6,938.75	6,636.00	6,620.55	22.29	19.84	-85.33	242.19	160.49	1,879.92	1,837.79	42.13	44.624	
7,500.00	6,946.33	6,630.84	6,615.88	22.44	19.82	-82.14	241.98	158.32	1,905.97	1,863.71	42.26	45.099	
7,550.00	6,949.78	6,624.55	6,610.15	22.59	19.80	-79.21	241.72	155.73	1,931.33	1,888.94	42.39	45.558	
7,568.05	6,950.00	6,622.03	6,607.85	22.65	19.79	-78.23	241.61	154.71	1,940.27	1,897.83	42.44	45.719	
7,600.00	6,949.92	6,617.53	6,603.72	22.74	19.78	-78.09	241.43	152.92	1,956.19	1,913.67	42.52	46.004	
7,700.00	6,949.66	6,600.00	6,587.53	23.04	19.73	-77.56	240.69	146.24	2,008.30	1,965.53	42.77	46.956	
7,800.00	6,949.40	6,600.00	6,587.53	23.35	19.73	-77.56	240.69	146.24	2,063.73	2,020.66	43.07	47.915	
7,900.00	6,949.14	6,582.04	6,570.74	23.65	19.67	-77.01	239.93	139.91	2,122.18	2,078.86	43.32	48.991	
8,000.00	6,948.88	6,572.40	6,561.65	23.95	19.64	-76.72	239.51	136.73	2,183.52	2,139.93	43.59	50.093	
8,100.00	6,948.62	6,550.00	6,540.33	24.25	19.58	-76.03	238.53	129.95	2,247.66	2,203.84	43.82	51.289	
8,200.00	6,948.36	6,550.00	6,540.33	24.55	19.58	-76.03	238.53	129.95	2,313.96	2,269.84	44.12	52.442	
8,300.00	6,948.11	6,550.00	6,540.33	24.85	19.58	-76.03	238.53	129.95	2,382.62	2,338.19	44.42	53.633	
8,400.00	6,947.85	6,550.00	6,540.33	25.15	19.58	-76.03	238.53	129.95	2,453.43	2,408.70	44.73	54.856	
8,500.00	6,947.59	6,550.00	6,540.33	25.45	19.58	-76.03	238.53	129.95	2,526.21	2,481.19	45.03	56.106	
8,600.00	6,947.33	6,529.44	6,520.54	25.75	19.52	-75.40	237.62	124.45	2,600.44	2,555.17	45.26	57.450	
8,700.00	6,947.07	6,524.08	6,515.34	26.05	19.50	-75.23	237.38	123.14	2,676.47	2,630.92	45.55	58.760	
8,800.00	6,946.81	6,519.08	6,510.50	26.35	19.48	-75.08	237.16	121.96	2,753.98	2,708.15	45.83	60.085	
8,900.00	6,946.55	6,500.00	6,491.89	26.65	19.43	-74.49	236.30	117.83	2,833.05	2,786.98	46.08	61.484	
9,000.00	6,946.29	6,500.00	6,491.89	26.95	19.43	-74.49	236.30	117.83	2,913.11	2,866.73	46.38	62.811	
9,100.00	6,946.03	6,500.00	6,491.89	27.25	19.43	-74.49	236.30	117.83	2,994.36	2,947.68	46.68	64.148	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	6,500.00	6,491.89	27.55	19.43	-74.49	236.30	117.83	3,076.72	3,029.74	46.98	65.491	
9,300.00	6,945.52	6,500.00	6,491.89	27.85	19.43	-74.49	236.30	117.83	3,160.09	3,112.81	47.28	66.838	
9,400.00	6,945.26	6,500.00	6,491.89	28.15	19.43	-74.49	236.30	117.83	3,244.41	3,196.83	47.58	68.188	
9,500.00	6,945.00	6,500.00	6,491.89	28.45	19.43	-74.49	236.30	117.83	3,329.59	3,281.71	47.88	69.539	
9,600.00	6,944.74	6,500.00	6,491.89	28.75	19.43	-74.49	236.30	117.83	3,415.58	3,367.40	48.18	70.891	
9,700.00	6,944.48	6,500.00	6,491.89	29.05	19.43	-74.49	236.30	117.83	3,502.31	3,453.83	48.48	72.240	
9,800.00	6,944.22	6,500.00	6,491.89	29.35	19.43	-74.49	236.30	117.83	3,589.73	3,540.95	48.78	73.588	
9,900.00	6,943.96	6,500.00	6,491.89	29.66	19.43	-74.49	236.30	117.83	3,677.80	3,628.71	49.08	74.931	
10,000.00	6,943.70	6,478.37	6,470.64	29.96	19.36	-73.82	235.31	113.92	3,766.02	3,716.71	49.32	76.362	
10,100.00	6,943.45	6,476.05	6,468.35	30.26	19.36	-73.74	235.20	113.54	3,855.14	3,805.53	49.61	77.707	
10,200.00	6,943.19	6,473.83	6,466.16	30.56	19.35	-73.68	235.10	113.19	3,944.77	3,894.86	49.91	79.045	
10,300.00	6,942.93	6,471.72	6,464.08	30.86	19.34	-73.61	235.00	112.87	4,034.88	3,984.68	50.20	80.378	
10,400.00	6,942.67	6,450.00	6,442.57	31.16	19.28	-72.94	234.00	110.00	4,125.79	4,075.36	50.43	81.805	
10,500.00	6,942.41	6,450.00	6,442.57	31.46	19.28	-72.94	234.00	110.00	4,216.70	4,165.96	50.73	83.113	
10,600.00	6,942.15	6,450.00	6,442.57	31.76	19.28	-72.94	234.00	110.00	4,308.01	4,256.98	51.04	84.413	
10,700.00	6,941.89	6,450.00	6,442.57	32.06	19.28	-72.94	234.00	110.00	4,399.70	4,348.36	51.34	85.705	
10,800.00	6,941.63	6,450.00	6,442.57	32.36	19.28	-72.94	234.00	110.00	4,491.74	4,440.11	51.64	86.989	
10,900.00	6,941.37	6,450.00	6,442.57	32.66	19.28	-72.94	234.00	110.00	4,584.12	4,532.19	51.94	88.265	
11,000.00	6,941.11	6,450.00	6,442.57	32.96	19.28	-72.94	234.00	110.00	4,676.81	4,624.58	52.24	89.532	
11,100.00	6,940.86	6,450.00	6,442.57	33.26	19.28	-72.94	234.00	110.00	4,769.80	4,717.26	52.54	90.790	
11,200.00	6,940.60	6,450.00	6,442.57	33.56	19.28	-72.94	234.00	110.00	4,863.06	4,810.23	52.84	92.039	
11,300.00	6,940.34	6,450.00	6,442.57	33.86	19.28	-72.94	234.00	110.00	4,956.59	4,903.45	53.14	93.279	
11,400.00	6,940.08	6,450.00	6,442.57	34.16	19.28	-72.94	234.00	110.00	5,050.37	4,996.93	53.44	94.510	
11,500.00	6,939.82	6,450.00	6,442.57	34.46	19.28	-72.94	234.00	110.00	5,144.38	5,090.64	53.74	95.731	
11,600.00	6,939.56	6,450.00	6,442.57	34.76	19.28	-72.94	234.00	110.00	5,238.61	5,184.57	54.04	96.943	
11,700.00	6,939.30	6,450.00	6,442.57	35.06	19.28	-72.94	234.00	110.00	5,333.05	5,278.71	54.34	98.145	
11,800.00	6,939.04	6,450.00	6,442.57	35.36	19.28	-72.94	234.00	110.00	5,427.69	5,373.05	54.64	99.338	
11,900.00	6,938.78	6,450.00	6,442.57	35.66	19.28	-72.94	234.00	110.00	5,522.52	5,467.58	54.94	100.521	
12,000.00	6,938.53	6,450.00	6,442.57	35.96	19.28	-72.94	234.00	110.00	5,617.53	5,562.29	55.24	101.695	
12,100.00	6,938.27	6,450.00	6,442.57	36.26	19.28	-72.94	234.00	110.00	5,712.71	5,657.17	55.54	102.858	
12,200.00	6,938.01	6,450.00	6,442.57	36.56	19.28	-72.94	234.00	110.00	5,808.05	5,752.21	55.84	104.013	
12,300.00	6,937.75	6,450.00	6,442.57	36.86	19.28	-72.94	234.00	110.00	5,903.55	5,847.41	56.14	105.157	
12,400.00	6,937.49	6,450.00	6,442.57	37.16	19.28	-72.94	234.00	110.00	5,999.19	5,942.75	56.44	106.293	
12,500.00	6,937.23	6,450.00	6,442.57	37.46	19.28	-72.94	234.00	110.00	6,094.97	6,038.23	56.74	107.418	
12,600.00	6,936.97	6,450.00	6,442.57	37.77	19.28	-72.94	234.00	110.00	6,190.89	6,133.85	57.04	108.534	
12,700.00	6,936.71	6,450.00	6,442.57	38.07	19.28	-72.94	234.00	110.00	6,286.93	6,229.59	57.34	109.641	
12,800.00	6,936.45	6,450.00	6,442.57	38.37	19.28	-72.94	234.00	110.00	6,383.10	6,325.45	57.64	110.738	
12,900.00	6,936.20	6,450.00	6,442.57	38.67	19.28	-72.94	234.00	110.00	6,479.38	6,421.43	57.94	111.826	
13,000.00	6,935.94	6,450.00	6,442.57	38.97	19.28	-72.94	234.00	110.00	6,575.77	6,517.53	58.24	112.905	
13,100.00	6,935.68	6,450.00	6,442.57	39.27	19.28	-72.94	234.00	110.00	6,672.27	6,613.72	58.54	113.974	
13,200.00	6,935.42	6,450.00	6,442.57	39.57	19.28	-72.94	234.00	110.00	6,768.87	6,710.02	58.84	115.034	
13,300.00	6,935.16	6,450.00	6,442.57	39.87	19.28	-72.94	234.00	110.00	6,865.56	6,806.42	59.14	116.085	
13,400.00	6,934.90	6,450.00	6,442.57	40.17	19.28	-72.94	234.00	110.00	6,962.35	6,902.91	59.44	117.127	
13,500.00	6,934.64	6,450.00	6,442.57	40.47	19.28	-72.94	234.00	110.00	7,059.23	6,999.49	59.74	118.160	
13,600.00	6,934.38	6,450.00	6,442.57	40.77	19.28	-72.94	234.00	110.00	7,156.20	7,096.15	60.04	119.184	
13,700.00	6,934.12	6,450.00	6,442.57	41.07	19.28	-72.94	234.00	110.00	7,253.25	7,192.90	60.34	120.199	
13,800.00	6,933.87	6,450.00	6,442.57	41.37	19.28	-72.94	234.00	110.00	7,350.37	7,289.73	60.64	121.206	
13,900.00	6,933.61	6,450.00	6,442.57	41.67	19.28	-72.94	234.00	110.00	7,447.58	7,386.63	60.94	122.204	
14,000.00	6,933.35	6,450.00	6,442.57	41.97	19.28	-72.94	234.00	110.00	7,544.85	7,483.61	61.24	123.193	
14,100.00	6,933.09	6,450.00	6,442.57	42.27	19.28	-72.94	234.00	110.00	7,642.20	7,580.65	61.54	124.174	
14,200.00	6,932.83	6,450.00	6,442.57	42.57	19.28	-72.94	234.00	110.00	7,739.61	7,677.77	61.84	125.146	
14,300.00	6,932.57	6,450.00	6,442.57	42.87	19.28	-72.94	234.00	110.00	7,837.09	7,774.95	62.14	126.110	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,400.00	6,932.31	6,450.00	6,442.57	43.17	19.28	-72.94	234.00	110.00	7,934.63	7,872.19	62.45	127.066	
14,500.00	6,932.05	6,450.00	6,442.57	43.47	19.28	-72.94	234.00	110.00	8,032.24	7,969.49	62.75	128.013	
14,600.00	6,931.79	6,450.00	6,442.57	43.77	19.28	-72.94	234.00	110.00	8,129.90	8,066.85	63.05	128.953	
14,700.00	6,931.54	6,426.86	6,419.56	44.07	19.21	-72.23	232.92	107.83	8,227.12	8,163.85	63.28	130.019	
14,800.00	6,931.28	6,426.36	6,419.07	44.37	19.21	-72.21	232.90	107.80	8,324.87	8,261.30	63.58	130.946	
14,900.00	6,931.02	6,425.88	6,418.58	44.67	19.20	-72.20	232.87	107.76	8,422.68	8,358.80	63.87	131.864	
15,000.00	6,930.76	6,425.40	6,418.11	44.97	19.20	-72.18	232.85	107.73	8,520.53	8,456.36	64.17	132.775	
15,100.00	6,930.50	6,424.94	6,417.65	45.27	19.20	-72.17	232.83	107.69	8,618.43	8,553.96	64.47	133.678	
15,200.00	6,930.24	6,424.48	6,417.19	45.57	19.20	-72.16	232.81	107.66	8,716.38	8,651.61	64.77	134.574	
15,300.00	6,929.98	6,424.04	6,416.75	45.87	19.20	-72.14	232.79	107.63	8,814.38	8,749.31	65.07	135.462	
15,400.00	6,929.72	6,423.61	6,416.32	46.17	19.20	-72.13	232.77	107.60	8,912.42	8,847.05	65.37	136.342	
15,500.00	6,929.46	6,423.18	6,415.89	46.47	19.20	-72.12	232.75	107.57	9,010.50	8,944.83	65.67	137.215	
15,600.00	6,929.21	6,400.00	6,392.77	46.77	19.13	-71.41	231.66	106.49	9,109.09	9,043.20	65.90	138.231	
15,700.00	6,928.95	6,400.00	6,392.77	47.07	19.13	-71.41	231.66	106.49	9,207.24	9,141.04	66.20	139.087	
15,800.00	6,928.69	6,400.00	6,392.77	47.37	19.13	-71.41	231.66	106.49	9,305.43	9,238.93	66.50	139.936	
15,900.00	6,928.43	6,400.00	6,392.77	47.67	19.13	-71.41	231.66	106.49	9,403.65	9,336.85	66.80	140.777	
16,000.00	6,928.17	6,400.00	6,392.77	47.97	19.13	-71.41	231.66	106.49	9,501.91	9,434.81	67.10	141.612	
16,100.00	6,927.91	6,400.00	6,392.77	48.27	19.13	-71.41	231.66	106.49	9,600.21	9,532.81	67.40	142.440	
16,200.00	6,927.65	6,400.00	6,392.77	48.57	19.13	-71.41	231.66	106.49	9,698.54	9,630.84	67.70	143.261	
16,300.00	6,927.39	6,400.00	6,392.77	48.87	19.13	-71.41	231.66	106.49	9,796.91	9,728.91	68.00	144.075	
16,400.00	6,927.13	6,400.00	6,392.77	49.17	19.13	-71.41	231.66	106.49	9,895.30	9,827.01	68.30	144.882	
16,500.00	6,926.88	6,400.00	6,392.77	49.47	19.13	-71.41	231.66	106.49	9,993.73	9,925.14	68.60	145.683	
16,600.00	6,926.62	6,400.00	6,392.77	49.77	19.13	-71.41	231.66	106.49	10,092.20	10,023.30	68.90	146.478	
16,700.00	6,926.36	6,400.00	6,392.77	50.07	19.13	-71.41	231.66	106.49	10,190.69	10,121.49	69.20	147.265	
16,800.00	6,926.10	6,400.00	6,392.77	50.37	19.13	-71.41	231.66	106.49	10,289.21	10,219.71	69.50	148.047	
16,900.00	6,925.84	6,400.00	6,392.77	50.67	19.13	-71.41	231.66	106.49	10,387.76	10,317.96	69.80	148.822	
17,000.00	6,925.58	6,400.00	6,392.77	50.97	19.13	-71.41	231.66	106.49	10,486.33	10,416.23	70.10	149.591	
17,100.00	6,925.32	6,400.00	6,392.77	51.27	19.13	-71.41	231.66	106.49	10,584.93	10,514.53	70.40	150.354	
17,200.00	6,925.06	6,400.00	6,392.77	51.58	19.13	-71.41	231.66	106.49	10,683.56	10,612.86	70.70	151.111	
17,224.45	6,925.00	6,400.00	6,392.77	51.65	19.13	-71.41	231.66	106.49	10,707.68	10,636.90	70.77	151.295	
17,224.92	6,925.00	6,400.00	6,392.77	51.65	19.13	-71.41	231.66	106.49	10,708.15	10,637.37	70.78	151.298	

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #720H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	165.01	-57.89	15.50	59.92					
100.00	100.00	100.00	100.00	0.23	0.23	165.01	-57.89	15.50	59.92	59.47	0.45	132.284		
200.00	200.00	200.00	200.00	0.53	0.53	165.01	-57.89	15.50	59.92	58.87	1.05	56.908		
300.00	300.00	300.00	300.00	0.83	0.83	165.01	-57.89	15.50	59.92	58.27	1.65	36.252		
400.00	400.00	400.00	400.00	1.13	1.13	165.01	-57.89	15.50	59.92	57.67	2.25	26.598		
500.00	500.00	500.00	500.00	1.43	1.43	165.01	-57.89	15.50	59.92	57.07	2.85	21.004 CC, ES		
600.00	599.98	598.30	598.28	1.73	1.72	173.45	-59.42	14.80	62.99	59.54	3.45	18.269		
700.00	699.84	695.95	695.80	2.03	2.01	176.37	-63.98	12.73	72.31	68.27	4.04	17.894 SF		
800.00	799.45	806.91	792.59	2.33	2.35	179.82	-71.38	9.36	87.95	83.28	4.67	18.815		
900.00	898.70	909.04	890.05	2.63	2.65	-177.58	-79.56	5.65	107.95	102.67	5.28	20.438		
1,000.00	997.47	988.09	986.77	2.93	2.89	-175.88	-87.67	1.96	131.50	125.68	5.82	22.594		
1,100.00	1,095.62	1,084.34	1,082.62	3.23	3.18	-174.79	-95.72	-1.70	158.47	152.06	6.41	24.723		
1,200.00	1,193.06	1,179.61	1,177.48	3.53	3.47	-174.10	-103.68	-5.32	188.81	181.82	7.00	26.985		
1,300.00	1,289.64	1,273.77	1,271.24	3.83	3.75	-173.68	-111.55	-8.90	222.45	214.87	7.58	29.344		
1,382.94	1,369.03	1,350.94	1,348.09	4.08	3.98	-173.46	-117.99	-11.83	252.82	244.76	8.06	31.358		
1,400.00	1,385.28	1,366.72	1,363.81	4.13	4.03	-173.44	-119.31	-12.43	259.30	251.14	8.16	31.773		
1,500.00	1,480.57	1,459.24	1,455.93	4.43	4.30	-173.34	-127.04	-15.94	297.25	288.51	8.74	34.014		
1,600.00	1,575.86	1,551.76	1,548.06	4.73	4.58	-173.27	-134.77	-19.46	335.20	325.89	9.32	35.977		
1,700.00	1,671.15	1,644.28	1,640.19	5.03	4.86	-173.21	-142.50	-22.97	373.16	363.26	9.90	37.711		
1,800.00	1,766.44	1,736.79	1,732.31	5.33	5.14	-173.16	-150.24	-26.49	411.11	400.64	10.47	39.254		
1,900.00	1,861.72	1,829.31	1,824.44	5.63	5.42	-173.12	-157.97	-30.00	449.07	438.01	11.05	40.635		
2,000.00	1,957.01	1,921.83	1,916.57	5.93	5.69	-173.09	-165.70	-33.52	487.02	475.39	11.63	41.880		
2,100.00	2,052.30	2,014.34	2,008.69	6.23	5.97	-173.06	-173.43	-37.03	524.97	512.77	12.21	43.007		
2,200.00	2,147.59	2,106.86	2,100.82	6.53	6.25	-173.04	-181.16	-40.55	562.93	550.14	12.78	44.032		
2,300.00	2,242.88	2,199.38	2,192.95	6.83	6.53	-173.02	-188.89	-44.06	600.88	587.52	13.36	44.968		
2,400.00	2,338.16	2,308.10	2,285.07	7.13	6.85	-173.00	-196.62	-47.58	638.84	624.85	13.99	45.668		
2,500.00	2,433.45	2,384.41	2,377.20	7.44	7.08	-172.98	-204.35	-51.09	676.79	662.28	14.52	46.618		
2,600.00	2,528.74	2,476.93	2,469.32	7.74	7.36	-172.97	-212.08	-54.61	714.75	699.65	15.10	47.348		
2,700.00	2,624.03	2,569.45	2,561.45	8.04	7.64	-172.95	-219.81	-58.13	752.70	737.03	15.67	48.024		
2,800.00	2,719.32	2,661.96	2,653.58	8.34	7.91	-172.94	-227.54	-61.64	790.66	774.41	16.25	48.653		
2,900.00	2,814.60	2,754.48	2,745.70	8.64	8.19	-172.93	-235.27	-65.16	828.61	811.78	16.83	49.238		
3,000.00	2,909.89	2,847.00	2,837.83	8.94	8.47	-172.92	-243.00	-68.67	866.57	849.16	17.41	49.784		
3,100.00	3,005.18	2,939.51	2,929.96	9.24	8.75	-172.91	-250.73	-72.19	904.52	886.54	17.98	50.295		
3,200.00	3,100.47	3,032.03	3,022.08	9.54	9.02	-172.90	-258.46	-75.70	942.48	923.92	18.56	50.775		
3,300.00	3,195.76	3,124.55	3,114.21	9.84	9.30	-172.89	-266.19	-79.22	980.43	961.29	19.14	51.225		
3,400.00	3,291.04	3,217.07	3,206.34	10.14	9.58	-172.89	-273.92	-82.73	1,018.39	998.67	19.72	51.650		
3,500.00	3,386.33	3,309.58	3,298.46	10.44	9.86	-172.88	-281.65	-86.25	1,056.34	1,036.05	20.29	52.050		
3,600.00	3,481.62	3,402.10	3,390.59	10.74	10.13	-172.87	-289.39	-89.76	1,094.30	1,073.43	20.87	52.428		
3,700.00	3,576.91	3,505.38	3,482.72	11.04	10.44	-172.87	-297.12	-93.28	1,132.25	1,110.77	21.48	52.706		
3,800.00	3,672.20	3,587.13	3,574.84	11.34	10.69	-172.86	-304.85	-96.79	1,170.21	1,148.18	22.03	53.124		
3,900.00	3,767.48	3,679.65	3,666.97	11.64	10.97	-172.86	-312.58	-100.31	1,208.16	1,185.56	22.61	53.446		
4,000.00	3,862.77	3,772.17	3,759.10	11.94	11.24	-172.85	-320.31	-103.82	1,246.12	1,222.93	23.18	53.751		
4,100.00	3,958.06	3,864.69	3,851.22	12.24	11.52	-172.85	-328.04	-107.34	1,284.07	1,260.31	23.76	54.042		
4,200.00	4,053.35	3,957.20	3,943.35	12.54	11.80	-172.84	-335.77	-110.85	1,322.03	1,297.69	24.34	54.319		
4,300.00	4,148.64	4,049.72	4,035.47	12.84	12.08	-172.84	-343.50	-114.37	1,359.98	1,335.07	24.92	54.583		
4,400.00	4,243.92	4,142.24	4,127.60	13.14	12.35	-172.83	-351.23	-117.88	1,397.94	1,372.44	25.49	54.835		
4,500.00	4,339.21	4,234.75	4,219.73	13.44	12.63	-172.83	-358.96	-121.40	1,435.89	1,409.82	26.07	55.076		
4,600.00	4,434.50	4,327.27	4,311.85	13.74	12.91	-172.83	-366.69	-124.91	1,473.85	1,447.20	26.65	55.306		
4,700.00	4,529.79	4,419.79	4,403.98	14.04	13.19	-172.82	-374.42	-128.43	1,511.80	1,484.58	27.23	55.527		
4,800.00	4,625.08	4,512.30	4,496.11	14.34	13.46	-172.82	-382.15	-131.94	1,549.76	1,521.95	27.80	55.739		
4,900.00	4,720.36	4,604.82	4,588.23	14.64	13.74	-172.82	-389.88	-135.46	1,587.71	1,559.33	28.38	55.942		
5,000.00	4,815.65	4,702.66	4,680.36	14.94	14.04	-172.81	-397.61	-138.97	1,625.67	1,596.69	28.98	56.106		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,789.86	4,772.49	15.24	14.30	-172.81	-405.34	-142.49	1,663.62	1,634.09	29.54	56.324	
5,200.00	5,006.23	4,882.37	4,864.61	15.54	14.57	-172.81	-413.07	-146.00	1,701.58	1,671.46	30.11	56.504	
5,300.00	5,101.52	4,974.89	4,956.74	15.84	14.85	-172.81	-420.80	-149.52	1,739.53	1,708.84	30.69	56.677	
5,400.00	5,196.80	5,067.41	5,048.87	16.14	15.13	-172.80	-428.53	-153.03	1,777.49	1,746.22	31.27	56.844	
5,500.00	5,292.09	5,159.92	5,140.99	16.44	15.41	-172.80	-436.27	-156.55	1,815.44	1,783.60	31.85	57.005	
5,600.00	5,387.38	5,252.44	5,233.12	16.74	15.68	-172.80	-444.00	-160.06	1,853.40	1,820.97	32.42	57.160	
5,700.00	5,482.67	5,344.96	5,325.25	17.04	15.96	-172.80	-451.73	-163.58	1,891.35	1,858.35	33.00	57.310	
5,800.00	5,577.96	5,437.48	5,417.37	17.34	16.24	-172.80	-459.46	-167.09	1,929.31	1,895.73	33.58	57.454	
5,900.00	5,673.24	5,529.99	5,509.50	17.64	16.52	-172.79	-467.19	-170.61	1,967.26	1,933.11	34.16	57.594	
6,000.00	5,768.53	5,622.51	5,601.62	17.94	16.80	-172.79	-474.92	-174.12	2,005.22	1,970.48	34.74	57.729	
6,100.00	5,863.82	5,715.03	5,693.75	18.24	17.07	-172.79	-482.65	-177.64	2,043.18	2,007.86	35.31	57.860	
6,200.00	5,959.11	5,807.54	5,785.88	18.54	17.35	-172.79	-490.38	-181.15	2,081.13	2,045.24	35.89	57.986	
6,300.00	6,054.40	5,900.06	5,878.00	18.84	17.63	-172.79	-498.11	-184.67	2,119.09	2,082.62	36.47	58.108	
6,400.00	6,149.68	6,007.42	5,970.13	19.14	17.95	-172.79	-505.84	-188.18	2,157.04	2,119.95	37.09	58.157	
6,500.00	6,244.97	6,085.09	6,062.26	19.44	18.18	-172.78	-513.57	-191.70	2,195.00	2,157.37	37.62	58.342	
6,600.00	6,340.26	6,177.61	6,154.38	19.74	18.46	-172.78	-521.30	-195.21	2,232.95	2,194.75	38.20	58.453	
6,689.41	6,425.45	6,260.33	6,236.75	20.01	18.71	-172.78	-528.21	-198.35	2,266.89	2,228.17	38.72	58.550	
6,700.00	6,435.54	6,270.13	6,246.51	20.04	18.74	-169.08	-529.03	-198.73	2,270.91	2,232.13	38.78	58.561	
6,750.00	6,482.96	6,316.28	6,292.47	20.19	18.88	-152.89	-532.89	-200.48	2,289.84	2,250.78	39.07	58.614	
6,800.00	6,529.78	6,362.02	6,338.01	20.34	19.01	-139.59	-536.71	-202.22	2,308.63	2,269.27	39.35	58.664	
6,850.00	6,575.63	6,406.98	6,382.78	20.49	19.15	-129.16	-540.47	-203.93	2,327.15	2,287.51	39.64	58.709	
6,900.00	6,620.18	6,455.23	6,430.77	20.64	19.29	-121.08	-544.49	-206.85	2,345.31	2,305.38	39.93	58.731	
6,950.00	6,663.07	6,506.61	6,481.42	20.79	19.45	-114.73	-548.71	-214.26	2,362.93	2,322.69	40.24	58.726	
7,000.00	6,704.00	6,559.99	6,533.12	20.94	19.61	-109.64	-553.00	-226.74	2,379.85	2,339.31	40.55	58.694	
7,050.00	6,742.63	6,615.63	6,585.53	21.09	19.78	-105.51	-557.33	-244.83	2,395.96	2,355.10	40.86	58.634	
7,100.00	6,778.69	6,673.77	6,638.17	21.24	19.95	-102.12	-561.64	-269.09	2,411.12	2,369.93	41.19	58.541	
7,150.00	6,811.89	6,734.64	6,690.35	21.39	20.13	-99.33	-565.89	-300.08	2,425.19	2,383.67	41.52	58.412	
7,200.00	6,841.98	6,798.40	6,741.19	21.54	20.33	-97.03	-569.99	-338.30	2,438.04	2,396.18	41.86	58.243	
7,250.00	6,868.74	6,865.14	6,789.51	21.69	20.53	-95.13	-573.84	-384.10	2,449.55	2,407.34	42.21	58.034	
7,300.00	6,891.96	6,934.81	6,833.95	21.84	20.74	-93.59	-577.34	-437.59	2,459.59	2,417.02	42.57	57.781	
7,350.00	6,911.46	7,007.20	6,872.92	21.99	20.95	-92.36	-580.34	-498.47	2,468.04	2,425.10	42.93	57.485	
7,400.00	6,927.10	7,081.93	6,904.80	22.14	21.18	-91.39	-582.71	-565.96	2,474.81	2,431.50	43.31	57.145	
7,450.00	6,938.75	7,158.41	6,928.08	22.29	21.41	-90.67	-584.33	-638.73	2,479.80	2,436.12	43.69	56.765	
7,500.00	6,946.33	7,235.88	6,941.62	22.44	21.64	-90.18	-585.13	-714.95	2,482.97	2,438.90	44.07	56.345	
7,550.00	6,949.78	7,308.20	6,944.99	22.59	21.86	-89.90	-585.08	-787.14	2,484.29	2,439.85	44.43	55.910	
7,568.05	6,950.00	7,326.24	6,944.98	22.65	21.91	-89.88	-585.00	-805.18	2,484.37	2,439.83	44.54	55.776	
7,600.00	6,949.92	7,358.20	6,944.96	22.74	22.01	-89.89	-584.85	-837.14	2,484.37	2,439.64	44.73	55.537	
7,700.00	6,949.66	7,458.20	6,944.90	23.04	22.31	-89.89	-584.39	-937.14	2,484.37	2,439.04	45.33	54.802	
7,800.00	6,949.40	7,558.19	6,944.84	23.35	22.61	-89.89	-583.92	-1,037.13	2,484.37	2,438.44	45.93	54.087	
7,900.00	6,949.14	7,658.19	6,944.78	23.65	22.91	-89.90	-583.46	-1,137.13	2,484.37	2,437.84	46.53	53.389	
8,000.00	6,948.88	7,758.19	6,944.71	23.95	23.21	-89.90	-583.00	-1,237.13	2,484.37	2,437.24	47.13	52.710	
8,100.00	6,948.62	7,858.19	6,944.65	24.25	23.51	-89.91	-582.54	-1,337.13	2,484.37	2,436.64	47.73	52.047	
8,200.00	6,948.36	7,958.19	6,944.59	24.55	23.82	-89.91	-582.08	-1,437.13	2,484.37	2,436.04	48.33	51.401	
8,300.00	6,948.11	8,058.19	6,944.53	24.85	24.12	-89.92	-581.62	-1,537.13	2,484.37	2,435.44	48.93	50.771	
8,400.00	6,947.85	8,158.19	6,944.47	25.15	24.42	-89.92	-581.15	-1,637.13	2,484.37	2,434.84	49.53	50.156	
8,500.00	6,947.59	8,258.19	6,944.40	25.45	24.72	-89.93	-580.69	-1,737.13	2,484.37	2,434.24	50.13	49.556	
8,600.00	6,947.33	8,358.19	6,944.34	25.75	25.02	-89.93	-580.23	-1,837.12	2,484.37	2,433.64	50.73	48.970	
8,700.00	6,947.07	8,458.19	6,944.28	26.05	25.32	-89.94	-579.77	-1,937.12	2,484.37	2,433.04	51.33	48.397	
8,800.00	6,946.81	8,558.19	6,944.22	26.35	25.62	-89.94	-579.31	-2,037.12	2,484.37	2,432.44	51.93	47.838	
8,900.00	6,946.55	8,658.19	6,944.15	26.65	25.92	-89.94	-578.85	-2,137.12	2,484.37	2,431.84	52.53	47.292	
9,000.00	6,946.29	8,758.19	6,944.09	26.95	26.22	-89.95	-578.38	-2,237.12	2,484.37	2,431.24	53.13	46.758	
9,100.00	6,946.03	8,858.19	6,944.03	27.25	26.52	-89.95	-577.92	-2,337.12	2,484.38	2,430.64	53.73	46.236	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,200.00	6,945.78	8,958.19	6,943.97	27.55	26.82	-89.96	-577.46	-2,437.12	2,484.38	2,430.04	54.33	45.725		
9,300.00	6,945.52	9,058.19	6,943.90	27.85	27.12	-89.96	-577.00	-2,537.12	2,484.38	2,429.44	54.93	45.226		
9,400.00	6,945.26	9,158.19	6,943.84	28.15	27.42	-89.97	-576.54	-2,637.11	2,484.38	2,428.84	55.53	44.737		
9,500.00	6,945.00	9,258.19	6,943.78	28.45	27.72	-89.97	-576.07	-2,737.11	2,484.38	2,428.24	56.13	44.259		
9,600.00	6,944.74	9,358.19	6,943.72	28.75	28.02	-89.98	-575.61	-2,837.11	2,484.38	2,427.64	56.73	43.791		
9,700.00	6,944.48	9,458.19	6,943.66	29.05	28.32	-89.98	-575.15	-2,937.11	2,484.38	2,427.04	57.33	43.333		
9,800.00	6,944.22	9,558.19	6,943.59	29.35	28.63	-89.99	-574.69	-3,037.11	2,484.38	2,426.45	57.93	42.884		
9,900.00	6,943.96	9,658.19	6,943.53	29.66	28.93	-89.99	-574.23	-3,137.11	2,484.38	2,425.85	58.53	42.445		
10,000.00	6,943.70	9,758.19	6,943.47	29.96	29.23	-89.99	-573.77	-3,237.11	2,484.38	2,425.25	59.13	42.014		
10,100.00	6,943.45	9,858.19	6,943.41	30.26	29.53	-90.00	-573.30	-3,337.11	2,484.38	2,424.65	59.73	41.592		
10,200.00	6,943.19	9,958.19	6,943.34	30.56	29.83	-90.00	-572.84	-3,437.10	2,484.38	2,424.05	60.33	41.178		
10,300.00	6,942.93	10,058.19	6,943.28	30.86	30.13	-90.01	-572.38	-3,537.10	2,484.38	2,423.45	60.93	40.773		
10,400.00	6,942.67	10,158.19	6,943.22	31.16	30.43	-90.01	-571.92	-3,637.10	2,484.38	2,422.85	61.53	40.375		
10,500.00	6,942.41	10,258.19	6,943.16	31.46	30.73	-90.02	-571.46	-3,737.10	2,484.38	2,422.25	62.13	39.986		
10,600.00	6,942.15	10,358.19	6,943.10	31.76	31.03	-90.02	-571.00	-3,837.10	2,484.38	2,421.65	62.73	39.603		
10,700.00	6,941.89	10,458.19	6,943.03	32.06	31.33	-90.03	-570.53	-3,937.10	2,484.38	2,421.05	63.33	39.228		
10,800.00	6,941.63	10,558.19	6,942.97	32.36	31.63	-90.03	-570.07	-4,037.10	2,484.38	2,420.45	63.93	38.860		
10,900.00	6,941.37	10,658.19	6,942.91	32.66	31.93	-90.04	-569.61	-4,137.10	2,484.38	2,419.85	64.53	38.499		
11,000.00	6,941.11	10,758.19	6,942.85	32.96	32.23	-90.04	-569.15	-4,237.09	2,484.38	2,419.25	65.13	38.144		
11,100.00	6,940.86	10,858.19	6,942.78	33.26	32.53	-90.04	-568.69	-4,337.09	2,484.38	2,418.65	65.73	37.796		
11,200.00	6,940.60	10,958.19	6,942.72	33.56	32.83	-90.05	-568.23	-4,437.09	2,484.38	2,418.05	66.33	37.454		
11,300.00	6,940.34	11,058.19	6,942.66	33.86	33.13	-90.05	-567.76	-4,537.09	2,484.38	2,417.45	66.93	37.118		
11,400.00	6,940.08	11,158.19	6,942.60	34.16	33.43	-90.06	-567.30	-4,637.09	2,484.39	2,416.85	67.53	36.789		
11,500.00	6,939.82	11,258.19	6,942.54	34.46	33.73	-90.06	-566.84	-4,737.09	2,484.39	2,416.25	68.13	36.465		
11,600.00	6,939.56	11,358.19	6,942.47	34.76	34.03	-90.07	-566.38	-4,837.09	2,484.39	2,415.65	68.73	36.146		
11,700.00	6,939.30	11,458.19	6,942.41	35.06	34.33	-90.07	-565.92	-4,937.08	2,484.39	2,415.06	69.33	35.834		
11,800.00	6,939.04	11,558.19	6,942.35	35.36	34.63	-90.08	-565.45	-5,037.08	2,484.39	2,414.46	69.93	35.526		
11,900.00	6,938.78	11,658.19	6,942.29	35.66	34.93	-90.08	-564.99	-5,137.08	2,484.39	2,413.86	70.53	35.224		
12,000.00	6,938.53	11,758.19	6,942.22	35.96	35.23	-90.09	-564.53	-5,237.08	2,484.39	2,413.26	71.13	34.927		
12,100.00	6,938.27	11,858.19	6,942.16	36.26	35.54	-90.09	-564.07	-5,337.08	2,484.39	2,412.66	71.73	34.635		
12,200.00	6,938.01	11,958.19	6,942.10	36.56	35.84	-90.09	-563.61	-5,437.08	2,484.39	2,412.06	72.33	34.347		
12,300.00	6,937.75	12,058.19	6,942.04	36.86	36.14	-90.10	-563.15	-5,537.08	2,484.39	2,411.46	72.93	34.065		
12,400.00	6,937.49	12,158.19	6,941.97	37.16	36.44	-90.10	-562.68	-5,637.08	2,484.39	2,410.86	73.53	33.787		
12,500.00	6,937.23	12,258.19	6,941.91	37.46	36.74	-90.11	-562.22	-5,737.07	2,484.39	2,410.26	74.13	33.513		
12,600.00	6,936.97	12,358.19	6,941.85	37.77	37.04	-90.11	-561.76	-5,837.07	2,484.39	2,409.66	74.73	33.244		
12,700.00	6,936.71	12,458.19	6,941.79	38.07	37.34	-90.12	-561.30	-5,937.07	2,484.39	2,409.06	75.33	32.980		
12,800.00	6,936.45	12,558.19	6,941.73	38.37	37.64	-90.12	-560.84	-6,037.07	2,484.40	2,408.46	75.93	32.719		
12,900.00	6,936.20	12,658.19	6,941.66	38.67	37.94	-90.13	-560.38	-6,137.07	2,484.40	2,407.86	76.53	32.463		
13,000.00	6,935.94	12,758.19	6,941.60	38.97	38.24	-90.13	-559.91	-6,237.07	2,484.40	2,407.27	77.13	32.210		
13,100.00	6,935.68	12,858.19	6,941.54	39.27	38.54	-90.14	-559.45	-6,337.07	2,484.40	2,406.67	77.73	31.961		
13,200.00	6,935.42	12,958.19	6,941.48	39.57	38.84	-90.14	-558.99	-6,437.07	2,484.40	2,406.07	78.33	31.717		
13,300.00	6,935.16	13,058.19	6,941.41	39.87	39.14	-90.14	-558.53	-6,537.06	2,484.40	2,405.47	78.93	31.476		
13,400.00	6,934.90	13,158.19	6,941.35	40.17	39.44	-90.15	-558.07	-6,637.06	2,484.40	2,404.87	79.53	31.238		
13,500.00	6,934.64	13,258.19	6,941.29	40.47	39.74	-90.15	-557.61	-6,737.06	2,484.40	2,404.27	80.13	31.004		
13,600.00	6,934.38	13,358.19	6,941.23	40.77	40.04	-90.16	-557.14	-6,837.06	2,484.40	2,403.67	80.73	30.774		
13,700.00	6,934.12	13,458.19	6,941.17	41.07	40.34	-90.16	-556.68	-6,937.06	2,484.40	2,403.07	81.33	30.547		
13,800.00	6,933.87	13,558.19	6,941.10	41.37	40.64	-90.17	-556.22	-7,037.06	2,484.40	2,402.47	81.93	30.323		
13,900.00	6,933.61	13,658.19	6,941.04	41.67	40.94	-90.17	-555.76	-7,137.06	2,484.41	2,401.87	82.53	30.103		
14,000.00	6,933.35	13,758.19	6,940.98	41.97	41.24	-90.18	-555.30	-7,237.06	2,484.41	2,401.28	83.13	29.886		
14,100.00	6,933.09	13,858.19	6,940.92	42.27	41.54	-90.18	-554.84	-7,337.05	2,484.41	2,400.68	83.73	29.671		
14,200.00	6,932.83	13,958.19	6,940.85	42.57	41.84	-90.19	-554.37	-7,437.05	2,484.41	2,400.08	84.33	29.460		
14,300.00	6,932.57	14,058.19	6,940.79	42.87	42.14	-90.19	-553.91	-7,537.05	2,484.41	2,399.48	84.93	29.252		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #720H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,400.00	6,932.31	14,158.18	6,940.73	43.17	42.44	-90.19	-553.45	-7,637.05	2,484.41	2,398.88	85.53	29.047		
14,500.00	6,932.05	14,258.18	6,940.67	43.47	42.74	-90.20	-552.99	-7,737.05	2,484.41	2,398.28	86.13	28.845		
14,600.00	6,931.79	14,358.18	6,940.61	43.77	43.04	-90.20	-552.53	-7,837.05	2,484.41	2,397.68	86.73	28.645		
14,700.00	6,931.54	14,458.18	6,940.54	44.07	43.34	-90.21	-552.06	-7,937.05	2,484.41	2,397.08	87.33	28.448		
14,800.00	6,931.28	14,558.18	6,940.48	44.37	43.64	-90.21	-551.60	-8,037.05	2,484.41	2,396.48	87.93	28.254		
14,900.00	6,931.02	14,658.18	6,940.42	44.67	43.94	-90.22	-551.14	-8,137.04	2,484.42	2,395.89	88.53	28.063		
15,000.00	6,930.76	14,758.18	6,940.36	44.97	44.24	-90.22	-550.68	-8,237.04	2,484.42	2,395.29	89.13	27.874		
15,100.00	6,930.50	14,858.18	6,940.29	45.27	44.54	-90.23	-550.22	-8,337.04	2,484.42	2,394.69	89.73	27.688		
15,200.00	6,930.24	14,958.18	6,940.23	45.57	44.84	-90.23	-549.76	-8,437.04	2,484.42	2,394.09	90.33	27.504		
15,300.00	6,929.98	15,058.18	6,940.17	45.87	45.14	-90.23	-549.29	-8,537.04	2,484.42	2,393.49	90.93	27.322		
15,400.00	6,929.72	15,158.18	6,940.11	46.17	45.44	-90.24	-548.83	-8,637.04	2,484.42	2,392.89	91.53	27.143		
15,500.00	6,929.46	15,258.18	6,940.05	46.47	45.74	-90.24	-548.37	-8,737.04	2,484.42	2,392.29	92.13	26.966		
15,500.14	6,929.46	15,258.32	6,940.04	46.47	45.74	-90.24	-548.37	-8,737.18	2,484.42	2,392.29	92.13	26.966		
15,600.00	6,929.21	15,330.32	6,940.00	46.77	45.96	-90.25	-548.04	-8,809.17	2,484.58	2,391.93	92.65	26.818		
15,700.00	6,928.95	15,330.32	6,940.00	47.07	45.96	-90.25	-548.04	-8,809.17	2,487.71	2,394.77	92.95	26.765		
15,800.00	6,928.69	15,330.32	6,940.00	47.37	45.96	-90.25	-548.04	-8,809.17	2,494.85	2,401.61	93.25	26.755		
15,900.00	6,928.43	15,330.32	6,940.00	47.67	45.96	-90.25	-548.04	-8,809.17	2,505.97	2,412.42	93.55	26.787		
16,000.00	6,928.17	15,330.32	6,940.00	47.97	45.96	-90.25	-548.04	-8,809.17	2,521.00	2,427.15	93.85	26.862		
16,100.00	6,927.91	15,330.32	6,940.00	48.27	45.96	-90.25	-548.04	-8,809.17	2,539.89	2,445.73	94.15	26.976		
16,200.00	6,927.65	15,330.32	6,940.00	48.57	45.96	-90.25	-548.04	-8,809.17	2,562.54	2,468.08	94.46	27.130		
16,300.00	6,927.39	15,330.32	6,940.00	48.87	45.96	-90.25	-548.04	-8,809.17	2,588.86	2,494.10	94.76	27.321		
16,400.00	6,927.13	15,330.32	6,940.00	49.17	45.96	-90.25	-548.04	-8,809.17	2,618.73	2,523.67	95.06	27.548		
16,500.00	6,926.88	15,330.32	6,940.00	49.47	45.96	-90.25	-548.04	-8,809.17	2,652.05	2,556.68	95.36	27.810		
16,600.00	6,926.62	15,330.32	6,940.00	49.77	45.96	-90.25	-548.04	-8,809.17	2,688.67	2,593.00	95.66	28.105		
16,700.00	6,926.36	15,330.32	6,940.00	50.07	45.96	-90.25	-548.04	-8,809.17	2,728.46	2,632.50	95.97	28.431		
16,800.00	6,926.10	15,330.32	6,940.00	50.37	45.96	-90.25	-548.04	-8,809.17	2,771.30	2,675.03	96.27	28.787		
16,900.00	6,925.84	15,330.32	6,940.00	50.67	45.96	-90.25	-548.04	-8,809.17	2,817.03	2,720.46	96.57	29.170		
17,000.00	6,925.58	15,330.32	6,940.00	50.97	45.96	-90.25	-548.04	-8,809.17	2,865.53	2,768.65	96.88	29.580		
17,100.00	6,925.32	15,330.32	6,940.00	51.27	45.96	-90.25	-548.04	-8,809.17	2,916.65	2,819.47	97.18	30.014		
17,200.00	6,925.06	15,330.32	6,940.00	51.58	45.96	-90.25	-548.04	-8,809.17	2,970.25	2,872.77	97.48	30.470		
17,224.45	6,925.00	15,330.32	6,940.00	51.65	45.96	-90.25	-548.04	-8,809.17	2,983.72	2,886.17	97.55	30.585		
17,224.92	6,925.00	15,330.32	6,940.00	51.65	45.96	-90.25	-548.04	-8,809.17	2,983.99	2,886.43	97.56	30.588		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #722H - OH - Prelim #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	165.01	-72.08	19.30	74.62				
100.00	100.00	100.00	100.00	0.23	0.23	165.01	-72.08	19.30	74.62	74.17	0.45	164.725	
200.00	200.00	200.00	200.00	0.53	0.53	165.01	-72.08	19.30	74.62	73.57	1.05	70.865	
300.00	300.00	300.00	300.00	0.83	0.83	165.01	-72.08	19.30	74.62	72.97	1.65	45.143	
400.00	400.00	400.00	400.00	1.13	1.13	165.01	-72.08	19.30	74.62	72.37	2.25	33.121	
500.00	500.00	500.00	500.00	1.43	1.43	165.01	-72.08	19.30	74.62	71.77	2.85	26.155 CC, ES	
600.00	599.98	597.55	597.53	1.73	1.72	172.92	-73.73	19.06	77.92	74.47	3.45	22.614	
700.00	699.84	694.42	694.27	2.03	2.01	174.55	-78.61	18.36	87.85	83.81	4.04	21.763 SF	
800.00	799.45	789.95	789.46	2.33	2.30	176.57	-86.60	17.21	104.43	99.81	4.62	22.586	
900.00	898.70	883.53	882.39	2.63	2.58	178.51	-97.46	15.66	127.62	122.42	5.21	24.519	
1,000.00	997.47	974.59	972.42	2.93	2.85	-179.84	-110.91	13.73	157.28	151.50	5.78	27.215	
1,100.00	1,095.62	1,062.62	1,059.01	3.23	3.12	-178.51	-126.59	11.48	193.19	186.84	6.34	30.450	
1,200.00	1,193.06	1,147.19	1,141.70	3.53	3.37	-177.45	-144.14	8.96	235.08	228.18	6.90	34.071	
1,300.00	1,289.64	1,227.96	1,220.15	3.83	3.61	-176.61	-163.14	6.23	282.66	275.21	7.44	37.973	
1,382.94	1,369.03	1,291.85	1,281.80	4.08	3.81	-176.03	-179.72	3.86	326.20	318.32	7.89	41.369	
1,400.00	1,385.28	1,304.66	1,294.12	4.13	3.84	-175.94	-183.21	3.36	335.56	327.58	7.97	42.077	
1,500.00	1,480.57	1,386.28	1,372.44	4.43	4.09	-175.43	-205.94	0.10	390.95	382.43	8.52	45.883	
1,600.00	1,575.86	1,469.46	1,452.26	4.73	4.34	-175.03	-229.15	-3.23	446.40	437.32	9.07	49.212	
1,700.00	1,671.15	1,552.65	1,532.07	5.03	4.59	-174.72	-252.35	-6.56	501.85	492.23	9.62	52.161	
1,800.00	1,766.44	1,635.84	1,611.89	5.33	4.84	-174.48	-275.55	-9.89	557.32	547.14	10.17	54.792	
1,900.00	1,861.72	1,719.03	1,691.71	5.63	5.09	-174.27	-298.76	-13.22	612.79	602.06	10.72	57.154	
2,000.00	1,957.01	1,802.21	1,771.52	5.93	5.34	-174.10	-321.96	-16.55	668.26	656.99	11.27	59.287	
2,100.00	2,052.30	1,885.40	1,851.34	6.23	5.59	-173.96	-345.16	-19.87	723.74	711.92	11.82	61.221	
2,200.00	2,147.59	1,968.59	1,931.16	6.53	5.84	-173.84	-368.36	-23.20	779.22	766.85	12.37	62.984	
2,300.00	2,242.88	2,051.77	2,010.97	6.83	6.09	-173.73	-391.57	-26.53	834.70	821.78	12.92	64.597	
2,400.00	2,338.16	2,134.96	2,090.79	7.13	6.34	-173.64	-414.77	-29.86	890.19	876.72	13.47	66.078	
2,500.00	2,433.45	2,218.15	2,170.60	7.44	6.59	-173.56	-437.97	-33.19	945.67	931.65	14.02	67.444	
2,600.00	2,528.74	2,301.34	2,250.42	7.74	6.84	-173.48	-461.17	-36.51	1,001.16	986.59	14.57	68.707	
2,700.00	2,624.03	2,384.52	2,330.24	8.04	7.09	-173.42	-484.38	-39.84	1,056.65	1,041.53	15.12	69.878	
2,800.00	2,719.32	2,467.71	2,410.05	8.34	7.34	-173.36	-507.58	-43.17	1,112.14	1,096.47	15.67	70.967	
2,900.00	2,814.60	2,550.90	2,489.87	8.64	7.59	-173.31	-530.78	-46.50	1,167.63	1,151.41	16.22	71.983	
3,000.00	2,909.89	2,634.08	2,569.69	8.94	7.84	-173.26	-553.99	-49.83	1,223.12	1,206.35	16.77	72.932	
3,100.00	3,005.18	2,717.27	2,649.50	9.24	8.09	-173.21	-577.19	-53.15	1,278.61	1,261.29	17.32	73.820	
3,200.00	3,100.47	2,800.46	2,729.32	9.54	8.34	-173.17	-600.39	-56.48	1,334.10	1,316.23	17.87	74.655	
3,300.00	3,195.76	2,883.65	2,809.14	9.84	8.59	-173.14	-623.59	-59.81	1,389.59	1,371.17	18.42	75.439	
3,400.00	3,291.04	2,966.83	2,888.95	10.14	8.84	-173.10	-646.80	-63.14	1,445.08	1,426.11	18.97	76.178	
3,500.00	3,386.33	3,050.02	2,968.77	10.44	9.08	-173.07	-670.00	-66.47	1,500.58	1,481.06	19.52	76.876	
3,600.00	3,481.62	3,133.21	3,048.59	10.74	9.33	-173.04	-693.20	-69.79	1,556.07	1,536.00	20.07	77.535	
3,700.00	3,576.91	3,216.40	3,128.40	11.04	9.58	-173.01	-716.40	-73.12	1,611.56	1,590.94	20.62	78.159	
3,800.00	3,672.20	3,300.42	3,208.22	11.34	9.84	-172.99	-739.61	-76.45	1,667.06	1,645.88	21.17	78.742	
3,900.00	3,767.48	3,382.77	3,288.03	11.64	10.08	-172.96	-762.81	-79.78	1,722.55	1,700.83	21.72	79.313	
4,000.00	3,862.77	3,465.96	3,367.85	11.94	10.33	-172.94	-786.01	-83.11	1,778.04	1,755.77	22.27	79.847	
4,100.00	3,958.06	3,549.14	3,447.67	12.24	10.58	-172.92	-809.22	-86.43	1,833.54	1,810.72	22.82	80.356	
4,200.00	4,053.35	3,632.33	3,527.48	12.54	10.83	-172.90	-832.42	-89.76	1,889.03	1,865.66	23.37	80.840	
4,300.00	4,148.64	3,715.52	3,607.30	12.84	11.08	-172.88	-855.62	-93.09	1,944.53	1,920.61	23.92	81.303	
4,400.00	4,243.92	3,801.29	3,687.12	13.14	11.34	-172.86	-878.82	-96.42	2,000.02	1,975.55	24.47	81.718	
4,500.00	4,339.21	3,881.89	3,766.93	13.44	11.58	-172.84	-902.03	-99.75	2,055.51	2,030.50	25.02	82.166	
4,600.00	4,434.50	3,965.08	3,846.75	13.74	11.83	-172.83	-925.23	-103.08	2,111.01	2,085.44	25.57	82.570	
4,700.00	4,529.79	4,048.27	3,926.57	14.04	12.08	-172.81	-948.43	-106.40	2,166.50	2,140.39	26.12	82.957	
4,800.00	4,625.08	4,131.45	4,006.38	14.34	12.33	-172.80	-971.64	-109.73	2,222.00	2,195.33	26.67	83.329	
4,900.00	4,720.36	4,214.64	4,086.20	14.64	12.58	-172.79	-994.84	-113.06	2,277.49	2,250.28	27.22	83.685	
5,000.00	4,815.65	4,297.83	4,166.02	14.94	12.83	-172.77	-1,018.04	-116.39	2,332.99	2,305.22	27.76	84.027	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,381.02	4,245.83	15.24	13.08	-172.76	-1,041.24	-119.72	2,388.48	2,360.17	28.31	84.356	
5,200.00	5,006.23	4,464.20	4,325.65	15.54	13.33	-172.75	-1,064.45	-123.04	2,443.98	2,415.11	28.86	84.672	
5,300.00	5,101.52	4,547.39	4,405.47	15.84	13.58	-172.74	-1,087.65	-126.37	2,499.47	2,470.06	29.41	84.977	
5,400.00	5,196.80	4,630.58	4,485.28	16.14	13.83	-172.73	-1,110.85	-129.70	2,554.97	2,525.01	29.96	85.270	
5,500.00	5,292.09	4,713.76	4,565.10	16.44	14.08	-172.72	-1,134.05	-133.03	2,610.46	2,579.95	30.51	85.553	
5,600.00	5,387.38	4,803.05	4,644.91	16.74	14.35	-172.71	-1,157.26	-136.36	2,665.96	2,634.88	31.08	85.775	
5,700.00	5,482.67	4,880.14	4,724.73	17.04	14.58	-172.70	-1,180.46	-139.68	2,721.46	2,689.84	31.61	86.089	
5,800.00	5,577.96	4,963.33	4,804.55	17.34	14.83	-172.69	-1,203.66	-143.01	2,776.95	2,744.79	32.16	86.343	
5,900.00	5,673.24	5,046.51	4,884.36	17.64	15.08	-172.68	-1,226.87	-146.34	2,832.45	2,799.74	32.71	86.589	
6,000.00	5,768.53	5,129.70	4,964.18	17.94	15.33	-172.67	-1,250.07	-149.67	2,887.94	2,854.68	33.26	86.826	
6,100.00	5,863.82	5,212.89	5,044.00	18.24	15.57	-172.66	-1,273.27	-153.00	2,943.44	2,909.63	33.81	87.056	
6,200.00	5,959.11	5,296.08	5,123.81	18.54	15.82	-172.65	-1,296.47	-156.32	2,998.93	2,964.57	34.36	87.279	
6,300.00	6,054.40	5,379.26	5,203.63	18.84	16.07	-172.65	-1,319.68	-159.65	3,054.43	3,019.52	34.91	87.495	
6,400.00	6,149.68	5,462.45	5,283.45	19.14	16.32	-172.64	-1,342.88	-162.98	3,109.93	3,074.47	35.46	87.703	
6,500.00	6,244.97	5,545.64	5,363.26	19.44	16.57	-172.63	-1,366.08	-166.31	3,165.42	3,129.41	36.01	87.906	
6,600.00	6,340.26	5,628.82	5,443.08	19.74	16.82	-172.63	-1,389.28	-169.64	3,220.92	3,184.36	36.56	88.102	
6,689.41	6,425.45	5,703.20	5,514.44	20.01	17.05	-172.62	-1,410.03	-172.61	3,270.53	3,233.48	37.05	88.273	
6,700.00	6,435.54	5,712.01	5,522.90	20.04	17.07	-168.64	-1,412.49	-172.96	3,276.41	3,239.30	37.11	88.293	
6,750.00	6,482.96	5,753.53	5,562.73	20.19	17.20	-151.16	-1,424.07	-174.63	3,304.09	3,266.71	37.38	88.385	
6,800.00	6,529.78	5,805.32	5,602.22	20.34	17.35	-136.57	-1,435.55	-176.27	3,331.52	3,293.83	37.69	88.398	
6,850.00	6,575.63	5,835.17	5,641.06	20.49	17.44	-124.88	-1,446.84	-177.89	3,358.51	3,320.59	37.93	88.552	
6,900.00	6,620.18	5,874.67	5,678.96	20.64	17.56	-115.58	-1,457.86	-179.47	3,384.91	3,346.72	38.20	88.622	
6,950.00	6,663.07	5,912.89	5,715.63	20.79	17.68	-108.11	-1,468.52	-181.00	3,410.57	3,372.11	38.46	88.680	
7,000.00	6,704.00	5,949.53	5,750.79	20.94	17.79	-102.00	-1,478.74	-182.47	3,435.35	3,396.64	38.72	88.727	
7,050.00	6,742.63	5,984.33	5,784.18	21.09	17.89	-96.94	-1,488.44	-183.86	3,459.15	3,420.18	38.97	88.760	
7,100.00	6,778.69	6,017.00	5,815.53	21.24	17.99	-92.71	-1,497.56	-185.17	3,481.87	3,442.65	39.22	88.780	
7,150.00	6,811.89	6,047.32	5,844.61	21.39	18.08	-89.12	-1,506.01	-186.38	3,503.41	3,463.96	39.46	88.786	
7,200.00	6,841.98	6,075.03	5,871.21	21.54	18.16	-86.07	-1,513.74	-187.49	3,523.71	3,484.02	39.69	88.778	
7,250.00	6,868.74	6,100.06	5,895.11	21.69	18.24	-83.46	-1,520.69	-188.48	3,542.69	3,502.77	39.92	88.755	
7,300.00	6,891.96	6,121.85	5,916.13	21.84	18.30	-81.24	-1,526.80	-189.36	3,560.29	3,520.16	40.13	88.720	
7,350.00	6,911.46	6,140.60	5,934.12	21.99	18.36	-79.34	-1,532.03	-190.11	3,576.45	3,536.11	40.33	88.670	
7,400.00	6,927.10	6,156.04	5,948.94	22.14	18.40	-77.73	-1,536.34	-190.73	3,591.12	3,550.59	40.53	88.605	
7,450.00	6,938.75	6,168.06	5,960.47	22.29	18.44	-76.38	-1,539.69	-191.21	3,604.26	3,563.55	40.71	88.525	
7,500.00	6,946.33	6,176.57	5,968.63	22.44	18.47	-75.28	-1,542.06	-191.55	3,615.82	3,574.93	40.89	88.430	
7,550.00	6,949.78	6,181.49	5,973.35	22.59	18.48	-74.40	-1,543.44	-191.75	3,625.74	3,584.68	41.05	88.320	
7,568.05	6,950.00	6,182.38	5,974.21	22.65	18.48	-74.14	-1,543.68	-191.78	3,628.90	3,587.80	41.11	88.275	
7,600.00	6,949.92	6,183.54	5,975.32	22.74	18.49	-74.16	-1,544.01	-191.83	3,634.46	3,593.25	41.21	88.196	
7,700.00	6,949.66	6,187.16	5,978.79	23.04	18.50	-74.22	-1,545.02	-191.97	3,653.59	3,612.07	41.52	87.994	
7,800.00	6,949.40	6,209.22	5,982.27	23.35	18.56	-74.27	-1,546.03	-192.12	3,675.34	3,633.45	41.89	87.742	
7,900.00	6,949.14	6,205.59	5,985.75	23.65	18.55	-74.33	-1,547.04	-192.26	3,699.66	3,657.49	42.18	87.716	
8,000.00	6,948.88	7,975.21	6,940.00	23.95	23.87	-89.86	-1,819.77	-1,242.85	3,721.17	3,673.38	47.79	77.868	
8,100.00	6,948.62	8,075.21	6,940.00	24.25	24.17	-89.87	-1,819.31	-1,342.85	3,721.16	3,672.78	48.39	76.902	
8,200.00	6,948.36	8,175.21	6,940.00	24.55	24.47	-89.87	-1,818.85	-1,442.85	3,721.16	3,672.18	48.99	75.961	
8,300.00	6,948.11	8,275.21	6,940.00	24.85	24.77	-89.88	-1,818.39	-1,542.85	3,721.16	3,671.58	49.59	75.042	
8,400.00	6,947.85	8,375.21	6,940.00	25.15	25.07	-89.88	-1,817.92	-1,642.85	3,721.16	3,670.98	50.19	74.145	
8,500.00	6,947.59	8,475.21	6,940.00	25.45	25.37	-89.88	-1,817.46	-1,742.84	3,721.16	3,670.38	50.79	73.269	
8,600.00	6,947.33	8,575.21	6,940.00	25.75	25.67	-89.89	-1,817.00	-1,842.84	3,721.16	3,669.78	51.39	72.414	
8,700.00	6,947.07	8,675.20	6,940.00	26.05	25.97	-89.89	-1,816.54	-1,942.84	3,721.16	3,669.18	51.99	71.578	
8,800.00	6,946.81	8,775.20	6,940.00	26.35	26.28	-89.90	-1,816.08	-2,042.84	3,721.16	3,668.58	52.59	70.761	
8,900.00	6,946.55	8,875.20	6,940.00	26.65	26.58	-89.90	-1,815.62	-2,142.84	3,721.16	3,667.97	53.19	69.963	
9,000.00	6,946.29	8,975.20	6,940.00	26.95	26.88	-89.90	-1,815.15	-2,242.84	3,721.16	3,667.37	53.79	69.183	
9,100.00	6,946.03	9,075.20	6,940.00	27.25	27.18	-89.91	-1,814.69	-2,342.84	3,721.16	3,666.77	54.39	68.420	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	9,175.20	6,940.00	27.55	27.48	-89.91	-1,814.23	-2,442.84	3,721.16	3,666.17	54.99	67.673	
9,300.00	6,945.52	9,275.20	6,940.00	27.85	27.78	-89.92	-1,813.77	-2,542.83	3,721.16	3,665.57	55.59	66.943	
9,400.00	6,945.26	9,375.20	6,940.00	28.15	28.08	-89.92	-1,813.31	-2,642.83	3,721.16	3,664.97	56.19	66.228	
9,500.00	6,945.00	9,475.20	6,940.00	28.45	28.38	-89.92	-1,812.84	-2,742.83	3,721.16	3,664.37	56.79	65.529	
9,600.00	6,944.74	9,575.20	6,940.00	28.75	28.68	-89.93	-1,812.38	-2,842.83	3,721.16	3,663.77	57.39	64.844	
9,700.00	6,944.48	9,675.20	6,940.00	29.05	28.98	-89.93	-1,811.92	-2,942.83	3,721.16	3,663.17	57.99	64.173	
9,800.00	6,944.22	9,775.20	6,940.00	29.35	29.28	-89.94	-1,811.46	-3,042.83	3,721.16	3,662.57	58.59	63.516	
9,900.00	6,943.96	9,875.20	6,940.00	29.66	29.58	-89.94	-1,811.00	-3,142.83	3,721.16	3,661.97	59.19	62.872	
10,000.00	6,943.70	9,975.20	6,940.00	29.96	29.88	-89.94	-1,810.53	-3,242.82	3,721.16	3,661.37	59.79	62.241	
10,100.00	6,943.45	10,075.20	6,940.00	30.26	30.18	-89.95	-1,810.07	-3,342.82	3,721.16	3,660.77	60.39	61.623	
10,114.61	6,943.41	10,089.81	6,940.00	30.30	30.23	-89.95	-1,810.00	-3,357.43	3,721.16	3,660.69	60.47	61.533	
10,200.00	6,943.19	10,175.20	6,940.00	30.56	30.48	-89.95	-1,809.61	-3,442.82	3,721.16	3,660.17	60.99	61.016	
10,300.00	6,942.93	10,275.20	6,940.00	30.86	30.78	-89.95	-1,809.15	-3,542.82	3,721.16	3,659.57	61.59	60.422	
10,400.00	6,942.67	10,375.20	6,940.00	31.16	31.08	-89.96	-1,808.69	-3,642.82	3,721.16	3,658.98	62.19	59.839	
10,500.00	6,942.41	10,475.20	6,940.00	31.46	31.38	-89.96	-1,808.22	-3,742.82	3,721.16	3,658.38	62.79	59.267	
10,600.00	6,942.15	10,575.20	6,940.00	31.76	31.68	-89.97	-1,807.76	-3,842.82	3,721.16	3,657.78	63.39	58.706	
10,700.00	6,941.89	10,675.20	6,940.00	32.06	31.98	-89.97	-1,807.30	-3,942.81	3,721.16	3,657.18	63.99	58.156	
10,800.00	6,941.63	10,775.20	6,940.00	32.36	32.28	-89.97	-1,806.84	-4,042.81	3,721.16	3,656.58	64.59	57.616	
10,900.00	6,941.37	10,875.20	6,940.00	32.66	32.58	-89.98	-1,806.38	-4,142.81	3,721.16	3,655.98	65.19	57.086	
11,000.00	6,941.11	10,975.20	6,940.00	32.96	32.88	-89.98	-1,805.92	-4,242.81	3,721.16	3,655.38	65.79	56.565	
11,100.00	6,940.86	11,075.20	6,940.00	33.26	33.19	-89.99	-1,805.45	-4,342.81	3,721.16	3,654.78	66.39	56.054	
11,200.00	6,940.60	11,175.20	6,940.00	33.56	33.49	-89.99	-1,804.99	-4,442.81	3,721.16	3,654.18	66.99	55.552	
11,300.00	6,940.34	11,275.20	6,940.00	33.86	33.79	-89.99	-1,804.53	-4,542.81	3,721.16	3,653.58	67.59	55.059	
11,400.00	6,940.08	11,375.20	6,940.00	34.16	34.09	-90.00	-1,804.07	-4,642.80	3,721.16	3,652.98	68.19	54.574	
11,500.00	6,939.82	11,475.20	6,940.00	34.46	34.39	-90.00	-1,803.61	-4,742.80	3,721.16	3,652.38	68.79	54.098	
11,600.00	6,939.56	11,575.20	6,940.00	34.76	34.69	-90.01	-1,803.14	-4,842.80	3,721.16	3,651.78	69.39	53.630	
11,700.00	6,939.30	11,675.19	6,940.00	35.06	34.99	-90.01	-1,802.68	-4,942.80	3,721.16	3,651.18	69.99	53.171	
11,800.00	6,939.04	11,775.19	6,940.00	35.36	35.29	-90.01	-1,802.22	-5,042.80	3,721.16	3,650.58	70.59	52.719	
11,900.00	6,938.78	11,875.19	6,940.00	35.66	35.59	-90.02	-1,801.76	-5,142.80	3,721.16	3,649.98	71.19	52.274	
12,000.00	6,938.53	11,975.19	6,940.00	35.96	35.89	-90.02	-1,801.30	-5,242.80	3,721.16	3,649.38	71.79	51.838	
12,100.00	6,938.27	12,075.19	6,940.00	36.26	36.19	-90.03	-1,800.83	-5,342.79	3,721.16	3,648.78	72.38	51.408	
12,200.00	6,938.01	12,175.19	6,940.00	36.56	36.49	-90.03	-1,800.37	-5,442.79	3,721.16	3,648.18	72.98	50.985	
12,300.00	6,937.75	12,275.19	6,940.00	36.86	36.79	-90.03	-1,799.91	-5,542.79	3,721.17	3,647.58	73.58	50.570	
12,400.00	6,937.49	12,375.19	6,940.00	37.16	37.09	-90.04	-1,799.45	-5,642.79	3,721.17	3,646.98	74.18	50.161	
12,500.00	6,937.23	12,475.19	6,940.00	37.46	37.39	-90.04	-1,798.99	-5,742.79	3,721.17	3,646.38	74.78	49.758	
12,600.00	6,936.97	12,575.19	6,940.00	37.77	37.69	-90.05	-1,798.52	-5,842.79	3,721.17	3,645.78	75.38	49.362	
12,700.00	6,936.71	12,675.19	6,940.00	38.07	37.99	-90.05	-1,798.06	-5,942.79	3,721.17	3,645.18	75.98	48.973	
12,800.00	6,936.45	12,775.19	6,940.00	38.37	38.29	-90.05	-1,797.60	-6,042.78	3,721.17	3,644.58	76.58	48.589	
12,900.00	6,936.20	12,875.19	6,940.00	38.67	38.59	-90.06	-1,797.14	-6,142.78	3,721.17	3,643.98	77.18	48.211	
13,000.00	6,935.94	12,975.19	6,940.00	38.97	38.89	-90.06	-1,796.68	-6,242.78	3,721.17	3,643.38	77.78	47.839	
13,100.00	6,935.68	13,075.19	6,940.00	39.27	39.19	-90.07	-1,796.21	-6,342.78	3,721.17	3,642.78	78.38	47.473	
13,200.00	6,935.42	13,175.19	6,940.00	39.57	39.49	-90.07	-1,795.75	-6,442.78	3,721.17	3,642.19	78.98	47.113	
13,300.00	6,935.16	13,275.19	6,940.00	39.87	39.79	-90.07	-1,795.29	-6,542.78	3,721.17	3,641.59	79.58	46.758	
13,400.00	6,934.90	13,375.19	6,940.00	40.17	40.09	-90.08	-1,794.83	-6,642.78	3,721.17	3,640.99	80.18	46.408	
13,500.00	6,934.64	13,475.19	6,940.00	40.47	40.39	-90.08	-1,794.37	-6,742.77	3,721.17	3,640.39	80.78	46.063	
13,600.00	6,934.38	13,575.19	6,940.00	40.77	40.69	-90.09	-1,793.91	-6,842.77	3,721.17	3,639.79	81.38	45.723	
13,700.00	6,934.12	13,675.19	6,940.00	41.07	40.99	-90.09	-1,793.44	-6,942.77	3,721.17	3,639.19	81.98	45.389	
13,800.00	6,933.87	13,775.19	6,940.00	41.37	41.29	-90.09	-1,792.98	-7,042.77	3,721.17	3,638.59	82.58	45.059	
13,900.00	6,933.61	13,875.19	6,940.00	41.67	41.59	-90.10	-1,792.52	-7,142.77	3,721.17	3,637.99	83.18	44.734	
14,000.00	6,933.35	13,975.19	6,940.00	41.97	41.89	-90.10	-1,792.06	-7,242.77	3,721.17	3,637.39	83.78	44.414	
14,100.00	6,933.09	14,075.19	6,940.00	42.27	42.19	-90.11	-1,791.60	-7,342.77	3,721.18	3,636.79	84.38	44.098	
14,200.00	6,932.83	14,175.19	6,940.00	42.57	42.49	-90.11	-1,791.13	-7,442.77	3,721.18	3,636.19	84.98	43.787	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #722H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,300.00	6,932.57	14,275.19	6,940.00	42.87	42.79	-90.11	-1,790.67	-7,542.76	3,721.18	3,635.59	85.58	43.480		
14,400.00	6,932.31	14,375.19	6,940.00	43.17	43.09	-90.12	-1,790.21	-7,642.76	3,721.18	3,634.99	86.18	43.177		
14,500.00	6,932.05	14,475.19	6,940.00	43.47	43.40	-90.12	-1,789.75	-7,742.76	3,721.18	3,634.39	86.78	42.879		
14,600.00	6,931.79	14,575.19	6,940.00	43.77	43.70	-90.13	-1,789.29	-7,842.76	3,721.18	3,633.80	87.38	42.584		
14,700.00	6,931.54	14,675.18	6,940.00	44.07	44.00	-90.13	-1,788.82	-7,942.76	3,721.18	3,633.20	87.98	42.294		
14,800.00	6,931.28	14,775.18	6,940.00	44.37	44.30	-90.13	-1,788.36	-8,042.76	3,721.18	3,632.60	88.58	42.007		
14,900.00	6,931.02	14,875.18	6,940.00	44.67	44.60	-90.14	-1,787.90	-8,142.76	3,721.18	3,632.00	89.18	41.725		
15,000.00	6,930.76	14,975.18	6,940.00	44.97	44.90	-90.14	-1,787.44	-8,242.75	3,721.18	3,631.40	89.78	41.446		
15,100.00	6,930.50	15,075.18	6,940.00	45.27	45.20	-90.15	-1,786.98	-8,342.75	3,721.18	3,630.80	90.38	41.171		
15,200.00	6,930.24	15,175.18	6,940.00	45.57	45.50	-90.15	-1,786.51	-8,442.75	3,721.18	3,630.20	90.98	40.899		
15,300.00	6,929.98	15,275.18	6,940.00	45.87	45.80	-90.15	-1,786.05	-8,542.75	3,721.19	3,629.60	91.58	40.632		
15,400.00	6,929.72	15,375.18	6,940.00	46.17	46.10	-90.16	-1,785.59	-8,642.75	3,721.19	3,629.00	92.18	40.367		
15,500.00	6,929.46	15,475.18	6,940.00	46.47	46.40	-90.16	-1,785.13	-8,742.75	3,721.19	3,628.40	92.78	40.106		
15,505.83	6,929.45	15,481.01	6,940.00	46.49	46.41	-90.16	-1,785.10	-8,748.57	3,721.19	3,628.37	92.82	40.091		
15,600.00	6,929.21	15,561.88	6,940.00	46.77	46.66	-90.17	-1,784.73	-8,829.45	3,721.21	3,627.87	93.34	39.866		
15,700.00	6,928.95	15,561.88	6,940.00	47.07	46.66	-90.17	-1,784.73	-8,829.45	3,722.91	3,629.27	93.64	39.756		
15,800.00	6,928.69	15,561.88	6,940.00	47.37	46.66	-90.17	-1,784.73	-8,829.45	3,727.30	3,633.35	93.94	39.676		
15,900.00	6,928.43	15,561.88	6,940.00	47.67	46.66	-90.17	-1,784.73	-8,829.45	3,734.36	3,640.11	94.24	39.624		
16,000.00	6,928.17	15,561.88	6,940.00	47.97	46.66	-90.17	-1,784.73	-8,829.45	3,744.07	3,649.53	94.54	39.601		
16,100.00	6,927.91	15,561.88	6,940.00	48.27	46.66	-90.17	-1,784.73	-8,829.45	3,756.43	3,661.58	94.85	39.606		
16,200.00	6,927.65	15,561.88	6,940.00	48.57	46.66	-90.17	-1,784.73	-8,829.45	3,771.39	3,676.25	95.15	39.638		
16,300.00	6,927.39	15,561.88	6,940.00	48.87	46.66	-90.17	-1,784.73	-8,829.45	3,788.94	3,693.50	95.45	39.697		
16,400.00	6,927.13	15,561.88	6,940.00	49.17	46.66	-90.17	-1,784.73	-8,829.45	3,809.04	3,713.29	95.75	39.782		
16,500.00	6,926.88	15,561.88	6,940.00	49.47	46.66	-90.17	-1,784.73	-8,829.45	3,831.63	3,735.59	96.05	39.893		
16,600.00	6,926.62	15,561.88	6,940.00	49.77	46.66	-90.17	-1,784.73	-8,829.45	3,856.69	3,760.34	96.35	40.028		
16,700.00	6,926.36	15,561.88	6,940.00	50.07	46.66	-90.17	-1,784.73	-8,829.45	3,884.17	3,787.52	96.65	40.188		
16,800.00	6,926.10	15,561.88	6,940.00	50.37	46.66	-90.17	-1,784.73	-8,829.45	3,914.00	3,817.05	96.95	40.371		
16,900.00	6,925.84	15,561.88	6,940.00	50.67	46.66	-90.17	-1,784.73	-8,829.45	3,946.15	3,848.90	97.25	40.576		
17,000.00	6,925.58	15,561.88	6,940.00	50.97	46.66	-90.17	-1,784.73	-8,829.45	3,980.55	3,882.99	97.55	40.803		
17,100.00	6,925.32	15,561.88	6,940.00	51.27	46.66	-90.17	-1,784.73	-8,829.45	4,017.14	3,919.29	97.86	41.052		
17,200.00	6,925.06	15,561.88	6,940.00	51.58	46.66	-90.17	-1,784.73	-8,829.45	4,055.87	3,957.71	98.16	41.320		
17,224.45	6,925.00	15,561.88	6,940.00	51.65	46.66	-90.17	-1,784.73	-8,829.45	4,065.66	3,967.43	98.23	41.389		
17,224.92	6,925.00	15,561.88	6,940.00	51.65	46.66	-90.17	-1,784.73	-8,829.45	4,065.85	3,967.62	98.23	41.390		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	164.90	-86.65	23.39	89.75				
100.00	100.00	100.00	100.00	0.23	0.23	164.90	-86.65	23.39	89.75	89.30	0.45	198.129	
200.00	200.00	200.00	200.00	0.53	0.53	164.90	-86.65	23.39	89.75	88.70	1.05	85.235	
300.00	300.00	300.00	300.00	0.83	0.83	164.90	-86.65	23.39	89.75	88.10	1.65	54.297	
400.00	400.00	400.00	400.00	1.13	1.13	164.90	-86.65	23.39	89.75	87.50	2.25	39.837	
500.00	500.00	500.00	500.00	1.43	1.43	164.90	-86.65	23.39	89.75	86.90	2.85	31.459	CC, ES
600.00	599.98	596.88	596.86	1.73	1.72	172.44	-88.28	23.58	93.16	89.71	3.44	27.051	
700.00	699.84	693.08	692.93	2.03	2.01	173.16	-93.11	24.15	103.35	99.32	4.03	25.629	SF
800.00	799.45	787.94	787.46	2.33	2.29	174.10	-101.01	25.09	120.28	115.66	4.62	26.048	
900.00	898.70	883.17	882.08	2.63	2.58	175.03	-111.65	26.34	143.44	138.23	5.20	27.562	
1,000.00	997.47	979.44	977.70	2.93	2.87	175.81	-122.78	27.66	170.38	164.59	5.79	29.405	
1,100.00	1,095.62	1,074.71	1,072.32	3.23	3.15	176.44	-133.79	28.96	200.69	194.30	6.38	31.448	
1,200.00	1,193.06	1,168.86	1,165.83	3.53	3.43	176.94	-144.67	30.25	234.31	227.35	6.97	33.639	
1,300.00	1,289.64	1,261.78	1,258.12	3.83	3.71	177.34	-155.41	31.51	271.21	263.67	7.55	35.943	
1,382.94	1,369.03	1,337.83	1,333.65	4.08	3.94	177.62	-164.20	32.55	304.27	296.25	8.02	37.920	
1,400.00	1,385.28	1,353.38	1,349.09	4.13	3.99	177.67	-166.00	32.77	311.30	303.17	8.12	38.328	
1,500.00	1,480.57	1,444.49	1,439.58	4.43	4.26	177.96	-176.53	34.01	352.49	343.79	8.70	40.535	
1,600.00	1,575.86	1,535.60	1,530.07	4.73	4.53	178.19	-187.06	35.26	393.68	384.41	9.27	42.470	
1,700.00	1,671.15	1,626.71	1,620.56	5.03	4.81	178.38	-197.59	36.50	434.88	425.04	9.84	44.180	
1,800.00	1,766.44	1,717.82	1,711.05	5.33	5.08	178.53	-208.12	37.74	476.09	465.67	10.42	45.702	
1,900.00	1,861.72	1,808.93	1,801.55	5.63	5.35	178.66	-218.65	38.99	517.29	506.30	10.99	47.065	
2,000.00	1,957.01	1,900.04	1,892.04	5.93	5.63	178.77	-229.18	40.23	558.50	546.94	11.56	48.294	
2,100.00	2,052.30	2,008.85	1,982.53	6.23	5.95	178.86	-239.71	41.48	599.71	587.52	12.19	49.191	
2,200.00	2,147.59	2,082.26	2,073.02	6.53	6.17	178.95	-250.24	42.72	640.92	628.21	12.71	50.419	
2,300.00	2,242.88	2,173.37	2,163.51	6.83	6.45	179.02	-260.77	43.97	682.13	668.85	13.29	51.344	
2,400.00	2,338.16	2,264.48	2,254.00	7.13	6.72	179.08	-271.30	45.21	723.34	709.49	13.86	52.193	
2,500.00	2,433.45	2,355.59	2,344.49	7.44	6.99	179.14	-281.83	46.46	764.56	750.13	14.43	52.974	
2,600.00	2,528.74	2,446.70	2,434.98	7.74	7.27	179.19	-292.36	47.70	805.77	790.77	15.01	53.696	
2,700.00	2,624.03	2,537.81	2,525.47	8.04	7.54	179.24	-302.90	48.95	846.99	831.41	15.58	54.365	
2,800.00	2,719.32	2,628.92	2,615.96	8.34	7.81	179.28	-313.43	50.19	888.20	872.05	16.15	54.986	
2,900.00	2,814.60	2,720.03	2,706.45	8.64	8.09	179.32	-323.96	51.44	929.41	912.69	16.73	55.565	
3,000.00	2,909.89	2,811.14	2,796.94	8.94	8.36	179.35	-334.49	52.68	970.63	953.33	17.30	56.105	
3,100.00	3,005.18	2,902.25	2,887.44	9.24	8.63	179.39	-345.02	53.92	1,011.85	993.97	17.87	56.611	
3,200.00	3,100.47	3,006.64	2,977.93	9.54	8.95	179.42	-355.55	55.17	1,053.06	1,034.57	18.49	56.963	
3,300.00	3,195.76	3,084.47	3,068.42	9.84	9.18	179.44	-366.08	56.41	1,094.28	1,075.26	19.02	57.531	
3,400.00	3,291.04	3,175.58	3,158.91	10.14	9.45	179.47	-376.61	57.66	1,135.49	1,115.90	19.59	57.951	
3,500.00	3,386.33	3,266.69	3,249.40	10.44	9.73	179.49	-387.14	58.90	1,176.71	1,156.54	20.17	58.347	
3,600.00	3,481.62	3,357.80	3,339.89	10.74	10.00	179.52	-397.67	60.15	1,217.93	1,197.18	20.74	58.721	
3,700.00	3,576.91	3,448.91	3,430.38	11.04	10.27	179.54	-408.20	61.39	1,259.14	1,237.83	21.31	59.075	
3,800.00	3,672.20	3,540.02	3,520.87	11.34	10.55	179.56	-418.73	62.64	1,300.36	1,278.47	21.89	59.411	
3,900.00	3,767.48	3,631.13	3,611.36	11.64	10.82	179.57	-429.26	63.88	1,341.58	1,319.11	22.46	59.729	
4,000.00	3,862.77	3,722.24	3,701.85	11.94	11.09	179.59	-439.79	65.13	1,382.79	1,359.76	23.03	60.031	
4,100.00	3,958.06	3,813.35	3,792.34	12.24	11.37	179.61	-450.33	66.37	1,424.01	1,400.40	23.61	60.319	
4,200.00	4,053.35	3,904.46	3,882.83	12.54	11.64	179.62	-460.86	67.61	1,465.23	1,441.04	24.18	60.593	
4,300.00	4,148.64	3,995.57	3,973.33	12.84	11.91	179.64	-471.39	68.86	1,506.44	1,481.69	24.75	60.855	
4,400.00	4,243.92	4,086.68	4,063.82	13.14	12.19	179.65	-481.92	70.10	1,547.66	1,522.33	25.33	61.104	
4,500.00	4,339.21	4,177.79	4,154.31	13.44	12.46	179.66	-492.45	71.35	1,588.88	1,562.98	25.90	61.343	
4,600.00	4,434.50	4,268.90	4,244.80	13.74	12.73	179.68	-502.98	72.59	1,630.10	1,603.62	26.47	61.571	
4,700.00	4,529.79	4,360.01	4,335.29	14.04	13.01	179.69	-513.51	73.84	1,671.31	1,644.26	27.05	61.790	
4,800.00	4,625.08	4,451.12	4,425.78	14.34	13.28	179.70	-524.04	75.08	1,712.53	1,684.91	27.62	62.000	
4,900.00	4,720.36	4,542.23	4,516.27	14.64	13.55	179.71	-534.57	76.33	1,753.75	1,725.55	28.20	62.201	
5,000.00	4,815.65	4,633.34	4,606.76	14.94	13.83	179.72	-545.10	77.57	1,794.97	1,766.20	28.77	62.394	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,724.45	4,697.25	15.24	14.10	179.73	-555.63	78.82	1,836.18	1,806.84	29.34	62.579	
5,200.00	5,006.23	4,815.56	4,787.74	15.54	14.37	179.74	-566.16	80.06	1,877.40	1,847.49	29.92	62.757	
5,300.00	5,101.52	4,906.67	4,878.23	15.84	14.65	179.75	-576.69	81.31	1,918.62	1,888.13	30.49	62.929	
5,400.00	5,196.80	5,002.22	4,968.72	16.14	14.93	179.75	-587.22	82.55	1,959.84	1,928.76	31.08	63.067	
5,500.00	5,292.09	5,088.89	5,059.22	16.44	15.19	179.76	-597.75	83.79	2,001.05	1,969.42	31.64	63.254	
5,600.00	5,387.38	5,180.00	5,149.71	16.74	15.47	179.77	-608.29	85.04	2,042.27	2,010.06	32.21	63.407	
5,700.00	5,482.67	5,271.11	5,240.20	17.04	15.74	179.78	-618.82	86.28	2,083.49	2,050.71	32.78	63.556	
5,800.00	5,577.96	5,362.22	5,330.69	17.34	16.01	179.79	-629.35	87.53	2,124.71	2,091.35	33.36	63.699	
5,900.00	5,673.24	5,453.33	5,421.18	17.64	16.29	179.79	-639.88	88.77	2,165.92	2,132.00	33.93	63.837	
6,000.00	5,768.53	5,544.44	5,511.67	17.94	16.56	179.80	-650.41	90.02	2,207.14	2,172.64	34.50	63.971	
6,100.00	5,863.82	5,635.55	5,602.16	18.24	16.83	179.80	-660.94	91.26	2,248.36	2,213.29	35.08	64.101	
6,200.00	5,959.11	5,726.66	5,692.65	18.54	17.11	179.81	-671.47	92.51	2,289.58	2,253.93	35.65	64.226	
6,300.00	6,054.40	5,817.77	5,783.14	18.84	17.38	179.82	-682.00	93.75	2,330.80	2,294.57	36.22	64.347	
6,400.00	6,149.68	5,908.88	5,873.63	19.14	17.65	179.82	-692.53	95.00	2,372.01	2,335.22	36.80	64.465	
6,500.00	6,244.97	6,000.01	5,964.12	19.44	17.93	179.83	-703.06	96.24	2,413.23	2,375.86	37.37	64.578	
6,600.00	6,340.26	6,108.90	6,054.61	19.74	18.25	179.83	-713.59	97.49	2,454.45	2,416.45	38.00	64.598	
6,689.41	6,425.45	6,172.56	6,135.52	20.01	18.45	179.84	-723.01	98.60	2,491.30	2,452.85	38.45	64.785	
6,700.00	6,435.54	6,182.20	6,145.10	20.04	18.47	-176.41	-724.12	98.73	2,495.68	2,457.16	38.52	64.796	
6,750.00	6,482.96	6,227.50	6,190.09	20.19	18.61	-159.98	-729.36	99.35	2,516.61	2,477.81	38.80	64.858	
6,800.00	6,529.78	6,272.15	6,234.44	20.34	18.74	-146.33	-734.52	99.96	2,537.87	2,498.79	39.09	64.931	
6,850.00	6,575.63	6,315.83	6,277.82	20.49	18.88	-135.49	-739.57	100.56	2,559.34	2,519.98	39.37	65.012	
6,900.00	6,620.18	6,358.19	6,319.90	20.64	19.00	-126.91	-744.46	101.13	2,580.92	2,541.27	39.64	65.102	
6,950.00	6,663.07	6,401.08	6,360.35	20.79	19.13	-120.03	-749.17	101.69	2,602.50	2,562.58	39.92	65.188	
7,000.00	6,704.00	6,431.29	6,392.49	20.94	19.22	-114.30	-752.91	102.20	2,624.03	2,583.86	40.16	65.334	
7,050.00	6,742.63	6,450.00	6,411.06	21.09	19.28	-109.30	-755.08	103.04	2,645.60	2,605.23	40.37	65.535	
7,100.00	6,778.69	6,468.68	6,429.55	21.24	19.33	-104.98	-757.23	104.49	2,667.18	2,626.61	40.58	65.734	
7,150.00	6,811.89	6,483.30	6,443.99	21.39	19.38	-101.12	-758.92	106.04	2,688.69	2,647.92	40.77	65.949	
7,200.00	6,841.98	6,500.00	6,460.43	21.54	19.43	-97.74	-760.84	108.27	2,710.03	2,669.06	40.97	66.148	
7,250.00	6,868.74	6,500.00	6,460.43	21.69	19.43	-94.36	-760.84	108.27	2,731.08	2,689.97	41.12	66.420	
7,300.00	6,891.96	6,511.60	6,471.81	21.84	19.46	-91.55	-762.18	110.11	2,751.75	2,710.45	41.30	66.623	
7,350.00	6,911.46	6,516.36	6,476.47	21.99	19.48	-88.87	-762.72	110.93	2,771.94	2,730.47	41.47	66.847	
7,400.00	6,927.10	6,519.09	6,479.13	22.14	19.49	-86.42	-763.03	111.41	2,791.51	2,749.88	41.62	67.064	
7,450.00	6,938.75	6,519.99	6,480.01	22.29	19.49	-84.19	-763.14	111.58	2,810.34	2,768.56	41.78	67.271	
7,500.00	6,946.33	6,519.23	6,479.27	22.44	19.49	-82.19	-763.05	111.44	2,828.32	2,786.39	41.92	67.463	
7,550.00	6,949.78	6,516.99	6,477.08	22.59	19.48	-80.42	-762.79	111.04	2,845.31	2,803.24	42.07	67.639	
7,568.05	6,950.00	6,515.85	6,475.96	22.65	19.48	-79.84	-762.66	110.84	2,851.18	2,809.06	42.12	67.697	
7,600.00	6,949.92	6,500.00	6,460.43	22.74	19.43	-79.51	-760.84	108.27	2,861.68	2,819.52	42.17	67.868	
7,700.00	6,949.66	6,500.00	6,460.43	23.04	19.43	-79.51	-760.84	108.27	2,896.24	2,853.78	42.47	68.201	
7,800.00	6,949.40	6,500.00	6,460.43	23.35	19.43	-79.51	-760.84	108.27	2,933.81	2,891.04	42.77	68.600	
7,900.00	6,949.14	6,500.00	6,460.43	23.65	19.43	-79.51	-760.84	108.27	2,974.26	2,931.19	43.07	69.060	
8,000.00	6,948.88	6,500.00	6,460.43	23.95	19.43	-79.51	-760.84	108.27	3,017.48	2,974.11	43.37	69.577	
8,100.00	6,948.62	6,500.00	6,460.43	24.25	19.43	-79.51	-760.84	108.27	3,063.36	3,019.69	43.67	70.149	
8,200.00	6,948.36	6,500.00	6,460.43	24.55	19.43	-79.51	-760.84	108.27	3,111.78	3,067.81	43.97	70.770	
8,300.00	6,948.11	6,482.26	6,442.97	24.85	19.38	-79.13	-758.80	105.92	3,162.43	3,118.21	44.22	71.519	
8,400.00	6,947.85	6,479.29	6,440.04	25.15	19.37	-79.07	-758.46	105.58	3,215.50	3,170.99	44.51	72.243	
8,500.00	6,947.59	6,476.57	6,437.36	25.45	19.36	-79.02	-758.15	105.28	3,270.75	3,225.95	44.80	73.004	
8,600.00	6,947.33	6,474.07	6,434.88	25.75	19.35	-78.96	-757.86	105.02	3,328.09	3,283.00	45.10	73.801	
8,700.00	6,947.07	6,471.75	6,432.59	26.05	19.34	-78.91	-757.59	104.78	3,387.40	3,342.01	45.39	74.630	
8,800.00	6,946.81	6,469.60	6,430.47	26.35	19.34	-78.87	-757.34	104.57	3,448.59	3,402.90	45.68	75.489	
8,900.00	6,946.55	6,450.00	6,411.06	26.65	19.28	-78.86	-755.08	103.04	3,511.76	3,465.84	45.93	76.467	
9,000.00	6,946.29	6,450.00	6,411.06	26.95	19.28	-78.46	-755.08	103.04	3,576.37	3,530.14	46.23	77.368	
9,100.00	6,946.03	6,450.00	6,411.06	27.25	19.28	-78.46	-755.08	103.04	3,642.57	3,596.04	46.53	78.291	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #724H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,200.00	6,945.78	6,450.00	6,411.06	27.55	19.28	-78.46	-755.08	103.04	3,710.29	3,663.46	46.83	79.234		
9,300.00	6,945.52	6,450.00	6,411.06	27.85	19.28	-78.46	-755.08	103.04	3,779.44	3,732.31	47.13	80.196		
9,400.00	6,945.26	6,450.00	6,411.06	28.15	19.28	-78.46	-755.08	103.04	3,849.94	3,802.51	47.43	81.175		
9,500.00	6,945.00	6,450.00	6,411.06	28.45	19.28	-78.46	-755.08	103.04	3,921.73	3,874.00	47.73	82.167		
9,600.00	6,944.74	6,450.00	6,411.06	28.75	19.28	-78.46	-755.08	103.04	3,994.73	3,946.70	48.03	83.173		
9,700.00	6,944.48	6,450.00	6,411.06	29.05	19.28	-78.46	-755.08	103.04	4,068.88	4,020.55	48.33	84.190		
9,800.00	6,944.22	6,450.00	6,411.06	29.35	19.28	-78.46	-755.08	103.04	4,144.12	4,095.49	48.63	85.217		
9,900.00	6,943.96	6,450.00	6,411.06	29.66	19.28	-78.46	-755.08	103.04	4,220.38	4,171.45	48.93	86.253		
10,000.00	6,943.70	6,450.00	6,411.06	29.96	19.28	-78.46	-755.08	103.04	4,297.62	4,248.39	49.23	87.295		
10,100.00	6,943.45	6,450.00	6,411.06	30.26	19.28	-78.46	-755.08	103.04	4,375.78	4,326.25	49.53	88.343		
10,200.00	6,943.19	6,450.00	6,411.06	30.56	19.28	-78.46	-755.08	103.04	4,454.81	4,404.98	49.83	89.397		
10,300.00	6,942.93	6,450.00	6,411.06	30.86	19.28	-78.46	-755.08	103.04	4,534.67	4,484.54	50.13	90.454		
10,400.00	6,942.67	6,450.00	6,411.06	31.16	19.28	-78.46	-755.08	103.04	4,615.32	4,564.89	50.43	91.514		
10,500.00	6,942.41	6,450.00	6,411.06	31.46	19.28	-78.46	-755.08	103.04	4,696.71	4,645.98	50.73	92.577		
10,600.00	6,942.15	6,450.00	6,411.06	31.76	19.28	-78.46	-755.08	103.04	4,778.81	4,727.77	51.03	93.640		
10,700.00	6,941.89	6,450.00	6,411.06	32.06	19.28	-78.46	-755.08	103.04	4,861.58	4,810.24	51.33	94.705		
10,800.00	6,941.63	6,450.00	6,411.06	32.36	19.28	-78.46	-755.08	103.04	4,944.98	4,893.35	51.63	95.769		
10,900.00	6,941.37	6,450.00	6,411.06	32.66	19.28	-78.46	-755.08	103.04	5,028.99	4,977.06	51.93	96.833		
11,000.00	6,941.11	6,450.00	6,411.06	32.96	19.28	-78.46	-755.08	103.04	5,113.58	5,061.34	52.24	97.895		
11,100.00	6,940.86	6,450.00	6,411.06	33.26	19.28	-78.46	-755.08	103.04	5,198.71	5,146.17	52.54	98.956		
11,200.00	6,940.60	6,450.00	6,411.06	33.56	19.28	-78.46	-755.08	103.04	5,284.36	5,231.53	52.84	100.015		
11,300.00	6,940.34	6,450.00	6,411.06	33.86	19.28	-78.46	-755.08	103.04	5,370.51	5,317.38	53.14	101.070		
11,400.00	6,940.08	6,450.00	6,411.06	34.16	19.28	-78.46	-755.08	103.04	5,457.13	5,403.70	53.44	102.123		
11,500.00	6,939.82	6,450.00	6,411.06	34.46	19.28	-78.46	-755.08	103.04	5,544.21	5,490.47	53.74	103.173		
11,600.00	6,939.56	6,450.00	6,411.06	34.76	19.28	-78.46	-755.08	103.04	5,631.71	5,577.67	54.04	104.219		
11,700.00	6,939.30	6,450.00	6,411.06	35.06	19.28	-78.46	-755.08	103.04	5,719.62	5,665.28	54.34	105.261		
11,800.00	6,939.04	6,450.00	6,411.06	35.36	19.28	-78.46	-755.08	103.04	5,807.92	5,753.29	54.64	106.298		
11,900.00	6,938.78	6,450.00	6,411.06	35.66	19.28	-78.46	-755.08	103.04	5,896.60	5,841.66	54.94	107.331		
12,000.00	6,938.53	6,450.00	6,411.06	35.96	19.28	-78.46	-755.08	103.04	5,985.63	5,930.39	55.24	108.359		
12,100.00	6,938.27	6,450.00	6,411.06	36.26	19.28	-78.46	-755.08	103.04	6,075.01	6,019.47	55.54	109.383		
12,200.00	6,938.01	6,450.00	6,411.06	36.56	19.28	-78.46	-755.08	103.04	6,164.71	6,108.87	55.84	110.401		
12,300.00	6,937.75	6,437.83	6,398.99	36.86	19.24	-78.20	-753.67	102.42	6,254.59	6,198.49	56.10	111.484		
12,400.00	6,937.49	6,437.44	6,398.60	37.16	19.24	-78.19	-753.62	102.41	6,344.90	6,288.49	56.40	112.494		
12,500.00	6,937.23	6,437.06	6,398.22	37.46	19.24	-78.18	-753.58	102.39	6,435.49	6,378.79	56.70	113.498		
12,600.00	6,936.97	6,436.69	6,397.86	37.77	19.24	-78.18	-753.54	102.38	6,526.35	6,469.35	57.00	114.496		
12,700.00	6,936.71	6,436.33	6,397.50	38.07	19.24	-78.17	-753.50	102.36	6,617.48	6,560.18	57.30	115.489		
12,800.00	6,936.45	6,435.99	6,397.16	38.37	19.24	-78.16	-753.46	102.35	6,708.86	6,651.26	57.60	116.475		
12,900.00	6,936.20	6,435.65	6,396.82	38.67	19.24	-78.15	-753.42	102.34	6,800.48	6,742.58	57.90	117.456		
13,000.00	6,935.94	6,435.33	6,396.50	38.97	19.23	-78.15	-753.38	102.33	6,892.34	6,834.14	58.20	118.430		
13,100.00	6,935.68	6,422.70	6,383.96	39.27	19.20	-77.88	-751.92	102.02	6,984.55	6,926.09	58.46	119.476		
13,200.00	6,935.42	6,422.70	6,383.96	39.57	19.20	-77.88	-751.92	102.02	7,076.84	7,018.08	58.76	120.436		
13,300.00	6,935.16	6,422.70	6,383.96	39.87	19.20	-77.88	-751.92	102.02	7,169.33	7,110.27	59.06	121.390		
13,400.00	6,934.90	6,422.70	6,383.96	40.17	19.20	-77.88	-751.92	102.02	7,262.03	7,202.67	59.36	122.337		
13,500.00	6,934.64	6,422.70	6,383.96	40.47	19.20	-77.88	-751.92	102.02	7,354.91	7,295.25	59.66	123.278		
13,600.00	6,934.38	6,422.70	6,383.96	40.77	19.20	-77.88	-751.92	102.02	7,447.98	7,388.02	59.96	124.213		
13,700.00	6,934.12	6,422.70	6,383.96	41.07	19.20	-77.88	-751.92	102.02	7,541.23	7,480.97	60.26	125.142		
13,800.00	6,933.87	6,422.70	6,383.96	41.37	19.20	-77.88	-751.92	102.02	7,634.64	7,574.08	60.56	126.064		
13,900.00	6,933.61	6,422.70	6,383.96	41.67	19.20	-77.88	-751.92	102.02	7,728.23	7,667.36	60.86	126.979		
14,000.00	6,933.35	6,422.70	6,383.96	41.97	19.20	-77.88	-751.92	102.02	7,821.97	7,760.81	61.16	127.889		
14,100.00	6,933.09	6,422.70	6,383.96	42.27	19.20	-77.88	-751.92	102.02	7,915.86	7,854.40	61.46	128.792		
14,200.00	6,932.83	6,422.70	6,383.96	42.57	19.20	-77.88	-751.92	102.02	8,009.90	7,948.14	61.76	129.688		
14,300.00	6,932.57	6,422.70	6,383.96	42.87	19.20	-77.88	-751.92	102.02	8,104.09	8,042.03	62.06	130.578		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #724H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,400.00	6,932.31	6,422.70	6,383.96	43.17	19.20	-77.88	-751.92	102.02	8,198.41	8,136.05	62.36	131.462		
14,500.00	6,932.05	6,422.70	6,383.96	43.47	19.20	-77.88	-751.92	102.02	8,292.87	8,230.20	62.66	132.340		
14,600.00	6,931.79	6,422.70	6,383.96	43.77	19.20	-77.88	-751.92	102.02	8,387.45	8,324.49	62.96	133.211		
14,700.00	6,931.54	6,422.70	6,383.96	44.07	19.20	-77.88	-751.92	102.02	8,482.16	8,418.90	63.26	134.076		
14,800.00	6,931.28	6,422.70	6,383.96	44.37	19.20	-77.88	-751.92	102.02	8,576.99	8,513.42	63.56	134.934		
14,900.00	6,931.02	6,422.70	6,383.96	44.67	19.20	-77.88	-751.92	102.02	8,671.93	8,608.07	63.86	135.787		
15,000.00	6,930.76	6,422.70	6,383.96	44.97	19.20	-77.88	-751.92	102.02	8,766.99	8,702.82	64.16	136.633		
15,100.00	6,930.50	6,422.70	6,383.96	45.27	19.20	-77.88	-751.92	102.02	8,862.15	8,797.69	64.46	137.473		
15,200.00	6,930.24	6,422.70	6,383.96	45.57	19.20	-77.88	-751.92	102.02	8,957.43	8,892.66	64.76	138.307		
15,300.00	6,929.98	6,422.70	6,383.96	45.87	19.20	-77.88	-751.92	102.02	9,052.80	8,987.73	65.07	139.134		
15,400.00	6,929.72	6,422.70	6,383.96	46.17	19.20	-77.88	-751.92	102.02	9,148.27	9,082.91	65.37	139.956		
15,500.00	6,929.46	6,422.70	6,383.96	46.47	19.20	-77.88	-751.92	102.02	9,243.84	9,178.17	65.67	140.771		
15,600.00	6,929.21	6,422.70	6,383.96	46.77	19.20	-77.88	-751.92	102.02	9,339.50	9,273.53	65.97	141.581		
15,700.00	6,928.95	6,422.70	6,383.96	47.07	19.20	-77.88	-751.92	102.02	9,435.25	9,368.98	66.27	142.385		
15,800.00	6,928.69	6,422.70	6,383.96	47.37	19.20	-77.88	-751.92	102.02	9,531.09	9,464.52	66.57	143.182		
15,900.00	6,928.43	6,422.70	6,383.96	47.67	19.20	-77.88	-751.92	102.02	9,627.01	9,560.14	66.87	143.974		
16,000.00	6,928.17	6,422.70	6,383.96	47.97	19.20	-77.88	-751.92	102.02	9,723.01	9,655.85	67.17	144.760		
16,100.00	6,927.91	6,422.70	6,383.96	48.27	19.20	-77.88	-751.92	102.02	9,819.10	9,751.63	67.47	145.540		
16,200.00	6,927.65	6,422.70	6,383.96	48.57	19.20	-77.88	-751.92	102.02	9,915.26	9,847.49	67.77	146.314		
16,300.00	6,927.39	6,422.70	6,383.96	48.87	19.20	-77.88	-751.92	102.02	10,011.50	9,943.43	68.07	147.083		
16,400.00	6,927.13	6,422.70	6,383.96	49.17	19.20	-77.88	-751.92	102.02	10,107.81	10,039.44	68.37	147.846		
16,500.00	6,926.88	6,422.70	6,383.96	49.47	19.20	-77.88	-751.92	102.02	10,204.19	10,135.52	68.67	148.603		
16,600.00	6,926.62	6,422.70	6,383.96	49.77	19.20	-77.88	-751.92	102.02	10,300.64	10,231.67	68.97	149.355		
16,700.00	6,926.36	6,422.70	6,383.96	50.07	19.20	-77.88	-751.92	102.02	10,397.16	10,327.89	69.27	150.101		
16,800.00	6,926.10	6,422.70	6,383.96	50.37	19.20	-77.88	-751.92	102.02	10,493.74	10,424.17	69.57	150.842		
16,900.00	6,925.84	6,422.70	6,383.96	50.67	19.20	-77.88	-751.92	102.02	10,590.38	10,520.52	69.87	151.577		
17,000.00	6,925.58	6,422.70	6,383.96	50.97	19.20	-77.88	-751.92	102.02	10,687.09	10,616.92	70.17	152.307		
17,100.00	6,925.32	6,422.70	6,383.96	51.27	19.20	-77.88	-751.92	102.02	10,783.86	10,713.39	70.47	153.031		
17,200.00	6,925.06	6,422.70	6,383.96	51.58	19.20	-77.88	-751.92	102.02	10,880.69	10,809.92	70.77	153.750		
17,224.45	6,925.00	6,422.70	6,383.96	51.65	19.20	-77.88	-751.92	102.02	10,904.36	10,833.52	70.84	153.925		
17,224.92	6,925.00	6,422.70	6,383.96	51.65	19.20	-77.88	-751.92	102.02	10,904.83	10,833.98	70.84	153.929		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #726H - OH - Prelim #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	164.96	-101.21	27.19	104.80					
100.00	100.00	100.00	100.00	0.23	0.23	164.96	-101.21	27.19	104.80	104.35	0.45	231.343		
200.00	200.00	200.00	200.00	0.53	0.53	164.96	-101.21	27.19	104.80	103.75	1.05	99.524		
300.00	300.00	300.00	300.00	0.83	0.83	164.96	-101.21	27.19	104.80	103.15	1.65	63.399		
400.00	400.00	400.00	400.00	1.13	1.13	164.96	-101.21	27.19	104.80	102.55	2.25	46.515		
500.00	500.00	500.00	500.00	1.43	1.43	164.96	-101.21	27.19	104.80	101.95	2.85	36.733 CC, ES		
600.00	599.98	596.44	596.42	1.73	1.72	172.52	-102.83	27.26	108.17	104.73	3.44	31.424		
700.00	699.84	692.21	692.06	2.03	2.00	173.32	-107.65	27.47	118.28	114.25	4.03	29.351		
800.00	799.45	786.65	786.17	2.33	2.29	174.37	-115.53	27.81	135.09	130.48	4.61	29.280 SF		
900.00	898.70	879.16	878.05	2.63	2.56	175.46	-126.24	28.27	158.50	153.31	5.19	30.528		
1,000.00	997.47	969.16	967.06	2.93	2.84	176.46	-139.50	28.85	188.35	182.59	5.76	32.683		
1,100.00	1,095.62	1,056.15	1,052.67	3.23	3.10	177.31	-154.97	29.52	224.43	218.10	6.33	35.482		
1,200.00	1,193.06	1,139.72	1,134.42	3.53	3.35	178.02	-172.27	30.26	266.48	259.60	6.88	38.748		
1,300.00	1,289.64	1,219.50	1,211.96	3.83	3.59	178.59	-191.00	31.08	314.20	306.79	7.42	42.356		
1,382.94	1,369.03	1,282.61	1,272.91	4.08	3.78	178.98	-207.34	31.78	357.88	350.02	7.86	45.546		
1,400.00	1,385.28	1,295.26	1,285.08	4.13	3.82	179.06	-210.78	31.93	367.26	359.31	7.95	46.216		
1,500.00	1,480.57	1,373.66	1,360.29	4.43	4.05	179.48	-232.94	32.89	423.20	414.71	8.48	49.890		
1,600.00	1,575.86	1,456.37	1,439.55	4.73	4.30	179.83	-256.52	33.91	479.37	470.34	9.03	53.077		
1,700.00	1,671.15	1,539.07	1,518.81	5.03	4.55	-179.90	-280.09	34.93	535.55	525.97	9.58	55.901		
1,800.00	1,766.44	1,621.77	1,598.08	5.33	4.80	-179.68	-303.67	35.95	591.74	581.61	10.13	58.419		
1,900.00	1,861.72	1,704.47	1,677.34	5.63	5.05	-179.50	-327.24	36.97	647.93	637.26	10.68	60.680		
2,000.00	1,957.01	1,787.17	1,756.61	5.93	5.29	-179.34	-350.82	37.99	704.13	692.90	11.23	62.720		
2,100.00	2,052.30	1,869.88	1,835.87	6.23	5.54	-179.21	-374.39	39.01	760.33	748.56	11.78	64.571		
2,200.00	2,147.59	1,952.58	1,915.14	6.53	5.79	-179.10	-397.97	40.03	816.53	804.21	12.32	66.257		
2,300.00	2,242.88	2,035.28	1,994.40	6.83	6.04	-179.00	-421.54	41.05	872.74	859.87	12.87	67.800		
2,400.00	2,338.16	2,117.98	2,073.66	7.13	6.29	-178.92	-445.12	42.07	928.94	915.52	13.42	69.217		
2,500.00	2,433.45	2,200.68	2,152.93	7.44	6.54	-178.84	-468.69	43.09	985.15	971.18	13.97	70.523		
2,600.00	2,528.74	2,283.39	2,232.19	7.74	6.78	-178.77	-492.26	44.11	1,041.36	1,026.84	14.52	71.731		
2,700.00	2,624.03	2,366.09	2,311.46	8.04	7.03	-178.71	-515.84	45.13	1,097.57	1,082.50	15.07	72.850		
2,800.00	2,719.32	2,448.79	2,390.72	8.34	7.28	-178.65	-539.41	46.14	1,153.78	1,138.17	15.61	73.892		
2,900.00	2,814.60	2,531.49	2,469.98	8.64	7.53	-178.60	-562.99	47.16	1,209.99	1,193.83	16.16	74.863		
3,000.00	2,909.89	2,614.19	2,549.25	8.94	7.78	-178.56	-586.56	48.18	1,266.20	1,249.49	16.71	75.770		
3,100.00	3,005.18	2,703.10	2,628.51	9.24	8.04	-178.52	-610.14	49.20	1,322.41	1,305.14	17.28	76.537		
3,200.00	3,100.47	2,779.60	2,707.78	9.54	8.27	-178.48	-633.71	50.22	1,378.63	1,360.82	17.81	77.417		
3,300.00	3,195.76	2,862.30	2,787.04	9.84	8.52	-178.44	-657.29	51.24	1,434.84	1,416.48	18.36	78.167		
3,400.00	3,291.04	2,945.00	2,866.30	10.14	8.77	-178.41	-680.86	52.26	1,491.05	1,472.15	18.90	78.873		
3,500.00	3,386.33	3,027.70	2,945.57	10.44	9.02	-178.38	-704.44	53.28	1,547.27	1,527.81	19.45	79.540		
3,600.00	3,481.62	3,110.40	3,024.83	10.74	9.27	-178.35	-728.01	54.30	1,603.48	1,583.48	20.00	80.170		
3,700.00	3,576.91	3,206.89	3,104.10	11.04	9.56	-178.32	-751.59	55.32	1,659.69	1,639.10	20.59	80.604		
3,800.00	3,672.20	3,275.81	3,183.36	11.34	9.76	-178.30	-775.16	56.34	1,715.91	1,694.81	21.10	81.332		
3,900.00	3,767.48	3,358.51	3,262.62	11.64	10.01	-178.28	-798.74	57.36	1,772.12	1,750.48	21.65	81.869		
4,000.00	3,862.77	3,441.21	3,341.89	11.94	10.26	-178.25	-822.31	58.38	1,828.34	1,806.14	22.19	82.380		
4,100.00	3,958.06	3,523.91	3,421.15	12.24	10.51	-178.23	-845.89	59.40	1,884.55	1,861.81	22.74	82.866		
4,200.00	4,053.35	3,606.62	3,500.42	12.54	10.76	-178.22	-869.46	60.42	1,940.77	1,917.48	23.29	83.329		
4,300.00	4,148.64	3,689.32	3,579.68	12.84	11.00	-178.20	-893.04	61.44	1,996.98	1,973.14	23.84	83.770		
4,400.00	4,243.92	3,772.02	3,658.94	13.14	11.25	-178.18	-916.61	62.46	2,053.20	2,028.81	24.39	84.192		
4,500.00	4,339.21	3,854.72	3,738.21	13.44	11.50	-178.16	-940.19	63.48	2,109.41	2,084.48	24.94	84.596		
4,600.00	4,434.50	3,937.42	3,817.47	13.74	11.75	-178.15	-963.76	64.50	2,165.63	2,140.14	25.48	84.982		
4,700.00	4,529.79	4,020.13	3,896.74	14.04	12.00	-178.13	-987.34	65.52	2,221.84	2,195.81	26.03	85.352		
4,800.00	4,625.08	4,102.83	3,976.00	14.34	12.24	-178.12	-1,010.91	66.54	2,278.06	2,251.48	26.58	85.706		
4,900.00	4,720.36	4,185.53	4,055.26	14.64	12.49	-178.11	-1,034.49	67.56	2,334.27	2,307.15	27.13	86.047		
5,000.00	4,815.65	4,268.23	4,134.53	14.94	12.74	-178.09	-1,058.06	68.58	2,390.49	2,362.81	27.68	86.373		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 26 - Rosa Unit #726H - OH - Prelim #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,100.00	4,910.94	4,350.93	4,213.79	15.24	12.99	-178.08	-1,081.64	69.60	2,446.71	2,418.48	28.22	86.688	
5,200.00	5,006.23	4,433.64	4,293.06	15.54	13.24	-178.07	-1,105.21	70.62	2,502.92	2,474.15	28.77	86.990	
5,300.00	5,101.52	4,516.34	4,372.32	15.84	13.49	-178.06	-1,128.79	71.64	2,559.14	2,529.82	29.32	87.281	
5,400.00	5,196.80	4,600.96	4,451.59	16.14	13.74	-178.05	-1,152.36	72.66	2,615.35	2,585.48	29.87	87.544	
5,500.00	5,292.09	4,681.74	4,530.85	16.44	13.98	-178.04	-1,175.93	73.68	2,671.57	2,641.15	30.42	87.831	
5,600.00	5,387.38	4,764.44	4,610.11	16.74	14.23	-178.03	-1,199.51	74.70	2,727.79	2,696.82	30.97	88.092	
5,700.00	5,482.67	4,847.14	4,689.38	17.04	14.48	-178.02	-1,223.08	75.72	2,784.00	2,752.49	31.51	88.343	
5,800.00	5,577.96	4,929.85	4,768.64	17.34	14.73	-178.01	-1,246.66	76.74	2,840.22	2,808.16	32.06	88.586	
5,900.00	5,673.24	5,012.55	4,847.91	17.64	14.97	-178.00	-1,270.23	77.75	2,896.44	2,863.83	32.61	88.821	
6,000.00	5,768.53	5,095.25	4,927.17	17.94	15.22	-178.00	-1,293.81	78.77	2,952.65	2,919.49	33.16	89.048	
6,100.00	5,863.82	5,177.95	5,006.43	18.24	15.47	-177.99	-1,317.38	79.79	3,008.87	2,975.16	33.71	89.288	
6,200.00	5,959.11	5,260.65	5,085.70	18.54	15.72	-177.98	-1,340.96	80.81	3,065.08	3,030.83	34.25	89.480	
6,300.00	6,054.40	5,343.36	5,164.96	18.84	15.97	-177.97	-1,364.53	81.83	3,121.30	3,086.50	34.80	89.686	
6,400.00	6,149.68	5,426.06	5,244.23	19.14	16.21	-177.97	-1,388.11	82.85	3,177.52	3,142.17	35.35	89.886	
6,500.00	6,244.97	5,508.76	5,323.49	19.44	16.46	-177.96	-1,411.68	83.87	3,233.73	3,197.83	35.90	90.079	
6,600.00	6,340.26	5,608.54	5,402.75	19.74	16.76	-177.95	-1,435.26	84.89	3,289.95	3,253.45	36.50	90.140	
6,689.41	6,425.45	5,665.40	5,473.62	20.01	16.93	-177.95	-1,456.34	85.80	3,340.21	3,303.27	36.94	90.430	
6,700.00	6,435.54	5,674.16	5,482.01	20.04	16.96	-173.96	-1,458.83	85.91	3,346.17	3,309.18	37.00	90.449	
6,750.00	6,482.96	5,715.27	5,521.42	20.19	17.08	-156.37	-1,470.55	86.42	3,374.45	3,337.18	37.27	90.544	
6,800.00	6,529.78	5,755.80	5,560.26	20.34	17.20	-141.60	-1,482.10	86.92	3,402.81	3,365.27	37.54	90.644	
6,850.00	6,575.63	5,804.57	5,598.25	20.49	17.35	-129.66	-1,493.40	87.41	3,431.05	3,393.21	37.84	90.681	
6,900.00	6,620.18	5,833.87	5,635.09	20.64	17.44	-120.06	-1,504.36	87.88	3,459.01	3,420.93	38.07	90.850	
6,950.00	6,663.07	5,870.83	5,670.51	20.79	17.55	-112.24	-1,514.89	88.34	3,486.52	3,448.18	38.33	90.950	
7,000.00	6,704.00	5,906.01	5,704.23	20.94	17.65	-105.75	-1,524.92	88.77	3,513.44	3,474.85	38.59	91.047	
7,050.00	6,742.63	5,939.16	5,736.00	21.09	17.75	-100.28	-1,534.37	89.18	3,539.64	3,500.80	38.84	91.138	
7,100.00	6,778.69	5,970.02	5,765.58	21.24	17.85	-95.61	-1,543.17	89.56	3,565.00	3,525.92	39.08	91.223	
7,150.00	6,811.89	6,001.64	5,792.74	21.39	17.94	-91.59	-1,551.25	89.91	3,589.40	3,550.07	39.32	91.277	
7,200.00	6,841.98	6,023.96	5,817.27	21.54	18.01	-88.10	-1,558.54	90.22	3,612.74	3,573.20	39.54	91.369	
7,250.00	6,868.74	6,046.62	5,839.00	21.69	18.08	-85.06	-1,565.01	90.50	3,634.93	3,595.17	39.76	91.428	
7,300.00	6,891.96	6,066.18	5,857.74	21.84	18.14	-82.40	-1,570.58	90.75	3,655.88	3,615.91	39.96	91.477	
7,350.00	6,911.46	6,082.49	5,873.37	21.99	18.18	-80.08	-1,575.23	90.95	3,675.49	3,635.33	40.16	91.515	
7,400.00	6,927.10	6,104.59	5,885.75	22.14	18.25	-78.06	-1,578.91	91.11	3,693.69	3,653.32	40.38	91.478	
7,450.00	6,938.75	6,104.86	5,894.81	22.29	18.25	-76.32	-1,581.61	91.22	3,710.40	3,669.87	40.53	91.553	
7,500.00	6,946.33	6,110.75	5,900.46	22.44	18.27	-74.84	-1,583.29	91.30	3,725.54	3,684.84	40.69	91.551	
7,550.00	6,949.78	6,113.06	5,902.67	22.59	18.28	-73.60	-1,583.94	91.32	3,739.02	3,698.17	40.85	91.532	
7,568.05	6,950.00	6,113.00	5,902.61	22.65	18.28	-73.21	-1,583.93	91.32	3,743.46	3,702.56	40.90	91.520	
7,600.00	6,949.92	6,112.49	5,902.12	22.74	18.27	-73.20	-1,583.78	91.32	3,751.26	3,710.26	41.00	91.499	
7,700.00	6,949.66	6,110.87	5,900.58	23.04	18.27	-73.18	-1,583.32	91.30	3,777.30	3,736.01	41.29	91.474	
7,800.00	6,949.40	6,109.26	5,899.03	23.35	18.26	-73.15	-1,582.86	91.28	3,805.79	3,764.20	41.59	91.508	
7,900.00	6,949.14	6,107.65	5,897.48	23.65	18.26	-73.13	-1,582.40	91.26	3,836.68	3,794.80	41.89	91.598	
8,000.00	6,948.88	6,106.04	5,895.94	23.95	18.25	-73.10	-1,581.94	91.24	3,869.91	3,827.73	42.18	91.743	
8,100.00	6,948.62	6,104.42	5,894.39	24.25	18.25	-73.08	-1,581.48	91.22	3,905.41	3,862.93	42.48	91.940	
8,200.00	6,948.36	6,102.81	5,892.85	24.55	18.25	-73.05	-1,581.02	91.20	3,943.13	3,900.36	42.77	92.186	
8,300.00	6,948.11	6,101.20	5,891.30	24.85	18.24	-73.02	-1,580.56	91.18	3,983.00	3,939.93	43.07	92.478	
8,400.00	6,947.85	6,100.42	5,889.75	25.15	18.24	-73.00	-1,580.10	91.16	4,024.97	3,981.60	43.37	92.809	
8,500.00	6,947.59	6,102.03	5,888.21	25.45	18.24	-72.97	-1,579.64	91.14	4,068.95	4,025.28	43.67	93.167	
8,600.00	6,947.33	6,103.64	5,886.66	25.75	18.25	-72.95	-1,579.18	91.12	4,114.90	4,070.92	43.98	93.564	
8,700.00	6,947.07	6,105.25	5,885.12	26.05	18.25	-72.92	-1,578.72	91.10	4,162.74	4,118.46	44.28	93.999	
8,800.00	6,946.81	6,106.87	5,883.57	26.35	18.26	-72.90	-1,578.26	91.08	4,212.41	4,167.82	44.59	94.469	
8,900.00	6,946.55	6,108.48	5,882.03	26.65	18.26	-72.87	-1,577.80	91.06	4,263.85	4,218.96	44.90	94.972	
9,000.00	6,946.29	6,089.91	5,880.48	26.95	18.21	-72.85	-1,577.34	91.04	4,316.99	4,271.85	45.14	95.634	
9,100.00	6,946.03	6,088.30	5,878.93	27.25	18.20	-72.82	-1,576.88	91.02	4,371.78	4,326.34	45.44	96.217	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,200.00	6,945.78	6,086.68	5,877.39	27.55	18.20	-72.80	-1,576.42	91.00	4,428.14	4,382.41	45.73	96.827	
9,300.00	6,945.52	6,085.07	5,875.84	27.85	18.19	-72.77	-1,575.96	90.98	4,486.02	4,439.99	46.03	97.462	
9,400.00	6,945.26	6,083.46	5,874.30	28.15	18.19	-72.74	-1,575.51	90.96	4,545.37	4,499.05	46.32	98.121	
9,500.00	6,945.00	6,081.84	5,872.75	28.45	18.18	-72.72	-1,575.05	90.94	4,606.12	4,559.50	46.62	98.802	
9,600.00	6,944.74	6,080.23	5,871.21	28.75	18.18	-72.69	-1,574.59	90.92	4,668.23	4,621.31	46.92	99.503	
9,700.00	6,944.48	6,078.62	5,869.66	29.05	18.17	-72.67	-1,574.13	90.90	4,731.63	4,684.42	47.21	100.222	
9,800.00	6,944.22	6,077.01	5,868.11	29.35	18.17	-72.64	-1,573.67	90.88	4,796.28	4,748.77	47.51	100.959	
9,900.00	6,943.96	6,075.39	5,866.57	29.66	18.16	-72.62	-1,573.21	90.86	4,862.12	4,814.32	47.80	101.712	
10,000.00	6,943.70	6,073.78	5,865.02	29.96	18.16	-72.59	-1,572.75	90.84	4,929.11	4,881.02	48.10	102.480	
10,100.00	6,943.45	6,072.17	5,863.48	30.26	18.15	-72.57	-1,572.29	90.82	4,997.21	4,948.82	48.39	103.261	
10,200.00	6,943.19	6,070.55	5,861.93	30.56	18.15	-72.54	-1,571.83	90.80	5,066.36	5,017.67	48.69	104.054	
10,300.00	6,942.93	6,068.94	5,860.39	30.86	18.14	-72.52	-1,571.37	90.78	5,136.53	5,087.55	48.99	104.859	
10,400.00	6,942.67	6,067.33	5,858.84	31.16	18.14	-72.49	-1,570.91	90.76	5,207.68	5,158.40	49.28	105.673	
10,500.00	6,942.41	6,065.72	5,857.29	31.46	18.13	-72.47	-1,570.45	90.74	5,279.76	5,230.18	49.58	106.497	
10,600.00	6,942.15	6,064.10	5,855.75	31.76	18.13	-72.44	-1,569.99	90.72	5,352.73	5,302.86	49.87	107.329	
10,700.00	6,941.89	6,062.49	5,854.20	32.06	18.12	-72.41	-1,569.53	90.70	5,426.57	5,376.40	50.17	108.168	
10,800.00	6,941.63	6,060.88	5,852.66	32.36	18.12	-72.39	-1,569.07	90.68	5,501.23	5,450.77	50.46	109.014	
10,900.00	6,941.37	6,059.26	5,851.11	32.66	18.11	-72.36	-1,568.61	90.66	5,576.69	5,525.93	50.76	109.866	
11,000.00	6,941.11	6,057.65	5,849.56	32.96	18.11	-72.34	-1,568.15	90.64	5,652.91	5,601.85	51.05	110.723	
11,100.00	6,940.86	6,056.04	5,848.02	33.26	18.10	-72.31	-1,567.69	90.62	5,729.86	5,678.51	51.35	111.584	
11,200.00	6,940.60	6,054.43	5,846.47	33.56	18.10	-72.29	-1,567.23	90.60	5,807.51	5,755.86	51.65	112.449	
11,300.00	6,940.34	6,052.81	5,844.93	33.86	18.10	-72.26	-1,566.77	90.58	5,885.83	5,833.89	51.94	113.317	
11,400.00	6,940.08	6,051.20	5,843.38	34.16	18.09	-72.24	-1,566.31	90.56	5,964.81	5,912.57	52.24	114.187	
11,500.00	6,939.82	6,049.59	5,841.84	34.46	18.09	-72.21	-1,565.85	90.54	6,044.40	5,991.87	52.53	115.060	
11,600.00	6,939.56	6,047.97	5,840.29	34.76	18.08	-72.19	-1,565.39	90.52	6,124.59	6,071.76	52.83	115.934	
11,700.00	6,939.30	6,046.36	5,838.74	35.06	18.08	-72.16	-1,564.93	90.50	6,205.36	6,152.24	53.12	116.810	
11,800.00	6,939.04	6,044.75	5,837.20	35.36	18.07	-72.13	-1,564.47	90.48	6,286.68	6,233.26	53.42	117.686	
11,900.00	6,938.78	6,043.14	5,835.65	35.66	18.07	-72.11	-1,564.01	90.46	6,368.53	6,314.82	53.71	118.562	
12,000.00	6,938.53	6,041.52	5,834.11	35.96	18.06	-72.08	-1,563.55	90.44	6,450.90	6,396.89	54.01	119.438	
12,100.00	6,938.27	6,039.91	5,832.56	36.26	18.06	-72.06	-1,563.09	90.42	6,533.75	6,479.44	54.31	120.314	
12,200.00	6,938.01	6,038.30	5,831.02	36.56	18.05	-72.03	-1,562.63	90.40	6,617.08	6,562.48	54.60	121.189	
12,300.00	6,937.75	6,036.69	5,829.47	36.86	18.05	-72.01	-1,562.17	90.38	6,700.86	6,645.97	54.90	122.063	
12,400.00	6,937.49	6,035.07	5,827.92	37.16	18.04	-71.98	-1,561.71	90.36	6,785.09	6,729.89	55.19	122.935	
12,500.00	6,937.23	6,033.46	5,826.38	37.46	18.04	-71.96	-1,561.25	90.34	6,869.73	6,814.24	55.49	123.806	
12,600.00	6,936.97	6,031.85	5,824.83	37.77	18.03	-71.93	-1,560.79	90.32	6,954.78	6,899.00	55.78	124.675	
12,700.00	6,936.71	6,030.23	5,823.29	38.07	18.03	-71.91	-1,560.33	90.30	7,040.23	6,984.15	56.08	125.542	
12,800.00	6,936.45	6,028.62	5,821.74	38.37	18.02	-71.88	-1,559.87	90.28	7,126.05	7,069.68	56.37	126.406	
12,900.00	6,936.20	6,027.01	5,820.20	38.67	18.02	-71.86	-1,559.41	90.26	7,212.24	7,155.57	56.67	127.268	
13,000.00	6,935.94	6,025.40	5,818.65	38.97	18.01	-71.83	-1,558.95	90.24	7,298.78	7,241.82	56.97	128.127	
13,100.00	6,935.68	6,023.78	5,817.10	39.27	18.01	-71.80	-1,558.49	90.22	7,385.66	7,328.40	57.26	128.983	
13,200.00	6,935.42	6,022.17	5,815.56	39.57	18.00	-71.78	-1,558.03	90.20	7,472.87	7,415.31	57.56	129.836	
13,300.00	6,935.16	6,020.56	5,814.01	39.87	18.00	-71.75	-1,557.58	90.18	7,560.39	7,502.54	57.85	130.686	
13,400.00	6,934.90	6,018.94	5,812.47	40.17	17.99	-71.73	-1,557.12	90.16	7,648.22	7,590.08	58.15	131.533	
13,500.00	6,934.64	6,017.33	5,810.92	40.47	17.99	-71.70	-1,556.66	90.14	7,736.35	7,677.91	58.44	132.376	
13,600.00	6,934.38	6,015.72	5,809.38	40.77	17.98	-71.68	-1,556.20	90.12	7,824.76	7,766.02	58.74	133.215	
13,700.00	6,934.12	6,014.11	5,807.83	41.07	17.98	-71.65	-1,555.74	90.10	7,913.45	7,854.41	59.03	134.051	
13,800.00	6,933.87	6,012.49	5,806.28	41.37	17.97	-71.63	-1,555.28	90.08	8,002.40	7,943.07	59.33	134.882	
13,900.00	6,933.61	6,010.88	5,804.74	41.67	17.97	-71.60	-1,554.82	90.06	8,091.61	8,031.98	59.62	135.710	
14,000.00	6,933.35	6,009.27	5,803.19	41.97	17.96	-71.58	-1,554.36	90.04	8,181.07	8,121.15	59.92	136.534	
14,100.00	6,933.09	6,007.65	5,801.65	42.27	17.96	-71.55	-1,553.90	90.02	8,270.77	8,210.55	60.21	137.354	
14,200.00	6,932.83	6,006.04	5,800.10	42.57	17.95	-71.53	-1,553.44	90.00	8,360.70	8,300.19	60.51	138.170	
14,300.00	6,932.57	6,004.43	5,798.55	42.87	17.95	-71.50	-1,552.98	89.98	8,450.86	8,390.06	60.81	138.981	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,400.00	6,932.31	6,002.82	5,797.01	43.17	17.95	-71.47	-1,552.52	89.96	8,541.24	8,480.14	61.10	139.788	
14,500.00	6,932.05	6,001.20	5,795.46	43.47	17.94	-71.45	-1,552.06	89.94	8,631.83	8,570.43	61.40	140.591	
14,600.00	6,931.79	6,000.41	5,793.92	43.77	17.94	-71.42	-1,551.60	89.92	8,722.63	8,660.93	61.69	141.384	
14,700.00	6,931.54	6,002.02	5,792.37	44.07	17.94	-71.40	-1,551.14	89.90	8,813.62	8,751.62	62.00	142.156	
14,800.00	6,931.28	5,996.37	5,790.83	44.37	17.93	-71.37	-1,550.68	89.88	8,904.81	8,842.53	62.28	142.974	
14,900.00	6,931.02	6,005.25	5,789.28	44.67	17.95	-71.35	-1,550.22	89.86	8,996.18	8,933.57	62.61	143.687	
15,000.00	6,930.76	6,006.86	5,787.73	44.97	17.96	-71.32	-1,549.76	89.84	9,087.74	9,024.82	62.91	144.445	
15,100.00	6,930.50	6,008.47	5,786.19	45.27	17.96	-71.30	-1,549.30	89.83	9,179.47	9,116.25	63.22	145.199	
15,200.00	6,930.24	5,989.91	5,784.64	45.57	17.91	-71.27	-1,548.84	89.81	9,271.37	9,207.91	63.46	146.088	
15,300.00	6,929.98	5,988.30	5,783.10	45.87	17.90	-71.25	-1,548.38	89.79	9,363.44	9,299.68	63.76	146.855	
15,400.00	6,929.72	5,986.69	5,781.55	46.17	17.90	-71.22	-1,547.92	89.77	9,455.67	9,391.62	64.06	147.618	
15,500.00	6,929.46	5,985.08	5,780.01	46.47	17.89	-71.20	-1,547.46	89.75	9,548.06	9,483.70	64.35	148.376	
15,600.00	6,929.21	5,983.46	5,778.46	46.77	17.89	-71.17	-1,547.00	89.73	9,640.59	9,575.95	64.65	149.129	
15,700.00	6,928.95	5,981.85	5,776.91	47.07	17.88	-71.14	-1,546.54	89.71	9,733.28	9,668.34	64.94	149.878	
15,800.00	6,928.69	5,980.24	5,775.37	47.37	17.88	-71.12	-1,546.08	89.69	9,826.10	9,760.87	65.24	150.623	
15,900.00	6,928.43	5,978.62	5,773.82	47.67	17.87	-71.09	-1,545.62	89.67	9,919.07	9,853.54	65.53	151.362	
16,000.00	6,928.17	5,977.01	5,772.28	47.97	17.87	-71.07	-1,545.16	89.65	10,012.17	9,946.35	65.83	152.098	
16,100.00	6,927.91	5,975.40	5,770.73	48.27	17.86	-71.04	-1,544.70	89.63	10,105.41	10,039.28	66.12	152.828	
16,200.00	6,927.65	5,973.79	5,769.19	48.57	17.86	-71.02	-1,544.24	89.61	10,198.77	10,132.35	66.42	153.554	
16,300.00	6,927.39	5,972.17	5,767.64	48.87	17.85	-70.99	-1,543.78	89.59	10,292.25	10,225.54	66.71	154.276	
16,400.00	6,927.13	5,970.56	5,766.09	49.17	17.85	-70.97	-1,543.32	89.57	10,385.86	10,318.85	67.01	154.993	
16,500.00	6,926.88	5,968.95	5,764.55	49.47	17.84	-70.94	-1,542.86	89.55	10,479.59	10,412.28	67.30	155.705	
16,600.00	6,926.62	5,967.33	5,763.00	49.77	17.84	-70.92	-1,542.40	89.53	10,573.42	10,505.83	67.60	156.413	
16,700.00	6,926.36	5,965.72	5,761.46	50.07	17.83	-70.89	-1,541.94	89.51	10,667.38	10,599.48	67.89	157.116	
16,800.00	6,926.10	5,964.11	5,759.91	50.37	17.83	-70.87	-1,541.48	89.49	10,761.44	10,693.25	68.19	157.815	
16,900.00	6,925.84	5,962.50	5,758.36	50.67	17.82	-70.84	-1,541.02	89.47	10,855.60	10,787.12	68.49	158.510	
17,000.00	6,925.58	5,960.88	5,756.82	50.97	17.82	-70.81	-1,540.56	89.45	10,949.87	10,881.09	68.78	159.200	
17,100.00	6,925.32	5,959.27	5,755.27	51.27	17.81	-70.79	-1,540.10	89.43	11,044.24	10,975.17	69.08	159.885	
17,200.00	6,925.06	5,957.66	5,753.73	51.58	17.81	-70.76	-1,539.65	89.41	11,138.71	11,069.34	69.37	160.566	
17,224.45	6,925.00	5,957.26	5,753.35	51.65	17.81	-70.76	-1,539.53	89.40	11,161.82	11,092.37	69.44	160.732	
17,224.92	6,925.00	5,957.26	5,753.34	51.65	17.81	-70.76	-1,539.53	89.40	11,162.27	11,092.82	69.44	160.735	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	18,786.08	7,055.00	0.00	56.33	-79.91	1,889.94	-10,620.59	12,818.91					
100.00	100.00	18,786.08	7,055.00	0.23	56.33	-79.91	1,889.94	-10,620.59	12,765.17	12,708.62	56.54	225.760		
200.00	200.00	18,786.08	7,055.00	0.53	56.33	-79.91	1,889.94	-10,620.59	12,711.98	12,655.14	56.84	223.632		
300.00	300.00	18,786.08	7,055.00	0.83	56.33	-79.91	1,889.94	-10,620.59	12,659.36	12,602.22	57.14	221.535		
400.00	400.00	18,786.08	7,055.00	1.13	56.33	-79.91	1,889.94	-10,620.59	12,607.32	12,549.87	57.44	219.471		
500.00	500.00	18,786.08	7,055.00	1.43	56.33	-79.91	1,889.94	-10,620.59	12,555.85	12,498.11	57.74	217.438		
600.00	599.98	18,786.08	7,055.00	1.73	56.33	-73.79	1,889.94	-10,620.59	12,504.54	12,446.49	58.05	215.426		
700.00	699.84	18,786.08	7,055.00	2.03	56.33	-74.95	1,889.94	-10,620.59	12,452.98	12,394.63	58.35	213.431		
800.00	799.45	18,786.08	7,055.00	2.33	56.33	-76.12	1,889.94	-10,620.59	12,401.23	12,342.58	58.65	211.454		
900.00	898.70	18,786.08	7,055.00	2.63	56.33	-77.30	1,889.94	-10,620.59	12,349.35	12,290.40	58.95	209.495		
1,000.00	997.47	18,786.08	7,055.00	2.93	56.33	-78.49	1,889.94	-10,620.59	12,297.41	12,238.16	59.25	207.554		
1,100.00	1,095.62	18,786.08	7,055.00	3.23	56.33	-79.69	1,889.94	-10,620.59	12,245.47	12,185.92	59.55	205.634		
1,200.00	1,193.06	18,786.08	7,055.00	3.53	56.33	-80.88	1,889.94	-10,620.59	12,193.59	12,133.74	59.85	203.734		
1,300.00	1,289.64	18,786.08	7,055.00	3.83	56.33	-82.08	1,889.94	-10,620.59	12,141.84	12,081.69	60.15	201.855		
1,382.94	1,369.03	18,786.08	7,055.00	4.08	56.33	-83.07	1,889.94	-10,620.59	12,099.06	12,038.66	60.40	200.314		
1,400.00	1,385.28	18,786.08	7,055.00	4.13	56.33	-83.07	1,889.94	-10,620.59	12,090.29	12,029.83	60.45	199.999		
1,500.00	1,480.57	18,786.08	7,055.00	4.43	56.33	-83.07	1,889.94	-10,620.59	12,039.21	11,978.46	60.75	198.169		
1,600.00	1,575.86	18,786.08	7,055.00	4.73	56.33	-83.07	1,889.94	-10,620.59	11,988.75	11,927.70	61.05	196.368		
1,700.00	1,671.15	18,786.08	7,055.00	5.03	56.33	-83.07	1,889.94	-10,620.59	11,938.91	11,877.56	61.35	194.595		
1,800.00	1,766.44	18,786.08	7,055.00	5.33	56.33	-83.07	1,889.94	-10,620.59	11,889.71	11,828.06	61.65	192.849		
1,900.00	1,861.72	18,786.08	7,055.00	5.63	56.33	-83.07	1,889.94	-10,620.59	11,841.15	11,779.20	61.95	191.130		
2,000.00	1,957.01	18,786.08	7,055.00	5.93	56.33	-83.07	1,889.94	-10,620.59	11,793.23	11,730.98	62.25	189.438		
2,100.00	2,052.30	18,786.08	7,055.00	6.23	56.33	-83.07	1,889.94	-10,620.59	11,745.98	11,683.42	62.55	187.773		
2,200.00	2,147.59	18,786.08	7,055.00	6.53	56.33	-83.07	1,889.94	-10,620.59	11,699.38	11,636.53	62.85	186.135		
2,300.00	2,242.88	18,786.08	7,055.00	6.83	56.33	-83.07	1,889.94	-10,620.59	11,653.46	11,590.30	63.15	184.523		
2,400.00	2,338.16	18,786.08	7,055.00	7.13	56.33	-83.07	1,889.94	-10,620.59	11,608.21	11,544.76	63.45	182.936		
2,500.00	2,433.45	18,786.08	7,055.00	7.44	56.33	-83.07	1,889.94	-10,620.59	11,563.66	11,499.90	63.76	181.376		
2,600.00	2,528.74	18,786.08	7,055.00	7.74	56.33	-83.07	1,889.94	-10,620.59	11,519.80	11,455.74	64.06	179.841		
2,700.00	2,624.03	18,786.08	7,055.00	8.04	56.33	-83.07	1,889.94	-10,620.59	11,476.64	11,412.29	64.36	178.331		
2,800.00	2,719.32	18,786.08	7,055.00	8.34	56.33	-83.07	1,889.94	-10,620.59	11,434.20	11,369.54	64.66	176.847		
2,900.00	2,814.60	18,786.08	7,055.00	8.64	56.33	-83.07	1,889.94	-10,620.59	11,392.47	11,327.52	64.96	175.387		
3,000.00	2,909.89	18,786.08	7,055.00	8.94	56.33	-83.07	1,889.94	-10,620.59	11,351.48	11,286.22	65.26	173.952		
3,100.00	3,005.18	18,786.08	7,055.00	9.24	56.33	-83.07	1,889.94	-10,620.59	11,311.21	11,245.66	65.56	172.541		
3,200.00	3,100.47	18,786.08	7,055.00	9.54	56.33	-83.07	1,889.94	-10,620.59	11,271.70	11,205.84	65.86	171.154		
3,300.00	3,195.76	18,786.08	7,055.00	9.84	56.33	-83.07	1,889.94	-10,620.59	11,232.93	11,166.77	66.16	169.791		
3,400.00	3,291.04	18,786.08	7,055.00	10.14	56.33	-83.07	1,889.94	-10,620.59	11,194.92	11,128.46	66.46	168.453		
3,500.00	3,386.33	18,786.08	7,055.00	10.44	56.33	-83.07	1,889.94	-10,620.59	11,157.68	11,090.92	66.76	167.137		
3,600.00	3,481.62	18,786.08	7,055.00	10.74	56.33	-83.07	1,889.94	-10,620.59	11,121.21	11,054.16	67.06	165.845		
3,700.00	3,576.91	18,786.08	7,055.00	11.04	56.33	-83.07	1,889.94	-10,620.59	11,085.53	11,018.17	67.36	164.576		
3,800.00	3,672.20	18,786.08	7,055.00	11.34	56.33	-83.07	1,889.94	-10,620.59	11,050.63	10,982.98	67.66	163.330		
3,900.00	3,767.48	18,786.08	7,055.00	11.64	56.33	-83.07	1,889.94	-10,620.59	11,016.54	10,948.58	67.96	162.107		
4,000.00	3,862.77	18,786.08	7,055.00	11.94	56.33	-83.07	1,889.94	-10,620.59	10,983.24	10,914.98	68.26	160.906		
4,100.00	3,958.06	18,786.08	7,055.00	12.24	56.33	-83.07	1,889.94	-10,620.59	10,950.76	10,882.20	68.56	159.728		
4,200.00	4,053.35	18,786.08	7,055.00	12.54	56.33	-83.07	1,889.94	-10,620.59	10,919.10	10,850.24	68.86	158.572		
4,300.00	4,148.64	18,786.08	7,055.00	12.84	56.33	-83.07	1,889.94	-10,620.59	10,888.26	10,819.11	69.16	157.438		
4,400.00	4,243.92	18,786.08	7,055.00	13.14	56.33	-83.07	1,889.94	-10,620.59	10,858.26	10,788.80	69.46	156.326		
4,500.00	4,339.21	18,786.08	7,055.00	13.44	56.33	-83.07	1,889.94	-10,620.59	10,829.10	10,759.34	69.76	155.235		
4,600.00	4,434.50	18,786.08	7,055.00	13.74	56.33	-83.07	1,889.94	-10,620.59	10,800.79	10,730.73	70.06	154.166		
4,700.00	4,529.79	18,786.08	7,055.00	14.04	56.33	-83.07	1,889.94	-10,620.59	10,773.33	10,702.97	70.36	153.118		
4,800.00	4,625.08	18,786.08	7,055.00	14.34	56.33	-83.07	1,889.94	-10,620.59	10,746.73	10,676.07	70.66	152.091		
4,900.00	4,720.36	18,786.08	7,055.00	14.64	56.33	-83.07	1,889.94	-10,620.59	10,720.99	10,650.03	70.96	151.086		
5,000.00	4,815.65	18,786.08	7,055.00	14.94	56.33	-83.07	1,889.94	-10,620.59	10,696.13	10,624.87	71.26	150.100		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	4,910.94	18,786.08	7,055.00	15.24	56.33	-83.07	1,889.94	-10,620.59	10,672.15	10,600.59	71.56	149.136		
5,200.00	5,006.23	18,786.08	7,055.00	15.54	56.33	-83.07	1,889.94	-10,620.59	10,649.06	10,577.20	71.86	148.192		
5,300.00	5,101.52	18,786.08	7,055.00	15.84	56.33	-83.07	1,889.94	-10,620.59	10,626.85	10,554.69	72.16	147.268		
5,400.00	5,196.80	18,786.08	7,055.00	16.14	56.33	-83.07	1,889.94	-10,620.59	10,605.54	10,533.08	72.46	146.364		
5,500.00	5,292.09	18,786.08	7,055.00	16.44	56.33	-83.07	1,889.94	-10,620.59	10,585.13	10,512.37	72.76	145.480		
5,600.00	5,387.38	18,786.08	7,055.00	16.74	56.33	-83.07	1,889.94	-10,620.59	10,565.63	10,492.57	73.06	144.616		
5,700.00	5,482.67	18,786.08	7,055.00	17.04	56.33	-83.07	1,889.94	-10,620.59	10,547.05	10,473.69	73.36	143.771		
5,800.00	5,577.96	18,786.08	7,055.00	17.34	56.33	-83.07	1,889.94	-10,620.59	10,529.38	10,455.72	73.66	142.946		
5,900.00	5,673.24	18,786.08	7,055.00	17.64	56.33	-83.07	1,889.94	-10,620.59	10,512.63	10,438.67	73.96	142.139		
6,000.00	5,768.53	18,786.08	7,055.00	17.94	56.33	-83.07	1,889.94	-10,620.59	10,496.80	10,422.54	74.26	141.352		
6,100.00	5,863.82	18,786.08	7,055.00	18.24	56.33	-83.07	1,889.94	-10,620.59	10,481.91	10,407.35	74.56	140.584		
6,200.00	5,959.11	18,786.08	7,055.00	18.54	56.33	-83.07	1,889.94	-10,620.59	10,467.95	10,393.09	74.86	139.834		
6,300.00	6,054.40	18,786.08	7,055.00	18.84	56.33	-83.07	1,889.94	-10,620.59	10,454.93	10,379.77	75.16	139.103		
6,400.00	6,149.68	18,786.08	7,055.00	19.14	56.33	-83.07	1,889.94	-10,620.59	10,442.85	10,367.39	75.46	138.390		
6,500.00	6,244.97	18,786.08	7,055.00	19.44	56.33	-83.07	1,889.94	-10,620.59	10,431.72	10,355.96	75.76	137.695		
6,600.00	6,340.26	18,786.08	7,055.00	19.74	56.33	-83.07	1,889.94	-10,620.59	10,421.53	10,345.47	76.06	137.018		
6,689.41	6,425.45	18,786.08	7,055.00	20.01	56.33	-83.07	1,889.94	-10,620.59	10,413.23	10,336.90	76.33	136.428		
6,700.00	6,435.54	18,786.08	7,055.00	20.04	56.33	-79.80	1,889.94	-10,620.59	10,412.19	10,335.83	76.36	136.358		
6,750.00	6,482.96	18,786.08	7,055.00	20.19	56.33	-65.58	1,889.94	-10,620.59	10,404.85	10,328.34	76.51	135.994		
6,800.00	6,529.78	18,786.08	7,055.00	20.34	56.33	-54.11	1,889.94	-10,620.59	10,393.45	10,316.79	76.66	135.578		
6,850.00	6,575.63	18,786.08	7,055.00	20.49	56.33	-45.38	1,889.94	-10,620.59	10,378.08	10,301.27	76.81	135.113		
6,900.00	6,620.18	18,786.08	7,055.00	20.64	56.33	-38.85	1,889.94	-10,620.59	10,358.83	10,281.87	76.96	134.599		
6,950.00	6,663.07	18,786.08	7,055.00	20.79	56.33	-33.94	1,889.94	-10,620.59	10,335.82	10,258.71	77.11	134.038		
7,000.00	6,704.00	18,786.08	7,055.00	20.94	56.33	-30.21	1,889.94	-10,620.59	10,309.21	10,231.95	77.26	133.433		
7,050.00	6,742.63	18,786.08	7,055.00	21.09	56.33	-27.34	1,889.94	-10,620.59	10,279.17	10,201.76	77.41	132.786		
7,100.00	6,778.69	18,786.08	7,055.00	21.24	56.33	-25.10	1,889.94	-10,620.59	10,245.91	10,168.35	77.56	132.100		
7,150.00	6,811.89	18,786.08	7,055.00	21.39	56.33	-23.34	1,889.94	-10,620.59	10,209.64	10,131.93	77.71	131.377		
7,200.00	6,841.98	18,786.08	7,055.00	21.54	56.33	-21.97	1,889.94	-10,620.59	10,170.61	10,092.75	77.86	130.622		
7,250.00	6,868.74	18,786.08	7,055.00	21.69	56.33	-20.91	1,889.94	-10,620.59	10,129.09	10,051.08	78.01	129.838		
7,300.00	6,891.96	18,786.08	7,055.00	21.84	56.33	-20.11	1,889.94	-10,620.59	10,085.37	10,007.20	78.16	129.029		
7,350.00	6,911.46	18,786.08	7,055.00	21.99	56.33	-19.56	1,889.94	-10,620.59	10,039.74	9,961.43	78.31	128.199		
7,400.00	6,927.10	18,786.08	7,055.00	22.14	56.33	-19.27	1,889.94	-10,620.59	9,992.54	9,914.08	78.46	127.351		
7,450.00	6,938.75	18,786.08	7,055.00	22.29	56.33	-19.33	1,889.94	-10,620.59	9,944.10	9,865.49	78.61	126.491		
7,500.00	6,946.33	18,786.08	7,055.00	22.44	56.33	-20.16	1,889.94	-10,620.59	9,894.79	9,816.02	78.77	125.623		
7,550.00	6,949.78	18,786.08	7,055.00	22.59	56.33	-26.66	1,889.94	-10,620.59	9,844.95	9,766.03	78.92	124.752		
7,568.05	6,950.00	18,786.08	7,055.00	22.65	56.33	-90.47	1,889.94	-10,620.59	9,826.91	9,747.94	78.97	124.438		
7,600.00	6,949.92	18,786.08	7,055.00	22.74	56.33	-90.47	1,889.94	-10,620.59	9,794.95	9,715.89	79.07	123.883		
7,700.00	6,949.66	18,786.08	7,055.00	23.04	56.33	-90.47	1,889.94	-10,620.59	9,694.95	9,615.59	79.37	122.153		
7,800.00	6,949.40	18,786.08	7,055.00	23.35	56.33	-90.47	1,889.94	-10,620.59	9,594.96	9,515.29	79.67	120.437		
7,900.00	6,949.14	18,786.08	7,055.00	23.65	56.33	-90.47	1,889.94	-10,620.59	9,494.96	9,414.99	79.97	118.733		
8,000.00	6,948.88	18,786.08	7,055.00	23.95	56.33	-90.47	1,889.94	-10,620.59	9,394.96	9,314.69	80.27	117.042		
8,100.00	6,948.62	18,786.08	7,055.00	24.25	56.33	-90.47	1,889.94	-10,620.59	9,294.96	9,214.39	80.57	115.364		
8,200.00	6,948.36	18,786.08	7,055.00	24.55	56.33	-90.47	1,889.94	-10,620.59	9,194.96	9,114.09	80.87	113.699		
8,300.00	6,948.11	18,786.08	7,055.00	24.85	56.33	-90.47	1,889.94	-10,620.59	9,094.96	9,013.79	81.17	112.046		
8,400.00	6,947.85	18,786.08	7,055.00	25.15	56.33	-90.47	1,889.94	-10,620.59	8,994.97	8,913.49	81.47	110.405		
8,500.00	6,947.59	18,786.08	7,055.00	25.45	56.33	-90.47	1,889.94	-10,620.59	8,894.97	8,813.19	81.77	108.776		
8,600.00	6,947.33	18,786.08	7,055.00	25.75	56.33	-90.47	1,889.94	-10,620.59	8,794.97	8,712.90	82.07	107.159		
8,700.00	6,947.07	18,786.08	7,055.00	26.05	56.33	-90.47	1,889.94	-10,620.59	8,694.97	8,612.60	82.37	105.554		
8,800.00	6,946.81	18,786.08	7,055.00	26.35	56.33	-90.47	1,889.94	-10,620.59	8,594.97	8,512.30	82.68	103.960		
8,900.00	6,946.55	18,786.08	7,055.00	26.65	56.33	-90.47	1,889.94	-10,620.59	8,494.98	8,412.00	82.98	102.378		
9,000.00	6,946.29	18,786.08	7,055.00	26.95	56.33	-90.47	1,889.94	-10,620.59	8,394.98	8,311.70	83.28	100.808		
9,100.00	6,946.03	18,786.08	7,055.00	27.25	56.33	-90.47	1,889.94	-10,620.59	8,294.98	8,211.40	83.58	99.249		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,200.00	6,945.78	18,786.08	7,055.00	27.55	56.33	-90.47	1,889.94	-10,620.59	8,194.98	8,111.10	83.88	97.701		
9,300.00	6,945.52	18,786.08	7,055.00	27.85	56.33	-90.47	1,889.94	-10,620.59	8,094.98	8,010.81	84.18	96.164		
9,400.00	6,945.26	18,786.08	7,055.00	28.15	56.33	-90.47	1,889.94	-10,620.59	7,994.99	7,910.51	84.48	94.638		
9,500.00	6,945.00	18,786.08	7,055.00	28.45	56.33	-90.47	1,889.94	-10,620.59	7,894.99	7,810.21	84.78	93.123		
9,600.00	6,944.74	18,786.08	7,055.00	28.75	56.33	-90.47	1,889.94	-10,620.59	7,794.99	7,709.91	85.08	91.619		
9,700.00	6,944.48	18,786.08	7,055.00	29.05	56.33	-90.47	1,889.94	-10,620.59	7,694.99	7,609.61	85.38	90.125		
9,800.00	6,944.22	18,786.08	7,055.00	29.35	56.33	-90.47	1,889.94	-10,620.59	7,595.00	7,509.32	85.68	88.642		
9,900.00	6,943.96	18,786.08	7,055.00	29.66	56.33	-90.47	1,889.94	-10,620.59	7,495.00	7,409.02	85.98	87.169		
10,000.00	6,943.70	18,786.08	7,055.00	29.96	56.33	-90.47	1,889.94	-10,620.59	7,395.00	7,308.72	86.28	85.707		
10,100.00	6,943.45	18,786.08	7,055.00	30.26	56.33	-90.47	1,889.94	-10,620.59	7,295.00	7,208.42	86.58	84.254		
10,200.00	6,943.19	18,786.08	7,055.00	30.56	56.33	-90.47	1,889.94	-10,620.59	7,195.01	7,108.12	86.88	82.812		
10,300.00	6,942.93	18,786.08	7,055.00	30.86	56.33	-90.47	1,889.94	-10,620.59	7,095.01	7,007.83	87.18	81.380		
10,400.00	6,942.67	18,786.08	7,055.00	31.16	56.33	-90.47	1,889.94	-10,620.59	6,995.01	6,907.53	87.48	79.957		
10,500.00	6,942.41	18,786.08	7,055.00	31.46	56.33	-90.47	1,889.94	-10,620.59	6,895.02	6,807.23	87.79	78.544		
10,600.00	6,942.15	18,786.08	7,055.00	31.76	56.33	-90.47	1,889.94	-10,620.59	6,795.02	6,706.93	88.09	77.141		
10,700.00	6,941.89	18,786.08	7,055.00	32.06	56.33	-90.47	1,889.94	-10,620.59	6,695.02	6,606.64	88.39	75.748		
10,800.00	6,941.63	18,786.08	7,055.00	32.36	56.33	-90.47	1,889.94	-10,620.59	6,595.03	6,506.34	88.69	74.363		
10,900.00	6,941.37	18,786.08	7,055.00	32.66	56.33	-90.47	1,889.94	-10,620.59	6,495.03	6,406.04	88.99	72.989		
11,000.00	6,941.11	18,786.08	7,055.00	32.96	56.33	-90.47	1,889.94	-10,620.59	6,395.03	6,305.75	89.29	71.623		
11,100.00	6,940.86	18,786.08	7,055.00	33.26	56.33	-90.47	1,889.94	-10,620.59	6,295.04	6,205.45	89.59	70.267		
11,200.00	6,940.60	18,786.08	7,055.00	33.56	56.33	-90.47	1,889.94	-10,620.59	6,195.04	6,105.15	89.89	68.919		
11,300.00	6,940.34	18,786.08	7,055.00	33.86	56.33	-90.47	1,889.94	-10,620.59	6,095.05	6,004.86	90.19	67.581		
11,400.00	6,940.08	18,786.08	7,055.00	34.16	56.33	-90.47	1,889.94	-10,620.59	5,995.05	5,904.56	90.49	66.252		
11,500.00	6,939.82	18,786.08	7,055.00	34.46	56.33	-90.47	1,889.94	-10,620.59	5,895.05	5,804.26	90.79	64.931		
11,600.00	6,939.56	18,786.08	7,055.00	34.76	56.33	-90.47	1,889.94	-10,620.59	5,795.06	5,703.97	91.09	63.619		
11,700.00	6,939.30	18,786.08	7,055.00	35.06	56.33	-90.47	1,889.94	-10,620.59	5,695.06	5,603.67	91.39	62.316		
11,800.00	6,939.04	18,786.08	7,055.00	35.36	56.33	-90.47	1,889.94	-10,620.59	5,595.07	5,503.38	91.69	61.021		
11,900.00	6,938.78	18,786.08	7,055.00	35.66	56.33	-90.47	1,889.94	-10,620.59	5,495.07	5,403.08	91.99	59.735		
12,000.00	6,938.53	18,786.08	7,055.00	35.96	56.33	-90.47	1,889.94	-10,620.59	5,395.08	5,302.79	92.29	58.457		
12,100.00	6,938.27	18,786.08	7,055.00	36.26	56.33	-90.47	1,889.94	-10,620.59	5,295.08	5,202.49	92.59	57.188		
12,200.00	6,938.01	18,786.08	7,055.00	36.56	56.33	-90.47	1,889.94	-10,620.59	5,195.09	5,102.20	92.89	55.926		
12,300.00	6,937.75	18,786.08	7,055.00	36.86	56.33	-90.47	1,889.94	-10,620.59	5,095.09	5,001.90	93.19	54.673		
12,400.00	6,937.49	18,786.08	7,055.00	37.16	56.33	-90.47	1,889.94	-10,620.59	4,995.10	4,901.61	93.49	53.428		
12,500.00	6,937.23	18,786.08	7,055.00	37.46	56.33	-90.47	1,889.94	-10,620.59	4,895.11	4,801.31	93.79	52.191		
12,600.00	6,936.97	18,786.08	7,055.00	37.77	56.33	-90.47	1,889.94	-10,620.59	4,795.11	4,701.02	94.09	50.961		
12,700.00	6,936.71	18,786.08	7,055.00	38.07	56.33	-90.47	1,889.94	-10,620.59	4,695.12	4,600.73	94.39	49.740		
12,800.00	6,936.45	18,786.08	7,055.00	38.37	56.33	-90.47	1,889.94	-10,620.59	4,595.13	4,500.43	94.69	48.526		
12,900.00	6,936.20	18,786.08	7,055.00	38.67	56.33	-90.47	1,889.94	-10,620.59	4,495.13	4,400.14	94.99	47.320		
13,000.00	6,935.94	18,786.08	7,055.00	38.97	56.33	-90.47	1,889.94	-10,620.59	4,395.14	4,299.85	95.29	46.122		
13,100.00	6,935.68	18,786.08	7,055.00	39.27	56.33	-90.47	1,889.94	-10,620.59	4,295.15	4,199.55	95.59	44.931		
13,200.00	6,935.42	18,786.08	7,055.00	39.57	56.33	-90.47	1,889.94	-10,620.59	4,195.16	4,099.26	95.89	43.747		
13,300.00	6,935.16	18,786.08	7,055.00	39.87	56.33	-90.47	1,889.94	-10,620.59	4,095.17	3,998.97	96.20	42.571		
13,400.00	6,934.90	18,786.08	7,055.00	40.17	56.33	-90.47	1,889.94	-10,620.59	3,995.17	3,898.68	96.50	41.403		
13,500.00	6,934.64	18,786.08	7,055.00	40.47	56.33	-90.47	1,889.94	-10,620.59	3,895.18	3,798.39	96.80	40.241		
13,600.00	6,934.38	18,786.08	7,055.00	40.77	56.33	-90.47	1,889.94	-10,620.59	3,795.19	3,698.10	97.10	39.087		
13,700.00	6,934.12	18,786.08	7,055.00	41.07	56.33	-90.47	1,889.94	-10,620.59	3,695.21	3,597.81	97.40	37.940		
13,800.00	6,933.87	18,786.08	7,055.00	41.37	56.33	-90.47	1,889.94	-10,620.59	3,595.22	3,497.52	97.70	36.800		
13,900.00	6,933.61	18,786.08	7,055.00	41.67	56.33	-90.47	1,889.94	-10,620.59	3,495.23	3,397.23	98.00	35.667		
14,000.00	6,933.35	18,786.08	7,055.00	41.97	56.33	-90.47	1,889.94	-10,620.59	3,395.24	3,296.94	98.30	34.541		
14,100.00	6,933.09	18,786.08	7,055.00	42.27	56.33	-90.47	1,889.94	-10,620.59	3,295.25	3,196.66	98.60	33.421		
14,200.00	6,932.83	18,786.08	7,055.00	42.57	56.33	-90.47	1,889.94	-10,620.59	3,195.27	3,096.37	98.90	32.309		
14,300.00	6,932.57	18,786.08	7,055.00	42.87	56.33	-90.47	1,889.94	-10,620.59	3,095.28	2,996.09	99.20	31.203		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 7 - Rosa Unit 574H - OH - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,400.00	6,932.31	18,786.08	7,055.00	43.17	56.33	-90.47	1,889.94	-10,620.59	2,995.30	2,895.80	99.50	30.104	
14,500.00	6,932.05	18,786.08	7,055.00	43.47	56.33	-90.47	1,889.94	-10,620.59	2,895.32	2,795.52	99.80	29.012	
14,600.00	6,931.79	18,786.08	7,055.00	43.77	56.33	-90.47	1,889.94	-10,620.59	2,795.34	2,695.24	100.10	27.926	
14,700.00	6,931.54	18,786.08	7,055.00	44.07	56.33	-90.47	1,889.94	-10,620.59	2,695.36	2,594.96	100.40	26.846	
14,800.00	6,931.28	18,786.08	7,055.00	44.37	56.33	-90.47	1,889.94	-10,620.59	2,595.38	2,494.68	100.70	25.774	
14,900.00	6,931.02	18,786.08	7,055.00	44.67	56.33	-90.47	1,889.94	-10,620.59	2,495.40	2,394.40	101.00	24.707	
15,000.00	6,930.76	18,786.08	7,055.00	44.97	56.33	-90.47	1,889.94	-10,620.59	2,395.43	2,294.13	101.30	23.647	
15,100.00	6,930.50	18,786.08	7,055.00	45.27	56.33	-90.47	1,889.94	-10,620.59	2,295.45	2,193.85	101.60	22.593	
15,200.00	6,930.24	18,786.08	7,055.00	45.57	56.33	-90.47	1,889.94	-10,620.59	2,195.48	2,093.58	101.90	21.545	
15,300.00	6,929.98	18,786.08	7,055.00	45.87	56.33	-90.47	1,889.94	-10,620.59	2,095.52	1,993.32	102.20	20.504	
15,400.00	6,929.72	18,786.08	7,055.00	46.17	56.33	-90.47	1,889.94	-10,620.59	1,995.55	1,893.05	102.50	19.469	
15,500.00	6,929.46	18,786.08	7,055.00	46.47	56.33	-90.47	1,889.94	-10,620.59	1,895.59	1,792.79	102.80	18.439	
15,600.00	6,929.21	18,786.08	7,055.00	46.77	56.33	-90.47	1,889.94	-10,620.59	1,795.64	1,692.53	103.10	17.416	
15,700.00	6,928.95	18,786.08	7,055.00	47.07	56.33	-90.47	1,889.94	-10,620.59	1,695.69	1,592.28	103.40	16.399	
15,800.00	6,928.69	18,786.08	7,055.00	47.37	56.33	-90.47	1,889.94	-10,620.59	1,595.74	1,492.04	103.70	15.388	
15,900.00	6,928.43	18,786.08	7,055.00	47.67	56.33	-90.47	1,889.94	-10,620.59	1,495.80	1,391.80	104.00	14.383	
16,000.00	6,928.17	18,786.08	7,055.00	47.97	56.33	-90.47	1,889.94	-10,620.59	1,395.88	1,291.57	104.30	13.383	
16,100.00	6,927.91	18,786.08	7,055.00	48.27	56.33	-90.47	1,889.94	-10,620.59	1,295.96	1,191.36	104.60	12.389	
16,200.00	6,927.65	18,786.08	7,055.00	48.57	56.33	-90.47	1,889.94	-10,620.59	1,196.06	1,091.15	104.90	11.402	
16,300.00	6,927.39	18,786.08	7,055.00	48.87	56.33	-90.47	1,889.94	-10,620.59	1,096.17	990.97	105.20	10.420	
16,400.00	6,927.13	18,786.08	7,055.00	49.17	56.33	-90.47	1,889.94	-10,620.59	996.31	890.81	105.50	9.443	
16,500.00	6,926.88	18,786.08	7,055.00	49.47	56.33	-90.47	1,889.94	-10,620.59	896.48	790.67	105.80	8.473	
16,600.00	6,926.62	18,786.08	7,055.00	49.77	56.33	-90.47	1,889.94	-10,620.59	796.69	690.58	106.10	7.509	
16,700.00	6,926.36	18,786.08	7,055.00	50.07	56.33	-90.47	1,889.94	-10,620.59	696.96	590.56	106.40	6.550	
16,800.00	6,926.10	18,786.08	7,055.00	50.37	56.33	-90.47	1,889.94	-10,620.59	597.32	490.62	106.70	5.598	
16,900.00	6,925.84	18,786.08	7,055.00	50.67	56.33	-90.47	1,889.94	-10,620.59	497.83	390.82	107.00	4.652	
17,000.00	6,925.58	18,786.08	7,055.00	50.97	56.33	-90.47	1,889.94	-10,620.59	398.59	291.29	107.30	3.715	
17,100.00	6,925.32	18,786.08	7,055.00	51.27	56.33	-90.47	1,889.94	-10,620.59	299.85	192.25	107.60	2.787	
17,200.00	6,925.06	18,786.08	7,055.00	51.58	56.33	-90.47	1,889.94	-10,620.59	202.37	94.47	107.90	1.876	
17,224.45	6,925.00	18,786.08	7,055.00	51.65	56.33	-90.47	1,889.94	-10,620.59	178.96	70.99	107.97	1.658	
17,224.92	6,925.00	18,786.08	7,055.00	51.65	56.33	-90.47	1,889.94	-10,620.59	178.50	70.53	107.97	1.653 CC, ES, SF	

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	18,672.65	7,055.00	0.00	55.99	-86.76	598.75	-10,577.37	12,656.81					
100.00	100.00	18,672.65	7,055.00	0.23	55.99	-86.76	598.75	-10,577.37	12,602.38	12,546.17	56.21	224.220		
200.00	200.00	18,672.65	7,055.00	0.53	55.99	-86.76	598.75	-10,577.37	12,548.50	12,492.00	56.51	222.075		
300.00	300.00	18,672.65	7,055.00	0.83	55.99	-86.76	598.75	-10,577.37	12,495.20	12,438.39	56.81	219.962		
400.00	400.00	18,672.65	7,055.00	1.13	55.99	-86.76	598.75	-10,577.37	12,442.47	12,385.36	57.11	217.882		
500.00	500.00	18,672.65	7,055.00	1.43	55.99	-86.76	598.75	-10,577.37	12,390.32	12,332.91	57.41	215.833		
600.00	599.98	18,672.65	7,055.00	1.73	55.99	-80.69	598.75	-10,577.37	12,338.50	12,280.79	57.71	213.810		
700.00	699.84	18,672.65	7,055.00	2.03	55.99	-81.89	598.75	-10,577.37	12,286.78	12,228.78	58.01	211.810		
800.00	799.45	18,672.65	7,055.00	2.33	55.99	-83.08	598.75	-10,577.37	12,235.25	12,176.94	58.31	209.834		
900.00	898.70	18,672.65	7,055.00	2.63	55.99	-84.27	598.75	-10,577.37	12,183.95	12,125.34	58.61	207.883		
1,000.00	997.47	18,672.65	7,055.00	2.93	55.99	-85.45	598.75	-10,577.37	12,132.96	12,074.05	58.91	205.957		
1,100.00	1,095.62	18,672.65	7,055.00	3.23	55.99	-86.62	598.75	-10,577.37	12,082.35	12,023.13	59.21	204.056		
1,200.00	1,193.06	18,672.65	7,055.00	3.53	55.99	-87.78	598.75	-10,577.37	12,032.17	11,972.66	59.51	202.183		
1,300.00	1,289.64	18,672.65	7,055.00	3.83	55.99	-88.92	598.75	-10,577.37	11,982.50	11,922.69	59.81	200.337		
1,382.94	1,369.03	18,672.65	7,055.00	4.08	55.99	-89.86	598.75	-10,577.37	11,941.73	11,881.67	60.06	198.827		
1,400.00	1,385.28	18,672.65	7,055.00	4.13	55.99	-89.86	598.75	-10,577.37	11,933.40	11,873.29	60.11	198.519		
1,500.00	1,480.57	18,672.65	7,055.00	4.43	55.99	-89.86	598.75	-10,577.37	11,884.93	11,824.52	60.41	196.730		
1,600.00	1,575.86	18,672.65	7,055.00	4.73	55.99	-89.86	598.75	-10,577.37	11,837.11	11,776.40	60.71	194.969		
1,700.00	1,671.15	18,672.65	7,055.00	5.03	55.99	-89.86	598.75	-10,577.37	11,789.95	11,728.93	61.01	193.237		
1,800.00	1,766.44	18,672.65	7,055.00	5.33	55.99	-89.86	598.75	-10,577.37	11,743.44	11,682.13	61.31	191.532		
1,900.00	1,861.72	18,672.65	7,055.00	5.63	55.99	-89.86	598.75	-10,577.37	11,697.61	11,635.99	61.61	189.854		
2,000.00	1,957.01	18,672.65	7,055.00	5.93	55.99	-89.86	598.75	-10,577.37	11,652.45	11,590.54	61.91	188.204		
2,100.00	2,052.30	18,672.65	7,055.00	6.23	55.99	-89.86	598.75	-10,577.37	11,607.98	11,545.77	62.21	186.581		
2,200.00	2,147.59	18,672.65	7,055.00	6.53	55.99	-89.86	598.75	-10,577.37	11,564.21	11,501.69	62.51	184.984		
2,300.00	2,242.88	18,672.65	7,055.00	6.83	55.99	-89.86	598.75	-10,577.37	11,521.13	11,458.32	62.81	183.414		
2,400.00	2,338.16	18,672.65	7,055.00	7.13	55.99	-89.86	598.75	-10,577.37	11,478.77	11,415.65	63.12	181.870		
2,500.00	2,433.45	18,672.65	7,055.00	7.44	55.99	-89.86	598.75	-10,577.37	11,437.12	11,373.70	63.42	180.353		
2,600.00	2,528.74	18,672.65	7,055.00	7.74	55.99	-89.86	598.75	-10,577.37	11,396.19	11,332.48	63.72	178.860		
2,700.00	2,624.03	18,672.65	7,055.00	8.04	55.99	-89.86	598.75	-10,577.37	11,356.01	11,291.99	64.02	177.394		
2,800.00	2,719.32	18,672.65	7,055.00	8.34	55.99	-89.86	598.75	-10,577.37	11,316.56	11,252.24	64.32	175.952		
2,900.00	2,814.60	18,672.65	7,055.00	8.64	55.99	-89.86	598.75	-10,577.37	11,277.86	11,213.24	64.62	174.536		
3,000.00	2,909.89	18,672.65	7,055.00	8.94	55.99	-89.86	598.75	-10,577.37	11,239.91	11,175.00	64.92	173.144		
3,100.00	3,005.18	18,672.65	7,055.00	9.24	55.99	-89.86	598.75	-10,577.37	11,202.73	11,137.52	65.22	171.777		
3,200.00	3,100.47	18,672.65	7,055.00	9.54	55.99	-89.86	598.75	-10,577.37	11,166.33	11,100.81	65.52	170.434		
3,300.00	3,195.76	18,672.65	7,055.00	9.84	55.99	-89.86	598.75	-10,577.37	11,130.70	11,064.88	65.82	169.115		
3,400.00	3,291.04	18,672.65	7,055.00	10.14	55.99	-89.86	598.75	-10,577.37	11,095.86	11,029.74	66.12	167.820		
3,500.00	3,386.33	18,672.65	7,055.00	10.44	55.99	-89.86	598.75	-10,577.37	11,061.81	10,995.39	66.42	166.549		
3,600.00	3,481.62	18,672.65	7,055.00	10.74	55.99	-89.86	598.75	-10,577.37	11,028.57	10,961.85	66.72	165.301		
3,700.00	3,576.91	18,672.65	7,055.00	11.04	55.99	-89.86	598.75	-10,577.37	10,996.13	10,929.11	67.02	164.077		
3,800.00	3,672.20	18,672.65	7,055.00	11.34	55.99	-89.86	598.75	-10,577.37	10,964.51	10,897.19	67.32	162.875		
3,900.00	3,767.48	18,672.65	7,055.00	11.64	55.99	-89.86	598.75	-10,577.37	10,933.71	10,866.09	67.62	161.697		
4,000.00	3,862.77	18,672.65	7,055.00	11.94	55.99	-89.86	598.75	-10,577.37	10,903.75	10,835.83	67.92	160.541		
4,100.00	3,958.06	18,672.65	7,055.00	12.24	55.99	-89.86	598.75	-10,577.37	10,874.62	10,806.40	68.22	159.408		
4,200.00	4,053.35	18,672.65	7,055.00	12.54	55.99	-89.86	598.75	-10,577.37	10,846.33	10,777.81	68.52	158.297		
4,300.00	4,148.64	18,672.65	7,055.00	12.84	55.99	-89.86	598.75	-10,577.37	10,818.89	10,750.08	68.82	157.208		
4,400.00	4,243.92	18,672.65	7,055.00	13.14	55.99	-89.86	598.75	-10,577.37	10,792.32	10,723.20	69.12	156.140		
4,500.00	4,339.21	18,672.65	7,055.00	13.44	55.99	-89.86	598.75	-10,577.37	10,766.60	10,697.18	69.42	155.095		
4,600.00	4,434.50	18,672.65	7,055.00	13.74	55.99	-89.86	598.75	-10,577.37	10,741.75	10,672.03	69.72	154.071		
4,700.00	4,529.79	18,672.65	7,055.00	14.04	55.99	-89.86	598.75	-10,577.37	10,717.78	10,647.76	70.02	153.068		
4,800.00	4,625.08	18,672.65	7,055.00	14.34	55.99	-89.86	598.75	-10,577.37	10,694.69	10,624.37	70.32	152.087		
4,900.00	4,720.36	18,672.65	7,055.00	14.64	55.99	-89.86	598.75	-10,577.37	10,672.49	10,601.87	70.62	151.126		
5,000.00	4,815.65	18,672.65	7,055.00	14.94	55.99	-89.86	598.75	-10,577.37	10,651.18	10,580.26	70.92	150.186		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	4,910.94	18,672.65	7,055.00	15.24	55.99	-89.86	598.75	-10,577.37	10,630.77	10,559.55	71.22	149.267		
5,200.00	5,006.23	18,672.65	7,055.00	15.54	55.99	-89.86	598.75	-10,577.37	10,611.26	10,539.74	71.52	148.368		
5,300.00	5,101.52	18,672.65	7,055.00	15.84	55.99	-89.86	598.75	-10,577.37	10,592.66	10,520.84	71.82	147.489		
5,400.00	5,196.80	18,672.65	7,055.00	16.14	55.99	-89.86	598.75	-10,577.37	10,574.97	10,502.85	72.12	146.630		
5,500.00	5,292.09	18,672.65	7,055.00	16.44	55.99	-89.86	598.75	-10,577.37	10,558.21	10,485.79	72.42	145.791		
5,600.00	5,387.38	18,672.65	7,055.00	16.74	55.99	-89.86	598.75	-10,577.37	10,542.36	10,469.64	72.72	144.972		
5,700.00	5,482.67	18,672.65	7,055.00	17.04	55.99	-89.86	598.75	-10,577.37	10,527.44	10,454.42	73.02	144.172		
5,800.00	5,577.96	18,672.65	7,055.00	17.34	55.99	-89.86	598.75	-10,577.37	10,513.44	10,440.12	73.32	143.391		
5,900.00	5,673.24	18,672.65	7,055.00	17.64	55.99	-89.86	598.75	-10,577.37	10,500.39	10,426.77	73.62	142.630		
6,000.00	5,768.53	18,672.65	7,055.00	17.94	55.99	-89.86	598.75	-10,577.37	10,488.26	10,414.35	73.92	141.887		
6,100.00	5,863.82	18,672.65	7,055.00	18.24	55.99	-89.86	598.75	-10,577.37	10,477.08	10,402.86	74.22	141.163		
6,200.00	5,959.11	18,672.65	7,055.00	18.54	55.99	-89.86	598.75	-10,577.37	10,466.85	10,392.33	74.52	140.457		
6,300.00	6,054.40	18,672.65	7,055.00	18.84	55.99	-89.86	598.75	-10,577.37	10,457.56	10,382.74	74.82	139.770		
6,400.00	6,149.68	18,672.65	7,055.00	19.14	55.99	-89.86	598.75	-10,577.37	10,449.22	10,374.10	75.12	139.101		
6,500.00	6,244.97	18,672.65	7,055.00	19.44	55.99	-89.86	598.75	-10,577.37	10,441.82	10,366.41	75.42	138.450		
6,600.00	6,340.26	18,672.65	7,055.00	19.74	55.99	-89.86	598.75	-10,577.37	10,435.39	10,359.67	75.72	137.817		
6,689.41	6,425.45	18,672.65	7,055.00	20.01	55.99	-89.86	598.75	-10,577.37	10,430.44	10,354.45	75.99	137.265		
6,700.00	6,435.54	18,672.65	7,055.00	20.04	55.99	-86.59	598.75	-10,577.37	10,429.81	10,353.79	76.02	137.200		
6,750.00	6,482.96	18,672.65	7,055.00	20.19	55.99	-72.44	598.75	-10,577.37	10,424.35	10,348.18	76.17	136.858		
6,800.00	6,529.78	18,672.65	7,055.00	20.34	55.99	-61.08	598.75	-10,577.37	10,414.86	10,338.54	76.32	136.464		
6,850.00	6,575.63	18,672.65	7,055.00	20.49	55.99	-52.52	598.75	-10,577.37	10,401.37	10,324.91	76.47	136.020		
6,900.00	6,620.18	18,672.65	7,055.00	20.64	55.99	-46.22	598.75	-10,577.37	10,384.00	10,307.38	76.62	135.526		
6,950.00	6,663.07	18,672.65	7,055.00	20.79	55.99	-41.62	598.75	-10,577.37	10,362.84	10,286.07	76.77	134.986		
7,000.00	6,704.00	18,672.65	7,055.00	20.94	55.99	-38.28	598.75	-10,577.37	10,338.04	10,261.12	76.92	134.400		
7,050.00	6,742.63	18,672.65	7,055.00	21.09	55.99	-35.90	598.75	-10,577.37	10,309.76	10,232.69	77.07	133.771		
7,100.00	6,778.69	18,672.65	7,055.00	21.24	55.99	-34.29	598.75	-10,577.37	10,278.18	10,200.96	77.22	133.102		
7,150.00	6,811.89	18,672.65	7,055.00	21.39	55.99	-33.34	598.75	-10,577.37	10,243.52	10,166.15	77.37	132.396		
7,200.00	6,841.98	18,672.65	7,055.00	21.54	55.99	-32.99	598.75	-10,577.37	10,206.01	10,128.49	77.52	131.656		
7,250.00	6,868.74	18,672.65	7,055.00	21.69	55.99	-33.29	598.75	-10,577.37	10,165.92	10,088.24	77.67	130.885		
7,300.00	6,891.96	18,672.65	7,055.00	21.84	55.99	-34.32	598.75	-10,577.37	10,123.50	10,045.68	77.82	130.087		
7,350.00	6,911.46	18,672.65	7,055.00	21.99	55.99	-36.34	598.75	-10,577.37	10,079.06	10,001.09	77.97	129.266		
7,400.00	6,927.10	18,672.65	7,055.00	22.14	55.99	-39.85	598.75	-10,577.37	10,032.92	9,954.80	78.12	128.427		
7,450.00	6,938.75	18,672.65	7,055.00	22.29	55.99	-45.91	598.75	-10,577.37	9,985.40	9,907.12	78.27	127.573		
7,500.00	6,946.33	18,672.65	7,055.00	22.44	55.99	-56.99	598.75	-10,577.37	9,936.84	9,858.42	78.42	126.709		
7,550.00	6,949.78	18,672.65	7,055.00	22.59	55.99	-78.48	598.75	-10,577.37	9,887.61	9,809.04	78.57	125.840		
7,568.05	6,950.00	18,672.65	7,055.00	22.65	55.99	-90.01	598.75	-10,577.37	9,869.75	9,791.12	78.63	125.526		
7,600.00	6,949.92	18,672.65	7,055.00	22.74	55.99	-90.01	598.75	-10,577.37	9,838.10	9,759.37	78.72	124.970		
7,700.00	6,949.66	18,672.65	7,055.00	23.04	55.99	-90.01	598.75	-10,577.37	9,739.04	9,660.02	79.02	123.241		
7,800.00	6,949.40	18,672.65	7,055.00	23.35	55.99	-90.01	598.75	-10,577.37	9,640.01	9,560.69	79.33	121.526		
7,900.00	6,949.14	18,672.65	7,055.00	23.65	55.99	-90.01	598.75	-10,577.37	9,541.00	9,461.38	79.63	119.823		
8,000.00	6,948.88	18,672.65	7,055.00	23.95	55.99	-90.01	598.75	-10,577.37	9,442.01	9,362.09	79.93	118.134		
8,100.00	6,948.62	18,672.65	7,055.00	24.25	55.99	-90.01	598.75	-10,577.37	9,343.05	9,262.82	80.23	116.457		
8,200.00	6,948.36	18,672.65	7,055.00	24.55	55.99	-90.01	598.75	-10,577.37	9,244.10	9,163.57	80.53	114.794		
8,300.00	6,948.11	18,672.65	7,055.00	24.85	55.99	-90.01	598.75	-10,577.37	9,145.18	9,064.35	80.83	113.143		
8,400.00	6,947.85	18,672.65	7,055.00	25.15	55.99	-90.01	598.75	-10,577.37	9,046.28	8,965.15	81.13	111.504		
8,500.00	6,947.59	18,672.65	7,055.00	25.45	55.99	-90.01	598.75	-10,577.37	8,947.40	8,865.97	81.43	109.879		
8,600.00	6,947.33	18,672.65	7,055.00	25.75	55.99	-90.01	598.75	-10,577.37	8,848.55	8,766.82	81.73	108.285		
8,700.00	6,947.07	18,672.65	7,055.00	26.05	55.99	-90.01	598.75	-10,577.37	8,749.73	8,667.70	82.03	106.663		
8,800.00	6,946.81	18,672.65	7,055.00	26.35	55.99	-90.01	598.75	-10,577.37	8,650.93	8,568.60	82.33	105.074		
8,900.00	6,946.55	18,672.65	7,055.00	26.65	55.99	-90.01	598.75	-10,577.37	8,552.17	8,469.53	82.63	103.497		
9,000.00	6,946.29	18,672.65	7,055.00	26.95	55.99	-90.01	598.75	-10,577.37	8,453.43	8,370.49	82.93	101.931		
9,100.00	6,946.03	18,672.65	7,055.00	27.25	55.99	-90.01	598.75	-10,577.37	8,354.72	8,271.48	83.23	100.377		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,200.00	6,945.78	18,672.65	7,055.00	27.55	55.99	-90.01	598.75	-10,577.37	8,256.04	8,172.50	83.53	98.835		
9,300.00	6,945.52	18,672.65	7,055.00	27.85	55.99	-90.01	598.75	-10,577.37	8,157.39	8,073.56	83.83	97.304		
9,400.00	6,945.26	18,672.65	7,055.00	28.15	55.99	-90.01	598.75	-10,577.37	8,058.78	7,974.64	84.13	95.784		
9,500.00	6,945.00	18,672.65	7,055.00	28.45	55.99	-90.01	598.75	-10,577.37	7,960.20	7,875.77	84.44	94.276		
9,600.00	6,944.74	18,672.65	7,055.00	28.75	55.99	-90.01	598.75	-10,577.37	7,861.66	7,776.92	84.74	92.778		
9,700.00	6,944.48	18,672.65	7,055.00	29.05	55.99	-90.01	598.75	-10,577.37	7,763.15	7,678.12	85.04	91.292		
9,800.00	6,944.22	18,672.65	7,055.00	29.35	55.99	-90.01	598.75	-10,577.37	7,664.69	7,579.35	85.34	89.817		
9,900.00	6,943.96	18,672.65	7,055.00	29.66	55.99	-90.01	598.75	-10,577.37	7,566.26	7,480.62	85.64	88.353		
10,000.00	6,943.70	18,672.65	7,055.00	29.96	55.99	-90.01	598.75	-10,577.37	7,467.88	7,381.94	85.94	86.899		
10,100.00	6,943.45	18,672.65	7,055.00	30.26	55.99	-90.01	598.75	-10,577.37	7,369.54	7,283.30	86.24	85.456		
10,200.00	6,943.19	18,672.65	7,055.00	30.56	55.99	-90.01	598.75	-10,577.37	7,271.24	7,184.70	86.54	84.023		
10,300.00	6,942.93	18,672.65	7,055.00	30.86	55.99	-90.01	598.75	-10,577.37	7,172.99	7,086.15	86.84	82.601		
10,400.00	6,942.67	18,672.65	7,055.00	31.16	55.99	-90.01	598.75	-10,577.37	7,074.79	6,987.65	87.14	81.190		
10,500.00	6,942.41	18,672.65	7,055.00	31.46	55.99	-90.01	598.75	-10,577.37	6,976.64	6,889.21	87.44	79.788		
10,600.00	6,942.15	18,672.65	7,055.00	31.76	55.99	-90.01	598.75	-10,577.37	6,878.55	6,790.81	87.74	78.397		
10,700.00	6,941.89	18,672.65	7,055.00	32.06	55.99	-90.01	598.75	-10,577.37	6,780.51	6,692.47	88.04	77.016		
10,800.00	6,941.63	18,672.65	7,055.00	32.36	55.99	-90.01	598.75	-10,577.37	6,682.53	6,594.19	88.34	75.645		
10,900.00	6,941.37	18,672.65	7,055.00	32.66	55.99	-90.01	598.75	-10,577.37	6,584.61	6,495.97	88.64	74.284		
11,000.00	6,941.11	18,672.65	7,055.00	32.96	55.99	-90.01	598.75	-10,577.37	6,486.75	6,397.81	88.94	72.933		
11,100.00	6,940.86	18,672.65	7,055.00	33.26	55.99	-90.01	598.75	-10,577.37	6,388.96	6,299.72	89.24	71.592		
11,200.00	6,940.60	18,672.65	7,055.00	33.56	55.99	-90.01	598.75	-10,577.37	6,291.24	6,201.70	89.54	70.261		
11,300.00	6,940.34	18,672.65	7,055.00	33.86	55.99	-90.01	598.75	-10,577.37	6,193.59	6,103.75	89.84	68.939		
11,400.00	6,940.08	18,672.65	7,055.00	34.16	55.99	-90.01	598.75	-10,577.37	6,096.02	6,005.88	90.14	67.627		
11,500.00	6,939.82	18,672.65	7,055.00	34.46	55.99	-90.01	598.75	-10,577.37	5,998.53	5,908.09	90.44	66.325		
11,600.00	6,939.56	18,672.65	7,055.00	34.76	55.99	-90.01	598.75	-10,577.37	5,901.12	5,810.38	90.74	65.032		
11,700.00	6,939.30	18,672.65	7,055.00	35.06	55.99	-90.01	598.75	-10,577.37	5,803.80	5,712.76	91.04	63.748		
11,800.00	6,939.04	18,672.65	7,055.00	35.36	55.99	-90.01	598.75	-10,577.37	5,706.57	5,615.23	91.34	62.475		
11,900.00	6,938.78	18,672.65	7,055.00	35.66	55.99	-90.01	598.75	-10,577.37	5,609.44	5,517.80	91.64	61.210		
12,000.00	6,938.53	18,672.65	7,055.00	35.96	55.99	-90.01	598.75	-10,577.37	5,512.42	5,420.47	91.94	59.955		
12,100.00	6,938.27	18,672.65	7,055.00	36.26	55.99	-90.01	598.75	-10,577.37	5,415.50	5,323.25	92.24	58.709		
12,200.00	6,938.01	18,672.65	7,055.00	36.56	55.99	-90.01	598.75	-10,577.37	5,318.69	5,226.15	92.54	57.473		
12,300.00	6,937.75	18,672.65	7,055.00	36.86	55.99	-90.01	598.75	-10,577.37	5,222.01	5,129.16	92.84	56.246		
12,400.00	6,937.49	18,672.65	7,055.00	37.16	55.99	-90.01	598.75	-10,577.37	5,125.45	5,032.31	93.14	55.028		
12,500.00	6,937.23	18,672.65	7,055.00	37.46	55.99	-90.01	598.75	-10,577.37	5,029.03	4,935.58	93.44	53.819		
12,600.00	6,936.97	18,672.65	7,055.00	37.77	55.99	-90.01	598.75	-10,577.37	4,932.75	4,839.00	93.74	52.620		
12,700.00	6,936.71	18,672.65	7,055.00	38.07	55.99	-90.01	598.75	-10,577.37	4,836.62	4,742.58	94.04	51.430		
12,800.00	6,936.45	18,672.65	7,055.00	38.37	55.99	-90.01	598.75	-10,577.37	4,740.65	4,646.31	94.34	50.249		
12,900.00	6,936.20	18,672.65	7,055.00	38.67	55.99	-90.01	598.75	-10,577.37	4,644.85	4,550.21	94.64	49.078		
13,000.00	6,935.94	18,672.65	7,055.00	38.97	55.99	-90.01	598.75	-10,577.37	4,549.23	4,454.29	94.94	47.916		
13,100.00	6,935.68	18,672.65	7,055.00	39.27	55.99	-90.01	598.75	-10,577.37	4,453.81	4,358.56	95.24	46.763		
13,200.00	6,935.42	18,672.65	7,055.00	39.57	55.99	-90.01	598.75	-10,577.37	4,358.58	4,263.04	95.54	45.619		
13,300.00	6,935.16	18,672.65	7,055.00	39.87	55.99	-90.01	598.75	-10,577.37	4,263.58	4,167.74	95.84	44.486		
13,400.00	6,934.90	18,672.65	7,055.00	40.17	55.99	-90.01	598.75	-10,577.37	4,168.81	4,072.67	96.14	43.361		
13,500.00	6,934.64	18,672.65	7,055.00	40.47	55.99	-90.01	598.75	-10,577.37	4,074.30	3,977.86	96.44	42.246		
13,600.00	6,934.38	18,672.65	7,055.00	40.77	55.99	-90.01	598.75	-10,577.37	3,980.05	3,883.31	96.74	41.141		
13,700.00	6,934.12	18,672.65	7,055.00	41.07	55.99	-90.01	598.75	-10,577.37	3,886.08	3,789.04	97.04	40.046		
13,800.00	6,933.87	18,672.65	7,055.00	41.37	55.99	-90.01	598.75	-10,577.37	3,792.43	3,695.09	97.34	38.960		
13,900.00	6,933.61	18,672.65	7,055.00	41.67	55.99	-90.01	598.75	-10,577.37	3,699.11	3,601.47	97.64	37.885		
14,000.00	6,933.35	18,672.65	7,055.00	41.97	55.99	-90.01	598.75	-10,577.37	3,606.15	3,508.21	97.94	36.820		
14,100.00	6,933.09	18,672.65	7,055.00	42.27	55.99	-90.01	598.75	-10,577.37	3,513.57	3,415.33	98.24	35.766		
14,200.00	6,932.83	18,672.65	7,055.00	42.57	55.99	-90.01	598.75	-10,577.37	3,421.41	3,322.87	98.54	34.722		
14,300.00	6,932.57	18,672.65	7,055.00	42.87	55.99	-90.01	598.75	-10,577.37	3,329.70	3,230.86	98.84	33.689		

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Offset Design Rosa Pad 7 - Rosa Unit 576H - OH - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-MWD-SDI												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,400.00	6,932.31	18,672.65	7,055.00	43.17	55.99	-90.01	598.75	-10,577.37	3,238.49	3,139.35	99.14	32.667	
14,500.00	6,932.05	18,672.65	7,055.00	43.47	55.99	-90.01	598.75	-10,577.37	3,147.80	3,048.37	99.44	31.657	
14,600.00	6,931.79	18,672.65	7,055.00	43.77	55.99	-90.01	598.75	-10,577.37	3,057.70	2,957.97	99.74	30.658	
14,700.00	6,931.54	18,672.65	7,055.00	44.07	55.99	-90.01	598.75	-10,577.37	2,968.24	2,868.20	100.03	29.672	
14,800.00	6,931.28	18,672.65	7,055.00	44.37	55.99	-90.01	598.75	-10,577.37	2,879.46	2,779.13	100.33	28.699	
14,900.00	6,931.02	18,672.65	7,055.00	44.67	55.99	-90.01	598.75	-10,577.37	2,791.45	2,690.82	100.63	27.739	
15,000.00	6,930.76	18,672.65	7,055.00	44.97	55.99	-90.01	598.75	-10,577.37	2,704.27	2,603.34	100.93	26.793	
15,100.00	6,930.50	18,672.65	7,055.00	45.27	55.99	-90.01	598.75	-10,577.37	2,618.00	2,516.77	101.23	25.862	
15,200.00	6,930.24	18,672.65	7,055.00	45.57	55.99	-90.01	598.75	-10,577.37	2,532.75	2,431.22	101.53	24.946	
15,300.00	6,929.98	18,672.65	7,055.00	45.87	55.99	-90.01	598.75	-10,577.37	2,448.61	2,346.78	101.83	24.047	
15,400.00	6,929.72	18,672.65	7,055.00	46.17	55.99	-90.01	598.75	-10,577.37	2,365.71	2,263.58	102.12	23.165	
15,500.00	6,929.46	18,672.65	7,055.00	46.47	55.99	-90.01	598.75	-10,577.37	2,284.17	2,181.75	102.42	22.302	
15,600.00	6,929.21	18,672.65	7,055.00	46.77	55.99	-90.01	598.75	-10,577.37	2,204.16	2,101.44	102.72	21.458	
15,700.00	6,928.95	18,672.65	7,055.00	47.07	55.99	-90.01	598.75	-10,577.37	2,125.84	2,022.82	103.02	20.636	
15,800.00	6,928.69	18,672.65	7,055.00	47.37	55.99	-90.01	598.75	-10,577.37	2,049.41	1,946.09	103.31	19.837	
15,900.00	6,928.43	18,672.65	7,055.00	47.67	55.99	-90.01	598.75	-10,577.37	1,975.08	1,871.47	103.61	19.062	
16,000.00	6,928.17	18,672.65	7,055.00	47.97	55.99	-90.01	598.75	-10,577.37	1,903.11	1,799.20	103.91	18.315	
16,100.00	6,927.91	18,672.65	7,055.00	48.27	55.99	-90.01	598.75	-10,577.37	1,833.77	1,729.56	104.21	17.598	
16,200.00	6,927.65	18,672.65	7,055.00	48.57	55.99	-90.01	598.75	-10,577.37	1,767.37	1,662.87	104.50	16.912	
16,300.00	6,927.39	18,672.65	7,055.00	48.87	55.99	-90.01	598.75	-10,577.37	1,704.25	1,599.45	104.80	16.262	
16,400.00	6,927.13	18,672.65	7,055.00	49.17	55.99	-90.01	598.75	-10,577.37	1,644.79	1,539.70	105.09	15.651	
16,500.00	6,926.88	18,672.65	7,055.00	49.47	55.99	-90.01	598.75	-10,577.37	1,589.41	1,484.02	105.39	15.081	
16,600.00	6,926.62	18,672.65	7,055.00	49.77	55.99	-90.01	598.75	-10,577.37	1,538.54	1,432.85	105.69	14.558	
16,700.00	6,926.36	18,672.65	7,055.00	50.07	55.99	-90.01	598.75	-10,577.37	1,492.64	1,386.66	105.98	14.084	
16,800.00	6,926.10	18,672.65	7,055.00	50.37	55.99	-90.01	598.75	-10,577.37	1,452.19	1,345.91	106.28	13.664	
16,900.00	6,925.84	18,672.65	7,055.00	50.67	55.99	-90.01	598.75	-10,577.37	1,417.65	1,311.07	106.58	13.302	
17,000.00	6,925.58	18,672.65	7,055.00	50.97	55.99	-90.01	598.75	-10,577.37	1,389.46	1,282.59	106.87	13.001	
17,100.00	6,925.32	18,672.65	7,055.00	51.27	55.99	-90.01	598.75	-10,577.37	1,368.02	1,260.85	107.17	12.765	
17,200.00	6,925.06	18,672.65	7,055.00	51.58	55.99	-90.01	598.75	-10,577.37	1,353.65	1,246.18	107.47	12.595	
17,224.45	6,925.00	18,672.65	7,055.00	51.65	55.99	-90.01	598.75	-10,577.37	1,351.24	1,243.69	107.55	12.564	
17,224.92	6,925.00	18,672.65	7,055.00	51.65	55.99	-90.01	598.75	-10,577.37	1,351.19	1,243.65	107.55	12.564	CC, ES, SF

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

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6300+24.5 @ 6324.50usft (Ensign T2)

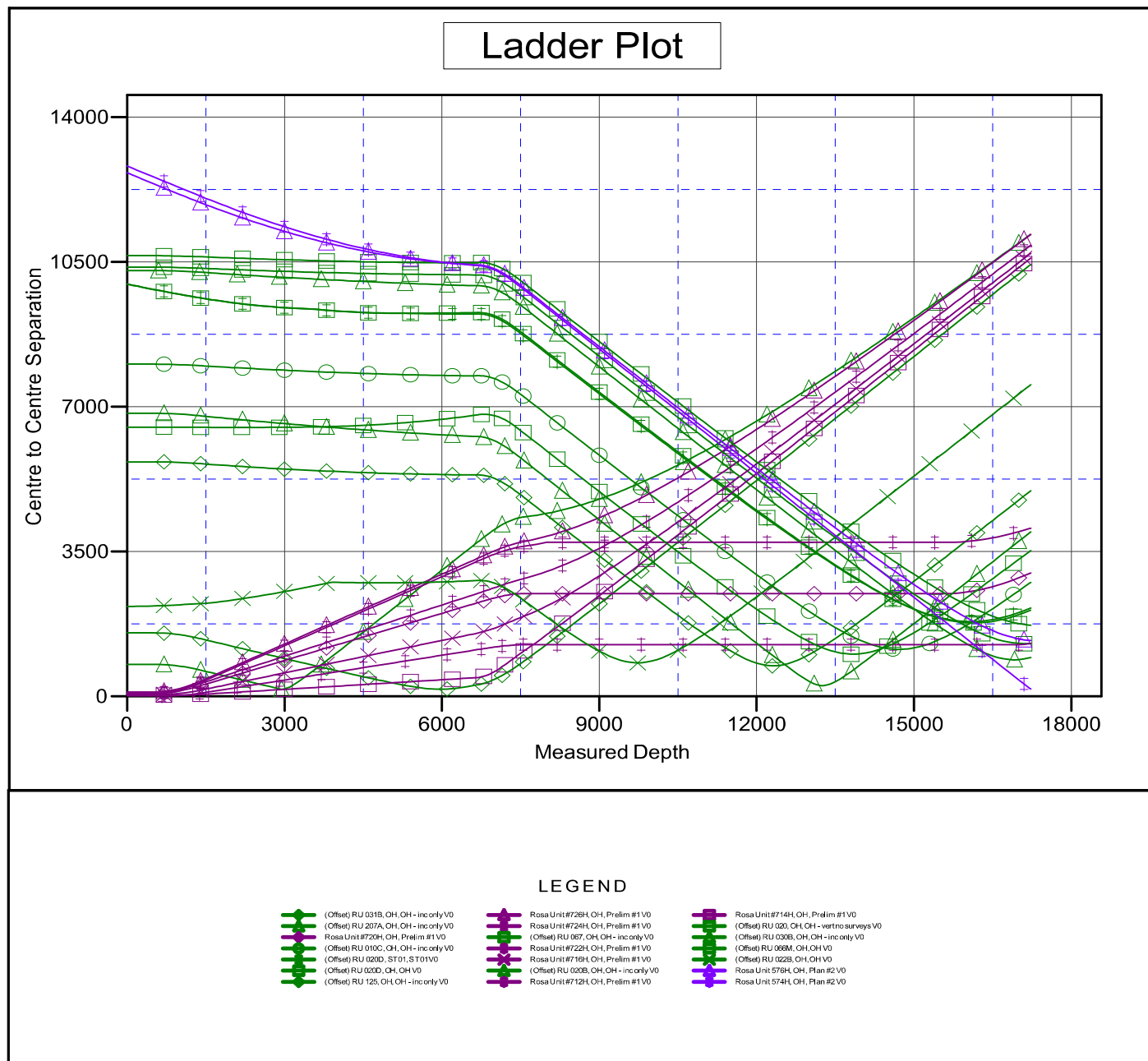
Offset Depths are relative to Offset Datum

Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit #710H

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

Grid Convergence at Surface is: 0.26°



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

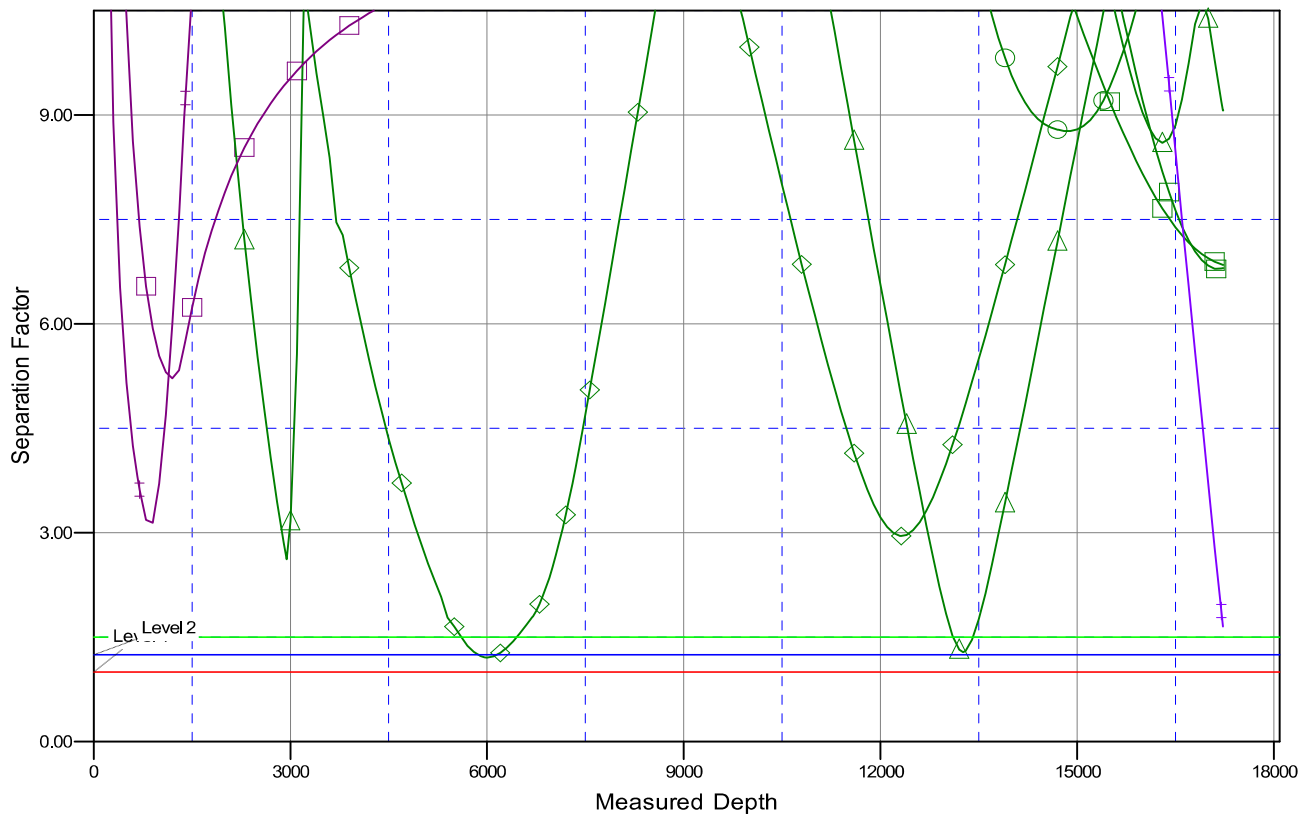
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #710H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Reference Site:	Rosa Pad 26	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Well Planning
Reference Design:	Prelim #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6300+24.5 @ 6324.50usft (Ensign T2)
Offset Depths are relative to Offset Datum
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit #710H
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.26°

Separation Factor Plot



LEGEND

(Offset) RU 031B, OH, OH - inc only V0	Rosa Unit #726H, OH, Prelim #1 V0	Rosa Unit #714H, OH, Prelim #1 V0
(Offset) RU 207A, OH, OH - inc only V0	Rosa Unit #724H, OH, Prelim #1 V0	(Offset) RU 023, OH, OH - vert no surveys V0
Rosa Unit #720H, OH, Prelim #1 V0	(Offset) RU 067, OH, OH - inc only V0	(Offset) RU 030B, OH, OH - inc only V0
(Offset) RU 010C, OH, OH - inc only V0	Rosa Unit #722H, OH, Prelim #1 V0	(Offset) RU 066M, OH, OH V0
(Offset) RU 0200, ST01, ST01 V0	Rosa Unit #716H, OH, Prelim #1 V0	(Offset) RU 022B, OH, OH V0
(Offset) RU 0200, OH, OH V0	(Offset) RU 002B, OH, OH - inc only V0	Rosa Unit 578H, OH, Plan #2 V0
(Offset) RU 125, OH, OH - inc only V0	Rosa Unit #712H, OH, Prelim #1 V0	Rosa Unit 574H, OH, Plan #2 V0

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

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Pad 26

Rosa Unit #710H

OH

Plan: Prelim #1

Standard Planning Report

21 January, 2023

Planning Report

Database:	Well Planning	Local Co-ordinate Reference:	Well Rosa Unit #710H
Company:	Logos Operating LLC	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site:	Rosa Pad 26	North Reference:	True
Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim #1		

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 Pad 26				
Site Position:		Northing:	2,147,556.27 usft	Latitude:	36.900914
From:	Lat/Long	Easting:	2,851,875.56 usft	Longitude:	-107.392877
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.26 °

Well	Rosa Unit #710H					
Well Position	+N/-S	0.00 usft	Northing:	2,147,556.27 usft	Latitude:	36.900914
	+E/-W	0.00 usft	Easting:	2,851,875.56 usft	Longitude:	-107.392877
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	6,300.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/11/2023	8.55	63.46	49,574.25577664

Design	Prelim #1			
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	270.26

Plan Survey Tool Program	Date	1/19/2023		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,223.97 Prelim #1 (OH)	MWD-SDI	

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	
1,382.94	17.66	352.74	1,369.03	133.91	-17.07	2.00	2.00	0.00	352.74	
6,689.41	17.66	352.74	6,425.45	1,730.70	-220.57	0.00	0.00	0.00	0.00	
7,568.05	90.15	270.26	6,950.00	1,899.35	-793.72	10.00	8.25	-9.39	-82.78	Rosa 26 710H POE
17,224.45	90.15	270.26	6,925.00	1,943.97	-10,449.98	0.00	0.00	0.00	0.00	Rosa 26 710H PBHL

Planning Report

Database:	Well Planning	Local Co-ordinate Reference:	Well Rosa Unit #710H
Company:	Logos Operating LLC	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site:	Rosa Pad 26	North Reference:	True
Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim #1		

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	352.74	599.98	1.73	-0.22	0.23	2.00	2.00	0.00
700.00	4.00	352.74	699.84	6.92	-0.88	0.91	2.00	2.00	0.00
800.00	6.00	352.74	799.45	15.57	-1.98	2.05	2.00	2.00	0.00
900.00	8.00	352.74	898.70	27.66	-3.52	3.65	2.00	2.00	0.00
1,000.00	10.00	352.74	997.47	43.17	-5.50	5.70	2.00	2.00	0.00
1,100.00	12.00	352.74	1,095.62	62.10	-7.91	8.20	2.00	2.00	0.00
1,200.00	14.00	352.74	1,193.06	84.41	-10.76	11.14	2.00	2.00	0.00
1,300.00	16.00	352.74	1,289.64	110.09	-14.03	14.53	2.00	2.00	0.00
1,382.94	17.66	352.74	1,369.03	133.91	-17.07	17.67	2.00	2.00	0.00
Start 5306.47 hold at 1382.94 MD									
1,400.00	17.66	352.74	1,385.28	139.04	-17.72	18.35	0.00	0.00	0.00
1,500.00	17.66	352.74	1,480.57	169.13	-21.55	22.32	0.00	0.00	0.00
1,600.00	17.66	352.74	1,575.86	199.22	-25.39	26.29	0.00	0.00	0.00
1,700.00	17.66	352.74	1,671.15	229.31	-29.22	30.27	0.00	0.00	0.00
1,800.00	17.66	352.74	1,766.44	259.41	-33.06	34.24	0.00	0.00	0.00
1,900.00	17.66	352.74	1,861.72	289.50	-36.89	38.21	0.00	0.00	0.00
2,000.00	17.66	352.74	1,957.01	319.59	-40.73	42.18	0.00	0.00	0.00
2,100.00	17.66	352.74	2,052.30	349.68	-44.56	46.15	0.00	0.00	0.00
2,200.00	17.66	352.74	2,147.59	379.77	-48.40	50.12	0.00	0.00	0.00
2,300.00	17.66	352.74	2,242.88	409.86	-52.23	54.09	0.00	0.00	0.00
2,400.00	17.66	352.74	2,338.16	439.95	-56.07	58.07	0.00	0.00	0.00
2,498.48	17.66	352.74	2,432.00	469.59	-59.85	61.98	0.00	0.00	0.00
Ojo Alamo									
2,500.00	17.66	352.74	2,433.45	470.04	-59.90	62.04	0.00	0.00	0.00
2,600.00	17.66	352.74	2,528.74	500.14	-63.74	66.01	0.00	0.00	0.00
2,613.92	17.66	352.74	2,542.00	504.32	-64.27	66.56	0.00	0.00	0.00
Kirtland									
2,700.00	17.66	352.74	2,624.03	530.23	-67.57	69.98	0.00	0.00	0.00
2,800.00	17.66	352.74	2,719.32	560.32	-71.41	73.95	0.00	0.00	0.00
2,900.00	17.66	352.74	2,814.60	590.41	-75.24	77.92	0.00	0.00	0.00
3,000.00	17.66	352.74	2,909.89	620.50	-79.08	81.89	0.00	0.00	0.00
3,100.00	17.66	352.74	3,005.18	650.59	-82.91	85.87	0.00	0.00	0.00
3,102.96	17.66	352.74	3,008.00	651.48	-83.03	85.98	0.00	0.00	0.00
Fruitland									
3,200.00	17.66	352.74	3,100.47	680.68	-86.75	89.84	0.00	0.00	0.00
3,300.00	17.66	352.74	3,195.76	710.78	-90.58	93.81	0.00	0.00	0.00
3,400.00	17.66	352.74	3,291.04	740.87	-94.42	97.78	0.00	0.00	0.00
3,466.07	17.66	352.74	3,354.00	760.75	-96.95	100.40	0.00	0.00	0.00
Pictured Cliffs									
3,500.00	17.66	352.74	3,386.33	770.96	-98.25	101.75	0.00	0.00	0.00
3,576.26	17.66	352.74	3,459.00	793.91	-101.18	104.78	0.00	0.00	0.00
Lewis									
3,600.00	17.66	352.74	3,481.62	801.05	-102.09	105.72	0.00	0.00	0.00
3,700.00	17.66	352.74	3,576.91	831.14	-105.92	109.70	0.00	0.00	0.00
3,800.00	17.66	352.74	3,672.20	861.23	-109.76	113.67	0.00	0.00	0.00
3,900.00	17.66	352.74	3,767.48	891.32	-113.59	117.64	0.00	0.00	0.00

Planning Report

Database:	Well Planning	Local Co-ordinate Reference:	Well Rosa Unit #710H
Company:	Logos Operating LLC	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site:	Rosa Pad 26	North Reference:	True
Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim #1		

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)	
4,000.00	17.66	352.74	3,862.77	921.42	-117.43	121.61	0.00	0.00	0.00	
4,100.00	17.66	352.74	3,958.06	951.51	-121.26	125.58	0.00	0.00	0.00	
4,200.00	17.66	352.74	4,053.35	981.60	-125.10	129.55	0.00	0.00	0.00	
4,300.00	17.66	352.74	4,148.64	1,011.69	-128.93	133.52	0.00	0.00	0.00	
4,400.00	17.66	352.74	4,243.92	1,041.78	-132.77	137.50	0.00	0.00	0.00	
4,500.00	17.66	352.74	4,339.21	1,071.87	-136.60	141.47	0.00	0.00	0.00	
4,600.00	17.66	352.74	4,434.50	1,101.96	-140.44	145.44	0.00	0.00	0.00	
4,700.00	17.66	352.74	4,529.79	1,132.06	-144.27	149.41	0.00	0.00	0.00	
4,756.89	17.66	352.74	4,584.00	1,149.18	-146.46	151.67	0.00	0.00	0.00	
Chacra										
4,800.00	17.66	352.74	4,625.08	1,162.15	-148.11	153.38	0.00	0.00	0.00	
4,900.00	17.66	352.74	4,720.36	1,192.24	-151.94	157.35	0.00	0.00	0.00	
5,000.00	17.66	352.74	4,815.65	1,222.33	-155.78	161.33	0.00	0.00	0.00	
5,100.00	17.66	352.74	4,910.94	1,252.42	-159.61	165.30	0.00	0.00	0.00	
5,200.00	17.66	352.74	5,006.23	1,282.51	-163.45	169.27	0.00	0.00	0.00	
5,300.00	17.66	352.74	5,101.52	1,312.60	-167.28	173.24	0.00	0.00	0.00	
5,400.00	17.66	352.74	5,196.80	1,342.69	-171.12	177.21	0.00	0.00	0.00	
5,500.00	17.66	352.74	5,292.09	1,372.79	-174.95	181.18	0.00	0.00	0.00	
5,572.32	17.66	352.74	5,361.00	1,394.55	-177.73	184.05	0.00	0.00	0.00	
Cliff House										
5,600.00	17.66	352.74	5,387.38	1,402.88	-178.79	185.15	0.00	0.00	0.00	
5,615.34	17.66	352.74	5,402.00	1,407.49	-179.38	185.76	0.00	0.00	0.00	
Menefee										
5,700.00	17.66	352.74	5,482.67	1,432.97	-182.62	189.13	0.00	0.00	0.00	
5,800.00	17.66	352.74	5,577.96	1,463.06	-186.46	193.10	0.00	0.00	0.00	
5,855.67	17.66	352.74	5,631.00	1,479.81	-188.59	195.31	0.00	0.00	0.00	
Point Lookout										
5,900.00	17.66	352.74	5,673.24	1,493.15	-190.29	197.07	0.00	0.00	0.00	
6,000.00	17.66	352.74	5,768.53	1,523.24	-194.13	201.04	0.00	0.00	0.00	
6,100.00	17.66	352.74	5,863.82	1,553.33	-197.97	205.01	0.00	0.00	0.00	
6,200.00	17.66	352.74	5,959.11	1,583.43	-201.80	208.98	0.00	0.00	0.00	
6,300.00	17.66	352.74	6,054.40	1,613.52	-205.64	212.95	0.00	0.00	0.00	
6,400.00	17.66	352.74	6,149.68	1,643.61	-209.47	216.93	0.00	0.00	0.00	
6,419.22	17.66	352.74	6,168.00	1,649.39	-210.21	217.69	0.00	0.00	0.00	
Mancos										
6,500.00	17.66	352.74	6,244.97	1,673.70	-213.31	220.90	0.00	0.00	0.00	
6,600.00	17.66	352.74	6,340.26	1,703.79	-217.14	224.87	0.00	0.00	0.00	
6,689.41	17.66	352.74	6,425.45	1,730.70	-220.57	228.42	0.00	0.00	0.00	
Start DLS 10.00 TFO -82.78										
6,700.00	17.82	349.30	6,435.54	1,733.88	-221.07	228.94	10.00	1.54	-32.43	
6,750.00	19.35	334.31	6,482.96	1,748.87	-226.09	234.02	10.00	3.05	-29.98	
6,800.00	21.89	322.05	6,529.78	1,763.70	-235.42	243.42	10.00	5.10	-24.52	
6,850.00	25.16	312.53	6,575.63	1,778.24	-248.99	257.06	10.00	6.52	-19.05	
6,900.00	28.89	305.19	6,620.18	1,792.40	-266.70	274.84	10.00	7.47	-14.67	
6,950.00	32.94	299.46	6,663.07	1,806.05	-288.43	296.62	10.00	8.09	-11.46	
7,000.00	37.19	294.88	6,704.00	1,819.10	-313.99	322.24	10.00	8.51	-9.15	
7,050.00	41.59	291.14	6,742.63	1,831.46	-343.19	351.50	10.00	8.80	-7.49	
7,100.00	46.10	287.99	6,778.69	1,843.01	-375.83	384.19	10.00	9.00	-6.29	
7,150.00	50.67	285.30	6,811.89	1,853.68	-411.63	420.04	10.00	9.15	-5.39	
7,200.00	55.30	282.93	6,841.98	1,863.39	-450.35	458.80	10.00	9.26	-4.73	
7,250.00	59.97	280.82	6,868.74	1,872.06	-491.66	500.15	10.00	9.34	-4.22	
7,300.00	64.68	278.90	6,891.96	1,879.62	-535.28	543.80	10.00	9.40	-3.84	
7,350.00	69.40	277.12	6,911.46	1,886.03	-580.85	589.41	10.00	9.45	-3.55	

Planning Report

Database:	Well Planning	Local Co-ordinate Reference:	Well Rosa Unit #710H
Company:	Logos Operating LLC	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site:	Rosa Pad 26	North Reference:	True
Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim #1		

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)
7,400.00	74.14	275.45	6,927.10	1,891.22	-628.04	636.62	10.00	9.48	-3.34
7,450.00	78.90	273.86	6,938.75	1,895.16	-676.49	685.08	10.00	9.51	-3.18
7,500.00	83.66	272.32	6,946.33	1,897.82	-725.83	734.43	10.00	9.52	-3.08
7,550.00	88.43	270.81	6,949.78	1,899.18	-775.67	784.28	10.00	9.53	-3.03
7,568.05	90.15	270.26	6,950.00	1,899.35	-793.72	802.33	10.00	9.54	-3.01
Start 9656.40 hold at 7568.05 MD									
7,600.00	90.15	270.26	6,949.92	1,899.49	-825.67	834.28	0.00	0.00	0.00
7,700.00	90.15	270.26	6,949.66	1,899.96	-925.67	934.28	0.00	0.00	0.00
7,800.00	90.15	270.26	6,949.40	1,900.42	-1,025.67	1,034.28	0.00	0.00	0.00
7,900.00	90.15	270.26	6,949.14	1,900.88	-1,125.66	1,134.28	0.00	0.00	0.00
8,000.00	90.15	270.26	6,948.88	1,901.34	-1,225.66	1,234.28	0.00	0.00	0.00
8,100.00	90.15	270.26	6,948.62	1,901.80	-1,325.66	1,334.28	0.00	0.00	0.00
8,200.00	90.15	270.26	6,948.36	1,902.27	-1,425.66	1,434.28	0.00	0.00	0.00
8,300.00	90.15	270.26	6,948.11	1,902.73	-1,525.66	1,534.28	0.00	0.00	0.00
8,400.00	90.15	270.26	6,947.85	1,903.19	-1,625.66	1,634.28	0.00	0.00	0.00
8,500.00	90.15	270.26	6,947.59	1,903.65	-1,725.66	1,734.28	0.00	0.00	0.00
8,600.00	90.15	270.26	6,947.33	1,904.12	-1,825.66	1,834.28	0.00	0.00	0.00
8,700.00	90.15	270.26	6,947.07	1,904.58	-1,925.65	1,934.28	0.00	0.00	0.00
8,800.00	90.15	270.26	6,946.81	1,905.04	-2,025.65	2,034.28	0.00	0.00	0.00
8,900.00	90.15	270.26	6,946.55	1,905.50	-2,125.65	2,134.28	0.00	0.00	0.00
9,000.00	90.15	270.26	6,946.29	1,905.96	-2,225.65	2,234.28	0.00	0.00	0.00
9,100.00	90.15	270.26	6,946.03	1,906.43	-2,325.65	2,334.28	0.00	0.00	0.00
9,200.00	90.15	270.26	6,945.78	1,906.89	-2,425.65	2,434.27	0.00	0.00	0.00
9,300.00	90.15	270.26	6,945.52	1,907.35	-2,525.65	2,534.27	0.00	0.00	0.00
9,400.00	90.15	270.26	6,945.26	1,907.81	-2,625.64	2,634.27	0.00	0.00	0.00
9,500.00	90.15	270.26	6,945.00	1,908.27	-2,725.64	2,734.27	0.00	0.00	0.00
9,600.00	90.15	270.26	6,944.74	1,908.74	-2,825.64	2,834.27	0.00	0.00	0.00
9,700.00	90.15	270.26	6,944.48	1,909.20	-2,925.64	2,934.27	0.00	0.00	0.00
9,800.00	90.15	270.26	6,944.22	1,909.66	-3,025.64	3,034.27	0.00	0.00	0.00
9,900.00	90.15	270.26	6,943.96	1,910.12	-3,125.64	3,134.27	0.00	0.00	0.00
10,000.00	90.15	270.26	6,943.70	1,910.59	-3,225.64	3,234.27	0.00	0.00	0.00
10,100.00	90.15	270.26	6,943.45	1,911.05	-3,325.63	3,334.27	0.00	0.00	0.00
10,200.00	90.15	270.26	6,943.19	1,911.51	-3,425.63	3,434.27	0.00	0.00	0.00
10,300.00	90.15	270.26	6,942.93	1,911.97	-3,525.63	3,534.27	0.00	0.00	0.00
10,400.00	90.15	270.26	6,942.67	1,912.43	-3,625.63	3,634.27	0.00	0.00	0.00
10,500.00	90.15	270.26	6,942.41	1,912.90	-3,725.63	3,734.27	0.00	0.00	0.00
10,600.00	90.15	270.26	6,942.15	1,913.36	-3,825.63	3,834.27	0.00	0.00	0.00
10,700.00	90.15	270.26	6,941.89	1,913.82	-3,925.63	3,934.27	0.00	0.00	0.00
10,800.00	90.15	270.26	6,941.63	1,914.28	-4,025.62	4,034.27	0.00	0.00	0.00
10,900.00	90.15	270.26	6,941.37	1,914.74	-4,125.62	4,134.27	0.00	0.00	0.00
11,000.00	90.15	270.26	6,941.11	1,915.21	-4,225.62	4,234.27	0.00	0.00	0.00
11,100.00	90.15	270.26	6,940.86	1,915.67	-4,325.62	4,334.27	0.00	0.00	0.00
11,200.00	90.15	270.26	6,940.60	1,916.13	-4,425.62	4,434.27	0.00	0.00	0.00
11,300.00	90.15	270.26	6,940.34	1,916.59	-4,525.62	4,534.27	0.00	0.00	0.00
11,400.00	90.15	270.26	6,940.08	1,917.06	-4,625.62	4,634.27	0.00	0.00	0.00
11,500.00	90.15	270.26	6,939.82	1,917.52	-4,725.61	4,734.27	0.00	0.00	0.00
11,600.00	90.15	270.26	6,939.56	1,917.98	-4,825.61	4,834.27	0.00	0.00	0.00
11,700.00	90.15	270.26	6,939.30	1,918.44	-4,925.61	4,934.27	0.00	0.00	0.00
11,800.00	90.15	270.26	6,939.04	1,918.90	-5,025.61	5,034.27	0.00	0.00	0.00
11,900.00	90.15	270.26	6,938.78	1,919.37	-5,125.61	5,134.27	0.00	0.00	0.00
12,000.00	90.15	270.26	6,938.53	1,919.83	-5,225.61	5,234.27	0.00	0.00	0.00
12,100.00	90.15	270.26	6,938.27	1,920.29	-5,325.61	5,334.27	0.00	0.00	0.00
12,200.00	90.15	270.26	6,938.01	1,920.75	-5,425.60	5,434.26	0.00	0.00	0.00

Planning Report

Database:	Well Planning	Local Co-ordinate Reference:	Well Rosa Unit #710H
Company:	Logos Operating LLC	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site:	Rosa Pad 26	North Reference:	True
Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim #1		

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)
12,300.00	90.15	270.26	6,937.75	1,921.21	-5,525.60	5,534.26	0.00	0.00	0.00
12,400.00	90.15	270.26	6,937.49	1,921.68	-5,625.60	5,634.26	0.00	0.00	0.00
12,500.00	90.15	270.26	6,937.23	1,922.14	-5,725.60	5,734.26	0.00	0.00	0.00
12,600.00	90.15	270.26	6,936.97	1,922.60	-5,825.60	5,834.26	0.00	0.00	0.00
12,700.00	90.15	270.26	6,936.71	1,923.06	-5,925.60	5,934.26	0.00	0.00	0.00
12,800.00	90.15	270.26	6,936.45	1,923.53	-6,025.60	6,034.26	0.00	0.00	0.00
12,900.00	90.15	270.26	6,936.20	1,923.99	-6,125.59	6,134.26	0.00	0.00	0.00
13,000.00	90.15	270.26	6,935.94	1,924.45	-6,225.59	6,234.26	0.00	0.00	0.00
13,100.00	90.15	270.26	6,935.68	1,924.91	-6,325.59	6,334.26	0.00	0.00	0.00
13,200.00	90.15	270.26	6,935.42	1,925.37	-6,425.59	6,434.26	0.00	0.00	0.00
13,300.00	90.15	270.26	6,935.16	1,925.84	-6,525.59	6,534.26	0.00	0.00	0.00
13,400.00	90.15	270.26	6,934.90	1,926.30	-6,625.59	6,634.26	0.00	0.00	0.00
13,500.00	90.15	270.26	6,934.64	1,926.76	-6,725.59	6,734.26	0.00	0.00	0.00
13,600.00	90.15	270.26	6,934.38	1,927.22	-6,825.59	6,834.26	0.00	0.00	0.00
13,700.00	90.15	270.26	6,934.12	1,927.68	-6,925.58	6,934.26	0.00	0.00	0.00
13,800.00	90.15	270.26	6,933.87	1,928.15	-7,025.58	7,034.26	0.00	0.00	0.00
13,900.00	90.15	270.26	6,933.61	1,928.61	-7,125.58	7,134.26	0.00	0.00	0.00
14,000.00	90.15	270.26	6,933.35	1,929.07	-7,225.58	7,234.26	0.00	0.00	0.00
14,100.00	90.15	270.26	6,933.09	1,929.53	-7,325.58	7,334.26	0.00	0.00	0.00
14,200.00	90.15	270.26	6,932.83	1,930.00	-7,425.58	7,434.26	0.00	0.00	0.00
14,300.00	90.15	270.26	6,932.57	1,930.46	-7,525.58	7,534.26	0.00	0.00	0.00
14,400.00	90.15	270.26	6,932.31	1,930.92	-7,625.57	7,634.26	0.00	0.00	0.00
14,500.00	90.15	270.26	6,932.05	1,931.38	-7,725.57	7,734.26	0.00	0.00	0.00
14,600.00	90.15	270.26	6,931.79	1,931.84	-7,825.57	7,834.26	0.00	0.00	0.00
14,700.00	90.15	270.26	6,931.54	1,932.31	-7,925.57	7,934.26	0.00	0.00	0.00
14,800.00	90.15	270.26	6,931.28	1,932.77	-8,025.57	8,034.26	0.00	0.00	0.00
14,900.00	90.15	270.26	6,931.02	1,933.23	-8,125.57	8,134.26	0.00	0.00	0.00
15,000.00	90.15	270.26	6,930.76	1,933.69	-8,225.57	8,234.26	0.00	0.00	0.00
15,100.00	90.15	270.26	6,930.50	1,934.15	-8,325.56	8,334.26	0.00	0.00	0.00
15,200.00	90.15	270.26	6,930.24	1,934.62	-8,425.56	8,434.25	0.00	0.00	0.00
15,300.00	90.15	270.26	6,929.98	1,935.08	-8,525.56	8,534.25	0.00	0.00	0.00
15,400.00	90.15	270.26	6,929.72	1,935.54	-8,625.56	8,634.25	0.00	0.00	0.00
15,500.00	90.15	270.26	6,929.46	1,936.00	-8,725.56	8,734.25	0.00	0.00	0.00
15,600.00	90.15	270.26	6,929.21	1,936.47	-8,825.56	8,834.25	0.00	0.00	0.00
15,700.00	90.15	270.26	6,928.95	1,936.93	-8,925.56	8,934.25	0.00	0.00	0.00
15,800.00	90.15	270.26	6,928.69	1,937.39	-9,025.55	9,034.25	0.00	0.00	0.00
15,900.00	90.15	270.26	6,928.43	1,937.85	-9,125.55	9,134.25	0.00	0.00	0.00
16,000.00	90.15	270.26	6,928.17	1,938.31	-9,225.55	9,234.25	0.00	0.00	0.00
16,100.00	90.15	270.26	6,927.91	1,938.78	-9,325.55	9,334.25	0.00	0.00	0.00
16,200.00	90.15	270.26	6,927.65	1,939.24	-9,425.55	9,434.25	0.00	0.00	0.00
16,300.00	90.15	270.26	6,927.39	1,939.70	-9,525.55	9,534.25	0.00	0.00	0.00
16,400.00	90.15	270.26	6,927.13	1,940.16	-9,625.55	9,634.25	0.00	0.00	0.00
16,500.00	90.15	270.26	6,926.88	1,940.62	-9,725.54	9,734.25	0.00	0.00	0.00
16,600.00	90.15	270.26	6,926.62	1,941.09	-9,825.54	9,834.25	0.00	0.00	0.00
16,700.00	90.15	270.26	6,926.36	1,941.55	-9,925.54	9,934.25	0.00	0.00	0.00
16,800.00	90.15	270.26	6,926.10	1,942.01	-10,025.54	10,034.25	0.00	0.00	0.00
16,900.00	90.15	270.26	6,925.84	1,942.47	-10,125.54	10,134.25	0.00	0.00	0.00
17,000.00	90.15	270.26	6,925.58	1,942.94	-10,225.54	10,234.25	0.00	0.00	0.00
17,100.00	90.15	270.26	6,925.32	1,943.40	-10,325.54	10,334.25	0.00	0.00	0.00
17,200.00	90.15	270.26	6,925.06	1,943.86	-10,425.53	10,434.25	0.00	0.00	0.00
17,224.45	90.15	270.26	6,925.00	1,943.97	-10,449.98	10,458.69	0.00	0.00	0.00
TD at 17224.45									

Planning Report

Database:	Well Planning	Local Co-ordinate Reference:	Well Rosa Unit #710H
Company:	Logos Operating LLC	TVD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	6300+24.5 @ 6324.50usft (Ensign T223)
Site:	Rosa Pad 26	North Reference:	True
Well:	Rosa Unit #710H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Rosa 26 710H SHL	0.00	0.00	0.00	0.00	0.00	2,147,556.27	2,851,875.56	36.900914	-107.392877
- plan hits target center									
- Point									
Rosa 26 710H PBHL	0.00	0.00	6,925.00	1,943.97	-10,449.98	2,149,451.98	2,841,416.71	36.906248	-107.428619
- plan hits target center									
- Point									
Rosa 26 710H POE	0.00	0.00	6,950.00	1,899.35	-793.72	2,149,451.93	2,851,073.08	36.906131	-107.395592
- plan hits target center									
- Point									

Formations						
Measured Depth	Vertical Depth					
(usft)	(usft)	Name	Lithology	Dip	Dip Direction	
				(°)	(°)	
2,498.48	2,432.00	Ojo Alamo				
2,613.92	2,542.00	Kirtland				
3,102.96	3,008.00	Fruitland				
3,466.07	3,354.00	Pictured Cliffs				
3,576.26	3,459.00	Lewis				
4,756.89	4,584.00	Chacra				
5,572.32	5,361.00	Cliff House				
5,615.34	5,402.00	Menefee				
5,855.67	5,631.00	Point Lookout				
6,419.22	6,168.00	Mancos				

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(usft)	(usft)	+N/-S	+E/-W	Comment
		(usft)	(usft)	
500.00	500.00	0.00	0.00	Start Build 2.00
1,382.94	1,369.03	133.91	-17.07	Start 5306.47 hold at 1382.94 MD
6,689.41	6,425.45	1,730.70	-220.57	Start DLS 10.00 TFO -82.78
7,568.05	6,950.00	1,899.35	-793.72	Start 9656.40 hold at 7568.05 MD
17,224.45	6,925.00	1,943.97	-10,449.98	TD at 17224.45

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

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

CONDITIONS

Action 371194

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID:
	289408
	Action Number:
	371194
Action Type:	
[C-101] BLM - Federal/Indian Land Lease (Form 3160-3)	

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	Notify OCD 24 hours prior to casing & cement	8/16/2024
ward.rikala	Will require a File As Drilled C-102 and a Directional Survey with the C-104	8/16/2024
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	8/16/2024
ward.rikala	Cement is required to circulate on both surface and intermediate1 strings of casing	8/16/2024
ward.rikala	If cement does not circulate on any string, a CBL is required for that string of casing	8/16/2024
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	8/16/2024