

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER 1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other 1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		5. Lease Serial No. NMSF078763 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. NMNM078407E/ROSA UNIT 8. Lease Name and Well No. ROSA UNIT 674H 9. API Well No. 30-039-31493
2. Name of Operator LOGOS OPERATING LLC 3a. Address 2010 AFTON PLACE, FARMINGTON, NM 87401 3b. Phone No. (include area code) (505) 278-8720		10. Field and Pool, or Exploratory BASIN MANCOS/BASIN MANCOS 11. Sec., T. R. M. or Blk. and Survey or Area SEC 8/T31N/R5W/NMP
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NWNE / 731 FNL / 1941 FEL / LAT 36.919248 / LONG -107.383388 At proposed prod. zone SWSW / 1072 FSL / 1318 FWL / LAT 36.924355 / LONG -107.436711		12. County or Parish RIO ARRIBA 13. State NM
14. Distance in miles and direction from nearest town or post office* 38 miles		15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 731 feet 16. No of acres in lease 17. Spacing Unit dedicated to this well 1292.66
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet 19. Proposed Depth 6977 feet / 22530 feet 20. BLM/BIA Bond No. in file FED: NMB001821		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6347 feet 22. Approximate date work will start* 04/01/2025 23. Estimated duration 65 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)

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| 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. |
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25. Signature (Electronic Submission) Title Regulatory Specialist	Name (Printed/Typed) ETTA TRUJILLO / Ph: (505) 324-4145 Date 01/30/2025
Approved by (Signature) (Electronic Submission) Title AFM-Minerals	Name (Printed/Typed) DAVE J MANKIEWICZ / Ph: (505) 564-7761 Date 06/05/2025 Office Farmington Field Office

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

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 an 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: NWNE / 731 FNL / 1941 FEL / TWSP: 31N / RANGE: 5W / SECTION: 8 / LAT: 36.919248 / LONG: -107.383388 (TVD: 0 feet, MD: 0 feet)
PPP: SESE / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 6W / SECTION: 2 / LAT: 36.924184 / LONG: -107.389988 (TVD: 0 feet, MD: 0 feet)
PPP: SESW / 1066 FSL / 1392 FWL / TWSP: 31N / RANGE: 5W / SECTION: 5 / LAT: 36.924184 / LONG: -107.389988 (TVD: 0 feet, MD: 0 feet)
PPP: SESE / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 6 / LAT: 36.924184 / LONG: -107.389988 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 10 / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 6W / SECTION: 1 / LAT: 36.924184 / LONG: -107.389988 (TVD: 0 feet, MD: 0 feet)
PPP: SWSE / 718 FSL / 2515 FEL / TWSP: 31N / RANGE: 5W / SECTION: 5 / LAT: 36.92323 / LONG: -107.385359 (TVD: 6988 feet, MD: 7461 feet)
BHL: SWSW / 1072 FSL / 1318 FWL / TWSP: 31N / RANGE: 6W / SECTION: 2 / LAT: 36.924355 / LONG: -107.436711 (TVD: 6977 feet, MD: 22530 feet)

BLM Point of Contact

Name: CHRISTOPHER P WENMAN
Title: Natural Resource Specialist
Phone: (505) 564-7727
Email: cwenman@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 Resources, LLC (LOGOS)
Well Names: Rosa Unit Pad 34 Natural Gas Wells Project
Legal Location: Sec 8 T31N R5W, Rio Arriba County, NM
NEPA Log Number: DOI-BLM-NM-F010-2025-0013-EA
Onsite Date: July 18, 2023
Lease Number: NMSF078763

The following conditions of approval will apply to LOGOS Rosa Unit Pad 34 Natural Gas Wells 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.

1. **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, Navajo Tribe, State, or other jurisdictional entities.
2. **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), Conditions of Approval, Cultural Resource Record of Review, Cultural Resources Compliance Form (if required), and Project Stipulations (if required) shall be at the project area at all times and available to all persons.
3. **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-F010-2025-0013-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/planning).
4. **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. Farmington Field Office BMP's are integrated into the Environmental Assessment, Surface Use Plan of Operations, Bare Soil Reclamation Plan, and COAs.

Construction, Production, Facilities, Reclamation & Maintenance

5. **Construction & Reclamation Notification:** The operator or their contractor will contact the Bureau of Land Management, Farmington Field Office Environmental Protection Staff at (505) 564-7600 or by email, at least 48 hours prior to any construction or reclamation on this project. The operator or their contractor will contact the grazing permittee to give notice at least 10 days prior to start of construction operations.

6. **Grazing Allotments, Permittee Notification, and Concerns:** The operator will notify the grazing lease operator of the Rosa Community allotment 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. No cattle guards needed. If fencing has to be temporarily open to place layflat, ensure fencing secured.
7. **Livestock Grazing:** Cattle are in allotment between 5/1 and 10/31. Industry may need to coordinate with permittee if concerns of livestock in area during construction.
8. **Production Facilities:** As marked in the APD, 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 Bureau of Land Management, Farmington Field Office, Surface, and Environmental Protection Staff (505) 564-7600 to schedule a facility layout onsite.
9. **Open Trenches:** No more than ½ mile of trench or the amount of trench that can be worked in one day will be open at any given time.
10. **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 plan of development. If stakes are disturbed, they shall be replaced before proceeding with construction.
11. **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.
12. **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.
13. **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: Federal 595a-34127 (Juniper Green)
14. **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 water and or other production waste shall be screened, netted, or otherwise covered to protect migratory birds and other wildlife from access.

15. **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.
16. **Acquisition of Water:** Water acquired to construct, produce, and maintain actions authorized by this permit to drill must be acquired from permitted water sources, or water authorized for use by the New Mexico Oil Conservation Division (OCD). Upon request the AO shall be provided with documentation of water sources.
17. **Culverts:** No culverts smaller than 18" will be installed. Silt Traps/Bell Holes will be built upstream of all culvert locations. Rip-rap will be placed at the downstream end of all culverts to prevent undercutting.
18. **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.
19. **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.
20. **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.
21. **Seed Mix:** The Pinyon/Juniper Seed Mix will be used for interim and final reclamation. The SUPO in the approved APD contains information on the specific seed mix and application rate. Seeding shall be accomplished within 120 days after final construction (time frame may be extended on a case-by-case basis with AO approval). Seeding shall be repeated if a satisfactory stand is not obtained as determined by the AO upon evaluation after the second growing season.
22. **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.

23. **Non-Permitted Disturbance:** Construction maintenance or any other activity outside the areas permitted by the APO will require additional approval and may require a new cultural survey and clearance.
24. **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.
25. **“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:

- a. 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.).*
- b. Maintain and clean all equipment regularly to remove flammable debris buildup and prevent fluid leaks that can lead to ignitions.
- c. 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.
- d. 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.

- e. 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.
- f. 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.
- g. 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

Taos Field Office at 575-758-8851

26. **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. Construction 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.
 - d. 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.
 - e. 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.
 - f. 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. (Company Name)'s weed-control contractor would contact the BLM-FFO prior to using these chemicals.
 - g. Noxious/invasive weed treatments must be reported to the FFO Noxious Weed Coordinator. A Pesticide Application Record (PAR) 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.
27. **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' 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.
28. **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.
29. **Visual Resources:** Dark Sky COAs need to be applied to existing lighting, which is not dark sky friendly and to any additional lights added as part of pad expansion. 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.
30. **Wildlife:** The proposed project is not anticipated to have significant impacts on small or big game species. However, the project is located within the BLM FFO-designated Rosa Mesa Wildlife Area, requiring a closure from December 1st through March 31st of each year. This stipulation applies only to construction, drilling, and completion activities. It does not apply to operation and maintenance of production facilities.
31. **Hazards:** Wildlife hazards associated with the proposed project would be fenced, covered, and/or contained in storage tanks, as necessary.
32. **Migratory Birds:** The BLM/FFO migratory bird policy requires a bird nest survey between May 15 - July 31 for any projects that would remove 4.0 or more acres or vegetation. The proposed project is estimated to disturb more than four acres of vegetation, a survey will be required if construction occurs within the specified timeframe. The operator would equip all open-top pits, tanks, ponds, and pipes containing hydrocarbons with nets, screens, or other avian exclusion devices to prevent injury or death to migratory birds (NTL-FFO/AUFO-2004-01, IM No. WO-2013-033, Onshore Order #7 III E-3). Exemptions to this stipulation would be made by the BLM/FFO Authorized Officer. Nest surveys will be conducted within 48 hours of scheduled construction by BLM/FFO personnel or approved biologist. Any active nests will require a disturbance buffer to eliminate impacts to nesting birds. Active nests will not be disturbed. Applicant will adhere to timing limitations and management measures if any new raptor nests are discovered within the project area. These timing limitations are species specific depending on the raptor that is discovered.

33. **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).

Cultural Resources

34. **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.
35. **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.



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
#674H ROSA UNIT
Lease: NMSF078763 Unit: NMNM78407E
SH: NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8, T.31 N., R.5 W.
Rio Arriba County, New Mexico
BH: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 2, 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 and regulations, with the approved Permit to drill, and with the approved Surface Use and Operations Plan is required. Lessees and/or operators are fully accountable for the actions of their contractors and subcontractors. Failure to comply with these requirements and the filing of required reports will result in strict enforcement pursuant to 43 CFR 3163.1 or 3163.2.
- B. Each well shall have a well sign in legible condition from spud date to final abandonment. The sign should show the operator's name, lease serial number, or unit name, well number, location of the well, and whether lease is Tribal or Allotted, (See 43 CFR 3162.6(b)).
- C. A complete copy of the approved Application for Permit to Drill, along with any conditions of approval, shall be available to authorized personnel at the drill site whenever active drilling operations are under way.
- D. For Wildcat wells only, a drilling operations progress report is to be submitted, to the BLM-Field Office, weekly from the spud date until the well is completed and the Well Completion Report is filed. The report should be on 8-1/2 x 11 inch paper, and each page should identify the well by; operator's name, well number, location and lease number.
- E. As soon as practical, notice is required of all blowouts, fires and accidents involving life-threatening injuries or loss of life. (See NTL-3A).
- F. BOP equipment (except the annular preventer) shall be tested utilizing a test plug to full working pressure for 10 minutes. No bleed-off of pressure is acceptable. (See 43 CFR 3172.6(b)(9)(ii)).
- G. The operator shall have sufficient weighting materials and lost circulation materials on location in the event of a pressure kick or in the event of lost circulation. (See 43 CFR 3172.8(a)).
- H. The flare line(s) discharge shall be located not less than 100 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of the prevailing wind direction and shall be anchored. The flare system shall have an effective method for ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and to maintain a continuous flare. (See 43 CFR 3172.8(b)(7)).
- I. Prior approval by the BLM-Authorized Office (Drilling and Production Section) is required for variance from the approved drilling program and before commencing plugging operations, plug back work, casing repair work, corrective cementing operations, or suspending drilling operations indefinitely. Emergency approval may be obtained orally, but such approval is contingent upon filing of a Notice of Intent sundry within three business days. **Any changes to the approved plan or any questions regarding drilling operations should be directed to BLM during regular business hours at 505-564-7600. Emergency program changes after hours should be directed to Virgil Lucero at 505-793-1836.**
- J. **The Inspection and Enforcement Section (I&E), phone number (505-564-7750) is to be notified at least 24 hours in advance of BOP test, spudding, cementing, or plugging operations so that a BLM representative may witness the operations.**
- K. Unless drilling operations are commenced within three years according to 43 CFR 3171.14, approval of the Application for Permit to Drill will expire. No extensions will be granted.

- L. From the time drilling operations are initiated and until drilling operations are completed, a member of the drilling crew or the tool pusher shall maintain rig surveillance at all times, unless the well is secured with blowout preventers or cement plugs.
- M. If for any reason, drilling operations are suspended for more than 90 days, a written notice must be provided to this office outlining your plans for this well.
- N. **Commingling:** No production (oil, gas, and water) from the subject well should start until Sundry Notices (if necessary) granting variances from applicable regulations as related to commingling and off-lease measurement are approved by this office. (See 43 CFR 3173.14)

II. REPORTING REQUIREMENTS

- A. For reporting purposes, all well Sundry notices, well completion and other well actions shall be referenced by the appropriate lease, communitization agreement and/or unit agreement numbers.
- B. The following reports shall be filed with the BLM-Authorized Officer online through AFMSS 2 within 30 days after the work is completed.
 - 1. Provide complete information concerning.
 - a. Setting of each string of casing. Show size and depth of hole, grade and weight of casing, depth set, depth of all cementing tools that are used, amount (in cubic feet) and types of cement used, whether cement circulated to surface and all cement tops in the casing annulus, casing test method and results, and the date work was done. Show spud date on first report submitted.
 - b. Intervals tested, perforated (include size, number and location of perforations), acidized, or fractured; and results obtained. Provide date work was done on well completion report and completion sundry notice.
 - c. Subsequent Report of Abandonment, show the way the well was plugged, including depths where casing was cut and pulled, intervals (by depths) where cement plugs were replaced, and dates of the operations.
 - 2. Well Completion Report will be submitted with 30 days after well has been completed.
 - a. Initial Bottom Hole Pressure (BHP) for the producing formations. Show the BHP on the completion report. The pressure may be: 1) measured with a bottom hole bomb, or; 2) calculated based on shut in surface pressures (minimum seven day buildup) and fluid level shot.
 - 3. Submit a cement evaluation log if cement is not circulated to surface.
- C. Production Startup Notification is required no later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site or resumes production in the case of a well which has been off production for more than 90 days. The operator shall notify the Authorized Officer by letter or Sundry Notice, Form 3160-5, or orally to be followed by a letter or Sundry Notice, of the date on which such production has begun or resumed. CFR 43 3162.4-1(c).

III. DRILLER'S LOG

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

IV. GAS FLARING

Gas produced from this well may not be vented or flared beyond an initial, authorized test period of * Days, 20 MMCF following its (completion)(recompletion), or flowback has been routed to the production separator, whichever first occurs, without the prior, written approval of the authorized officer in accordance with 43 CFR 3179.81. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted. You shall be required to compensate the lessor for the portion of the gas vented or flared without approval which is determined to have been avoidably lost.

**30 days, unless a longer test period is specifically approved by the authorized officer. The 30-day period will commence upon the beginning of flowback following completion or recompletion.*

V. SAFETY

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

VI. CHANGE OF PLANS OR ABANDONMENT

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

VII. PHONE NUMBERS

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

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

WELL LOCATION INFORMATION

API Number 30-039-31493	Pool Code 97232	Pool Name BASIN MANCOS
Property Code 320608	Property Name ROSA UNIT	Well Number 674H
OGRID No. 289408	Operator Name LOGOS OPERATING, LLC	Ground Level Elevation 6347'
Surface Owner: ☒ State ☐ Fee ☐ Tribal ☒ Federal		Mineral Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal

Surface Location

UL B	Section 8	Township 31N	Range 5W	Lot	Feet from N/S Line 731' NORTH	Feet from E/W Line 1941' EAST	Latitude 36.919248 °N	Longitude -107.383388 °W	County RIO ARRIBA
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Bottom Hole Location

UL M	Section 2	Township 31N	Range 6W	Lot	Feet from N/S Line 1072' SOUTH	Feet from E/W Line 1318' WEST	Latitude 36.924355 °N	Longitude -107.436711 °W	County RIO ARRIBA
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Dedicated Acres 1292.66	Penetrated Spacing Unit: Entire Sections 5 & 6, T31N, R5W Entire Sections 1 & 2, T31N, R6W	Infill or Defining Well INFILL	Defining Well API	Overlapping Spacing Unit ☐ Yes ☒ No	Consolidation Code UNITIZATION
Order Numbers R-13457			Well setbacks are under Common Ownership: ☐ Yes ☒ No		

Kick Off Point (KOP)

UL O	Section 5	Township 31N	Range 5W	Lot	Feet from N/S Line 364' SOUTH	Feet from E/W Line 1985' EAST	Latitude 36.922254 °N	Longitude -107.383544 °W	County RIO ARRIBA
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First Take Point (FTP)

UL O	Section 5	Township 31N	Range 5W	Lot	Feet from N/S Line 718' SOUTH	Feet from E/W Line 2515' EAST	Latitude 36.923230 °N	Longitude -107.385359 °W	County RIO ARRIBA
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Last Take Point (LTP)

UL M	Section 2	Township 31N	Range 6W	Lot	Feet from N/S Line 1072' SOUTH	Feet from E/W Line 1318' WEST	Latitude 36.924355 °N	Longitude -107.436711 °W	County RIO ARRIBA
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Unitized Area or Area of Uniform Interest ROSA UNIT	Spacing Unit Type ☒ Horizontal ☐ Vertical ☐ Directional	Ground Floor Elevation 6317'
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OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division. <i>Etta Trujillo</i> Signature Etta Trujillo Printed Name etrujillo@logosresourcesllc.com E-mail Address 12/12/2024 Date	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.  JASON C. EDWARDS Signature and Seal of Professional Surveyor Certificate Number 15269 Date of Survey DECEMBER 20, 2022
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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:** 1 / 29 / 2025

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

If Other, please describe: _____

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

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Rosa Unit 672H	30-039-pending	B-8-31N-5W	713'FNL, 1931'FWL	N/A	23,527	771
Rosa Unit 674H	30-039-pending	B-8-31N-5W	713'FNL, 1941'FEL	N/A	22,790	746
Rosa Unit 690H	30-039-pending	B-8-31N-5W	748'FNL, 1950'FEL	N/A	17,013	609
Rosa Unit 692H	30-039-pending	B-8-31N-5W	766'FNL, 1960'FEL	N/A	18,265	597
Rosa Unit 694H	30-039-pending	B-8-31N-5W	783'FNL, 1970'FEL	N/A	22,790	746
Rosa Unit 696H	30-039-pending	B-8-31N-5W	801'FNL, 1980'FEL	N/A	16,661	597

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 672H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 674H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 690H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 692H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 694H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 696H	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

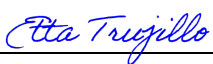
1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(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 II
E-mail Address:	etrujillo@logosresourcesllc.com
Date:	1/28/2025
Phone:	(505) 324-4154
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)	
Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

VI. Separation Equipment

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

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

VII. Operational Practices 19.15.27.8 NMAC A through F

- A. The operator will maximize the recovery of natural gas and minimize the amount of gas vented or flared when technically and safely feasible as further described and detailed within the following subsections (B-F of 19.15.27.8). In all cases where natural gas venting and flaring requires regulatory reporting, reporting will be submitted accurately and within the required time frames.
- B. Venting and flaring during drilling operations:
 - a. New Drill HZ Oil Wells: The operator drills wells in the area by utilizing a balanced mud to safely drill the wellbore. This technique prevents gas from coming to surface during the drilling process. If there is an emergency or malfunction and natural gas does come to surface the natural gas will be captured or combusted, with an appropriately sized and located flare stack, if technically and safely feasible.
 - b. New Drill HZ Gas Wells: The operator drills wells in the area by balancing the mud weight to safely drill the wellbore with as minimal flaring as possible. When gas kicks enter the wellbore, sometimes it is necessary to circulate it out of the wellbore to an appropriately sized and located flare stack. The operator will estimate the volume flared and appropriately report.
- C. Venting and flaring during completion or recompletion operations:
 - a. New Drill HZ Oil Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. During the separation flowback period natural gas will be routed to a properly sized and located flare until the natural gas is of pipeline quality (less than 60 days). The natural gas will also be utilized on site as needed for fuel gas or injection gas.
 - b. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During

initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. The natural gas will be utilized on site as needed for fuel gas and natural gas will be sold.

D. Venting and flaring during production operations:

- a. New Drill HZ Oil Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. This facility will operate under a notice of intent (NOI) from the New Mexico Environment Department (NMED).

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

- (a) If there is an emergency or malfunction, vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore requires liquids to be unloaded to atmosphere, the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging with minor exceptions.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will utilize a LACT system when available to minimize gas vented during oil tank loading.
- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) Storage tanks and other low-pressure vessel normal operational venting will be minimized during the early life of the well with the installation of

a vapor recovery unit to limit the flash and working and breathing emissions to atmosphere.

- (h) No dehydration or amine units are anticipated to be set on location.
 - (i) Compressors, compressor engines, turbines, flanges, connectors, valves, and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operation.
 - (j) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
 - (k) When natural gas does not meet gathering pipeline specifications, for example high nitrogen content after a nearby frac, gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
 - (l) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.
- b. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible.

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

- (a) If there is an emergency or malfunction vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore needs to be unloaded to atmosphere the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging. The formation is only anticipated to produce water and therefore tank emissions are anticipated to be negligible.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will always utilize the water transfer systems when available. Water loading emissions are anticipated to be negligible.

- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps, or instrument air, will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) No dehydration or amine units are anticipated to be set on location.
- (h) Compressors, compressor engines, turbines, flanges, connectors, valves, storage tanks, and other low-pressure vessels and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operations.
- (i) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
- (j) If natural gas does not meet gathering pipeline specifications gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
- (k) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

E. Performance standards:

- a. The production facilities are designed to handle the maximum throughput and pressures from producing wellbores and will be designed to minimize waste. The amount of gas vented and flared will be minimized when technically and safely feasible.
- b. All tanks that are routed to a control device that is installed after 5/25/2021 will have an automatic gauging system to minimize the amount of vented natural gas.
- c. If a flare stack is installed or replaced after 5/25/2021 it will be equipped with an automatic ignitor or continuous pilot. The flare stack will be properly sized and designed to ensure proper combustion efficiency. The flare stack will be located 100 feet away from the nearest wellhead or storage tank.
- d. AVO inspections will be conducted weekly for the year after completion and for all wells producing greater than 60,000 cubic feet of natural gas daily. The AVO inspection will include all components, including flare stacks, thief hatches, closed vent systems, pumps, compressors, pressure relief devices, valves, lines, flanges, connectors, and associated pipeline to identify any leaks and releases by comprehensive auditory, visual, and olfactory inspection. The AVO inspection records will be maintained for 5 years which will be available at the department's request. Identified leaks will be repaired as soon as feasible to minimize the amount of vented natural gas.

F. Measurement or estimation of vented and flared natural gas.

- a. The volume of natural gas that is vented, flared or consumed for beneficial use will be measured when possible, or estimated, during drilling, completions, or production operations.
- b. Equipment will be installed to measure the volume of natural gas flared for all APD's issued after 5/25/2021 on facilities that will have an average daily gas rate greater than 60,000 cubic feet of natural gas. Measurement equipment will conform to API MPMS Chapter 14.10 regulations. The measurement equipment will not have a manifold that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing the measurement equipment. If metering is not practical then the volume of gas will be estimated.



LOGOS Operating, LLC Operations Plan

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

Date:	December 11, 2024	Pool:	Basin Mancos
Well Name:	Rosa Unit 674H	GL Elevation:	6347
Surface Location:	Sec 08, T31N, R5W 731' FNL, 1941' FEL (36.919248° N, -107.383388° W – NAD83)	KB:	30'
Bottom Hole Location:	Sec 2, T31N, R6W 1072' FSL, 1318' FWL (36.924355° N, -107.436711° W – NAD83)	Measured Depth:	22,530' (KB)
Lease Serial CA Serial	# NMSF78763 # NMNM78407E	County:	Rio Arriba

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,470'	2,439'	*POINT LOOKOUT	5,733'	5,635'
KIRTLAND	2,593'	2,559'	*MANCOS	6,343'	6,238'
*FRUITLAND	2,898'	2,858'	KICKOFF POINT	6,498'	6,392'
*PICTURED CLIFFS	3,419'	3,368'	LANDING POINT	7,461'	6,988'
LEWIS	3,524'	3,471'	TD	22,530'	6,977'
CHACRA	4,727'	4,649'			
*CLIFF HOUSE	5,520'	5,426'			
MENEFEE	5,555'	5,461'			

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

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



- B. BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **3000 psi (High) for 10 minutes**. Pressure test surface casing to **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:** $6988' \text{ TVD} \times 0.43 = 3,005 \text{ psi}$
- E. H2S Concerns:** There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
CONDUCTOR (Pre-set)	26" or 24"	350' (GL) or Greater	20"	94 LBS	J-55 or equiv	LTC/BTC
SURFACE	17.5"	3,469'	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,418'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	22,530'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

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

B. FLOAT EQUIPMENT:

- 1. CONDUCTOR CASING:** 20" cement nose guide shoe. Place float shoe 1 joint above shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
- 2. SURFACE CASING:** 13-3/8" cement nose guide shoe with float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,000ft., 1,500 ft., 1,000 ft., and 500ft.
 - Casing will be kept fluid filled during drilling
- 3. INTERMEDIATE CASING:** 9-5/8" cement float shoe. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancellation plugs for DV tools may be used if losses while cementing are not encountered. Optional use of an ICP may be used in conjunction with DV Tools.
- 4. PRODUCTION CASING:** Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one Toe Sleeve (Sliding Sleeve) positioned inside the applicable production area. Centralizer



program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

C. CEMENTING:

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

1. CONDUCTOR: Casing shall be set at ~ 350' and cemented to surface. TOC at Surface.

Conductor - 20"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Type G	-	350	0.9599	1.3	487	87	1.10	442	15.8
Type III		350	0.9599	1.3	487	87	1.39	350	14.6
24" hole									
Set Depth	350								

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

Surface - 13-3/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	2,869	600	0.6947	1.3	575	102	1.10	523	15.8
Stage 1 Lead - OH	350	2,519	0.6947	1.3	2,275	405	1.90	1,197	12.4
Stage 2 Lead - Cased	-	350	1.019	1	357	64	1.90	188	12.4
					3,207	571		1908	
Set Depth	3469								

3. 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 and optional ICP's above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. If losses are not observed during the second stage a 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

Intermediate - 9-5/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Annular Hole capacity (ft3)	Annular Hole capacity (bbl)	Shoe Joint (ft)	Cement (ft3/ft) Capacity of casing	Excess (0%)		Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)	
Stage 1 Tail	5,918	500	0.3132	1.3	203.58	36.3	40	0.411	1	16.44	2.9	220	39	1.10	200	15.8
Stage 1 Lead	4,802	1,116	0.3132	1.3	454.39	80.9	0	0.411	1	0	0.0	454	81	1.90	239	12.4
											674	120			439	
Stage 2 Tail	4,202	600	0.3132	1.3	244.30	43.5	0	0.411	1	0	0.0	244	44	1.58	155	13.2
Stage 2 Lead	3,469	733	0.3132	1.3	298.45	53.2	0	0.411	1	0	0.0	298	53	1.90	157	12.4
Stage 2 Lead - Cased	3,269	200	0.3627	1	72.54	12.9	0	0.411	1	0	0.0	73	13	1.90	38	12.4
Stage 2 Totals											615	110			350	
Int 2 Totals											1,290	230			789	
Contingency																
Stage 3 Tail	3,469	75	0.3132	1.3	30.54	5.4	0	0.411	1	0	0.0	31	5	1.58	19	13.2
Stage 3 Tail - Cased	2,969	500	0.3627	1	181.35	32.3	0	0.411	1	0	0.0	181	32	1.58	115	13.2
Stage 3 Lead - Cased	-	2,969	0.3627	1	1076.86	191.8	0	0.411	1	0	0.0	1,077	192	1.90	567	12.4
Contingency Stage 3 Totals											1,289	230			701	
Set Depth	6418															

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

4. 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.



Production - 5-1/2"	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,318	100	0.2531	1	25	5	1.59	16	13.2
Open Hole Lead	6,418	16,112	0.2291	1.15	4,250	757	1.59	2,673	13.2
					4,275	761		2,689	

Set depth 22530

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

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

IV. COMPLETION

A. CBL

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

B. PRESSURE TEST

C. Pressure test 5-1/2" casing to 0.22 psi/ft * 6988' TVD = 1537 psi for 30 minutes. Increase pressure to Open RSI sleeves.

D. STIMULATION

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

E. PRODUCTION TUBING

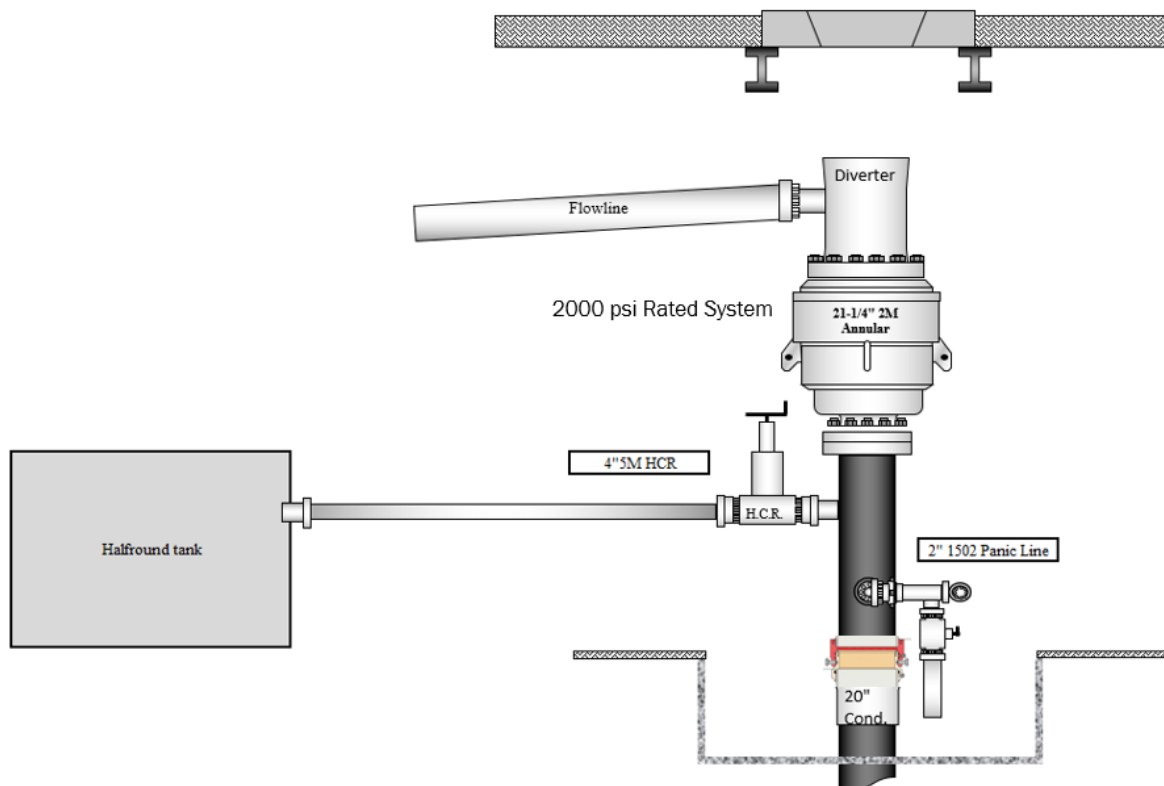
2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-36 months after completion.

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



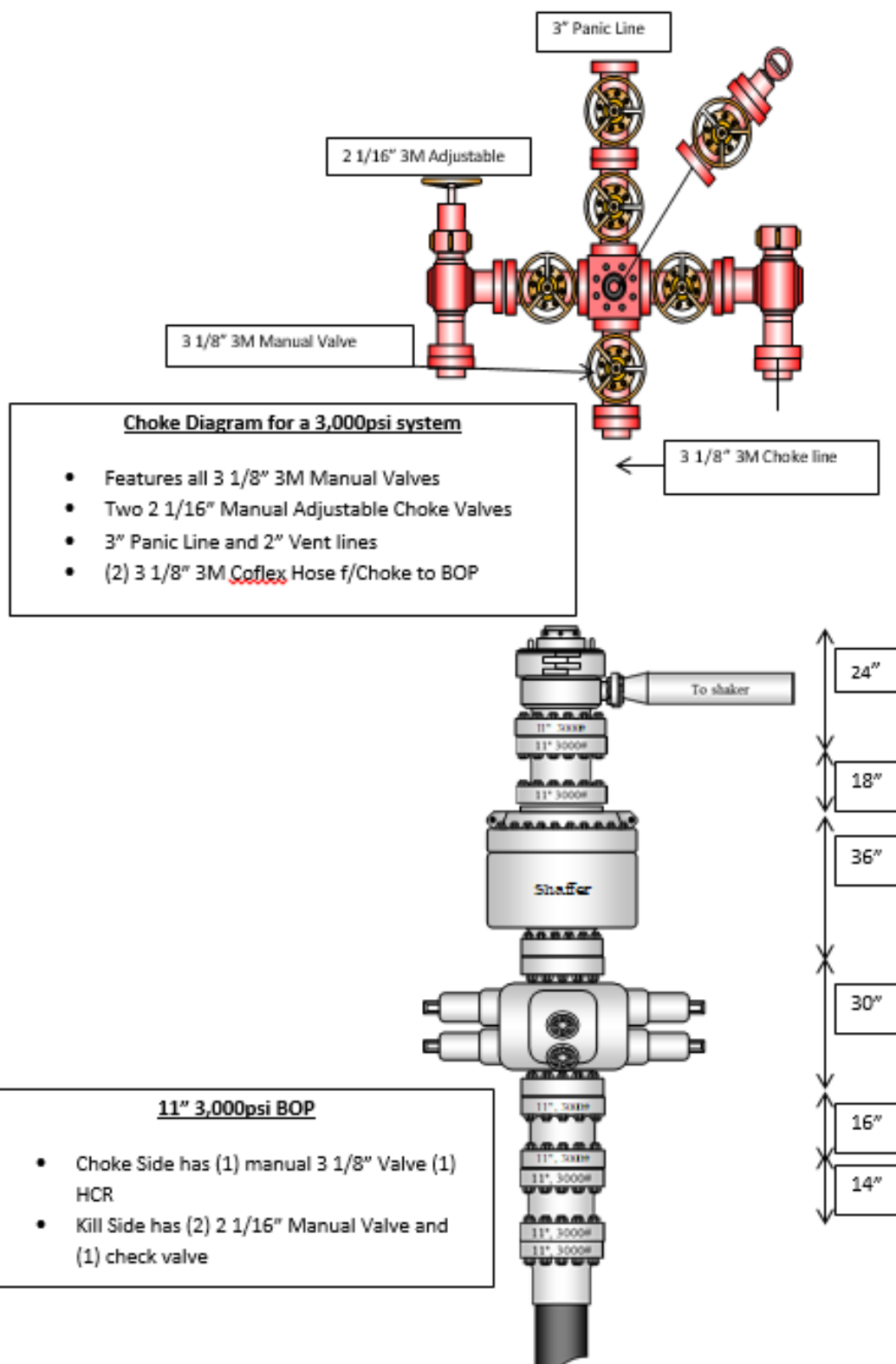
BOP Equipment

Surface Hole Diverter





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



Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 34

Rosa Unit #674H

OH

Prelim 5

Anticollision Report

22 November, 2024

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Reference	Prelim 5		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Max. Cent. Dist. of 99,999.00usft or Max. SF of 100	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	11/22/2024		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	22,529.49	Prelim 5 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	

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 Unit 34						
(O) Carson #1 - OH - OH-INC	500.00	641.00	8,534.58	8,521.54	654.421	CC
(O) Carson #1 - OH - OH-INC	6,500.00	6,531.83	8,635.40	8,466.00	50.975	ES
(O) Carson #1 - OH - OH-INC	7,200.00	7,079.24	8,971.95	8,780.49	46.862	SF
(O) Rosa Unit #041B - OH - OH-SVY	10,000.00	7,378.23	703.64	599.97	6.787	ES, SF
(O) Rosa Unit #041B - OH - OH-SVY	10,004.45	7,378.18	703.64	600.03	6.791	CC
(O) Rosa Unit #041C - OH - OH-SVY	1,090.72	1,090.53	49.93	42.79	6.992	CC
(O) Rosa Unit #041C - OH - OH-SVY	1,100.00	1,099.38	50.02	42.73	6.864	ES
(O) Rosa Unit #041C - OH - OH-SVY	1,130.50	1,128.22	51.66	43.93	6.682	SF
(O) Rosa Unit #053 - OH - OH-INC	562.50	551.50	414.05	402.29	35.222	CC
(O) Rosa Unit #053 - OH - OH-INC	600.00	588.88	414.42	401.85	32.986	ES
(O) Rosa Unit #053 - OH - OH-INC	6,700.00	6,577.31	1,511.23	1,347.49	9.229	SF
(O) Rosa Unit #072C - OH - OH-SVY	13,093.73	7,127.44	196.31	79.02	1.674	CC, ES, SF
(O) Rosa Unit #080A - OH - OH-INC	281.75	187.73	2,002.21	1,997.46	421.890	CC
(O) Rosa Unit #080A - OH - OH-INC	700.00	604.84	2,003.87	1,989.64	140.848	ES
(O) Rosa Unit #080A - OH - OH-INC	5,000.00	4,786.00	2,485.40	2,361.84	20.115	SF
(O) Rosa Unit #107 - OH - OH-INC	6,543.50	6,252.50	4,242.68	4,090.54	27.886	CC
(O) Rosa Unit #107 - OH - OH-INC	6,550.00	6,258.90	4,242.70	4,090.40	27.857	ES
(O) Rosa Unit #107 - OH - OH-INC	7,050.00	6,676.52	4,364.39	4,200.79	26.677	SF
(O) Rosa Unit #108 - OH - OH-SVY	11,961.38	6,883.33	2,962.11	2,738.46	13.244	CC
(O) Rosa Unit #108 - OH - OH-SVY	12,000.00	6,883.30	2,962.36	2,738.40	13.227	ES
(O) Rosa Unit #108 - OH - OH-SVY	12,200.00	6,883.15	2,971.71	2,746.34	13.186	SF
(O) Rosa Unit #149 - OH - OH-INC	14,890.03	5,949.00	2,756.49	2,462.21	9.367	CC
(O) Rosa Unit #149 - OH - OH-INC	14,900.00	5,949.00	2,756.51	2,462.16	9.365	ES
(O) Rosa Unit #149 - OH - OH-INC	15,000.00	5,949.00	2,758.68	2,463.67	9.351	SF
(O) Rosa Unit #149A - OH - OH-INC	16,267.54	6,000.00	3,088.45	2,829.35	11.920	CC
(O) Rosa Unit #149A - OH - OH-INC	16,300.00	6,000.00	3,088.62	2,829.26	11.908	ES
(O) Rosa Unit #149A - OH - OH-INC	16,500.00	6,000.00	3,097.18	2,836.50	11.881	SF
(O) Rosa Unit #149B - OH - OH-INC	18,206.26	7,025.79	2,487.99	2,131.71	6.983	CC, ES
(O) Rosa Unit #149B - OH - OH-INC	18,300.00	7,025.72	2,489.75	2,132.92	6.977	SF
(O) Rosa Unit #149C - OH - OH-SVY	15,588.24	7,098.21	2,265.98	1,689.50	3.931	CC
(O) Rosa Unit #149C - OH - OH-SVY	15,600.00	7,098.37	2,266.01	1,689.43	3.930	ES, SF
(O) Rosa Unit #164 - OH - OH-SVY	17,195.52	4,604.00	2,867.41	2,763.08	27.484	CC
(O) Rosa Unit #164 - OH - OH-SVY	17,200.00	4,604.00	2,867.41	2,763.06	27.477	ES
(O) Rosa Unit #164 - OH - OH-SVY	17,500.00	4,604.00	2,883.53	2,777.79	27.270	SF
(O) Rosa Unit #164A - OH - OH-INC	15,280.67	6,060.00	957.81	798.14	5.999	CC
(O) Rosa Unit #164A - OH - OH-INC	15,300.00	6,060.00	958.01	797.83	5.981	ES
(O) Rosa Unit #164A - OH - OH-INC	15,700.00	6,060.00	1,045.58	863.50	5.742	SF

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	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 Unit 34						
(O) Rosa Unit #164B - OH - OH-SVY	17,376.96	7,574.63	640.90	411.76	2.797	CC, ES, SF
(O) Rosa Unit #164C - OH - OH-SVY	14,988.27	7,333.48	828.40	680.16	5.588	CC, ES, SF
(O) Rosa Unit #171 - OH - OH-INC	11,736.88	6,028.00	3,056.73	2,864.82	15.927	CC, ES
(O) Rosa Unit #171 - OH - OH-INC	12,000.00	6,028.00	3,068.04	2,874.25	15.832	SF
(O) Rosa Unit #171A - OH - OH-SVY	12,964.92	3,337.00	4,687.94	4,603.76	55.686	CC, ES
(O) Rosa Unit #171A - OH - OH-SVY	13,900.00	3,337.00	4,780.29	4,693.27	54.931	SF
(O) Rosa Unit #171B - OH - OH-SVY	12,491.21	6,388.00	1,622.32	1,513.01	14.841	CC, ES, SF
(O) Rosa Unit #171C - OH - OH-SVY	14,066.44	6,990.00	1,609.30	1,457.01	10.567	CC, ES
(O) Rosa Unit #171C - OH - OH-SVY	14,200.00	6,990.00	1,614.84	1,461.70	10.545	SF
(O) Rosa Unit #226 - OH - OH-INC	15,760.42	3,135.00	4,729.44	4,589.43	33.778	CC
(O) Rosa Unit #226 - OH - OH-INC	15,800.00	3,135.00	4,729.61	4,589.30	33.708	ES
(O) Rosa Unit #226 - OH - OH-INC	16,700.00	3,135.00	4,821.87	4,675.56	32.956	SF
(O) Rosa Unit #226A - OH - OH-SVY	15,316.35	5,392.00	4,089.15	3,986.48	39.828	CC, ES
(O) Rosa Unit #226A - OH - OH-SVY	17,400.00	3,998.00	4,367.84	4,249.94	37.048	SF
(O) Rosa Unit #228A - OH - OH-SVY	12,890.15	3,253.00	4,630.34	4,558.40	64.363	CC
(O) Rosa Unit #228A - OH - OH-SVY	12,900.00	3,253.00	4,630.35	4,558.37	64.332	ES
(O) Rosa Unit #228A - OH - OH-SVY	13,600.00	3,253.00	4,684.43	4,610.43	63.296	SF
(O) Rosa Unit #336 - OH - OH-INC	550.00	522.00	178.72	167.12	15.406	CC
(O) Rosa Unit #336 - OH - OH-INC	600.00	572.00	179.12	166.39	14.070	ES
(O) Rosa Unit #336 - OH - OH-INC	3,000.00	2,930.60	602.99	523.63	7.598	SF
(O) Rosa Unit #336A - OH - OH-INC	550.00	472.00	2,557.87	2,547.05	236.407	CC
(O) Rosa Unit #336A - OH - OH-INC	800.00	719.67	2,561.11	2,544.37	153.024	ES
(O) Rosa Unit #336A - OH - OH-INC	3,000.00	2,809.00	2,724.24	2,654.31	38.954	SF
(O) Rosa Unit #350A - OH - OH-SVY	0.00	284.22	7,249.85			
(O) Rosa Unit #350A - OH - OH-SVY	100.00	365.41	7,250.28	7,247.97	3,138.260	ES
(O) Rosa Unit #350A - OH - OH-SVY	6,600.00	3,645.00	8,720.99	8,677.66	201.274	SF
(O) Rosa Unit #46 - OH - OH-INC	526.84	490.84	169.47	158.53	15.484	CC
(O) Rosa Unit #46 - OH - OH-INC	600.00	563.79	169.92	157.29	13.454	ES
(O) Rosa Unit #46 - OH - OH-INC	5,600.00	5,469.50	1,114.66	982.16	8.412	SF
(O) Rosa Unit #80B - OH - OH-SVY	9,510.36	7,108.05	1,714.97	1,412.24	5.665	CC, ES, SF
(O) Rosa Unit #95 - OH - OH-INC	100.00	528.49	6,151.66	6,140.16	534.980	CC
(O) Rosa Unit #95 - OH - OH-INC	1,600.00	2,014.95	6,170.61	6,120.91	124.143	ES
(O) Rosa Unit #95 - OH - OH-INC	6,000.00	5,990.00	6,358.39	6,190.70	37.919	SF
(O) Rosa Unit 072B - OH - OH-SVY	12,570.09	7,498.51	1,071.85	939.66	8.108	CC
(O) Rosa Unit 072B - OH - OH-SVY	12,600.00	7,498.53	1,072.27	939.10	8.052	ES
(O) Rosa Unit 072B - OH - OH-SVY	12,700.00	7,498.61	1,079.70	943.93	7.952	SF
(O) Rosa Unit 148 COM - OH - OH-INC	21,000.00	6,936.74	627.66	211.83	1.509	ES, SF
(O) Rosa Unit 148 COM - OH - OH-INC	21,011.74	6,936.73	627.55	211.90	1.510	CC
Rosa Unit #672H - OH - Prelim 5	500.00	500.00	19.96	16.59	5.924	CC, ES
Rosa Unit #672H - OH - Prelim 5	22,529.62	23,156.15	1,319.43	817.33	2.628	SF
Rosa Unit #690H - OH - Prelim 5	550.00	550.00	20.10	16.38	5.393	CC, ES
Rosa Unit #690H - OH - Prelim 5	1,500.00	1,505.25	30.98	19.99	2.820	SF
Rosa Unit #692H - OH - Prelim 5	550.00	550.00	40.06	36.34	10.747	CC, ES
Rosa Unit #692H - OH - Prelim 5	5,493.23	5,493.91	264.70	223.58	6.438	SF
Rosa Unit #694H - OH - Prelim 5	550.00	550.00	60.03	56.30	16.101	CC, ES
Rosa Unit #694H - OH - Prelim 5	22,529.62	22,269.73	1,253.79	753.49	2.506	SF
Rosa Unit #696H - OH - Prelim 5	550.00	550.00	80.13	76.40	21.493	CC, ES
Rosa Unit #696H - OH - Prelim 5	1,000.00	1,000.51	106.28	99.31	15.254	SF

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program: 434-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	141.00	141.00	0.00	2.50	89.26	110.52	8,533.86	8,534.58					
100.00	100.00	241.00	241.00	0.25	4.27	89.26	110.52	8,533.86	8,534.58	8,530.06	4.52	1,887.844		
200.00	200.00	341.00	341.00	0.61	6.04	89.26	110.52	8,533.86	8,534.58	8,527.93	6.65	1,283.216		
300.00	300.00	441.00	441.00	0.97	7.81	89.26	110.52	8,533.86	8,534.58	8,525.80	8.78	971.928		
400.00	400.00	541.00	541.00	1.33	9.58	89.26	110.52	8,533.86	8,534.58	8,523.67	10.91	782.182		
500.00	500.00	641.00	641.00	1.68	11.36	89.26	110.52	8,533.86	8,534.58	8,521.54	13.04	654.421	CC	
550.00	550.00	691.04	691.04	1.86	12.24	89.26	110.76	8,533.86	8,534.58	8,520.47	14.11	604.981		
552.25	552.25	693.29	693.29	1.87	12.28	91.64	110.76	8,533.86	8,534.58	8,520.43	14.16	602.931		
600.00	600.00	741.09	741.09	2.04	13.13	91.64	110.73	8,533.86	8,534.59	8,519.42	15.17	562.485		
700.00	699.93	841.13	841.12	2.40	14.90	91.67	110.60	8,533.86	8,534.69	8,517.39	17.30	493.252		
800.00	799.68	940.69	940.68	2.77	16.67	91.71	110.52	8,533.86	8,534.90	8,515.47	19.43	439.369		
900.00	899.13	1,040.14	1,040.13	3.13	18.43	91.77	110.52	8,533.86	8,535.22	8,513.67	21.55	396.073		
1,000.00	998.15	1,139.20	1,139.19	3.49	20.18	91.86	110.74	8,533.86	8,535.66	8,511.99	23.67	360.548		
1,100.00	1,096.63	1,237.72	1,237.72	3.87	21.93	91.96	110.63	8,533.86	8,536.25	8,510.45	25.80	330.866		
1,130.50	1,126.54	1,267.64	1,267.63	3.99	22.46	91.99	110.58	8,533.86	8,536.46	8,510.01	26.45	322.765		
1,200.00	1,194.61	1,335.62	1,335.61	4.26	23.67	92.09	110.52	8,533.86	8,536.97	8,509.03	27.94	305.581		
1,300.00	1,292.57	1,433.58	1,433.57	4.66	25.44	92.22	110.52	8,533.86	8,537.74	8,507.64	30.10	283.649		
1,400.00	1,390.52	1,531.53	1,531.52	5.07	27.20	92.35	110.73	8,533.86	8,538.56	8,506.29	32.27	264.612		
1,500.00	1,488.48	1,629.45	1,629.44	5.48	28.96	92.48	110.63	8,533.86	8,539.43	8,504.98	34.44	247.946		
1,600.00	1,586.43	1,727.45	1,727.43	5.90	30.73	92.62	110.52	8,533.86	8,540.34	8,503.72	36.62	233.222		
1,700.00	1,684.38	1,825.40	1,825.38	6.31	32.49	92.75	110.52	8,533.86	8,541.30	8,502.50	38.80	220.136		
1,800.00	1,782.34	1,923.11	1,923.09	6.73	34.25	92.88	110.70	8,533.86	8,542.31	8,501.33	40.98	208.455		
1,900.00	1,880.29	2,021.32	2,021.29	7.15	36.03	93.01	110.52	8,533.86	8,543.36	8,500.18	43.19	197.825		
2,000.00	1,978.25	2,119.27	2,119.25	7.58	37.83	93.14	110.52	8,533.86	8,544.47	8,499.06	45.41	188.177		
2,100.00	2,076.20	2,217.15	2,217.12	8.00	39.63	93.27	110.73	8,533.86	8,545.61	8,497.99	47.63	179.430		
2,200.00	2,174.15	2,314.91	2,314.89	8.43	41.42	93.41	110.62	8,533.86	8,546.81	8,496.97	49.85	171.466		
2,300.00	2,272.11	2,413.15	2,413.11	8.85	43.26	93.54	110.52	8,533.86	8,548.06	8,495.95	52.11	164.032		
2,400.00	2,370.06	2,511.10	2,511.06	9.28	45.14	93.67	110.52	8,533.86	8,549.35	8,494.94	54.41	157.117		
2,500.00	2,468.02	2,608.47	2,608.43	9.71	47.00	93.80	111.00	8,533.86	8,550.68	8,493.97	56.71	150.791		
2,600.00	2,565.97	2,705.49	2,705.44	10.14	48.86	93.93	110.57	8,533.86	8,552.08	8,493.09	58.99	144.974		
2,700.00	2,663.92	2,804.99	2,804.92	10.57	50.81	94.07	110.52	8,533.86	8,553.51	8,492.14	61.37	139.366		
2,800.00	2,761.88	2,902.21	2,902.14	11.00	52.73	94.19	110.90	8,533.86	8,554.98	8,491.26	63.72	134.263		
2,900.00	2,859.83	3,000.93	3,000.83	11.43	54.68	94.33	110.52	8,533.86	8,556.52	8,490.42	66.10	129.443		
3,000.00	2,957.79	3,098.89	3,098.79	11.86	56.67	94.46	110.52	8,533.86	8,558.09	8,489.57	68.52	124.893		
3,100.00	3,055.74	3,196.01	3,195.90	12.29	58.65	94.59	111.19	8,533.86	8,559.69	8,488.76	70.93	120.682		
3,200.00	3,153.69	3,292.09	3,291.97	12.72	60.60	94.72	110.72	8,533.86	8,561.37	8,488.06	73.31	116.782		
3,300.00	3,251.65	3,392.80	3,392.65	13.15	62.62	94.86	110.52	8,533.86	8,563.10	8,487.33	75.76	113.023		
3,400.00	3,349.60	3,490.76	3,490.60	13.59	64.58	94.99	110.52	8,533.86	8,564.86	8,486.71	78.15	109.589		
3,500.00	3,447.56	3,587.32	3,587.15	14.02	66.51	95.11	111.26	8,533.86	8,566.63	8,486.12	80.52	106.395		
3,600.00	3,545.51	3,683.33	3,683.16	14.45	68.43	95.24	110.74	8,533.86	8,568.52	8,485.65	82.87	103.398		
3,700.00	3,643.46	3,784.66	3,784.46	14.88	70.47	95.38	110.52	8,533.86	8,570.43	8,485.09	85.34	100.432		
3,800.00	3,741.42	3,882.62	3,882.42	15.32	72.44	95.51	110.52	8,533.86	8,572.38	8,484.64	87.74	97.706		
3,900.00	3,839.37	3,980.24	3,980.03	15.75	74.40	95.64	111.32	8,533.86	8,574.33	8,484.20	90.13	95.132		
4,000.00	3,937.33	4,076.83	4,076.62	16.18	76.34	95.77	111.13	8,533.86	8,576.38	8,483.88	92.50	92.713		
4,100.00	4,035.28	4,173.33	4,173.12	16.62	78.28	95.90	110.70	8,533.86	8,578.50	8,483.62	94.88	90.418		
4,200.00	4,133.23	4,274.49	4,274.23	17.05	80.41	96.04	110.52	8,533.86	8,580.65	8,483.21	97.44	88.065		
4,300.00	4,231.19	4,372.45	4,372.19	17.48	82.50	96.17	110.52	8,533.86	8,582.83	8,482.87	99.96	85.862		
4,400.00	4,329.14	4,469.78	4,469.51	17.92	84.58	96.29	111.56	8,533.86	8,584.99	8,482.51	102.47	83.777		
4,500.00	4,427.10	4,565.55	4,565.28	18.35	86.63	96.42	111.29	8,533.86	8,587.28	8,482.33	104.95	81.820		
4,600.00	4,525.05	4,661.19	4,660.91	18.78	88.67	96.55	110.70	8,533.86	8,589.65	8,482.22	107.43	79.956		
4,700.00	4,623.00	4,764.35	4,764.00	19.22	91.10	96.69	110.52	8,533.86	8,592.03	8,481.74	110.29	77.903		
4,800.00	4,720.96	4,861.17	4,860.81	19.65	93.44	96.81	111.35	8,533.86	8,594.38	8,481.32	113.06	76.019		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 434-A027Ua_INC-ONLY				Rule Assigned:								Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
4,900.00	4,818.91	4,954.49	4,954.12	20.09	95.69	96.94	110.89	8,533.86	8,596.88	8,481.14	115.74	74.280	
5,000.00	4,916.87	5,058.34	5,057.87	20.52	98.36	97.08	110.52	8,533.86	8,599.42	8,480.58	118.84	72.360	
5,100.00	5,014.82	5,156.30	5,155.82	20.96	100.98	97.21	110.52	8,533.86	8,601.97	8,480.08	121.89	70.571	
5,200.00	5,112.77	5,252.90	5,252.38	21.39	103.56	97.33	112.56	8,533.86	8,604.39	8,479.49	124.90	68.889	
5,300.00	5,210.73	5,345.50	5,344.96	21.82	106.03	97.45	112.08	8,533.86	8,607.08	8,479.28	127.81	67.344	
5,400.00	5,308.68	5,437.86	5,437.30	22.26	108.49	97.58	110.97	8,533.86	8,609.88	8,479.18	130.71	65.872	
5,493.23	5,400.00	5,541.76	5,541.00	22.66	111.39	97.72	110.52	8,533.86	8,612.47	8,478.47	134.00	64.273	
5,500.00	5,406.64	5,548.40	5,547.64	22.69	111.57	97.73	110.52	8,533.86	8,612.66	8,478.44	134.22	64.170	
5,600.00	5,504.69	5,646.45	5,645.69	23.12	114.34	97.87	110.52	8,533.86	8,615.38	8,477.96	137.41	62.698	
5,700.00	5,602.91	5,741.29	5,740.48	23.55	117.02	97.99	112.39	8,533.86	8,617.83	8,477.32	140.51	61.333	
5,800.00	5,701.29	5,833.38	5,832.55	23.97	119.61	98.12	111.70	8,533.86	8,620.46	8,476.93	143.53	60.062	
5,900.00	5,799.82	5,941.90	5,940.82	24.39	122.78	98.26	110.52	8,533.86	8,623.04	8,475.94	147.10	58.619	
6,000.00	5,898.50	6,040.57	6,039.50	24.79	125.96	98.38	110.52	8,533.86	8,625.42	8,474.73	150.69	57.241	
6,100.00	5,997.31	6,134.88	6,133.76	25.20	128.99	98.47	112.14	8,533.86	8,627.52	8,473.40	154.12	55.978	
6,200.00	6,096.26	6,224.37	6,223.22	25.60	131.87	98.58	111.26	8,533.86	8,629.80	8,472.40	157.40	54.827	
6,300.00	6,195.33	6,337.78	6,336.33	25.99	135.78	98.69	110.52	8,533.86	8,631.93	8,470.24	161.70	53.384	
6,400.00	6,294.51	6,436.96	6,435.51	26.37	139.33	98.78	110.52	8,533.86	8,633.89	8,468.26	165.63	52.127	
6,498.19	6,392.00	6,530.21	6,528.68	26.75	142.66	98.85	113.40	8,533.86	8,635.37	8,466.03	169.34	50.994	
6,500.00	6,393.80	6,531.83	6,530.30	26.76	142.72	100.05	113.39	8,533.86	8,635.40	8,466.00	169.41	50.975 ES	
6,550.00	6,443.29	6,576.27	6,574.71	26.95	144.31	122.75	113.07	8,533.86	8,638.28	8,467.10	171.19	50.461	
6,600.00	6,492.24	6,620.14	6,618.56	27.16	145.88	133.37	112.54	8,533.86	8,644.83	8,471.87	172.96	49.981	
6,650.00	6,540.33	6,663.15	6,661.54	27.38	147.42	138.92	111.80	8,533.86	8,654.99	8,480.28	174.71	49.540	
6,700.00	6,587.28	6,730.35	6,728.28	27.60	149.81	142.12	110.52	8,533.86	8,668.73	8,491.41	177.32	48.888	
6,750.00	6,632.80	6,775.87	6,773.80	27.84	151.39	143.94	110.52	8,533.86	8,685.80	8,506.68	179.11	48.494	
6,800.00	6,676.60	6,819.67	6,817.60	28.09	152.91	144.90	110.52	8,533.86	8,706.22	8,525.37	180.85	48.141	
6,850.00	6,718.42	6,861.46	6,859.35	28.34	154.36	145.23	112.39	8,533.86	8,729.65	8,547.14	182.52	47.829	
6,900.00	6,758.00	6,894.49	6,892.37	28.60	155.50	145.03	112.29	8,533.86	8,756.42	8,572.54	183.88	47.620	
6,950.00	6,795.09	6,925.27	6,923.13	28.87	156.57	144.36	112.01	8,533.86	8,786.15	8,600.99	185.16	47.451	
7,000.00	6,829.46	6,953.61	6,951.46	29.14	157.55	143.21	111.61	8,533.86	8,818.66	8,632.30	186.36	47.322	
7,050.00	6,860.91	7,004.30	7,001.91	29.43	159.31	141.67	110.52	8,533.86	8,853.78	8,665.46	188.32	47.015	
7,100.00	6,889.24	7,032.63	7,030.24	29.73	160.28	139.47	110.52	8,533.86	8,891.13	8,701.64	189.49	46.922	
7,150.00	6,914.27	7,057.66	7,055.27	30.05	161.13	136.56	110.52	8,533.86	8,930.60	8,740.07	190.53	46.872	
7,200.00	6,935.85	7,079.24	7,076.85	30.37	161.87	132.78	110.52	8,533.86	8,971.95	8,780.49	191.45	46.862 SF	
7,250.00	6,953.84	7,097.24	7,094.84	30.71	162.48	127.90	110.52	8,533.86	9,014.92	8,822.68	192.24	46.893	
7,300.00	6,968.15	7,111.54	7,109.15	31.06	162.97	121.65	110.52	8,533.86	9,059.25	8,866.35	192.90	46.964	
7,350.00	6,978.67	7,122.06	7,119.67	31.42	163.33	113.74	110.52	8,533.86	9,104.67	8,911.25	193.42	47.073	
7,400.00	6,985.34	7,128.74	7,126.34	31.79	163.56	103.99	110.52	8,533.86	9,150.89	8,957.09	193.79	47.220	
7,450.00	6,988.13	7,131.53	7,129.13	32.17	163.65	92.59	110.52	8,533.86	9,197.62	9,003.60	194.03	47.404	
7,461.13	6,988.22	7,131.62	7,129.22	32.26	163.65	89.89	110.52	8,533.86	9,208.07	9,014.01	194.06	47.450	
7,500.00	6,988.19	7,131.59	7,129.19	32.56	163.65	89.89	110.52	8,533.86	9,244.66	9,050.50	194.16	47.614	
7,600.00	6,988.12	7,131.52	7,129.12	33.37	163.65	89.87	110.52	8,533.86	9,339.66	9,145.26	194.40	48.044	
7,700.00	6,988.05	7,131.45	7,129.05	34.21	163.65	89.85	110.52	8,533.86	9,435.79	9,241.17	194.62	48.484	
7,800.00	6,987.98	7,131.37	7,128.98	35.09	163.65	89.82	110.52	8,533.86	9,532.87	9,338.07	194.81	48.935	
7,900.00	6,987.91	7,131.30	7,128.91	35.99	163.64	89.78	110.52	8,533.86	9,630.79	9,435.82	194.97	49.396	
8,000.00	6,987.83	7,131.23	7,128.83	36.93	163.64	89.72	110.52	8,533.86	9,729.38	9,534.28	195.11	49.867	
8,100.00	6,987.76	7,131.15	7,128.76	37.88	163.64	89.63	110.52	8,533.86	9,828.52	9,633.30	195.22	50.347	
8,200.00	6,987.68	7,131.08	7,128.68	38.86	163.64	89.45	110.52	8,533.86	9,928.06	9,732.76	195.30	50.835	
8,300.00	6,987.61	7,131.00	7,128.61	39.86	163.63	88.97	110.52	8,533.86	10,027.88	9,832.53	195.35	51.332	
8,400.00	6,987.53	7,130.93	7,128.53	40.87	163.63	88.43	110.52	8,533.86	10,127.85	9,932.46	195.38	51.836	
8,500.00	6,987.46	7,130.85	7,128.46	41.90	163.63	-88.48	110.52	8,533.86	10,227.84	10,032.45	195.39	52.347	
8,600.00	6,987.38	7,130.78	7,128.38	42.93	163.63	-89.32	110.52	8,533.86	10,327.73	10,132.36	195.37	52.864	
8,700.00	6,987.31	7,130.70	7,128.31	43.98	163.62	-89.56	110.52	8,533.86	10,427.40	10,232.08	195.32	53.386	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC											Offset Site Error: 0.00 usft			
Survey Program: Reference		434-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.23	7,130.63	7,128.23	45.03	163.62	-89.67	110.52	8,533.86	10,526.75	10,331.50	195.25	53.913		
8,872.16	6,987.18	7,130.58	7,128.18	45.79	163.62	-89.73	110.52	8,533.86	10,598.17	10,402.98	195.19	54.296		
8,900.00	6,987.16	7,130.56	7,128.16	46.08	163.62	-89.73	110.52	8,533.86	10,625.68	10,430.51	195.17	54.444		
9,000.00	6,987.09	7,130.48	7,128.09	47.16	163.62	-89.72	110.52	8,533.86	10,724.50	10,529.42	195.08	54.975		
9,100.00	6,987.01	7,130.41	7,128.01	48.27	163.61	-89.72	110.52	8,533.86	10,823.34	10,628.35	194.99	55.506		
9,200.00	6,986.94	7,130.33	7,127.94	49.40	163.61	-89.72	110.52	8,533.86	10,922.20	10,727.29	194.91	56.037		
9,300.00	6,986.86	7,130.26	7,127.86	50.56	163.61	-89.72	110.52	8,533.86	11,021.09	10,826.26	194.83	56.567		
9,400.00	6,986.79	7,130.18	7,127.79	51.75	163.61	-89.71	110.52	8,533.86	11,119.99	10,925.23	194.76	57.097		
9,500.00	6,986.71	7,130.11	7,127.71	52.95	163.60	-89.71	110.52	8,533.86	11,218.91	11,024.23	194.69	57.626		
9,600.00	6,986.64	7,130.03	7,127.64	54.18	163.60	-89.71	110.52	8,533.86	11,317.85	11,123.24	194.62	58.155		
9,700.00	6,986.56	7,129.96	7,127.56	55.42	163.60	-89.70	110.52	8,533.86	11,416.81	11,222.26	194.55	58.683		
9,800.00	6,986.49	7,129.88	7,127.49	56.69	163.60	-89.70	110.52	8,533.86	11,515.79	11,321.30	194.49	59.211		
9,900.00	6,986.41	7,129.81	7,127.41	57.97	163.59	-89.70	110.52	8,533.86	11,614.79	11,420.36	194.43	59.738		
10,000.00	6,986.34	7,129.74	7,127.34	59.26	163.59	-89.70	110.52	8,533.86	11,713.80	11,519.43	194.37	60.265		
10,100.00	6,986.27	7,129.66	7,127.27	60.57	163.59	-89.69	110.52	8,533.86	11,812.83	11,618.51	194.32	60.791		
10,200.00	6,986.19	7,129.59	7,127.19	61.90	163.59	-89.69	110.52	8,533.86	11,911.87	11,717.60	194.27	61.317		
10,300.00	6,986.12	7,129.51	7,127.12	63.23	163.58	-89.69	110.52	8,533.86	12,010.93	11,816.71	194.22	61.842		
10,400.00	6,986.04	7,129.44	7,127.04	64.58	163.58	-89.69	110.52	8,533.86	12,110.01	11,915.84	194.17	62.367		
10,500.00	6,985.97	7,129.36	7,126.97	65.94	163.58	-89.68	110.52	8,533.86	12,209.10	12,014.97	194.13	62.892		
10,600.00	6,985.89	7,129.29	7,126.89	67.32	163.58	-89.68	110.52	8,533.86	12,308.21	12,114.12	194.09	63.415		
10,700.00	6,985.82	7,129.21	7,126.82	68.70	163.57	-89.68	110.52	8,533.86	12,407.33	12,213.28	194.05	63.938		
10,800.00	6,985.74	7,129.14	7,126.74	70.09	163.57	-89.68	110.52	8,533.86	12,506.46	12,312.44	194.02	64.461		
10,900.00	6,985.67	7,129.06	7,126.67	71.49	163.57	-89.67	110.52	8,533.86	12,605.61	12,411.63	193.98	64.983		
11,000.00	6,985.59	7,128.99	7,126.59	72.90	163.57	-89.67	110.52	8,533.86	12,704.77	12,510.82	193.95	65.505		
11,100.00	6,985.52	7,128.92	7,126.52	74.31	163.56	-89.67	110.52	8,533.86	12,803.94	12,610.02	193.92	66.026		
11,200.00	6,985.45	7,128.84	7,126.45	75.74	163.56	-89.67	110.52	8,533.86	12,903.13	12,709.23	193.90	66.546		
11,300.00	6,985.37	7,128.77	7,126.37	77.17	163.56	-89.66	110.52	8,533.86	13,002.33	12,808.46	193.87	67.066		
11,400.00	6,985.30	7,128.69	7,126.30	78.61	163.56	-89.66	110.52	8,533.86	13,101.54	12,907.69	193.85	67.586		
11,500.00	6,985.22	7,128.62	7,126.22	80.05	163.55	-89.66	110.52	8,533.86	13,200.77	13,006.94	193.83	68.104		
11,600.00	6,985.15	7,128.54	7,126.15	81.50	163.55	-89.66	110.52	8,533.86	13,300.00	13,106.19	193.81	68.622		
11,700.00	6,985.07	7,128.47	7,126.07	82.96	163.55	-89.65	110.52	8,533.86	13,399.25	13,205.45	193.80	69.140		
11,800.00	6,985.00	7,128.39	7,126.00	84.42	163.54	-89.65	110.52	8,533.86	13,498.51	13,304.72	193.79	69.657		
11,900.00	6,984.92	7,128.32	7,125.92	85.89	163.54	-89.65	110.52	8,533.86	13,597.78	13,404.00	193.77	70.173		
12,000.00	6,984.85	7,128.24	7,125.85	87.36	163.54	-89.64	110.52	8,533.86	13,697.05	13,503.29	193.76	70.689		
12,100.00	6,984.77	7,128.17	7,125.77	88.83	163.54	-89.64	110.52	8,533.86	13,796.34	13,602.59	193.76	71.204		
12,200.00	6,984.70	7,128.10	7,125.70	90.31	163.53	-89.64	110.52	8,533.86	13,895.64	13,701.89	193.75	71.719		
12,300.00	6,984.63	7,128.02	7,125.63	91.80	163.53	-89.64	110.52	8,533.86	13,994.95	13,801.21	193.75	72.233		
12,400.00	6,984.55	7,127.95	7,125.55	93.29	163.53	-89.63	110.52	8,533.86	14,094.27	13,900.53	193.75	72.746		
12,500.00	6,984.48	7,127.87	7,125.48	94.78	163.53	-89.63	110.52	8,533.86	14,193.60	13,999.86	193.75	73.259		
12,600.00	6,984.40	7,127.80	7,125.40	96.28	163.52	-89.63	110.52	8,533.86	14,292.94	14,099.19	193.75	73.771		
12,700.00	6,984.33	7,127.72	7,125.33	97.78	163.52	-89.63	110.52	8,533.86	14,392.29	14,198.54	193.75	74.282		
12,800.00	6,984.25	7,127.65	7,125.25	99.28	163.52	-89.62	110.52	8,533.86	14,491.65	14,297.89	193.76	74.793		
12,900.00	6,984.18	7,127.57	7,125.18	100.78	163.52	-89.62	110.52	8,533.86	14,591.01	14,397.25	193.76	75.303		
13,000.00	6,984.10	7,127.50	7,125.10	102.29	163.51	-89.62	110.52	8,533.86	14,690.39	14,496.61	193.77	75.813		
13,100.00	6,984.03	7,127.42	7,125.03	103.80	163.51	-89.62	110.52	8,533.86	14,789.77	14,595.99	193.78	76.322		
13,200.00	6,983.95	7,127.35	7,124.95	105.32	163.51	-89.61	110.52	8,533.86	14,889.16	14,695.37	193.79	76.830		
13,300.00	6,983.88	7,127.28	7,124.88	106.84	163.51	-89.61	110.52	8,533.86	14,988.56	14,794.75	193.81	77.338		
13,400.00	6,983.81	7,127.20	7,124.81	108.36	163.50	-89.61	110.52	8,533.86	15,087.96	14,894.14	193.82	77.845		
13,500.00	6,983.73	7,127.13	7,124.73	109.88	163.50	-89.61	110.52	8,533.86	15,187.38	14,993.54	193.84	78.351		
13,600.00	6,983.66	7,127.05	7,124.66	111.40	163.50	-89.60	110.52	8,533.86	15,286.80	15,092.95	193.86	78.856		
13,700.00	6,983.58	7,126.98	7,124.58	112.93	163.50	-89.60	110.52	8,533.86	15,386.23	15,192.36	193.88	79.361		
13,800.00	6,983.51	7,126.90	7,124.51	114.46	163.49	-89.60	110.52	8,533.86	15,485.67	15,291.77	193.90	79.866		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC												Offset Site Error: 0.00 usft		
Survey Program: Reference		434-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,900.00	6,983.43	7,126.83	7,124.43	115.99	163.49	-89.60	110.52	8,533.86	15,585.11	15,391.19	193.92	80.369		
14,000.00	6,983.36	7,126.75	7,124.36	117.52	163.49	-89.59	110.52	8,533.86	15,684.56	15,490.62	193.94	80.872		
14,100.00	6,983.28	7,126.68	7,124.28	119.06	163.49	-89.59	110.52	8,533.86	15,784.02	15,590.05	193.97	81.374		
14,200.00	6,983.21	7,126.60	7,124.21	120.59	163.48	-89.59	110.52	8,533.86	15,883.49	15,689.49	193.99	81.876		
14,300.00	6,983.13	7,126.53	7,124.13	122.13	163.48	-89.58	110.52	8,533.86	15,982.96	15,788.94	194.02	82.377		
14,400.00	6,983.06	7,126.46	7,124.06	123.67	163.48	-89.58	110.52	8,533.86	16,082.44	15,888.39	194.05	82.877		
14,500.00	6,982.99	7,126.38	7,123.99	125.21	163.48	-89.58	110.52	8,533.86	16,181.92	15,987.84	194.08	83.377		
14,600.00	6,982.91	7,126.31	7,123.91	126.75	163.47	-89.58	110.52	8,533.86	16,281.41	16,087.30	194.11	83.876		
14,700.00	6,982.84	7,126.23	7,123.84	128.30	163.47	-89.57	110.52	8,533.86	16,380.91	16,186.76	194.15	84.374		
14,800.00	6,982.76	7,126.16	7,123.76	129.85	163.47	-89.57	110.52	8,533.86	16,480.41	16,286.23	194.18	84.871		
14,900.00	6,982.69	7,126.08	7,123.69	131.39	163.47	-89.57	110.52	8,533.86	16,579.92	16,385.71	194.22	85.368		
15,000.00	6,982.61	7,126.01	7,123.61	132.94	163.46	-89.57	110.52	8,533.86	16,679.44	16,485.18	194.25	85.864		
15,100.00	6,982.54	7,125.93	7,123.54	134.49	163.46	-89.56	110.52	8,533.86	16,778.96	16,584.67	194.29	86.359		
15,200.00	6,982.46	7,125.86	7,123.46	136.04	163.46	-89.56	110.52	8,533.86	16,878.49	16,684.15	194.33	86.854		
15,300.00	6,982.39	7,125.78	7,123.39	137.60	163.46	-89.56	110.52	8,533.86	16,978.02	16,783.65	194.37	87.348		
15,400.00	6,982.31	7,125.71	7,123.31	139.15	163.45	-89.56	110.52	8,533.86	17,077.56	16,883.14	194.41	87.841		
15,500.00	6,982.24	7,125.64	7,123.24	140.70	163.45	-89.55	110.52	8,533.86	17,177.10	16,982.64	194.46	88.334		
15,600.00	6,982.17	7,125.56	7,123.17	142.26	163.45	-89.55	110.52	8,533.86	17,276.65	17,082.15	194.50	88.826		
15,700.00	6,982.09	7,125.49	7,123.09	143.82	163.45	-89.55	110.52	8,533.86	17,376.20	17,181.66	194.55	89.317		
15,800.00	6,982.02	7,125.41	7,123.02	145.38	163.44	-89.55	110.52	8,533.86	17,475.76	17,281.17	194.59	89.808		
15,900.00	6,981.94	7,125.34	7,122.94	146.94	163.44	-89.54	110.52	8,533.86	17,575.32	17,380.68	194.64	90.297		
16,000.00	6,981.87	7,125.26	7,122.87	148.50	163.44	-89.54	110.52	8,533.86	17,674.89	17,480.20	194.69	90.786		
16,100.00	6,981.79	7,125.19	7,122.79	150.06	163.44	-89.54	110.52	8,533.86	17,774.46	17,579.73	194.74	91.275		
16,200.00	6,981.72	7,125.11	7,122.72	151.62	163.43	-89.54	110.52	8,533.86	17,874.04	17,679.26	194.79	91.762		
16,300.00	6,981.64	7,125.04	7,122.64	153.18	163.43	-89.53	110.52	8,533.86	17,973.63	17,778.79	194.84	92.249		
16,400.00	6,981.57	7,124.96	7,122.57	154.74	163.43	-89.53	110.52	8,533.86	18,073.21	17,878.32	194.89	92.735		
16,500.00	6,981.49	7,124.89	7,122.49	156.31	163.43	-89.53	110.52	8,533.86	18,172.80	17,977.86	194.94	93.221		
16,600.00	6,981.42	7,124.82	7,122.42	157.87	163.42	-89.52	110.52	8,533.86	18,272.40	18,077.40	195.00	93.706		
16,700.00	6,981.35	7,124.74	7,122.35	159.44	163.42	-89.52	110.52	8,533.86	18,372.00	18,176.95	195.05	94.190		
16,800.00	6,981.27	7,124.67	7,122.27	161.01	163.42	-89.52	110.52	8,533.86	18,471.61	18,276.50	195.11	94.673		
16,900.00	6,981.20	7,124.59	7,122.20	162.58	163.42	-89.52	110.52	8,533.86	18,571.22	18,376.05	195.17	95.156		
17,000.00	6,981.12	7,124.52	7,122.12	164.14	163.41	-89.51	110.52	8,533.86	18,670.83	18,475.61	195.22	95.638		
17,100.00	6,981.05	7,124.44	7,122.05	165.71	163.41	-89.51	110.52	8,533.86	18,770.45	18,575.16	195.28	96.119		
17,200.00	6,980.97	7,124.37	7,121.97	167.28	163.41	-89.51	110.52	8,533.86	18,870.07	18,674.73	195.34	96.599		
17,300.00	6,980.90	7,124.29	7,121.90	168.85	163.41	-89.51	110.52	8,533.86	18,969.70	18,774.29	195.40	97.079		
17,400.00	6,980.82	7,124.22	7,121.82	170.42	163.40	-89.50	110.52	8,533.86	19,069.32	18,873.86	195.47	97.558		
17,500.00	6,980.75	7,124.14	7,121.75	172.00	163.40	-89.50	110.52	8,533.86	19,168.96	18,973.43	195.53	98.036		
17,600.00	6,980.67	7,124.07	7,121.67	173.57	163.40	-89.50	110.52	8,533.86	19,268.60	19,073.00	195.59	98.514		
17,700.00	6,980.60	7,124.00	7,121.60	175.14	163.39	-89.50	110.52	8,533.86	19,368.24	19,172.58	195.66	98.991		
17,800.00	6,980.53	7,123.92	7,121.53	176.71	163.39	-89.49	110.52	8,533.86	19,467.88	19,272.16	195.72	99.467		
17,900.00	6,980.45	7,123.85	7,121.45	178.29	163.39	-89.49	110.52	8,533.86	19,567.53	19,371.74	195.79	99.942		
18,000.00	6,980.38	7,123.77	7,121.38	179.86	163.39	-89.49	110.52	8,533.86	19,667.18	19,471.33	195.86	100.417		
18,100.00	6,980.30	7,123.70	7,121.30	181.44	163.38	-89.49	110.52	8,533.86	19,766.84	19,570.91	195.92	100.891		
18,200.00	6,980.23	7,123.62	7,121.23	183.01	163.38	-89.48	110.52	8,533.86	19,866.50	19,670.50	195.99	101.364		
18,300.00	6,980.15	7,123.55	7,121.15	184.59	163.38	-89.48	110.52	8,533.86	19,966.16	19,770.10	196.06	101.837		
18,400.00	6,980.08	7,123.47	7,121.08	186.16	163.38	-89.48	110.52	8,533.86	20,065.82	19,869.69	196.13	102.308		
18,500.00	6,980.00	7,123.40	7,121.00	187.74	163.37	-89.48	110.52	8,533.86	20,165.49	19,969.29	196.20	102.780		
18,600.00	6,979.93	7,123.32	7,120.93	189.32	163.37	-89.47	110.52	8,533.86	20,265.16	20,068.89	196.27	103.250		
18,700.00	6,979.85	7,123.25	7,120.85	190.90	163.37	-89.47	110.52	8,533.86	20,364.84	20,168.49	196.35	103.720		
18,800.00	6,979.78	7,123.18	7,120.78	192.48	163.37	-89.47	110.52	8,533.86	20,464.52	20,268.10	196.42	104.188		
18,900.00	6,979.71	7,123.10	7,120.71	194.05	163.36	-89.46	110.52	8,533.86	20,564.20	20,367.71	196.49	104.657		
19,000.00	6,979.63	7,123.03	7,120.63	195.63	163.36	-89.46	110.52	8,533.86	20,663.88	20,467.32	196.57	105.124		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Carson #1 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 434-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,100.00	6,979.56	7,122.95	7,120.56	197.21	163.36	-89.46	110.52	8,533.86	20,763.57	20,566.93	196.64	105.591	
19,200.00	6,979.48	7,122.88	7,120.48	198.79	163.36	-89.46	110.52	8,533.86	20,863.26	20,666.55	196.72	106.057	
19,300.00	6,979.41	7,122.80	7,120.41	200.37	163.35	-89.45	110.52	8,533.86	20,962.96	20,766.16	196.79	106.522	
19,400.00	6,979.33	7,122.73	7,120.33	201.95	163.35	-89.45	110.52	8,533.86	21,062.65	20,865.78	196.87	106.987	
19,500.00	6,979.26	7,122.65	7,120.26	203.54	163.35	-89.45	110.52	8,533.86	21,162.35	20,965.40	196.95	107.451	
19,600.00	6,979.18	7,122.58	7,120.18	205.12	163.35	-89.45	110.52	8,533.86	21,262.06	21,065.03	197.03	107.914	
19,700.00	6,979.11	7,122.50	7,120.11	206.70	163.34	-89.44	110.52	8,533.86	21,361.76	21,164.65	197.11	108.376	
19,800.00	6,979.03	7,122.43	7,120.03	208.28	163.34	-89.44	110.52	8,533.86	21,461.47	21,264.28	197.19	108.838	
19,900.00	6,978.96	7,122.36	7,119.96	209.86	163.34	-89.44	110.52	8,533.86	21,561.18	21,363.91	197.27	109.299	
20,000.00	6,978.89	7,122.28	7,119.89	211.45	163.34	-89.44	110.52	8,533.86	21,660.89	21,463.54	197.35	109.759	
20,100.00	6,978.81	7,122.21	7,119.81	213.03	163.33	-89.43	110.52	8,533.86	21,760.61	21,563.18	197.43	110.218	
20,200.00	6,978.74	7,122.13	7,119.74	214.61	163.33	-89.43	110.52	8,533.86	21,860.33	21,662.81	197.51	110.677	
20,300.00	6,978.66	7,122.06	7,119.66	216.20	163.33	-89.43	110.52	8,533.86	21,960.05	21,762.45	197.60	111.135	
20,400.00	6,978.59	7,121.98	7,119.59	217.78	163.33	-89.43	110.52	8,533.86	22,059.77	21,862.09	197.68	111.593	
20,500.00	6,978.51	7,121.91	7,119.51	219.37	163.32	-89.42	110.52	8,533.86	22,159.50	21,961.73	197.77	112.049	
20,600.00	6,978.44	7,121.83	7,119.44	220.95	163.32	-89.42	110.52	8,533.86	22,259.23	22,061.37	197.85	112.505	
20,700.00	6,978.36	7,121.76	7,119.36	222.53	163.32	-89.42	110.52	8,533.86	22,358.96	22,161.02	197.94	112.960	
20,800.00	6,978.29	7,121.68	7,119.29	224.12	163.32	-89.42	110.52	8,533.86	22,458.69	22,260.67	198.02	113.415	
20,900.00	6,978.21	7,121.61	7,119.21	225.71	163.31	-89.41	110.52	8,533.86	22,558.43	22,360.32	198.11	113.869	
21,000.00	6,978.14	7,121.54	7,119.14	227.29	163.31	-89.41	110.52	8,533.86	22,658.16	22,459.97	198.20	114.322	
21,100.00	6,978.07	7,121.46	7,119.07	228.88	163.31	-89.41	110.52	8,533.86	22,757.90	22,559.62	198.28	114.774	
21,200.00	6,977.99	7,121.39	7,118.99	230.46	163.31	-89.40	110.52	8,533.86	22,857.65	22,659.27	198.37	115.226	
21,300.00	6,977.92	7,121.31	7,118.92	232.05	163.30	-89.40	110.52	8,533.86	22,957.39	22,758.93	198.46	115.677	
21,400.00	6,977.84	7,121.24	7,118.84	233.64	163.30	-89.40	110.52	8,533.86	23,057.14	22,858.59	198.55	116.127	
21,500.00	6,977.77	7,121.16	7,118.77	235.22	163.30	-89.40	110.52	8,533.86	23,156.89	22,958.25	198.64	116.577	
21,600.00	6,977.69	7,121.09	7,118.69	236.81	163.30	-89.39	110.52	8,533.86	23,256.64	23,057.91	198.73	117.025	
21,700.00	6,977.62	7,121.01	7,118.62	238.40	163.29	-89.39	110.52	8,533.86	23,356.39	23,157.57	198.82	117.473	
21,800.00	6,977.54	7,120.94	7,118.54	239.99	163.29	-89.39	110.52	8,533.86	23,456.15	23,257.23	198.91	117.921	
21,900.00	6,977.47	7,120.86	7,118.47	241.57	163.29	-89.39	110.52	8,533.86	23,555.91	23,356.90	199.01	118.368	
22,000.00	6,977.39	7,120.79	7,118.39	243.16	163.29	-89.38	110.52	8,533.86	23,655.66	23,456.57	199.10	118.814	
22,100.00	6,977.32	7,120.72	7,118.32	244.75	163.28	-89.38	110.52	8,533.86	23,755.43	23,556.23	199.19	119.259	
22,200.00	6,977.25	7,120.64	7,118.25	246.34	163.28	-89.38	110.52	8,533.86	23,855.19	23,655.90	199.29	119.703	
22,300.00	6,977.17	7,120.57	7,118.17	247.93	163.28	-89.38	110.52	8,533.86	23,954.96	23,755.58	199.38	120.147	
22,400.00	6,977.10	7,120.49	7,118.10	249.52	163.28	-89.37	110.52	8,533.86	24,054.72	23,855.25	199.47	120.590	
22,500.00	6,977.02	7,120.42	7,118.02	251.11	163.27	-89.37	110.52	8,533.86	24,154.49	23,954.92	199.57	121.033	
22,529.62	6,977.00	7,120.39	7,118.00	251.58	163.27	-89.37	110.52	8,533.86	24,184.04	23,984.44	199.60	121.164	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 323-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	2,509.96	2,361.47	0.00	14.86	-71.47	1,294.79	-3,862.93	4,689.63				
100.00	100.00	2,559.02	2,404.10	0.25	15.32	-71.42	1,290.57	-3,839.03	4,640.52	4,624.36	16.16	287.161	
200.00	200.00	2,661.58	2,493.36	0.61	16.28	-71.32	1,280.99	-3,789.44	4,591.61	4,574.80	16.81	273.192	
300.00	300.00	2,802.55	2,615.42	0.97	17.59	-71.19	1,267.26	-3,720.24	4,541.83	4,524.13	17.71	256.501	
400.00	400.00	2,947.61	2,740.15	1.33	19.01	-71.07	1,251.07	-3,647.99	4,490.91	4,472.24	18.68	240.445	
500.00	500.00	3,157.43	2,918.49	1.68	21.14	-70.89	1,226.82	-3,540.20	4,438.48	4,418.44	20.04	221.496	
550.00	550.00	3,211.11	2,963.64	1.86	21.70	-70.82	1,221.23	-3,511.70	4,411.62	4,391.15	20.47	215.556	
600.00	600.00	3,249.82	2,996.19	2.04	22.11	-69.00	1,217.07	-3,491.17	4,384.60	4,363.78	20.82	210.626	
700.00	699.93	3,327.47	3,061.53	2.40	22.92	-70.19	1,208.25	-3,450.16	4,329.83	4,308.29	21.53	201.074	
800.00	799.68	3,389.00	3,113.39	2.77	23.56	-71.46	1,201.19	-3,417.80	4,274.27	4,252.09	22.18	192.696	
900.00	899.13	3,464.44	3,177.13	3.13	24.35	-72.83	1,192.12	-3,378.49	4,218.06	4,195.15	22.91	184.154	
1,000.00	998.15	3,483.00	3,192.85	3.49	24.54	-74.17	1,189.76	-3,368.90	4,161.67	4,138.31	23.36	178.154	
1,100.00	1,096.63	3,539.07	3,240.65	3.87	25.10	-75.62	1,182.64	-3,340.47	4,105.14	4,081.12	24.03	170.868	
1,130.50	1,126.54	3,574.00	3,270.73	3.99	25.45	-76.13	1,178.29	-3,323.25	4,088.20	4,063.88	24.32	168.079	
1,200.00	1,194.61	3,574.00	3,270.73	4.26	25.45	-76.13	1,178.29	-3,323.25	4,049.25	4,024.65	24.59	164.653	
1,300.00	1,292.57	3,574.00	3,270.73	4.66	25.45	-76.13	1,178.29	-3,323.25	3,994.66	3,969.67	24.99	159.847	
1,400.00	1,390.52	3,632.66	3,321.79	5.07	25.99	-76.32	1,171.23	-3,295.26	3,940.67	3,914.92	25.75	153.052	
1,500.00	1,488.48	3,667.00	3,352.02	5.48	26.31	-76.44	1,167.28	-3,279.45	3,888.13	3,861.76	26.37	147.448	
1,600.00	1,586.43	3,667.00	3,352.02	5.90	26.31	-76.44	1,167.28	-3,279.45	3,837.06	3,810.26	26.80	143.197	
1,700.00	1,684.38	3,716.20	3,395.82	6.31	26.72	-76.60	1,162.01	-3,257.69	3,786.91	3,759.35	27.55	137.441	
1,800.00	1,782.34	3,760.00	3,435.35	6.73	27.09	-76.75	1,157.85	-3,239.28	3,738.51	3,710.23	28.28	132.194	
1,900.00	1,880.29	3,760.00	3,435.35	7.15	27.09	-76.75	1,157.85	-3,239.28	3,691.35	3,662.63	28.72	128.523	
2,000.00	1,978.25	3,818.52	3,488.67	7.58	27.53	-76.94	1,152.76	-3,215.71	3,645.37	3,615.85	29.51	123.519	
2,100.00	2,076.20	3,853.00	3,520.27	8.00	27.79	-77.05	1,149.90	-3,202.22	3,600.62	3,570.45	30.16	119.367	
2,200.00	2,174.15	3,891.54	3,555.81	8.43	28.06	-77.18	1,146.70	-3,187.67	3,557.21	3,526.38	30.82	115.403	
2,300.00	2,272.11	3,944.00	3,604.64	8.85	28.42	-77.37	1,142.18	-3,169.03	3,515.46	3,483.89	31.56	111.374	
2,400.00	2,370.06	3,944.00	3,604.64	9.28	28.42	-77.37	1,142.18	-3,169.03	3,475.00	3,442.99	32.01	108.563	
2,500.00	2,468.02	3,981.01	3,639.42	9.71	28.63	-77.51	1,138.98	-3,156.80	3,436.31	3,403.59	32.71	105.047	
2,600.00	2,565.97	4,038.00	3,693.58	10.14	28.96	-77.73	1,134.27	-3,139.71	3,399.89	3,366.33	33.56	101.311	
2,700.00	2,663.92	4,038.00	3,693.58	10.57	28.96	-77.73	1,134.27	-3,139.71	3,364.43	3,330.44	33.99	98.983	
2,800.00	2,761.88	4,038.00	3,693.58	11.00	28.96	-77.73	1,134.27	-3,139.71	3,331.59	3,297.18	34.41	96.829	
2,900.00	2,859.83	4,084.86	3,738.66	11.43	29.18	-77.91	1,131.00	-3,127.32	3,300.21	3,264.98	35.23	93.680	
3,000.00	2,957.79	4,130.00	3,782.51	11.86	29.38	-78.08	1,128.75	-3,116.90	3,271.39	3,235.35	36.03	90.791	
3,100.00	3,055.74	4,130.00	3,782.51	12.29	29.38	-78.08	1,128.75	-3,116.90	3,244.22	3,207.80	36.42	89.084	
3,200.00	3,153.69	4,130.00	3,782.51	12.72	29.38	-78.08	1,128.75	-3,116.90	3,219.92	3,183.14	36.78	87.543	
3,300.00	3,251.65	4,222.00	3,872.94	13.15	29.69	-78.40	1,125.99	-3,100.29	3,197.17	3,159.17	38.00	84.134	
3,400.00	3,349.60	4,222.00	3,872.94	13.59	29.69	-78.40	1,125.99	-3,100.29	3,176.05	3,137.71	38.34	82.833	
3,500.00	3,447.56	4,251.49	3,902.14	14.02	29.75	-78.51	1,125.41	-3,096.21	3,157.58	3,118.71	38.86	81.245	
3,600.00	3,545.51	4,295.00	3,945.34	14.45	29.85	-78.66	1,124.62	-3,091.05	3,141.14	3,101.66	39.47	79.574	
3,700.00	3,643.46	4,295.00	3,945.34	14.88	29.85	-78.66	1,124.62	-3,091.05	3,126.98	3,087.23	39.75	78.662	
3,800.00	3,741.42	4,401.38	4,051.21	15.32	30.15	-79.06	1,122.60	-3,080.88	3,113.03	3,072.00	41.03	75.874	
3,900.00	3,839.37	4,461.44	4,111.06	15.75	30.32	-79.29	1,121.28	-3,076.17	3,100.93	3,059.07	41.86	74.079	
4,000.00	3,937.33	4,521.56	4,171.04	16.18	30.50	-79.52	1,119.83	-3,072.20	3,090.13	3,047.44	42.68	72.394	
4,100.00	4,035.28	4,581.72	4,231.09	16.62	30.68	-79.77	1,118.25	-3,068.97	3,080.64	3,037.13	43.50	70.814	
4,200.00	4,133.23	4,696.00	4,345.25	17.05	31.03	-80.24	1,114.90	-3,064.92	3,073.24	3,028.40	44.83	68.546	
4,300.00	4,231.19	4,696.00	4,345.25	17.48	31.03	-80.24	1,114.90	-3,064.92	3,065.64	3,020.58	45.06	68.038	
4,400.00	4,329.14	4,792.23	4,441.41	17.92	31.63	-80.64	1,112.11	-3,062.79	3,059.61	3,013.44	46.17	66.275	
4,500.00	4,427.10	4,879.80	4,528.94	18.35	32.17	-81.01	1,109.97	-3,061.10	3,054.06	3,006.87	47.19	64.714	
4,600.00	4,525.05	4,967.56	4,616.67	18.78	32.71	-81.36	1,108.21	-3,059.64	3,048.99	3,000.76	48.22	63.226	
4,700.00	4,623.00	5,055.50	4,704.59	19.22	33.26	-81.71	1,106.83	-3,058.41	3,044.37	2,995.12	49.26	61.806	
4,800.00	4,720.96	5,143.62	4,792.70	19.65	33.80	-82.06	1,105.83	-3,057.42	3,040.21	2,989.92	50.29	60.450	
4,900.00	4,818.91	5,231.92	4,880.99	20.09	34.35	-82.40	1,105.21	-3,056.67	3,036.50	2,985.17	51.33	59.154	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY											Offset Site Error: 0.00 usft			
Survey Program: Reference		323-MWD OWSG Rev5 Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,916.87	5,320.39	4,969.46	20.52	34.90	-82.74	1,104.98	-3,056.15	3,033.23	2,980.86	52.37	57.916		
5,100.00	5,014.82	5,409.02	5,058.09	20.96	35.45	-83.07	1,105.13	-3,055.88	3,030.40	2,976.98	53.42	56.732		
5,200.00	5,112.77	5,497.81	5,146.88	21.39	36.00	-83.40	1,105.68	-3,055.84	3,027.99	2,973.53	54.46	55.600		
5,300.00	5,210.73	5,586.76	5,235.83	21.82	36.55	-83.72	1,106.62	-3,056.05	3,026.00	2,970.49	55.51	54.516		
5,400.00	5,308.68	5,677.51	5,326.56	22.26	37.11	-84.04	1,107.97	-3,056.51	3,024.42	2,967.86	56.56	53.473		
5,493.23	5,400.00	5,769.18	5,418.22	22.66	37.70	-84.36	1,109.26	-3,057.07	3,023.15	2,965.59	57.56	52.521		
5,500.00	5,406.64	5,775.84	5,424.88	22.69	37.75	-84.39	1,109.35	-3,057.11	3,023.06	2,965.42	57.63	52.453		
5,600.00	5,504.69	5,874.13	5,523.16	23.12	38.38	-84.73	1,110.37	-3,057.73	3,021.85	2,963.15	58.70	51.476		
5,700.00	5,602.91	5,972.45	5,621.48	23.55	39.01	-85.06	1,111.05	-3,058.36	3,020.84	2,961.07	59.77	50.542		
5,800.00	5,701.29	6,070.79	5,719.82	23.97	39.64	-85.38	1,111.37	-3,059.01	3,020.01	2,959.18	60.83	49.649		
5,900.00	5,799.82	6,169.17	5,818.19	24.39	40.27	-85.70	1,111.35	-3,059.68	3,019.35	2,957.47	61.88	48.794		
6,000.00	5,898.50	6,267.57	5,916.59	24.79	40.90	-86.00	1,110.98	-3,060.37	3,018.86	2,955.93	62.93	47.974		
6,100.00	5,997.31	6,366.00	6,015.01	25.20	41.53	-86.30	1,110.26	-3,061.08	3,018.52	2,954.56	63.97	47.188		
6,200.00	6,096.26	6,464.45	6,113.46	25.60	42.16	-86.59	1,109.18	-3,061.80	3,018.34	2,953.34	65.00	46.434		
6,300.00	6,195.33	6,563.67	6,212.67	25.99	42.86	-86.87	1,107.75	-3,062.55	3,018.29	2,952.19	66.10	45.659		
6,400.00	6,294.51	6,667.15	6,316.13	26.37	43.92	-87.15	1,106.16	-3,063.23	3,018.27	2,950.67	67.60	44.646		
6,498.19	6,392.00	6,768.88	6,417.85	26.75	44.97	-87.41	1,104.65	-3,063.76	3,018.22	2,949.14	69.07	43.697		
6,500.00	6,393.80	6,770.76	6,419.73	26.76	44.99	-86.21	1,104.62	-3,063.77	3,018.21	2,949.11	69.10	43.679		
6,550.00	6,443.29	6,822.41	6,471.37	26.95	45.52	-63.68	1,103.88	-3,063.97	3,016.30	2,946.46	69.85	43.183		
6,600.00	6,492.24	6,873.47	6,522.42	27.16	46.05	-53.31	1,103.15	-3,064.14	3,010.94	2,940.34	70.60	42.645		
6,650.00	6,540.33	6,923.62	6,572.57	27.38	46.57	-48.07	1,102.45	-3,064.27	3,002.17	2,930.81	71.36	42.071		
6,700.00	6,587.28	6,972.55	6,621.50	27.60	47.07	-45.30	1,101.78	-3,064.35	2,990.06	2,917.95	72.11	41.466		
6,750.00	6,632.80	7,019.95	6,668.89	27.84	47.57	-43.94	1,101.15	-3,064.41	2,974.73	2,901.88	72.85	40.834		
6,800.00	6,676.60	7,065.79	6,714.73	28.09	48.00	-43.53	1,100.55	-3,064.43	2,956.28	2,882.74	73.54	40.200		
6,850.00	6,718.42	7,111.80	6,760.74	28.34	48.07	-43.85	1,100.01	-3,064.40	2,934.85	2,860.96	73.88	39.723		
6,900.00	6,758.00	7,155.33	6,804.26	28.60	48.14	-44.76	1,099.59	-3,064.31	2,910.57	2,836.35	74.23	39.212		
6,950.00	6,795.09	7,196.10	6,845.03	28.87	48.20	-46.22	1,099.29	-3,064.17	2,883.65	2,809.08	74.57	38.671		
7,000.00	6,829.46	7,233.85	6,882.77	29.14	48.26	-48.21	1,099.08	-3,063.99	2,854.29	2,779.38	74.91	38.103		
7,050.00	6,860.91	7,268.34	6,917.27	29.43	48.31	-50.75	1,098.95	-3,063.79	2,822.70	2,747.45	75.25	37.512		
7,100.00	6,889.24	7,299.36	6,948.29	29.73	48.36	-53.84	1,098.88	-3,063.58	2,789.13	2,713.54	75.58	36.901		
7,150.00	6,914.27	7,326.72	6,975.65	30.05	48.40	-57.51	1,098.86	-3,063.37	2,753.81	2,677.90	75.92	36.274		
7,200.00	6,935.85	7,350.25	6,999.17	30.37	48.44	-61.76	1,098.88	-3,063.17	2,717.01	2,640.77	76.25	35.634		
7,250.00	6,953.84	7,369.79	7,018.71	30.71	48.47	-66.58	1,098.91	-3,062.99	2,679.00	2,602.42	76.58	34.985		
7,300.00	6,968.15	7,385.23	7,034.15	31.06	48.49	-71.92	1,098.95	-3,062.84	2,640.03	2,563.12	76.90	34.330		
7,350.00	6,978.67	7,396.47	7,045.39	31.42	48.51	-77.67	1,098.98	-3,062.72	2,600.37	2,523.15	77.23	33.672		
7,400.00	6,985.34	7,403.45	7,052.37	31.79	48.52	-83.68	1,099.01	-3,062.65	2,560.31	2,482.76	77.55	33.015		
7,450.00	6,988.13	7,406.12	7,055.04	32.17	48.52	-89.77	1,099.02	-3,062.62	2,520.09	2,442.22	77.87	32.363		
7,461.13	6,988.22	7,406.12	7,055.04	32.26	48.52	-91.12	1,099.02	-3,062.62	2,511.14	2,433.20	77.94	32.218		
7,500.00	6,988.19	7,405.77	7,054.69	32.56	48.52	-91.13	1,099.01	-3,062.63	2,479.86	2,401.67	78.19	31.715		
7,600.00	6,988.12	7,404.83	7,053.75	33.37	48.52	-91.15	1,099.01	-3,062.64	2,398.94	2,320.08	78.86	30.420		
7,700.00	6,988.05	7,403.86	7,052.79	34.21	48.52	-91.17	1,099.01	-3,062.65	2,317.40	2,237.83	79.56	29.126		
7,800.00	6,987.98	7,402.87	7,051.79	35.09	48.52	-91.18	1,099.00	-3,062.66	2,235.28	2,154.98	80.30	27.836		
7,900.00	6,987.91	7,401.85	7,050.77	35.99	48.52	-91.20	1,099.00	-3,062.67	2,152.61	2,071.54	81.07	26.552		
8,000.00	6,987.83	7,400.80	7,049.73	36.93	48.51	-91.21	1,099.00	-3,062.68	2,069.45	1,987.57	81.88	25.275		
8,100.00	6,987.76	7,399.74	7,048.66	37.88	48.51	-91.22	1,098.99	-3,062.69	1,985.83	1,903.12	82.72	24.008		
8,200.00	6,987.68	7,398.65	7,047.57	38.86	48.51	-91.23	1,098.99	-3,062.70	1,901.81	1,818.22	83.59	22.751		
8,300.00	6,987.61	7,397.54	7,046.46	39.86	48.51	-91.24	1,098.98	-3,062.71	1,817.44	1,732.93	84.51	21.507		
8,400.00	6,987.53	7,396.42	7,045.34	40.87	48.51	-91.24	1,098.98	-3,062.72	1,732.77	1,647.31	85.46	20.276		
8,500.00	6,987.46	7,395.28	7,044.20	41.90	48.51	-91.24	1,098.98	-3,062.74	1,647.87	1,561.42	86.45	19.061		
8,600.00	6,987.38	7,394.13	7,043.06	42.93	48.50	-91.23	1,098.97	-3,062.75	1,562.82	1,475.33	87.49	17.863		
8,700.00	6,987.31	7,392.97	7,041.90	43.98	48.50	-91.22	1,098.97	-3,062.76	1,477.70	1,389.12	88.58	16.683		
8,800.00	6,987.23	7,391.81	7,040.73	45.03	48.50	-91.20	1,098.97	-3,062.77	1,392.61	1,302.90	89.71	15.523		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		323-MWD OWSG Rev5						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
8,872.16	6,987.18	7,390.96	7,039.89	45.79	48.50	-91.18	1,098.96	-3,062.78	1,331.30	1,240.73	90.57	14.699		
8,900.00	6,987.16	7,390.64	7,039.56	46.08	48.50	-91.16	1,098.96	-3,062.78	1,307.75	1,216.84	90.91	14.385		
9,000.00	6,987.09	7,389.47	7,038.40	47.16	48.50	-91.06	1,098.96	-3,062.80	1,224.65	1,132.43	92.22	13.280		
9,100.00	6,987.01	7,388.31	7,037.24	48.27	48.50	-90.97	1,098.96	-3,062.81	1,144.25	1,050.58	93.67	12.216		
9,200.00	6,986.94	7,387.16	7,036.09	49.40	48.49	-90.88	1,098.95	-3,062.82	1,067.17	971.91	95.25	11.203		
9,300.00	6,986.86	7,386.02	7,034.95	50.56	48.49	-90.78	1,098.95	-3,062.83	994.18	897.21	96.96	10.253		
9,400.00	6,986.79	7,384.89	7,033.81	51.75	48.49	-90.69	1,098.95	-3,062.84	926.24	827.49	98.76	9.379		
9,500.00	6,986.71	7,383.76	7,032.68	52.95	48.49	-90.60	1,098.94	-3,062.85	864.56	764.00	100.56	8.597		
9,600.00	6,986.64	7,382.64	7,031.56	54.18	48.49	-90.51	1,098.94	-3,062.86	810.55	708.31	102.25	7.928		
9,700.00	6,986.56	7,381.53	7,030.45	55.42	48.49	-90.42	1,098.94	-3,062.87	765.85	662.23	103.62	7.391		
9,800.00	6,986.49	7,380.42	7,029.34	56.69	48.48	-90.33	1,098.93	-3,062.89	732.16	627.69	104.46	7.009		
9,900.00	6,986.41	7,379.32	7,028.25	57.97	48.48	-90.24	1,098.93	-3,062.90	711.04	606.51	104.53	6.802		
10,000.00	6,986.34	7,378.23	7,027.15	59.26	48.48	-90.15	1,098.93	-3,062.91	703.64	599.97	103.67	6.787 ES, SF		
10,004.45	6,986.34	7,378.18	7,027.11	59.32	48.48	-90.14	1,098.93	-3,062.91	703.64	600.03	103.61	6.791 CC		
10,100.00	6,986.27	7,377.15	7,026.07	60.57	48.48	-90.06	1,098.92	-3,062.92	710.37	608.48	101.89	6.972		
10,200.00	6,986.19	7,376.07	7,024.99	61.90	48.48	-89.97	1,098.92	-3,062.93	730.85	631.47	99.38	7.354		
10,300.00	6,986.12	7,375.00	7,023.92	63.23	48.48	-89.88	1,098.92	-3,062.94	763.98	667.55	96.43	7.922		
10,400.00	6,986.04	7,373.93	7,022.86	64.58	48.47	-89.80	1,098.92	-3,062.95	808.19	714.85	93.34	8.658		
10,500.00	6,985.97	7,372.88	7,021.80	65.94	48.47	-89.71	1,098.91	-3,062.96	861.79	771.44	90.36	9.538		
10,600.00	6,985.89	7,371.83	7,020.75	67.32	48.47	-89.63	1,098.91	-3,062.97	923.15	835.52	87.63	10.535		
10,700.00	6,985.82	7,370.78	7,019.71	68.70	48.47	-89.54	1,098.91	-3,062.98	990.81	905.58	85.23	11.625		
10,800.00	6,985.74	7,369.74	7,018.67	70.09	48.47	-89.46	1,098.91	-3,062.99	1,063.59	980.41	83.17	12.788		
10,900.00	6,985.67	7,368.71	7,017.64	71.49	48.47	-89.37	1,098.91	-3,063.00	1,140.49	1,059.05	81.44	14.003		
11,000.00	6,985.59	7,367.69	7,016.62	72.90	48.46	-89.29	1,098.90	-3,063.01	1,220.75	1,140.74	80.01	15.258		
11,100.00	6,985.52	7,366.67	7,015.60	74.31	48.46	-89.21	1,098.90	-3,063.02	1,303.73	1,224.90	78.83	16.539		
11,200.00	6,985.45	7,365.66	7,014.59	75.74	48.46	-89.12	1,098.90	-3,063.03	1,388.96	1,311.10	77.86	17.838		
11,300.00	6,985.37	7,364.65	7,013.58	77.17	48.46	-89.04	1,098.90	-3,063.04	1,476.05	1,398.97	77.08	19.150		
11,400.00	6,985.30	7,363.66	7,012.58	78.61	48.46	-88.96	1,098.90	-3,063.05	1,564.68	1,488.23	76.44	20.468		
11,500.00	6,985.22	7,362.66	7,011.59	80.05	48.46	-88.88	1,098.89	-3,063.06	1,654.60	1,578.67	75.93	21.791		
11,600.00	6,985.15	7,361.68	7,010.60	81.50	48.45	-88.80	1,098.89	-3,063.06	1,745.62	1,670.10	75.52	23.115		
11,700.00	6,985.07	7,360.69	7,009.62	82.96	48.45	-88.72	1,098.89	-3,063.07	1,837.57	1,762.39	75.19	24.439		
11,800.00	6,985.00	7,359.72	7,008.65	84.42	48.45	-88.64	1,098.89	-3,063.08	1,930.33	1,855.40	74.93	25.763		
11,900.00	6,984.92	7,358.75	7,007.68	85.89	48.45	-88.56	1,098.89	-3,063.09	2,023.77	1,949.05	74.72	27.084		
12,000.00	6,984.85	7,357.79	7,006.71	87.36	48.45	-88.48	1,098.89	-3,063.10	2,117.81	2,043.25	74.56	28.403		
12,100.00	6,984.77	7,356.83	7,005.76	88.83	48.45	-88.41	1,098.89	-3,063.11	2,212.38	2,137.94	74.44	29.720		
12,200.00	6,984.70	7,355.88	7,004.81	90.31	48.45	-88.33	1,098.88	-3,063.12	2,307.40	2,233.05	74.35	31.034		
12,300.00	6,984.63	7,354.93	7,003.86	91.80	48.44	-88.25	1,098.88	-3,063.13	2,402.82	2,328.54	74.29	32.345		
12,400.00	6,984.55	7,353.99	7,002.92	93.29	48.44	-88.18	1,098.88	-3,063.13	2,498.61	2,424.36	74.25	33.653		
12,500.00	6,984.48	7,353.06	7,001.99	94.78	48.44	-88.10	1,098.88	-3,063.14	2,594.71	2,520.49	74.22	34.959		
12,600.00	6,984.40	7,352.13	7,001.06	96.28	48.44	-88.02	1,098.88	-3,063.15	2,691.09	2,616.88	74.21	36.261		
12,700.00	6,984.33	7,351.21	7,000.13	97.78	48.44	-87.95	1,098.88	-3,063.16	2,787.73	2,713.51	74.22	37.561		
12,800.00	6,984.25	7,350.29	6,999.21	99.28	48.44	-87.87	1,098.88	-3,063.17	2,884.60	2,810.37	74.23	38.858		
12,900.00	6,984.18	7,349.38	6,998.30	100.78	48.44	-87.80	1,098.88	-3,063.18	2,981.67	2,907.42	74.26	40.152		
13,000.00	6,984.10	7,348.47	6,997.40	102.29	48.43	-87.73	1,098.87	-3,063.18	3,078.94	3,004.64	74.29	41.443		
13,100.00	6,984.03	7,347.57	6,996.49	103.80	48.43	-87.65	1,098.87	-3,063.19	3,176.37	3,102.04	74.33	42.732		
13,200.00	6,983.95	7,346.67	6,995.60	105.32	48.43	-87.58	1,098.87	-3,063.20	3,273.95	3,199.58	74.38	44.018		
13,300.00	6,983.88	7,345.78	6,994.71	106.84	48.43	-87.51	1,098.87	-3,063.21	3,371.68	3,297.25	74.43	45.301		
13,400.00	6,983.81	7,344.89	6,993.82	108.36	48.43	-87.44	1,098.87	-3,063.22	3,469.54	3,395.06	74.48	46.582		
13,500.00	6,983.73	7,344.01	6,992.94	109.88	48.43	-87.36	1,098.87	-3,063.22	3,567.51	3,492.97	74.54	47.860		
13,600.00	6,983.66	7,343.14	6,992.06	111.40	48.43	-87.29	1,098.87	-3,063.23	3,665.60	3,590.99	74.60	49.136		
13,700.00	6,983.58	7,342.27	6,991.19	112.93	48.42	-87.22	1,098.87	-3,063.24	3,763.78	3,689.12	74.67	50.409		
13,800.00	6,983.51	7,341.40	6,990.33	114.46	48.42	-87.15	1,098.87	-3,063.25	3,862.06	3,787.33	74.73	51.679		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		323-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
13,900.00	6,983.43	7,340.54	6,989.46	115.99	48.42	-87.08	1,098.87	-3,063.25	3,960.42	3,885.62	74.80	52.947	
14,000.00	6,983.36	7,339.68	6,988.61	117.52	48.42	-87.01	1,098.87	-3,063.26	4,058.87	3,984.00	74.87	54.212	
14,100.00	6,983.28	7,338.83	6,987.76	119.06	48.42	-86.94	1,098.87	-3,063.27	4,157.38	4,082.44	74.94	55.474	
14,200.00	6,983.21	7,337.98	6,986.91	120.59	48.42	-86.87	1,098.87	-3,063.27	4,255.97	4,180.95	75.02	56.734	
14,300.00	6,983.13	7,337.14	6,986.07	122.13	48.42	-86.81	1,098.87	-3,063.28	4,354.62	4,279.53	75.09	57.992	
14,400.00	6,983.06	7,336.31	6,985.23	123.67	48.42	-86.74	1,098.87	-3,063.29	4,453.33	4,378.17	75.17	59.247	
14,500.00	6,982.99	7,335.47	6,984.40	125.21	48.41	-86.67	1,098.87	-3,063.30	4,552.10	4,476.86	75.24	60.499	
14,600.00	6,982.91	7,334.65	6,983.57	126.75	48.41	-86.60	1,098.87	-3,063.30	4,650.92	4,575.60	75.32	61.749	
14,700.00	6,982.84	7,333.82	6,982.75	128.30	48.41	-86.54	1,098.86	-3,063.31	4,749.79	4,674.39	75.40	62.996	
14,800.00	6,982.76	7,333.01	6,981.93	129.85	48.41	-86.47	1,098.86	-3,063.32	4,848.70	4,773.22	75.48	64.240	
14,900.00	6,982.69	7,332.19	6,981.12	131.39	48.41	-86.40	1,098.86	-3,063.32	4,947.66	4,872.10	75.56	65.482	
15,000.00	6,982.61	7,331.38	6,980.31	132.94	48.41	-86.34	1,098.86	-3,063.33	5,046.66	4,971.02	75.64	66.721	
15,100.00	6,982.54	7,330.58	6,979.51	134.49	48.41	-86.27	1,098.86	-3,063.34	5,145.70	5,069.98	75.72	67.957	
15,200.00	6,982.46	7,329.78	6,978.71	136.04	48.41	-86.21	1,098.86	-3,063.34	5,244.77	5,168.97	75.80	69.191	
15,300.00	6,982.39	7,328.98	6,977.91	137.60	48.40	-86.14	1,098.86	-3,063.35	5,343.88	5,268.00	75.88	70.422	
15,400.00	6,982.31	7,328.19	6,977.12	139.15	48.40	-86.08	1,098.86	-3,063.36	5,443.02	5,367.06	75.97	71.651	
15,500.00	6,982.24	7,327.40	6,976.33	140.70	48.40	-86.02	1,098.86	-3,063.36	5,542.19	5,466.15	76.05	72.877	
15,600.00	6,982.17	7,326.62	6,975.55	142.26	48.40	-85.95	1,098.86	-3,063.37	5,641.40	5,565.26	76.13	74.100	
15,700.00	6,982.09	7,325.84	6,974.77	143.82	48.40	-85.89	1,098.86	-3,063.38	5,740.62	5,664.41	76.22	75.320	
15,800.00	6,982.02	7,325.07	6,974.00	145.38	48.40	-85.83	1,098.86	-3,063.38	5,839.88	5,763.58	76.30	76.538	
15,900.00	6,981.94	7,324.30	6,973.23	146.94	48.40	-85.76	1,098.86	-3,063.39	5,939.16	5,862.77	76.39	77.752	
16,000.00	6,981.87	7,323.53	6,972.46	148.50	48.40	-85.70	1,098.86	-3,063.39	6,038.46	5,961.99	76.47	78.965	
16,100.00	6,981.79	7,322.77	6,971.70	150.06	48.39	-85.64	1,098.86	-3,063.40	6,137.79	6,061.23	76.56	80.174	
16,200.00	6,981.72	7,322.01	6,970.94	151.62	48.39	-85.58	1,098.86	-3,063.41	6,237.14	6,160.49	76.64	81.380	
16,300.00	6,981.64	7,321.26	6,970.19	153.18	48.39	-85.52	1,098.86	-3,063.41	6,336.50	6,259.77	76.73	82.584	
16,400.00	6,981.57	7,320.51	6,969.44	154.74	48.39	-85.46	1,098.87	-3,063.42	6,435.89	6,359.08	76.81	83.785	
16,500.00	6,981.49	7,319.77	6,968.69	156.31	48.39	-85.40	1,098.87	-3,063.42	6,535.30	6,458.39	76.90	84.983	
16,600.00	6,981.42	7,319.02	6,967.95	157.87	48.39	-85.34	1,098.87	-3,063.43	6,634.72	6,557.73	76.99	86.178	
16,700.00	6,981.35	7,318.29	6,967.21	159.44	48.39	-85.28	1,098.87	-3,063.44	6,734.16	6,657.08	77.08	87.371	
16,800.00	6,981.27	7,317.55	6,966.48	161.01	48.39	-85.22	1,098.87	-3,063.44	6,833.62	6,756.45	77.16	88.560	
16,900.00	6,981.20	7,316.82	6,965.75	162.58	48.39	-85.16	1,098.87	-3,063.45	6,933.09	6,855.84	77.25	89.747	
17,000.00	6,981.12	7,316.10	6,965.02	164.14	48.38	-85.10	1,098.87	-3,063.45	7,032.58	6,955.24	77.34	90.931	
17,100.00	6,981.05	7,315.37	6,964.30	165.71	48.38	-85.04	1,098.87	-3,063.46	7,132.08	7,054.65	77.43	92.112	
17,200.00	6,980.97	7,314.66	6,963.58	167.28	48.38	-84.98	1,098.87	-3,063.46	7,231.59	7,154.08	77.52	93.290	
17,300.00	6,980.90	7,313.94	6,962.87	168.85	48.38	-84.93	1,098.87	-3,063.47	7,331.12	7,253.51	77.61	94.465	
17,400.00	6,980.82	7,313.23	6,962.16	170.42	48.38	-84.87	1,098.87	-3,063.48	7,430.66	7,352.97	77.70	95.637	
17,500.00	6,980.75	7,312.52	6,961.45	172.00	48.38	-84.81	1,098.87	-3,063.48	7,530.21	7,452.43	77.79	96.806	
17,600.00	6,980.67	7,311.82	6,960.75	173.57	48.38	-84.76	1,098.87	-3,063.49	7,629.78	7,551.90	77.88	97.972	
17,700.00	6,980.60	7,311.12	6,960.05	175.14	48.38	-84.70	1,098.87	-3,063.49	7,729.36	7,651.39	77.97	99.136	
17,800.00	6,980.53	7,310.42	6,959.35	176.71	48.38	-84.64	1,098.87	-3,063.50	7,828.94	7,750.88	78.06	100.296	
17,900.00	6,980.45	7,309.73	6,958.66	178.29	48.37	-84.59	1,098.87	-3,063.50	7,928.54	7,850.39	78.15	101.453	
18,000.00	6,980.38	7,309.04	6,957.97	179.86	48.37	-84.53	1,098.87	-3,063.51	8,028.15	7,949.90	78.24	102.608	
18,100.00	6,980.30	7,308.36	6,957.28	181.44	48.37	-84.48	1,098.87	-3,063.51	8,127.76	8,049.43	78.33	103.759	
18,200.00	6,980.23	7,307.67	6,956.60	183.01	48.37	-84.42	1,098.87	-3,063.52	8,227.39	8,148.96	78.42	104.908	
18,300.00	6,980.15	7,306.99	6,955.92	184.59	48.37	-84.37	1,098.87	-3,063.52	8,327.02	8,248.50	78.52	106.053	
18,400.00	6,980.08	7,306.32	6,955.25	186.16	48.37	-84.31	1,098.87	-3,063.53	8,426.66	8,348.05	78.61	107.196	
18,500.00	6,980.00	7,305.65	6,954.58	187.74	48.37	-84.26	1,098.88	-3,063.53	8,526.32	8,447.61	78.70	108.335	
18,600.00	6,979.93	7,304.98	6,953.91	189.32	48.37	-84.20	1,098.88	-3,063.54	8,625.98	8,547.18	78.80	109.472	
18,700.00	6,979.85	7,304.31	6,953.24	190.90	48.37	-84.15	1,098.88	-3,063.54	8,725.64	8,646.75	78.89	110.605	
18,800.00	6,979.78	7,303.65	6,952.58	192.48	48.37	-84.10	1,098.88	-3,063.55	8,825.32	8,746.33	78.98	111.735	
18,900.00	6,979.71	7,302.99	6,951.92	194.05	48.36	-84.04	1,098.88	-3,063.55	8,925.00	8,845.92	79.08	112.863	
19,000.00	6,979.63	7,302.34	6,951.27	195.63	48.36	-83.99	1,098.88	-3,063.56	9,024.69	8,945.51	79.17	113.987	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		323-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,100.00	6,979.56	7,301.69	6,950.61	197.21	48.36	-83.94	1,098.88	-3,063.56	9,124.38	9,045.11	79.27	115.108		
19,200.00	6,979.48	7,301.04	6,949.97	198.79	48.36	-83.89	1,098.88	-3,063.57	9,224.08	9,144.72	79.36	116.226		
19,300.00	6,979.41	7,300.39	6,949.32	200.37	48.36	-83.83	1,098.88	-3,063.57	9,323.79	9,244.33	79.46	117.342		
19,400.00	6,979.33	7,299.75	6,948.68	201.95	48.36	-83.78	1,098.88	-3,063.58	9,423.51	9,343.95	79.55	118.454		
19,500.00	6,979.26	7,299.11	6,948.04	203.54	48.36	-83.73	1,098.88	-3,063.58	9,523.23	9,443.58	79.65	119.563		
19,600.00	6,979.18	7,298.48	6,947.40	205.12	48.36	-83.68	1,098.88	-3,063.59	9,622.95	9,543.21	79.75	120.669		
19,700.00	6,979.11	7,297.84	6,946.77	206.70	48.36	-83.63	1,098.89	-3,063.59	9,722.69	9,642.84	79.84	121.772		
19,800.00	6,979.03	7,297.21	6,946.14	208.28	48.36	-83.58	1,098.89	-3,063.60	9,822.42	9,742.48	79.94	122.871		
19,900.00	6,978.96	7,296.59	6,945.51	209.86	48.35	-83.53	1,098.89	-3,063.60	9,922.17	9,842.13	80.04	123.968		
20,000.00	6,978.89	7,295.96	6,944.89	211.45	48.35	-83.48	1,098.89	-3,063.60	10,021.91	9,941.78	80.14	125.062		
20,100.00	6,978.81	7,295.34	6,944.27	213.03	48.35	-83.43	1,098.89	-3,063.61	10,121.67	10,041.43	80.23	126.152		
20,200.00	6,978.74	7,294.72	6,943.65	214.61	48.35	-83.38	1,098.89	-3,063.61	10,221.42	10,141.09	80.33	127.240		
20,300.00	6,978.66	7,294.11	6,943.04	216.20	48.35	-83.33	1,098.89	-3,063.62	10,321.18	10,240.75	80.43	128.324		
20,400.00	6,978.59	7,293.50	6,942.43	217.78	48.35	-83.28	1,098.89	-3,063.62	10,420.95	10,340.42	80.53	129.405		
20,500.00	6,978.51	7,292.89	6,941.82	219.37	48.35	-83.23	1,098.89	-3,063.63	10,520.72	10,440.09	80.63	130.484		
20,600.00	6,978.44	7,292.28	6,941.21	220.95	48.35	-83.18	1,098.89	-3,063.63	10,620.50	10,539.77	80.73	131.559		
20,700.00	6,978.36	7,291.68	6,940.61	222.53	48.35	-83.13	1,098.90	-3,063.64	10,720.28	10,639.45	80.83	132.631		
20,800.00	6,978.29	7,291.08	6,940.01	224.12	48.35	-83.09	1,098.90	-3,063.64	10,820.06	10,739.13	80.93	133.700		
20,900.00	6,978.21	7,290.49	6,939.41	225.71	48.35	-83.04	1,098.90	-3,063.64	10,919.85	10,838.82	81.03	134.766		
21,000.00	6,978.14	7,289.89	6,938.82	227.29	48.34	-82.99	1,098.90	-3,063.65	11,019.64	10,938.51	81.13	135.828		
21,100.00	6,978.07	7,289.30	6,938.23	228.88	48.34	-82.94	1,098.90	-3,063.65	11,119.43	11,038.20	81.23	136.888		
21,200.00	6,977.99	7,288.71	6,937.64	230.46	48.34	-82.90	1,098.90	-3,063.66	11,219.23	11,137.90	81.33	137.944		
21,300.00	6,977.92	7,288.13	6,937.05	232.05	48.34	-82.85	1,098.90	-3,063.66	11,319.03	11,237.60	81.43	138.998		
21,400.00	6,977.84	7,287.54	6,936.47	233.64	48.34	-82.80	1,098.90	-3,063.66	11,418.84	11,337.30	81.53	140.048		
21,500.00	6,977.77	7,286.96	6,935.89	235.22	48.34	-82.76	1,098.90	-3,063.67	11,518.65	11,437.01	81.64	141.096		
21,600.00	6,977.69	7,286.38	6,935.31	236.81	48.34	-82.71	1,098.91	-3,063.67	11,618.46	11,536.72	81.74	142.140		
21,700.00	6,977.62	7,285.81	6,934.74	238.40	48.34	-82.66	1,098.91	-3,063.68	11,718.27	11,636.43	81.84	143.181		
21,800.00	6,977.54	7,285.24	6,934.17	239.99	48.34	-82.62	1,098.91	-3,063.68	11,818.09	11,736.15	81.95	144.219		
21,900.00	6,977.47	7,284.67	6,933.60	241.57	48.34	-82.57	1,098.91	-3,063.68	11,917.91	11,835.86	82.05	145.254		
22,000.00	6,977.39	7,284.10	6,933.03	243.16	48.34	-82.53	1,098.91	-3,063.69	12,017.74	11,935.58	82.15	146.286		
22,100.00	6,977.32	7,283.54	6,932.47	244.75	48.33	-82.48	1,098.91	-3,063.69	12,117.56	12,035.31	82.26	147.314		
22,200.00	6,977.25	7,282.98	6,931.90	246.34	48.33	-82.44	1,098.91	-3,063.70	12,217.39	12,135.03	82.36	148.340		
22,300.00	6,977.17	7,282.42	6,931.34	247.93	48.33	-82.39	1,098.91	-3,063.70	12,317.22	12,234.76	82.47	149.363		
22,400.00	6,977.10	7,281.86	6,930.79	249.52	48.33	-82.35	1,098.91	-3,063.70	12,417.06	12,334.49	82.57	150.382		
22,500.00	6,977.02	1,754.96	1,707.86	251.11	11.07	-4.58	1,382.28	-4,229.75	12,518.51	12,445.34	73.17	171.083		
22,529.62	6,977.00	1,752.52	1,705.66	251.58	11.06	-4.58	1,382.53	-4,230.77	12,545.31	12,472.12	73.19	171.404		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 388-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Offset												Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-162.14	-121.60	-39.17	131.00				
100.00	100.00	71.13	71.13	0.25	0.08	-162.15	-121.57	-39.15	127.72	127.39	0.33	385.761	
200.00	200.00	171.32	171.32	0.61	0.19	-162.18	-121.42	-39.04	127.54	126.74	0.80	159.000	
300.00	300.00	271.50	271.50	0.97	0.31	-162.22	-121.14	-38.84	127.22	125.95	1.27	99.920	
400.00	400.00	371.69	371.68	1.33	0.42	-162.29	-120.74	-38.55	126.75	125.01	1.74	72.666	
500.00	500.00	475.19	475.18	1.68	0.63	-162.39	-119.32	-37.87	125.26	122.94	2.32	54.055	
550.00	550.00	527.92	527.84	1.86	0.76	-162.58	-117.23	-36.79	123.06	120.44	2.62	47.026	
600.00	600.00	581.30	581.10	2.04	0.89	-160.62	-113.91	-35.02	120.01	117.09	2.92	41.133	
700.00	699.93	691.45	690.29	2.40	1.19	-162.67	-101.31	-28.53	110.69	107.17	3.53	31.402	
800.00	799.68	800.12	795.92	2.77	1.60	-167.59	-78.90	-16.74	94.68	90.55	4.13	22.910	
900.00	899.13	902.95	893.77	3.13	2.13	-176.70	-50.94	-2.18	76.06	71.26	4.80	15.849	
1,000.00	998.15	1,002.99	986.28	3.49	2.78	165.23	-17.13	15.24	57.57	51.81	5.77	9.982	
1,090.72	1,087.52	1,090.53	1,065.49	3.84	3.44	138.07	15.77	32.74	49.93	42.79	7.14	6.992 CC	
1,100.00	1,096.63	1,099.38	1,073.37	3.87	3.52	134.86	19.27	34.68	50.02	42.73	7.29	6.864 ES	
1,130.50	1,126.54	1,128.22	1,098.91	3.99	3.76	124.38	30.97	41.21	51.66	43.93	7.73	6.682 SF	
1,200.00	1,194.61	1,192.96	1,155.46	4.26	4.32	103.62	58.26	56.95	62.48	54.07	8.41	7.426	
1,300.00	1,292.57	1,282.77	1,231.71	4.66	5.19	83.49	99.46	80.45	90.38	81.49	8.90	10.160	
1,400.00	1,390.52	1,365.81	1,298.22	5.07	6.11	70.94	143.10	104.15	129.52	120.34	9.17	14.120	
1,500.00	1,488.48	1,444.52	1,357.57	5.48	7.06	62.61	189.15	127.65	176.89	167.42	9.48	18.669	
1,600.00	1,586.43	1,524.45	1,415.84	5.90	8.06	57.23	237.59	153.08	229.43	219.48	9.95	23.053	
1,700.00	1,684.38	1,605.90	1,474.59	6.31	9.08	53.56	287.66	179.07	283.76	273.21	10.54	26.910	
1,800.00	1,782.34	1,688.00	1,533.52	6.73	10.07	50.87	338.70	204.81	338.83	327.64	11.19	30.285	
1,900.00	1,880.29	1,765.42	1,588.71	7.15	11.06	49.11	386.79	230.00	395.11	383.30	11.81	33.456	
2,000.00	1,978.25	1,849.35	1,648.38	7.58	12.10	47.74	438.83	257.87	452.02	439.46	12.56	35.978	
2,100.00	2,076.20	1,942.33	1,715.36	8.00	13.22	46.74	495.26	289.07	508.27	494.81	13.46	37.755	
2,200.00	2,174.15	2,021.09	1,772.87	8.43	14.18	46.20	541.94	315.83	563.63	549.46	14.17	39.773	
2,300.00	2,272.11	2,099.51	1,829.64	8.85	15.18	45.66	589.21	342.13	619.56	604.67	14.89	41.614	
2,400.00	2,370.06	2,180.74	1,887.93	9.28	16.22	45.07	639.14	368.75	675.98	660.33	15.65	43.198	
2,500.00	2,468.02	2,269.14	1,951.36	9.71	17.31	44.43	693.99	396.71	732.15	715.66	16.49	44.390	
2,600.00	2,565.97	2,354.18	2,012.97	10.14	18.35	43.98	745.88	423.96	787.76	770.46	17.30	45.533	
2,700.00	2,663.92	2,441.23	2,076.01	10.57	19.43	43.57	799.14	451.67	843.40	825.26	18.14	46.502	
2,800.00	2,761.88	2,535.61	2,145.20	11.00	20.54	43.26	855.73	481.96	898.17	879.11	19.06	47.131	
2,900.00	2,859.83	2,617.42	2,205.51	11.43	21.54	43.05	904.32	508.30	952.52	932.68	19.83	48.029	
3,000.00	2,957.79	2,691.55	2,259.89	11.86	22.47	42.89	948.50	532.52	1,007.39	986.86	20.53	49.080	
3,100.00	3,055.74	2,869.79	2,396.59	12.29	24.50	42.82	1,047.59	589.35	1,057.71	1,035.35	22.36	47.305	
3,200.00	3,153.69	3,029.55	2,526.38	12.72	26.15	42.79	1,129.48	633.67	1,101.69	1,077.85	23.83	46.225	
3,300.00	3,251.65	3,190.10	2,662.09	13.15	27.67	42.77	1,205.96	672.39	1,140.28	1,115.09	25.19	45.267	
3,400.00	3,349.60	3,338.73	2,791.50	13.59	28.96	42.77	1,271.79	704.07	1,174.39	1,148.02	26.37	44.539	
3,500.00	3,447.56	3,699.16	3,127.50	14.02	31.28	43.80	1,384.03	765.34	1,194.11	1,166.02	28.09	42.507	
3,600.00	3,545.51	3,966.60	3,390.15	14.45	32.21	45.06	1,427.00	788.79	1,198.06	1,169.36	28.71	41.737	
3,700.00	3,643.46	4,134.51	3,557.59	14.88	32.49	46.04	1,437.95	793.63	1,189.95	1,160.75	29.20	40.756	
3,800.00	3,741.42	4,238.05	3,660.98	15.32	32.63	46.62	1,443.45	794.51	1,180.34	1,150.44	29.90	39.472	
3,900.00	3,839.37	4,336.93	3,759.72	15.75	32.77	47.18	1,448.65	795.33	1,170.80	1,140.14	30.66	38.188	
4,000.00	3,937.33	4,435.81	3,858.47	16.18	32.92	47.76	1,453.84	796.15	1,161.38	1,129.96	31.42	36.962	
4,100.00	4,035.28	4,534.69	3,957.21	16.62	33.06	48.34	1,459.03	796.97	1,152.07	1,119.88	32.19	35.793	
4,200.00	4,133.23	4,633.58	4,055.95	17.05	33.21	48.93	1,464.22	797.79	1,142.88	1,109.92	32.96	34.675	
4,300.00	4,231.19	4,732.46	4,154.69	17.48	33.35	49.53	1,469.41	798.61	1,133.81	1,100.07	33.74	33.607	
4,400.00	4,329.14	4,831.34	4,253.43	17.92	33.50	50.14	1,474.59	799.42	1,124.87	1,090.35	34.52	32.586	
4,500.00	4,427.10	4,930.22	4,352.18	18.35	33.64	50.76	1,479.78	800.24	1,116.06	1,080.75	35.31	31.608	
4,600.00	4,525.05	5,029.10	4,450.92	18.78	33.79	51.39	1,484.96	801.06	1,107.38	1,071.28	36.10	30.672	
4,700.00	4,623.00	5,127.98	4,549.66	19.22	33.93	52.04	1,490.14	801.88	1,098.84	1,061.93	36.90	29.776	
4,800.00	4,720.96	5,226.86	4,648.39	19.65	34.08	52.69	1,495.32	802.70	1,090.44	1,052.73	37.71	28.916	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		388-APC_ISCWSA REV 2 MWD							Rule Assigned:			Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,900.00	4,818.91	5,325.73	4,747.13	20.09	34.22	53.35	1,500.49	803.51	1,082.17	1,043.65	38.52	28.093	
5,000.00	4,916.87	5,424.61	4,845.87	20.52	34.37	54.02	1,505.67	804.33	1,074.06	1,034.72	39.34	27.303	
5,100.00	5,014.82	5,523.49	4,944.61	20.96	34.52	54.70	1,510.84	805.15	1,066.09	1,025.93	40.16	26.545	
5,200.00	5,112.77	5,622.36	5,043.35	21.39	34.66	55.39	1,516.01	805.96	1,058.28	1,017.29	40.99	25.818	
5,300.00	5,210.73	5,721.24	5,142.08	21.82	34.81	56.09	1,521.18	806.78	1,050.62	1,008.80	41.82	25.120	
5,400.00	5,308.68	5,820.11	5,240.82	22.26	34.95	56.80	1,526.35	807.59	1,043.13	1,000.46	42.66	24.450	
5,493.23	5,400.00	5,912.29	5,332.87	22.66	35.09	57.47	1,531.16	808.35	1,036.28	992.83	43.45	23.850	
5,500.00	5,406.64	5,918.99	5,339.56	22.69	35.10	57.51	1,531.51	808.41	1,035.79	992.28	43.51	23.807	
5,600.00	5,504.69	6,017.94	5,438.37	23.12	35.25	58.19	1,536.68	809.22	1,028.89	984.54	44.35	23.201	
5,700.00	5,602.91	6,117.00	5,537.30	23.55	35.39	58.84	1,541.85	810.04	1,022.59	977.42	45.17	22.638	
5,800.00	5,701.29	6,216.19	5,636.34	23.97	35.54	59.46	1,547.02	810.86	1,016.88	970.90	45.98	22.116	
5,900.00	5,799.82	6,315.48	5,735.50	24.39	35.69	60.05	1,552.20	811.68	1,011.73	964.96	46.77	21.631	
6,000.00	5,898.50	6,414.87	5,834.75	24.79	35.83	60.60	1,557.38	812.49	1,007.12	959.58	47.55	21.182	
6,100.00	5,997.31	6,514.36	5,934.10	25.20	35.98	61.12	1,562.57	813.31	1,003.04	954.74	48.30	20.767	
6,200.00	6,096.26	6,613.93	6,033.53	25.60	36.13	61.60	1,567.76	814.13	999.46	950.42	49.04	20.382	
6,300.00	6,195.33	6,713.57	6,133.03	25.99	36.28	62.04	1,572.95	814.95	996.36	946.61	49.75	20.026	
6,400.00	6,294.51	6,813.29	6,232.61	26.37	36.43	62.44	1,578.14	815.77	993.73	943.28	50.45	19.698	
6,498.19	6,392.00	6,911.26	6,330.44	26.75	36.57	62.80	1,583.24	816.57	991.58	940.47	51.11	19.400	
6,500.00	6,393.80	6,913.07	6,332.25	26.76	36.57	64.01	1,583.33	816.59	991.55	940.42	51.12	19.395	
6,521.60	6,415.23	6,934.60	6,353.76	26.84	36.61	76.16	1,584.45	816.77	991.35	940.07	51.28	19.332	
6,550.00	6,443.29	6,962.83	6,381.94	26.95	36.65	87.04	1,585.92	817.00	991.69	940.19	51.50	19.255	
6,600.00	6,492.24	7,012.11	6,431.15	27.16	36.72	98.11	1,588.48	817.40	993.98	942.02	51.97	19.127	
6,650.00	6,540.33	7,060.60	6,479.58	27.38	36.79	104.25	1,591.01	817.80	998.48	945.97	52.51	19.015	
6,700.00	6,587.28	7,108.02	6,526.93	27.60	36.86	108.11	1,593.47	818.19	1,005.27	952.14	53.13	18.921	
6,750.00	6,632.80	7,154.06	6,572.91	27.84	36.93	110.72	1,595.86	818.57	1,014.42	960.61	53.81	18.851	
6,800.00	6,676.60	7,198.43	6,617.22	28.09	37.00	112.55	1,598.17	818.93	1,026.03	971.48	54.56	18.807	
6,850.00	6,718.42	7,240.88	6,659.61	28.34	37.06	113.83	1,600.38	819.28	1,040.18	984.84	55.34	18.795	
6,900.00	6,758.00	7,281.13	6,699.81	28.60	37.12	114.66	1,602.47	819.61	1,056.92	1,000.75	56.17	18.818	
6,950.00	6,795.09	7,318.94	6,737.57	28.87	37.18	115.07	1,604.43	819.92	1,076.29	1,019.28	57.01	18.878	
7,000.00	6,829.46	7,354.08	6,772.65	29.14	37.23	115.08	1,606.26	820.21	1,098.30	1,040.43	57.87	18.980	
7,050.00	6,860.91	7,386.32	6,804.85	29.43	37.28	114.67	1,607.93	820.47	1,122.92	1,064.21	58.72	19.124	
7,100.00	6,889.24	7,415.47	6,833.96	29.73	37.32	113.81	1,609.45	820.71	1,150.10	1,090.54	59.56	19.311	
7,150.00	6,914.27	7,441.35	6,859.80	30.05	37.36	112.44	1,610.79	820.92	1,179.72	1,119.36	60.37	19.542	
7,200.00	6,935.85	7,463.80	6,882.22	30.37	37.39	110.50	1,611.96	821.11	1,211.66	1,150.51	61.15	19.816	
7,250.00	6,953.84	7,482.69	6,901.08	30.71	37.42	107.93	1,612.94	821.26	1,245.72	1,183.84	61.88	20.131	
7,300.00	6,968.15	7,497.88	6,916.26	31.06	37.45	104.64	1,613.73	821.39	1,281.70	1,219.13	62.57	20.484	
7,350.00	6,978.67	7,509.30	6,927.66	31.42	37.46	100.56	1,614.32	821.48	1,319.36	1,256.15	63.21	20.873	
7,400.00	6,985.34	7,516.87	6,935.22	31.79	37.47	95.65	1,614.71	821.54	1,358.43	1,294.63	63.79	21.294	
7,450.00	6,988.13	7,520.54	6,938.89	32.17	37.48	89.91	1,614.90	821.57	1,398.63	1,334.30	64.32	21.743	
7,461.13	6,988.22	7,520.83	6,939.17	32.26	37.48	88.53	1,614.92	821.57	1,407.70	1,343.26	64.44	21.847	
7,500.00	6,988.19	7,521.47	6,939.81	32.56	37.48	88.54	1,614.95	821.58	1,439.76	1,374.96	64.80	22.218	
7,600.00	6,988.12	7,523.00	6,941.34	33.37	37.48	88.57	1,615.03	821.59	1,524.97	1,459.35	65.63	23.237	
7,700.00	6,988.05	7,524.36	6,942.70	34.21	37.48	88.58	1,615.10	821.60	1,613.51	1,547.21	66.29	24.338	
7,800.00	6,987.98	7,525.54	6,943.87	35.09	37.49	88.57	1,615.16	821.61	1,704.75	1,637.92	66.84	25.507	
7,900.00	6,987.91	7,526.53	6,944.87	35.99	37.49	88.53	1,615.21	821.62	1,798.19	1,730.92	67.27	26.731	
8,000.00	6,987.83	7,527.35	6,945.68	36.93	37.49	88.44	1,615.26	821.63	1,893.39	1,825.78	67.62	28.001	
8,100.00	6,987.76	7,527.99	6,946.32	37.88	37.49	88.30	1,615.29	821.63	1,990.00	1,922.11	67.89	29.311	
8,200.00	6,987.68	7,528.44	6,946.77	38.86	37.49	88.06	1,615.31	821.64	2,087.71	2,019.60	68.11	30.653	
8,300.00	6,987.61	7,528.71	6,947.04	39.86	37.49	87.67	1,615.33	821.64	2,186.26	2,117.99	68.27	32.022	
8,400.00	6,987.53	7,528.79	6,947.13	40.87	37.49	86.96	1,615.33	821.64	2,285.43	2,217.03	68.39	33.416	
8,500.00	6,987.46	7,528.70	6,947.03	41.90	37.49	85.43	1,615.33	821.64	2,385.03	2,316.55	68.48	34.829	
8,600.00	6,987.38	7,528.42	6,946.75	42.93	37.49	80.49	1,615.31	821.64	2,484.89	2,416.36	68.53	36.260	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		388-APC_ISCWSA REV 2 MWD										Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
8,700.00	6,987.31	7,527.95	6,946.28	43.98	37.49	-29.60	1,615.29	821.63	2,584.87	2,516.32	68.55	37.706		
8,800.00	6,987.23	7,527.31	6,945.64	45.03	37.49	-81.69	1,615.25	821.63	2,684.85	2,616.29	68.55	39.164		
8,872.16	6,987.18	7,526.73	6,945.06	45.79	37.49	-84.85	1,615.22	821.62	2,756.91	2,688.38	68.54	40.224		
8,900.00	6,987.16	7,526.48	6,944.82	46.08	37.49	-84.77	1,615.21	821.62	2,784.71	2,716.17	68.53	40.634		
9,000.00	6,987.09	7,525.62	6,943.95	47.16	37.49	-84.48	1,615.17	821.61	2,884.53	2,816.02	68.51	42.106		
9,100.00	6,987.01	7,524.75	6,943.08	48.27	37.49	-84.19	1,615.12	821.61	2,984.36	2,915.88	68.49	43.577		
9,200.00	6,986.94	7,523.88	6,942.22	49.40	37.48	-83.90	1,615.08	821.60	3,084.20	3,015.74	68.47	45.047		
9,300.00	6,986.86	7,523.01	6,941.35	50.56	37.48	-83.61	1,615.03	821.59	3,184.06	3,115.61	68.45	46.516		
9,400.00	6,986.79	7,522.14	6,940.48	51.75	37.48	-83.32	1,614.99	821.59	3,283.92	3,215.48	68.44	47.984		
9,500.00	6,986.71	7,521.27	6,939.61	52.95	37.48	-83.03	1,614.94	821.58	3,383.79	3,315.36	68.43	49.451		
9,600.00	6,986.64	7,520.40	6,938.75	54.18	37.48	-82.74	1,614.90	821.57	3,483.67	3,415.25	68.42	50.918		
9,700.00	6,986.56	7,519.53	6,937.88	55.42	37.48	-82.45	1,614.85	821.56	3,583.55	3,515.14	68.41	52.382		
9,800.00	6,986.49	7,518.67	6,937.01	56.69	37.48	-82.17	1,614.81	821.56	3,683.44	3,615.04	68.41	53.846		
9,900.00	6,986.41	7,517.80	6,936.14	57.97	37.47	-81.88	1,614.76	821.55	3,783.34	3,714.93	68.40	55.309		
10,000.00	6,986.34	7,516.93	6,935.28	59.26	37.47	-81.60	1,614.72	821.54	3,883.24	3,814.83	68.40	56.770		
10,100.00	6,986.27	7,516.06	6,934.41	60.57	37.47	-81.31	1,614.67	821.54	3,983.14	3,914.74	68.40	58.229		
10,200.00	6,986.19	7,515.19	6,933.54	61.90	37.47	-81.02	1,614.63	821.53	4,083.05	4,014.65	68.41	59.688		
10,300.00	6,986.12	7,514.32	6,932.67	63.23	37.47	-80.74	1,614.58	821.52	4,182.97	4,114.56	68.41	61.144		
10,400.00	6,986.04	7,513.45	6,931.81	64.58	37.47	-80.46	1,614.54	821.51	4,282.89	4,214.47	68.42	62.600		
10,500.00	6,985.97	7,512.59	6,930.94	65.94	37.47	-80.17	1,614.49	821.51	4,382.81	4,314.38	68.42	64.053		
10,600.00	6,985.89	7,511.72	6,930.07	67.32	37.47	-79.89	1,614.45	821.50	4,482.73	4,414.30	68.43	65.505		
10,700.00	6,985.82	7,510.85	6,929.20	68.70	37.46	-79.61	1,614.40	821.49	4,582.66	4,514.22	68.44	66.956		
10,800.00	6,985.74	7,509.98	6,928.34	70.09	37.46	-79.33	1,614.36	821.49	4,682.59	4,614.14	68.45	68.404		
10,900.00	6,985.67	7,509.11	6,927.47	71.49	37.46	-79.05	1,614.31	821.48	4,782.53	4,714.06	68.47	69.851		
11,000.00	6,985.59	7,508.24	6,926.60	72.90	37.46	-78.77	1,614.26	821.47	4,882.46	4,813.98	68.48	71.296		
11,100.00	6,985.52	7,507.37	6,925.73	74.31	37.46	-78.49	1,614.22	821.46	4,982.40	4,913.90	68.50	72.739		
11,200.00	6,985.45	7,506.50	6,924.87	75.74	37.46	-78.21	1,614.17	821.46	5,082.34	5,013.83	68.51	74.181		
11,300.00	6,985.37	7,505.64	6,924.00	77.17	37.46	-77.93	1,614.13	821.45	5,182.28	5,113.75	68.53	75.620		
11,400.00	6,985.30	7,504.77	6,923.13	78.61	37.46	-77.66	1,614.08	821.44	5,282.23	5,213.68	68.55	77.057		
11,500.00	6,985.22	7,503.90	6,922.26	80.05	37.45	-77.38	1,614.04	821.44	5,382.18	5,313.61	68.57	78.493		
11,600.00	6,985.15	7,503.03	6,921.40	81.50	37.45	-77.10	1,613.99	821.43	5,482.12	5,413.53	68.59	79.926		
11,700.00	6,985.07	7,502.16	6,920.53	82.96	37.45	-76.83	1,613.95	821.42	5,582.08	5,513.46	68.61	81.357		
11,800.00	6,985.00	7,501.29	6,919.66	84.42	37.45	-76.56	1,613.90	821.41	5,682.03	5,613.39	68.64	82.786		
11,900.00	6,984.92	7,500.42	6,918.79	85.89	37.45	-76.28	1,613.86	821.41	5,781.98	5,713.32	68.66	84.213		
12,000.00	6,984.85	7,499.55	6,917.93	87.36	37.45	-76.01	1,613.81	821.40	5,881.94	5,813.25	68.68	85.637		
12,100.00	6,984.77	7,498.69	6,917.06	88.83	37.45	-75.74	1,613.77	821.39	5,981.89	5,913.18	68.71	87.060		
12,200.00	6,984.70	7,497.82	6,916.19	90.31	37.45	-75.47	1,613.72	821.39	6,081.85	6,013.11	68.74	88.480		
12,300.00	6,984.63	7,496.95	6,915.32	91.80	37.44	-75.20	1,613.68	821.38	6,181.81	6,113.04	68.77	89.898		
12,400.00	6,984.55	7,496.08	6,914.46	93.29	37.44	-74.93	1,613.63	821.37	6,281.77	6,212.98	68.79	91.313		
12,500.00	6,984.48	7,495.21	6,913.59	94.78	37.44	-74.66	1,613.59	821.36	6,381.73	6,312.91	68.82	92.726		
12,600.00	6,984.40	7,494.34	6,912.72	96.28	37.44	-74.39	1,613.54	821.36	6,481.69	6,412.84	68.85	94.136		
12,700.00	6,984.33	7,493.47	6,911.85	97.78	37.44	-74.13	1,613.50	821.35	6,581.66	6,512.77	68.89	95.544		
12,800.00	6,984.25	7,492.60	6,910.99	99.28	37.44	-73.86	1,613.45	821.34	6,681.62	6,612.70	68.92	96.950		
12,900.00	6,984.18	7,491.74	6,910.12	100.78	37.44	-73.59	1,613.41	821.34	6,781.59	6,712.63	68.95	98.353		
13,000.00	6,984.10	7,490.87	6,909.25	102.29	37.43	-73.33	1,613.36	821.33	6,881.55	6,812.57	68.99	99.753		
13,100.00	6,984.03	7,490.00	6,908.38	103.80	37.43	-73.07	1,613.32	821.32	6,981.52	6,912.50	69.02	101.151		
13,200.00	6,983.95	7,489.13	6,907.51	105.32	37.43	-72.80	1,613.27	821.32	7,081.49	7,012.43	69.06	102.546		
13,300.00	6,983.88	7,488.26	6,906.65	106.84	37.43	-72.54	1,613.23	821.31	7,181.46	7,112.36	69.09	103.938		
13,400.00	6,983.81	7,487.39	6,905.78	108.36	37.43	-72.28	1,613.18	821.30	7,281.43	7,212.29	69.13	105.328		
13,500.00	6,983.73	7,486.52	6,904.91	109.88	37.43	-72.02	1,613.14	821.29	7,381.40	7,312.23	69.17	106.715		
13,600.00	6,983.66	7,485.65	6,904.04	111.40	37.43	-71.76	1,613.09	821.29	7,481.37	7,412.16	69.21	108.099		
13,700.00	6,983.58	7,484.78	6,903.18	112.93	37.43	-71.51	1,613.05	821.28	7,581.34	7,512.09	69.25	109.481		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY													Offset Site Error: 0.00 usft	
Survey Program:		388-APC_ISCWSA REV 2 MWD						Rule Assigned:		Offset Well Error: 0.00 usft				
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Minimum Separation (usft)	Separation Factor	
13,800.00	6,983.51	7,483.92	6,902.31	114.46	37.42	-71.25	1,613.00	821.27	7,681.31	7,612.02	69.29	110.859		
13,900.00	6,983.43	7,483.05	6,901.44	115.99	37.42	-70.99	1,612.96	821.27	7,781.28	7,711.95	69.33	112.235		
14,000.00	6,983.36	7,482.18	6,900.57	117.52	37.42	-70.74	1,612.91	821.26	7,881.26	7,811.88	69.37	113.608		
14,100.00	6,983.28	7,481.31	6,899.71	119.06	37.42	-70.48	1,612.87	821.25	7,981.23	7,911.81	69.42	114.978		
14,200.00	6,983.21	7,480.44	6,898.84	120.59	37.42	-70.23	1,612.82	821.24	8,081.20	8,011.75	69.46	116.345		
14,300.00	6,983.13	7,479.57	6,897.97	122.13	37.42	-69.98	1,612.78	821.24	8,181.18	8,111.68	69.50	117.709		
14,400.00	6,983.06	7,478.70	6,897.10	123.67	37.42	-69.72	1,612.73	821.23	8,281.16	8,211.61	69.55	119.070		
14,500.00	6,982.99	7,477.83	6,896.24	125.21	37.42	-69.47	1,612.69	821.22	8,381.13	8,311.54	69.59	120.428		
14,600.00	6,982.91	7,476.96	6,895.37	126.75	37.41	-69.22	1,612.64	821.22	8,481.11	8,411.47	69.64	121.783		
14,700.00	6,982.84	7,476.10	6,894.50	128.30	37.41	-68.98	1,612.60	821.21	8,581.08	8,511.40	69.69	123.135		
14,800.00	6,982.76	7,475.23	6,893.63	129.85	37.41	-68.73	1,612.55	821.20	8,681.06	8,611.33	69.74	124.484		
14,900.00	6,982.69	7,474.36	6,892.76	131.39	37.41	-68.48	1,612.51	821.19	8,781.04	8,711.26	69.78	125.830		
15,000.00	6,982.61	7,473.49	6,891.90	132.94	37.41	-68.24	1,612.46	821.19	8,881.02	8,811.18	69.83	127.173		
15,100.00	6,982.54	7,472.62	6,891.03	134.49	37.41	-67.99	1,612.42	821.18	8,981.00	8,911.11	69.88	128.512		
15,200.00	6,982.46	7,471.75	6,890.16	136.04	37.41	-67.75	1,612.37	821.17	9,080.98	9,011.04	69.94	129.848		
15,300.00	6,982.39	7,470.88	6,889.29	137.60	37.40	-67.50	1,612.33	821.17	9,180.96	9,110.97	69.99	131.182		
15,400.00	6,982.31	7,470.01	6,888.43	139.15	37.40	-67.26	1,612.28	821.16	9,280.94	9,210.90	70.04	132.511		
15,500.00	6,982.24	7,469.14	6,887.56	140.70	37.40	-67.02	1,612.23	821.15	9,380.92	9,310.82	70.09	133.838		
15,600.00	6,982.17	7,468.28	6,886.69	142.26	37.40	-66.78	1,612.19	821.14	9,480.90	9,410.75	70.14	135.161		
15,700.00	6,982.09	7,467.41	6,885.82	143.82	37.40	-66.54	1,612.14	821.14	9,580.88	9,510.68	70.20	136.482		
15,800.00	6,982.02	7,466.54	6,884.95	145.38	37.40	-66.30	1,612.10	821.13	9,680.86	9,610.60	70.25	137.798		
15,900.00	6,981.94	7,465.67	6,884.09	146.94	37.40	-66.07	1,612.05	821.12	9,780.84	9,710.53	70.31	139.112		
16,000.00	6,981.87	7,464.80	6,883.22	148.50	37.40	-65.83	1,612.01	821.12	9,880.82	9,810.46	70.37	140.422		
16,100.00	6,981.79	7,463.93	6,882.35	150.06	37.39	-65.60	1,611.96	821.11	9,980.80	9,910.38	70.42	141.729		
16,200.00	6,981.72	7,463.06	6,881.48	151.62	37.39	-65.36	1,611.92	821.10	10,080.79	10,010.31	70.48	143.032		
16,300.00	6,981.64	7,462.19	6,880.62	153.18	37.39	-65.13	1,611.87	821.09	10,180.77	10,110.23	70.54	144.332		
16,400.00	6,981.57	7,461.32	6,879.75	154.74	37.39	-64.90	1,611.83	821.09	10,280.75	10,210.16	70.60	145.629		
16,500.00	6,981.49	7,460.45	6,878.88	156.31	37.39	-64.67	1,611.78	821.08	10,380.73	10,310.08	70.65	146.922		
16,600.00	6,981.42	7,459.59	6,878.01	157.87	37.39	-64.44	1,611.74	821.07	10,480.72	10,410.00	70.71	148.212		
16,700.00	6,981.35	7,458.72	6,877.14	159.44	37.39	-64.21	1,611.69	821.07	10,580.70	10,509.93	70.77	149.498		
16,800.00	6,981.27	7,457.85	6,876.28	161.01	37.39	-63.98	1,611.65	821.06	10,680.68	10,609.85	70.84	150.781		
16,900.00	6,981.20	7,456.98	6,875.41	162.58	37.38	-63.75	1,611.60	821.05	10,780.67	10,709.77	70.90	152.060		
17,000.00	6,981.12	7,456.11	6,874.54	164.14	37.38	-63.53	1,611.56	821.04	10,880.65	10,809.69	70.96	153.336		
17,100.00	6,981.05	7,455.24	6,873.67	165.71	37.38	-63.30	1,611.51	821.04	10,980.64	10,909.62	71.02	154.609		
17,200.00	6,980.97	7,454.37	6,872.81	167.28	37.38	-63.08	1,611.47	821.03	11,080.62	11,009.54	71.09	155.877		
17,300.00	6,980.90	7,453.50	6,871.94	168.85	37.38	-62.85	1,611.42	821.02	11,180.61	11,109.46	71.15	157.143		
17,400.00	6,980.82	7,452.63	6,871.07	170.42	37.38	-62.63	1,611.38	821.02	11,280.59	11,209.38	71.21	158.405		
17,500.00	6,980.75	7,451.76	6,870.20	172.00	37.38	-62.41	1,611.33	821.01	11,380.58	11,309.30	71.28	159.663		
17,600.00	6,980.67	7,450.90	6,869.33	173.57	37.38	-62.19	1,611.29	821.00	11,480.56	11,409.22	71.34	160.917		
17,700.00	6,980.60	7,450.03	6,868.47	175.14	37.37	-61.97	1,611.24	820.99	11,580.55	11,509.14	71.41	162.169		
17,800.00	6,980.53	7,449.16	6,867.60	176.71	37.37	-61.75	1,611.20	820.99	11,680.53	11,609.06	71.48	163.416		
17,900.00	6,980.45	7,448.29	6,866.73	178.29	37.37	-61.54	1,611.15	820.98	11,780.52	11,708.98	71.54	164.660		
18,000.00	6,980.38	7,447.42	6,865.86	179.86	37.37	-61.32	1,611.11	820.97	11,880.51	11,808.89	71.61	165.900		
18,100.00	6,980.30	7,446.55	6,864.99	181.44	37.37	-61.11	1,611.06	820.97	11,980.49	11,908.81	71.68	167.137		
18,200.00	6,980.23	7,445.68	6,864.13	183.01	37.37	-60.89	1,611.02	820.96	12,080.48	12,008.73	71.75	168.370		
18,300.00	6,980.15	7,444.81	6,863.26	184.59	37.37	-60.68	1,610.97	820.95	12,180.47	12,108.65	71.82	169.599		
18,400.00	6,980.08	7,443.94	6,862.39	186.16	37.36	-60.47	1,610.93	820.94	12,280.45	12,208.56	71.89	170.825		
18,500.00	6,980.00	7,443.07	6,861.52	187.74	37.36	-60.26	1,610.88	820.94	12,380.44	12,308.48	71.96	172.047		
18,600.00	6,979.93	7,442.20	6,860.66	189.32	37.36	-60.05	1,610.84	820.93	12,480.43	12,408.40	72.03	173.266		
18,700.00	6,979.85	7,441.34	6,859.79	190.90	37.36	-59.84	1,610.79	820.92	12,580.41	12,508.31	72.10	174.480		
18,800.00	6,979.78	7,440.47	6,858.92	192.48	37.36	-59.63	1,610.75	820.92	12,680.40	12,608.23	72.17	175.692		
18,900.00	6,979.71	7,439.60	6,858.05	194.05	37.36	-59.42	1,610.70	820.91	12,780.39	12,708.14	72.25	176.899		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #041C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 388-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Offset												Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre	Distance	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,000.00	6,979.63	7,438.73	6,857.18	195.63	37.36	-59.21	1,610.66	820.90	12,880.38	12,808.06	72.32	178.103	
19,100.00	6,979.56	7,437.86	6,856.32	197.21	37.36	-59.01	1,610.61	820.89	12,980.37	12,907.97	72.39	179.303	
19,200.00	6,979.48	7,436.99	6,855.45	198.79	37.35	-58.81	1,610.57	820.89	13,080.35	13,007.89	72.47	180.499	
19,300.00	6,979.41	7,436.12	6,854.58	200.37	37.35	-58.60	1,610.52	820.88	13,180.34	13,107.80	72.54	181.692	
19,400.00	6,979.33	7,435.25	6,853.71	201.95	37.35	-58.40	1,610.47	820.87	13,280.33	13,207.71	72.62	182.881	
19,500.00	6,979.26	7,434.38	6,852.84	203.54	37.35	-58.20	1,610.43	820.87	13,380.32	13,307.63	72.69	184.066	
19,600.00	6,979.18	7,433.51	6,851.98	205.12	37.35	-58.00	1,610.38	820.86	13,480.31	13,407.54	72.77	185.248	
19,700.00	6,979.11	7,432.64	6,851.11	206.70	37.35	-57.80	1,610.34	820.85	13,580.30	13,507.45	72.85	186.426	
19,800.00	6,979.03	7,431.78	6,850.24	208.28	37.35	-57.60	1,610.29	820.85	13,680.28	13,607.36	72.92	187.600	
19,900.00	6,978.96	7,430.91	6,849.37	209.86	37.35	-57.40	1,610.25	820.84	13,780.27	13,707.27	73.00	188.770	
20,000.00	6,978.89	7,430.04	6,848.50	211.45	37.34	-57.21	1,610.20	820.83	13,880.26	13,807.18	73.08	189.937	
20,100.00	6,978.81	7,429.17	6,847.64	213.03	37.34	-57.01	1,610.16	820.82	13,980.25	13,907.09	73.16	191.100	
20,200.00	6,978.74	7,428.30	6,846.77	214.61	37.34	-56.82	1,610.11	820.82	14,080.24	14,007.00	73.24	192.259	
20,300.00	6,978.66	7,427.43	6,845.90	216.20	37.34	-56.62	1,610.07	820.81	14,180.23	14,106.91	73.32	193.415	
20,400.00	6,978.59	7,426.56	6,845.03	217.78	37.34	-56.43	1,610.02	820.80	14,280.22	14,206.82	73.39	194.567	
20,500.00	6,978.51	7,425.69	6,844.16	219.37	37.34	-56.24	1,609.98	820.80	14,380.21	14,306.73	73.48	195.715	
20,600.00	6,978.44	7,424.82	6,843.30	220.95	37.34	-56.05	1,609.93	820.79	14,480.20	14,406.64	73.56	196.859	
20,700.00	6,978.36	7,423.95	6,842.43	222.53	37.34	-55.86	1,609.89	820.78	14,580.19	14,506.55	73.64	198.000	
20,800.00	6,978.29	7,423.08	6,841.56	224.12	37.33	-55.67	1,609.84	820.77	14,680.18	14,606.46	73.72	199.137	
20,900.00	6,978.21	7,422.21	6,840.69	225.71	37.33	-55.48	1,609.80	820.77	14,780.17	14,706.36	73.80	200.270	
21,000.00	6,978.14	7,421.34	6,839.82	227.29	37.33	-55.30	1,609.75	820.76	14,880.16	14,806.27	73.88	201.399	
21,100.00	6,978.07	7,420.48	6,838.96	228.88	37.33	-55.11	1,609.71	820.75	14,980.15	14,906.18	73.97	202.525	
21,200.00	6,977.99	7,419.61	6,838.09	230.46	37.33	-54.93	1,609.66	820.75	15,080.14	15,006.09	74.05	203.647	
21,300.00	6,977.92	7,418.74	6,837.22	232.05	37.33	-54.74	1,609.62	820.74	15,180.13	15,105.99	74.13	204.765	
21,400.00	6,977.84	7,417.87	6,836.35	233.64	37.33	-54.56	1,609.57	820.73	15,280.12	15,205.90	74.22	205.880	
21,500.00	6,977.77	7,417.00	6,835.48	235.22	37.32	-54.38	1,609.53	820.72	15,380.11	15,305.80	74.30	206.991	
21,600.00	6,977.69	7,416.13	6,834.62	236.81	37.32	-54.20	1,609.48	820.72	15,480.10	15,405.71	74.39	208.098	
21,700.00	6,977.62	7,415.26	6,833.75	238.40	37.32	-54.02	1,609.44	820.71	15,580.09	15,505.61	74.47	209.201	
21,800.00	6,977.54	7,414.39	6,832.88	239.99	37.32	-53.84	1,609.39	820.70	15,680.08	15,605.52	74.56	210.301	
21,900.00	6,977.47	7,413.52	6,832.01	241.57	37.32	-53.66	1,609.35	820.70	15,780.07	15,705.42	74.65	211.397	
22,000.00	6,977.39	7,412.65	6,831.14	243.16	37.32	-53.48	1,609.30	820.69	15,880.06	15,805.33	74.73	212.489	
22,100.00	6,977.32	7,411.78	6,830.28	244.75	37.32	-53.30	1,609.26	820.68	15,980.05	15,905.23	74.82	213.578	
22,200.00	6,977.25	7,410.91	6,829.41	246.34	37.32	-53.13	1,609.21	820.67	16,080.04	16,005.13	74.91	214.663	
22,300.00	6,977.17	7,410.04	6,828.54	247.93	37.31	-52.95	1,609.17	820.67	16,180.03	16,105.03	75.00	215.744	
22,400.00	6,977.10	7,409.18	6,827.67	249.52	37.31	-52.78	1,609.12	820.66	16,280.02	16,204.94	75.08	216.822	
22,500.00	6,977.02	7,408.31	6,826.80	251.11	37.31	-52.60	1,609.08	820.65	16,380.01	16,304.84	75.17	217.895	
22,529.62	6,977.00	7,408.05	6,826.55	251.58	37.31	-52.55	1,609.06	820.65	16,409.63	16,334.43	75.20	218.213	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 300-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-155.09	-375.72	-174.52	414.42				
100.00	100.00	89.00	89.00	0.25	1.58	-155.09	-375.72	-174.52	414.27	412.45	1.83	226.642	
200.00	200.00	189.00	189.00	0.61	3.35	-155.09	-375.72	-174.52	414.27	410.32	3.96	104.668	
300.00	300.00	289.00	289.00	0.97	5.12	-155.09	-375.72	-174.52	414.27	408.19	6.09	68.047	
400.00	400.00	389.00	389.00	1.33	6.92	-155.09	-375.72	-174.52	414.27	406.03	8.25	50.245	
500.00	500.00	489.00	489.00	1.68	8.72	-155.09	-375.72	-174.52	414.27	403.87	10.41	39.814	
550.00	550.00	539.00	539.00	1.86	9.62	-155.09	-375.72	-174.52	414.27	402.79	11.49	36.069	
562.50	562.50	551.50	551.50	1.91	9.85	-152.69	-375.45	-174.52	414.05	402.29	11.76	35.222 CC	
600.00	600.00	588.88	588.88	2.04	10.52	-152.71	-375.45	-174.52	414.42	401.85	12.56	32.986 ES	
700.00	699.93	688.48	688.48	2.40	12.31	-152.90	-375.53	-174.52	417.59	402.87	14.72	28.373	
800.00	799.68	787.89	787.89	2.77	14.11	-153.28	-375.69	-174.52	423.96	407.09	16.87	25.130	
900.00	899.13	888.14	888.13	3.13	16.06	-153.83	-375.72	-174.52	433.36	414.17	19.19	22.582	
1,000.00	998.15	987.16	987.15	3.49	18.02	-154.50	-375.72	-174.52	445.91	424.39	21.51	20.726	
1,100.00	1,096.63	1,084.96	1,084.95	3.87	19.96	-155.27	-375.33	-174.52	461.32	437.50	23.82	19.369	
1,130.50	1,126.54	1,114.59	1,114.57	3.99	20.54	-155.53	-375.39	-174.52	466.82	442.30	24.52	19.039	
1,200.00	1,194.61	1,182.00	1,181.99	4.26	21.87	-156.22	-375.58	-174.52	479.82	453.71	26.11	18.379	
1,300.00	1,292.57	1,281.63	1,281.57	4.66	24.02	-157.17	-375.72	-174.52	498.49	469.87	28.62	17.417	
1,400.00	1,390.52	1,377.16	1,377.08	5.07	26.17	-158.00	-375.25	-174.52	516.71	485.57	31.14	16.595	
1,500.00	1,488.48	1,477.60	1,477.48	5.48	28.51	-158.84	-375.72	-174.52	535.92	502.07	33.85	15.830	
1,600.00	1,586.43	1,575.56	1,575.43	5.90	30.93	-159.59	-375.72	-174.52	554.78	518.14	36.64	15.142	
1,700.00	1,684.38	1,671.43	1,671.29	6.31	33.29	-160.24	-374.63	-174.52	572.70	533.32	39.37	14.545	
1,800.00	1,782.34	1,765.51	1,765.35	6.73	35.61	-160.89	-375.31	-174.52	592.40	550.34	42.06	14.085	
1,900.00	1,880.29	1,869.57	1,869.29	7.15	38.17	-161.56	-375.72	-174.52	611.86	566.86	45.00	13.597	
2,000.00	1,978.25	1,967.52	1,967.25	7.58	40.57	-162.13	-375.72	-174.52	631.02	583.24	47.78	13.206	
2,100.00	2,076.20	2,065.47	2,065.20	8.00	42.98	-162.68	-375.72	-174.52	650.24	599.67	50.56	12.860	
2,200.00	2,174.15	2,160.23	2,159.92	8.43	45.31	-163.13	-373.87	-174.52	667.72	614.46	53.26	12.536	
2,300.00	2,272.11	2,254.61	2,254.28	8.85	47.62	-163.62	-374.59	-174.52	687.77	631.82	55.95	12.292	
2,400.00	2,370.06	2,359.52	2,359.06	9.28	50.19	-164.13	-375.72	-174.52	708.20	649.29	58.90	12.023	
2,500.00	2,468.02	2,457.48	2,457.02	9.71	52.54	-164.56	-375.72	-174.52	727.60	665.98	61.63	11.807	
2,600.00	2,565.97	2,555.32	2,554.85	10.14	54.88	-164.95	-374.58	-174.52	745.93	681.59	64.34	11.593	
2,700.00	2,663.92	2,649.62	2,649.14	10.57	57.14	-165.33	-374.82	-174.52	765.66	698.69	66.97	11.432	
2,800.00	2,761.88	2,743.74	2,743.25	11.00	59.39	-165.70	-375.53	-174.52	785.89	716.30	69.59	11.292	
2,900.00	2,859.83	2,849.41	2,848.83	11.43	61.93	-166.08	-375.72	-174.52	805.58	733.06	72.52	11.108	
3,000.00	2,957.79	2,947.37	2,946.79	11.86	64.28	-166.42	-375.72	-174.52	825.15	749.90	75.25	10.965	
3,100.00	3,055.74	3,045.32	3,044.74	12.29	66.63	-166.74	-375.72	-174.52	844.75	766.77	77.98	10.833	
3,200.00	3,153.69	3,140.03	3,139.41	12.72	68.91	-167.01	-373.98	-174.52	862.66	782.03	80.63	10.699	
3,300.00	3,251.65	3,234.28	3,233.65	13.15	71.17	-167.30	-374.54	-174.52	882.88	799.62	83.26	10.604	
3,400.00	3,349.60	3,328.38	3,327.74	13.59	73.43	-167.58	-375.50	-174.52	903.53	817.64	85.89	10.520	
3,500.00	3,447.56	3,437.31	3,436.56	14.02	75.71	-167.88	-375.72	-174.52	923.37	834.79	88.57	10.425	
3,600.00	3,545.51	3,535.26	3,534.51	14.45	77.70	-168.14	-375.72	-174.52	943.07	852.13	90.94	10.370	
3,700.00	3,643.46	3,631.49	3,630.72	14.88	79.66	-168.37	-374.42	-174.52	961.51	868.24	93.27	10.309	
3,800.00	3,741.42	3,725.37	3,724.59	15.32	81.57	-168.60	-374.79	-174.52	981.63	886.08	95.55	10.273	
3,900.00	3,839.37	3,819.10	3,818.32	15.75	83.48	-168.83	-375.55	-174.52	1,002.16	904.34	97.82	10.245	
4,000.00	3,937.33	3,927.14	3,926.33	16.18	85.51	-169.07	-375.72	-174.52	1,022.05	921.79	100.26	10.194	
4,100.00	4,035.28	4,025.09	4,024.28	16.62	87.33	-169.28	-375.72	-174.52	1,041.83	939.37	102.46	10.169	
4,200.00	4,133.23	4,122.20	4,121.39	17.05	89.13	-169.47	-375.21	-174.52	1,061.11	956.48	104.64	10.141	
4,300.00	4,231.19	4,218.29	4,217.48	17.48	90.92	-169.67	-375.37	-174.52	1,081.08	974.29	106.79	10.123	
4,400.00	4,329.14	4,314.32	4,313.50	17.92	92.70	-169.85	-375.70	-174.52	1,101.23	992.28	108.95	10.108	
4,500.00	4,427.10	4,416.94	4,416.10	18.35	94.45	-170.04	-375.72	-174.52	1,121.07	1,009.98	111.09	10.092	
4,600.00	4,525.05	4,514.89	4,514.05	18.78	96.11	-170.22	-375.72	-174.52	1,140.91	1,027.79	113.13	10.085	
4,700.00	4,623.00	4,611.76	4,610.91	19.22	97.75	-170.38	-374.90	-174.52	1,159.95	1,044.81	115.14	10.074	
4,800.00	4,720.96	4,706.85	4,706.00	19.65	99.36	-170.54	-375.11	-174.52	1,180.02	1,062.89	117.13	10.075	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 300-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
4,900.00	4,818.91	4,801.84	4,800.99	20.09	100.97	-170.69	-375.55	-174.52	1,200.33	1,081.23	119.11	10.078	
5,000.00	4,916.87	4,906.72	4,905.87	20.52	103.08	-170.86	-375.72	-174.52	1,220.36	1,098.75	121.61	10.035	
5,100.00	5,014.82	5,004.68	5,003.82	20.96	105.17	-171.01	-375.72	-174.52	1,240.24	1,116.17	124.07	9.996	
5,200.00	5,112.77	5,102.63	5,101.77	21.39	107.25	-171.15	-375.72	-174.52	1,260.13	1,133.60	126.54	9.959	
5,300.00	5,210.73	5,200.58	5,199.73	21.82	109.34	-171.29	-375.72	-174.52	1,280.03	1,151.03	129.00	9.923	
5,400.00	5,308.68	5,298.54	5,297.68	22.26	111.42	-171.42	-375.72	-174.52	1,299.94	1,168.47	131.46	9.888	
5,493.23	5,400.00	5,389.88	5,389.00	22.66	113.37	-171.54	-375.72	-174.52	1,318.50	1,184.74	133.76	9.857	
5,500.00	5,406.64	5,396.52	5,395.64	22.69	113.51	-171.55	-375.72	-174.52	1,319.85	1,185.92	133.93	9.855	
5,600.00	5,504.69	5,494.57	5,493.69	23.12	115.59	-171.69	-375.72	-174.52	1,339.29	1,202.89	136.39	9.819	
5,700.00	5,602.91	5,592.24	5,591.35	23.55	117.67	-171.81	-374.73	-174.52	1,356.89	1,218.05	138.85	9.773	
5,800.00	5,701.29	5,685.74	5,684.84	23.97	119.66	-171.93	-374.93	-174.52	1,374.86	1,233.66	141.20	9.737	
5,900.00	5,799.82	5,779.28	5,778.38	24.39	121.65	-172.04	-375.47	-174.52	1,392.33	1,248.78	143.55	9.699	
6,000.00	5,898.50	5,888.45	5,887.50	24.79	123.98	-172.15	-375.72	-174.52	1,408.59	1,262.32	146.27	9.630	
6,100.00	5,997.31	5,987.27	5,986.31	25.20	126.08	-172.25	-375.72	-174.52	1,423.80	1,275.05	148.74	9.572	
6,200.00	6,096.26	6,085.22	6,084.26	25.60	128.16	-172.33	-374.62	-174.52	1,437.05	1,285.85	151.20	9.505	
6,300.00	6,195.33	6,179.63	6,178.66	25.99	130.17	-172.41	-374.83	-174.52	1,450.78	1,297.22	153.56	9.448	
6,400.00	6,294.51	6,274.08	6,273.10	26.37	132.18	-172.48	-375.36	-174.52	1,463.97	1,308.04	155.92	9.389	
6,498.19	6,392.00	6,382.03	6,381.00	26.75	134.53	-172.55	-375.72	-174.52	1,475.87	1,317.21	158.66	9.302	
6,500.00	6,393.80	6,383.83	6,382.80	26.76	134.57	-171.34	-375.72	-174.52	1,476.08	1,317.38	158.70	9.301	
6,550.00	6,443.29	6,433.32	6,432.29	26.95	135.67	-148.14	-375.72	-174.52	1,482.59	1,322.60	159.98	9.267	
6,600.00	6,492.24	6,482.27	6,481.24	27.16	136.75	-136.91	-375.72	-174.52	1,490.62	1,329.36	161.26	9.244	
6,650.00	6,540.33	6,530.36	6,529.33	27.38	137.82	-130.63	-375.72	-174.52	1,500.16	1,337.65	162.51	9.231	
6,700.00	6,587.28	6,577.31	6,576.28	27.60	138.86	-126.59	-375.72	-174.52	1,511.23	1,347.49	163.74	9.229 SF	
6,750.00	6,632.80	6,621.55	6,620.51	27.84	139.83	-123.69	-374.53	-174.52	1,522.66	1,357.75	164.91	9.233	
6,800.00	6,676.60	6,663.31	6,662.27	28.09	140.76	-121.42	-374.60	-174.52	1,536.91	1,370.88	166.02	9.257	
6,850.00	6,718.42	6,703.14	6,702.10	28.34	141.64	-119.50	-374.71	-174.52	1,552.80	1,385.71	167.09	9.293	
6,900.00	6,758.00	6,740.79	6,739.74	28.60	142.47	-117.75	-374.86	-174.52	1,570.35	1,402.25	168.10	9.342	
6,950.00	6,795.09	6,776.02	6,774.97	28.87	143.25	-116.06	-375.04	-174.52	1,589.57	1,420.51	169.06	9.403	
7,000.00	6,829.46	6,808.62	6,807.57	29.14	143.98	-114.35	-375.25	-174.52	1,610.46	1,440.51	169.95	9.476	
7,050.00	6,860.91	6,838.39	6,837.34	29.43	144.64	-112.55	-375.46	-174.52	1,632.99	1,462.23	170.77	9.563	
7,100.00	6,889.24	6,879.37	6,878.24	29.73	145.55	-111.03	-375.72	-174.52	1,657.11	1,485.24	171.88	9.641	
7,150.00	6,914.27	6,904.40	6,903.27	30.05	146.13	-108.96	-375.72	-174.52	1,682.58	1,509.98	172.60	9.749	
7,200.00	6,935.85	6,925.98	6,924.85	30.37	146.62	-106.64	-375.72	-174.52	1,709.52	1,536.29	173.23	9.869	
7,250.00	6,953.84	6,943.98	6,942.84	30.71	147.04	-104.06	-375.72	-174.52	1,737.84	1,564.08	173.76	10.001	
7,300.00	6,968.15	6,958.28	6,957.15	31.06	147.37	-101.18	-375.72	-174.52	1,767.42	1,593.22	174.19	10.146	
7,350.00	6,978.67	6,968.81	6,967.67	31.42	147.61	-98.01	-375.72	-174.52	1,798.09	1,623.57	174.52	10.303	
7,400.00	6,985.34	6,975.48	6,974.34	31.79	147.76	-94.55	-375.72	-174.52	1,829.70	1,654.95	174.75	10.470	
7,450.00	6,988.13	6,978.27	6,977.13	32.17	147.83	-90.82	-375.72	-174.52	1,862.04	1,687.17	174.87	10.648	
7,461.13	6,988.22	6,978.36	6,977.22	32.26	147.83	-89.97	-375.72	-174.52	1,869.31	1,694.43	174.88	10.689	
7,500.00	6,988.19	6,978.33	6,977.19	32.56	147.83	-89.97	-375.72	-174.52	1,894.80	1,719.89	174.91	10.833	
7,600.00	6,988.12	6,978.26	6,977.12	33.37	147.83	-89.96	-375.72	-174.52	1,960.60	1,785.61	175.00	11.204	
7,700.00	6,988.05	6,978.19	6,977.05	34.21	147.82	-89.96	-375.72	-174.52	2,026.67	1,851.58	175.09	11.575	
7,800.00	6,987.98	6,978.11	6,976.98	35.09	147.82	-89.96	-375.72	-174.52	2,092.90	1,917.72	175.18	11.947	
7,900.00	6,987.91	6,978.04	6,976.91	35.99	147.82	-89.96	-375.72	-174.52	2,159.19	1,983.92	175.27	12.319	
8,000.00	6,987.83	6,977.97	6,976.83	36.93	147.82	-89.96	-375.72	-174.52	2,225.46	2,050.09	175.36	12.691	
8,100.00	6,987.76	6,977.89	6,976.76	37.88	147.82	-89.96	-375.72	-174.52	2,291.64	2,116.18	175.46	13.061	
8,200.00	6,987.68	6,977.82	6,976.68	38.86	147.82	-89.96	-375.72	-174.52	2,357.66	2,182.10	175.55	13.430	
8,300.00	6,987.61	6,977.75	6,976.61	39.86	147.81	-89.96	-375.72	-174.52	2,423.45	2,247.80	175.65	13.797	
8,400.00	6,987.53	6,977.67	6,976.53	40.87	147.81	-89.96	-375.72	-174.52	2,488.96	2,313.21	175.75	14.162	
8,500.00	6,987.46	6,977.60	6,976.46	41.90	147.81	-89.96	-375.72	-174.52	2,554.13	2,378.28	175.84	14.525	
8,600.00	6,987.38	6,977.52	6,976.38	42.93	147.81	-89.96	-375.72	-174.52	2,618.90	2,442.96	175.94	14.885	
8,700.00	6,987.31	6,977.45	6,976.31	43.98	147.81	-89.96	-375.72	-174.52	2,683.24	2,507.21	176.03	15.243	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 300-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,800.00	6,987.23	6,977.37	6,976.23	45.03	147.81	-89.96	-375.72	-174.52	2,747.09	2,570.97	176.12	15.598	
8,872.16	6,987.18	6,977.32	6,976.18	45.79	147.80	-89.97	-375.72	-174.52	2,792.85	2,616.66	176.19	15.852	
8,900.00	6,987.16	6,977.30	6,976.16	46.08	147.80	-89.96	-375.72	-174.52	2,810.53	2,634.32	176.21	15.950	
9,000.00	6,987.09	6,977.22	6,976.09	47.16	147.80	-89.96	-375.72	-174.52	2,875.36	2,699.06	176.30	16.309	
9,100.00	6,987.01	6,977.15	6,976.01	48.27	147.80	-89.96	-375.72	-174.52	2,942.16	2,765.77	176.39	16.680	
9,200.00	6,986.94	6,977.07	6,975.94	49.40	147.80	-89.96	-375.72	-174.52	3,010.81	2,834.33	176.47	17.061	
9,300.00	6,986.86	6,977.00	6,975.86	50.56	147.80	-89.96	-375.72	-174.52	3,081.17	2,904.61	176.56	17.451	
9,400.00	6,986.79	6,976.92	6,975.79	51.75	147.80	-89.95	-375.72	-174.52	3,153.13	2,976.49	176.64	17.851	
9,500.00	6,986.71	6,976.85	6,975.71	52.95	147.79	-89.95	-375.72	-174.52	3,226.59	3,049.87	176.71	18.259	
9,600.00	6,986.64	6,976.77	6,975.64	54.18	147.79	-89.95	-375.72	-174.52	3,301.44	3,124.65	176.79	18.675	
9,700.00	6,986.56	6,976.70	6,975.56	55.42	147.79	-89.95	-375.72	-174.52	3,377.59	3,200.73	176.86	19.098	
9,800.00	6,986.49	6,976.62	6,975.49	56.69	147.79	-89.95	-375.72	-174.52	3,454.96	3,278.03	176.93	19.527	
9,900.00	6,986.41	6,976.55	6,975.41	57.97	147.79	-89.94	-375.72	-174.52	3,533.47	3,356.47	177.00	19.963	
10,000.00	6,986.34	6,976.48	6,975.34	59.26	147.79	-89.94	-375.72	-174.52	3,613.03	3,435.97	177.06	20.405	
10,100.00	6,986.27	6,976.40	6,975.27	60.57	147.78	-89.94	-375.72	-174.52	3,693.60	3,516.47	177.13	20.853	
10,200.00	6,986.19	6,976.33	6,975.19	61.90	147.78	-89.94	-375.72	-174.52	3,775.09	3,597.90	177.19	21.305	
10,300.00	6,986.12	6,976.25	6,975.12	63.23	147.78	-89.94	-375.72	-174.52	3,857.45	3,680.20	177.25	21.763	
10,400.00	6,986.04	6,976.18	6,975.04	64.58	147.78	-89.94	-375.72	-174.52	3,940.63	3,763.32	177.31	22.224	
10,500.00	6,985.97	6,976.10	6,974.97	65.94	147.78	-89.93	-375.72	-174.52	4,024.57	3,847.20	177.37	22.690	
10,600.00	6,985.89	6,976.03	6,974.89	67.32	147.78	-89.93	-375.72	-174.52	4,109.23	3,931.81	177.43	23.160	
10,700.00	6,985.82	6,975.95	6,974.82	68.70	147.77	-89.93	-375.72	-174.52	4,194.57	4,017.09	177.48	23.634	
10,800.00	6,985.74	6,975.88	6,974.74	70.09	147.77	-89.93	-375.72	-174.52	4,280.55	4,103.01	177.54	24.111	
10,900.00	6,985.67	6,975.80	6,974.67	71.49	147.77	-89.93	-375.72	-174.52	4,367.12	4,189.52	177.59	24.591	
11,000.00	6,985.59	6,975.73	6,974.59	72.90	147.77	-89.92	-375.72	-174.52	4,454.25	4,276.60	177.65	25.074	
11,100.00	6,985.52	6,975.66	6,974.52	74.31	147.77	-89.92	-375.72	-174.52	4,541.91	4,364.21	177.70	25.559	
11,200.00	6,985.45	6,975.58	6,974.45	75.74	147.76	-89.92	-375.72	-174.52	4,630.07	4,452.32	177.75	26.048	
11,300.00	6,985.37	6,975.51	6,974.37	77.17	147.76	-89.92	-375.72	-174.52	4,718.71	4,540.90	177.81	26.539	
11,400.00	6,985.30	6,975.43	6,974.30	78.61	147.76	-89.92	-375.72	-174.52	4,807.79	4,629.93	177.86	27.032	
11,500.00	6,985.22	6,975.36	6,974.22	80.05	147.76	-89.91	-375.72	-174.52	4,897.29	4,719.38	177.91	27.527	
11,600.00	6,985.15	6,975.28	6,974.15	81.50	147.76	-89.91	-375.72	-174.52	4,987.20	4,809.23	177.96	28.024	
11,700.00	6,985.07	6,975.21	6,974.07	82.96	147.76	-89.91	-375.72	-174.52	5,077.47	4,899.46	178.01	28.523	
11,800.00	6,985.00	6,975.13	6,974.00	84.42	147.75	-89.91	-375.72	-174.52	5,168.11	4,990.05	178.06	29.024	
11,900.00	6,984.92	6,975.06	6,973.92	85.89	147.75	-89.91	-375.72	-174.52	5,259.09	5,080.97	178.12	29.526	
12,000.00	6,984.85	6,974.98	6,973.85	87.36	147.75	-89.90	-375.72	-174.52	5,350.39	5,172.22	178.17	30.030	
12,100.00	6,984.77	6,974.91	6,973.77	88.83	147.75	-89.90	-375.72	-174.52	5,441.99	5,263.77	178.22	30.536	
12,200.00	6,984.70	6,974.84	6,973.70	90.31	147.75	-89.90	-375.72	-174.52	5,533.89	5,355.62	178.27	31.042	
12,300.00	6,984.63	6,974.76	6,973.63	91.80	147.75	-89.90	-375.72	-174.52	5,626.06	5,447.74	178.32	31.550	
12,400.00	6,984.55	6,974.69	6,973.55	93.29	147.74	-89.90	-375.72	-174.52	5,718.49	5,540.12	178.37	32.059	
12,500.00	6,984.48	6,974.61	6,973.48	94.78	147.74	-89.89	-375.72	-174.52	5,811.18	5,632.75	178.43	32.569	
12,600.00	6,984.40	6,974.54	6,973.40	96.28	147.74	-89.89	-375.72	-174.52	5,904.10	5,725.63	178.48	33.080	
12,700.00	6,984.33	6,974.46	6,973.33	97.78	147.74	-89.89	-375.72	-174.52	5,997.25	5,818.72	178.53	33.592	
12,800.00	6,984.25	6,974.39	6,973.25	99.28	147.74	-89.89	-375.72	-174.52	6,090.62	5,912.04	178.58	34.105	
12,900.00	6,984.18	6,974.31	6,973.18	100.78	147.74	-89.89	-375.72	-174.52	6,184.20	6,005.56	178.64	34.619	
13,000.00	6,984.10	6,974.24	6,973.10	102.29	147.73	-89.88	-375.72	-174.52	6,277.97	6,099.29	178.69	35.134	
13,100.00	6,984.03	6,974.16	6,973.03	103.80	147.73	-89.88	-375.72	-174.52	6,371.94	6,193.20	178.74	35.649	
13,200.00	6,983.95	6,974.09	6,972.95	105.32	147.73	-89.88	-375.72	-174.52	6,466.08	6,287.29	178.80	36.165	
13,300.00	6,983.88	6,974.02	6,972.88	106.84	147.73	-89.88	-375.72	-174.52	6,560.40	6,381.55	178.85	36.681	
13,400.00	6,983.81	6,973.94	6,972.81	108.36	147.73	-89.88	-375.72	-174.52	6,654.88	6,475.98	178.90	37.198	
13,500.00	6,983.73	6,973.87	6,972.73	109.88	147.73	-89.87	-375.72	-174.52	6,749.53	6,570.57	178.96	37.715	
13,600.00	6,983.66	6,973.79	6,972.66	111.40	147.72	-89.87	-375.72	-174.52	6,844.32	6,665.31	179.01	38.233	
13,700.00	6,983.58	6,973.72	6,972.58	112.93	147.72	-89.87	-375.72	-174.52	6,939.26	6,760.19	179.07	38.752	
13,800.00	6,983.51	6,973.64	6,972.51	114.46	147.72	-89.87	-375.72	-174.52	7,034.34	6,855.22	179.13	39.270	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		300-A027Ua_INC-ONLY						Rule Assigned:		Offset Well Error:		0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	6,983.43	6,973.57	6,972.43	115.99	147.72	-89.87	-375.72	-174.52	7,129.56	6,950.38	179.18	39.789	
14,000.00	6,983.36	6,973.49	6,972.36	117.52	147.72	-89.86	-375.72	-174.52	7,224.91	7,045.67	179.24	40.309	
14,100.00	6,983.28	6,973.42	6,972.28	119.06	147.72	-89.86	-375.72	-174.52	7,320.38	7,141.08	179.30	40.828	
14,200.00	6,983.21	6,973.34	6,972.21	120.59	147.71	-89.86	-375.72	-174.52	7,415.96	7,236.61	179.36	41.348	
14,300.00	6,983.13	6,973.27	6,972.13	122.13	147.71	-89.86	-375.72	-174.52	7,511.67	7,332.25	179.41	41.868	
14,400.00	6,983.06	6,973.20	6,972.06	123.67	147.71	-89.86	-375.72	-174.52	7,607.48	7,428.01	179.47	42.388	
14,500.00	6,982.99	6,973.12	6,971.99	125.21	147.71	-89.85	-375.72	-174.52	7,703.40	7,523.87	179.53	42.908	
14,600.00	6,982.91	6,973.05	6,971.91	126.75	147.71	-89.85	-375.72	-174.52	7,799.43	7,619.83	179.59	43.429	
14,700.00	6,982.84	6,972.97	6,971.84	128.30	147.70	-89.85	-375.72	-174.52	7,895.55	7,715.90	179.65	43.949	
14,800.00	6,982.76	6,972.90	6,971.76	129.85	147.70	-89.85	-375.72	-174.52	7,991.77	7,812.05	179.71	44.470	
14,900.00	6,982.69	6,972.82	6,971.69	131.39	147.70	-89.85	-375.72	-174.52	8,088.07	7,908.30	179.77	44.990	
15,000.00	6,982.61	6,972.75	6,971.61	132.94	147.70	-89.84	-375.72	-174.52	8,184.47	8,004.64	179.84	45.511	
15,100.00	6,982.54	6,972.67	6,971.54	134.49	147.70	-89.84	-375.72	-174.52	8,280.95	8,101.06	179.90	46.031	
15,200.00	6,982.46	6,972.60	6,971.46	136.04	147.70	-89.84	-375.72	-174.52	8,377.52	8,197.56	179.96	46.552	
15,300.00	6,982.39	6,972.52	6,971.39	137.60	147.69	-89.84	-375.72	-174.52	8,474.16	8,294.14	180.02	47.073	
15,400.00	6,982.31	6,972.45	6,971.31	139.15	147.69	-89.84	-375.72	-174.52	8,570.89	8,390.80	180.09	47.593	
15,500.00	6,982.24	6,972.38	6,971.24	140.70	147.69	-89.83	-375.72	-174.52	8,667.68	8,487.53	180.15	48.113	
15,600.00	6,982.17	6,972.30	6,971.17	142.26	147.69	-89.83	-375.72	-174.52	8,764.55	8,584.34	180.22	48.634	
15,700.00	6,982.09	6,972.23	6,971.09	143.82	147.69	-89.83	-375.72	-174.52	8,861.49	8,681.21	180.28	49.154	
15,800.00	6,982.02	6,972.15	6,971.02	145.38	147.69	-89.83	-375.72	-174.52	8,958.49	8,778.15	180.35	49.674	
15,900.00	6,981.94	6,972.08	6,970.94	146.94	147.68	-89.83	-375.72	-174.52	9,055.56	8,875.15	180.41	50.193	
16,000.00	6,981.87	6,972.00	6,970.87	148.50	147.68	-89.82	-375.72	-174.52	9,152.70	8,972.22	180.48	50.713	
16,100.00	6,981.79	6,971.93	6,970.79	150.06	147.68	-89.82	-375.72	-174.52	9,249.89	9,069.35	180.55	51.232	
16,200.00	6,981.72	6,971.85	6,970.72	151.62	147.68	-89.82	-375.72	-174.52	9,347.15	9,166.53	180.62	51.752	
16,300.00	6,981.64	6,971.78	6,970.64	153.18	147.68	-89.82	-375.72	-174.52	9,444.46	9,263.77	180.68	52.271	
16,400.00	6,981.57	6,971.70	6,970.57	154.74	147.68	-89.82	-375.72	-174.52	9,541.82	9,361.07	180.75	52.789	
16,500.00	6,981.49	6,971.63	6,970.49	156.31	147.67	-89.81	-375.72	-174.52	9,639.24	9,458.42	180.82	53.308	
16,600.00	6,981.42	6,971.56	6,970.42	157.87	147.67	-89.81	-375.72	-174.52	9,736.72	9,555.83	180.89	53.826	
16,700.00	6,981.35	6,971.48	6,970.35	159.44	147.67	-89.81	-375.72	-174.52	9,834.24	9,653.28	180.96	54.344	
16,800.00	6,981.27	6,971.41	6,970.27	161.01	147.67	-89.81	-375.72	-174.52	9,931.81	9,750.78	181.03	54.862	
16,900.00	6,981.20	6,971.33	6,970.20	162.58	147.67	-89.81	-375.72	-174.52	10,029.43	9,848.33	181.10	55.379	
17,000.00	6,981.12	6,971.26	6,970.12	164.14	147.67	-89.80	-375.72	-174.52	10,127.10	9,945.93	181.18	55.897	
17,100.00	6,981.05	6,971.18	6,970.05	165.71	147.66	-89.80	-375.72	-174.52	10,224.81	10,043.57	181.25	56.413	
17,200.00	6,980.97	6,971.11	6,969.97	167.28	147.66	-89.80	-375.72	-174.52	10,322.57	10,141.25	181.32	56.930	
17,300.00	6,980.90	6,971.03	6,969.90	168.85	147.66	-89.80	-375.72	-174.52	10,420.37	10,238.97	181.39	57.446	
17,400.00	6,980.82	6,970.96	6,969.82	170.42	147.66	-89.80	-375.72	-174.52	10,518.21	10,336.74	181.47	57.962	
17,500.00	6,980.75	6,970.88	6,969.75	172.00	147.66	-89.79	-375.72	-174.52	10,616.09	10,434.55	181.54	58.477	
17,600.00	6,980.67	6,970.81	6,969.67	173.57	147.66	-89.79	-375.72	-174.52	10,714.01	10,532.39	181.62	58.992	
17,700.00	6,980.60	6,970.74	6,969.60	175.14	147.65	-89.79	-375.72	-174.52	10,811.97	10,630.27	181.69	59.507	
17,800.00	6,980.53	6,970.66	6,969.53	176.71	147.65	-89.79	-375.72	-174.52	10,909.96	10,728.19	181.77	60.021	
17,900.00	6,980.45	6,970.59	6,969.45	178.29	147.65	-89.79	-375.72	-174.52	11,007.99	10,826.15	181.84	60.535	
18,000.00	6,980.38	6,970.51	6,969.38	179.86	147.65	-89.79	-375.72	-174.52	11,106.06	10,924.14	181.92	61.049	
18,100.00	6,980.30	6,970.44	6,969.30	181.44	147.65	-89.78	-375.72	-174.52	11,204.16	11,022.16	182.00	61.562	
18,200.00	6,980.23	6,970.36	6,969.23	183.01	147.64	-89.78	-375.72	-174.52	11,302.29	11,120.21	182.08	62.075	
18,300.00	6,980.15	6,970.29	6,969.15	184.59	147.64	-89.78	-375.72	-174.52	11,400.46	11,218.30	182.15	62.587	
18,400.00	6,980.08	6,970.21	6,969.08	186.16	147.64	-89.78	-375.72	-174.52	11,498.65	11,316.42	182.23	63.099	
18,500.00	6,980.00	6,970.14	6,969.00	187.74	147.64	-89.78	-375.72	-174.52	11,596.88	11,414.57	182.31	63.610	
18,600.00	6,979.93	6,970.06	6,968.93	189.32	147.64	-89.77	-375.72	-174.52	11,695.14	11,512.75	182.39	64.121	
18,700.00	6,979.85	6,969.99	6,968.85	190.90	147.64	-89.77	-375.72	-174.52	11,793.43	11,610.96	182.47	64.632	
18,800.00	6,979.78	6,969.92	6,968.78	192.48	147.63	-89.77	-375.72	-174.52	11,891.74	11,709.19	182.55	65.142	
18,900.00	6,979.71	6,969.84	6,968.71	194.05	147.63	-89.77	-375.72	-174.52	11,990.09	11,807.45	182.63	65.651	
19,000.00	6,979.63	6,969.77	6,968.63	195.63	147.63	-89.77	-375.72	-174.52	12,088.46	11,905.74	182.71	66.160	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #053 - OH - OH-INC												Offset Site Error: 0.00 usft	
Survey Program:		300-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
19,100.00	6,979.56	6,969.69	6,968.56	197.21	147.63	-89.76	-375.72	-174.52	12,186.86	12,004.06	182.80	66.669	
19,200.00	6,979.48	6,969.62	6,968.48	198.79	147.63	-89.76	-375.72	-174.52	12,285.28	12,102.40	182.88	67.177	
19,300.00	6,979.41	6,969.54	6,968.41	200.37	147.63	-89.76	-375.72	-174.52	12,383.73	12,200.77	182.96	67.685	
19,400.00	6,979.33	6,969.47	6,968.33	201.95	147.62	-89.76	-375.72	-174.52	12,482.20	12,299.16	183.05	68.192	
19,500.00	6,979.26	6,969.39	6,968.26	203.54	147.62	-89.76	-375.72	-174.52	12,580.70	12,397.57	183.13	68.699	
19,600.00	6,979.18	6,969.32	6,968.18	205.12	147.62	-89.75	-375.72	-174.52	12,679.22	12,496.01	183.21	69.205	
19,700.00	6,979.11	6,969.24	6,968.11	206.70	147.62	-89.75	-375.72	-174.52	12,777.76	12,594.47	183.30	69.710	
19,800.00	6,979.03	6,969.17	6,968.03	208.28	147.62	-89.75	-375.72	-174.52	12,876.33	12,692.95	183.38	70.216	
19,900.00	6,978.96	6,969.10	6,967.96	209.86	147.62	-89.75	-375.72	-174.52	12,974.92	12,791.45	183.47	70.720	
20,000.00	6,978.89	6,969.02	6,967.89	211.45	147.61	-89.75	-375.72	-174.52	13,073.53	12,889.97	183.55	71.224	
20,100.00	6,978.81	6,968.95	6,967.81	213.03	147.61	-89.74	-375.72	-174.52	13,172.16	12,988.52	183.64	71.728	
20,200.00	6,978.74	6,968.87	6,967.74	214.61	147.61	-89.74	-375.72	-174.52	13,270.81	13,087.08	183.73	72.231	
20,300.00	6,978.66	6,968.80	6,967.66	216.20	147.61	-89.74	-375.72	-174.52	13,369.48	13,185.67	183.81	72.734	
20,400.00	6,978.59	6,968.72	6,967.59	217.78	147.61	-89.74	-375.72	-174.52	13,468.17	13,284.27	183.90	73.236	
20,500.00	6,978.51	6,968.65	6,967.51	219.37	147.61	-89.74	-375.72	-174.52	13,566.88	13,382.89	183.99	73.737	
20,600.00	6,978.44	6,968.57	6,967.44	220.95	147.60	-89.73	-375.72	-174.52	13,665.61	13,481.53	184.08	74.238	
20,700.00	6,978.36	6,968.50	6,967.36	222.53	147.60	-89.73	-375.72	-174.52	13,764.36	13,580.19	184.17	74.738	
20,800.00	6,978.29	6,968.42	6,967.29	224.12	147.60	-89.73	-375.72	-174.52	13,863.12	13,678.87	184.26	75.238	
20,900.00	6,978.21	6,968.35	6,967.21	225.71	147.60	-89.73	-375.72	-174.52	13,961.90	13,777.56	184.35	75.737	
21,000.00	6,978.14	6,968.28	6,967.14	227.29	147.60	-89.73	-375.72	-174.52	14,060.70	13,876.27	184.44	76.236	
21,100.00	6,978.07	6,968.20	6,967.07	228.88	147.60	-89.72	-375.72	-174.52	14,159.52	13,974.99	184.53	76.734	
21,200.00	6,977.99	6,968.13	6,966.99	230.46	147.59	-89.72	-375.72	-174.52	14,258.35	14,073.74	184.62	77.232	
21,300.00	6,977.92	6,968.05	6,966.92	232.05	147.59	-89.72	-375.72	-174.52	14,357.20	14,172.49	184.71	77.729	
21,400.00	6,977.84	6,967.98	6,966.84	233.64	147.59	-89.72	-375.72	-174.52	14,456.07	14,271.27	184.80	78.225	
21,500.00	6,977.77	6,967.90	6,966.77	235.22	147.59	-89.72	-375.72	-174.52	14,554.95	14,370.06	184.89	78.721	
21,600.00	6,977.69	6,967.83	6,966.69	236.81	147.59	-89.71	-375.72	-174.52	14,653.85	14,468.86	184.99	79.216	
21,700.00	6,977.62	6,967.75	6,966.62	238.40	147.58	-89.71	-375.72	-174.52	14,752.76	14,567.68	185.08	79.711	
21,800.00	6,977.54	6,967.68	6,966.54	239.99	147.58	-89.71	-375.72	-174.52	14,851.68	14,666.51	185.17	80.205	
21,900.00	6,977.47	6,967.60	6,966.47	241.57	147.58	-89.71	-375.72	-174.52	14,950.62	14,765.36	185.27	80.698	
22,000.00	6,977.39	6,967.53	6,966.39	243.16	147.58	-89.71	-375.72	-174.52	15,049.58	14,864.22	185.36	81.191	
22,100.00	6,977.32	6,967.46	6,966.32	244.75	147.58	-89.70	-375.72	-174.52	15,148.54	14,963.09	185.45	81.683	
22,200.00	6,977.25	6,967.38	6,966.25	246.34	147.58	-89.70	-375.72	-174.52	15,247.52	15,061.97	185.55	82.175	
22,300.00	6,977.17	6,967.31	6,966.17	247.93	147.57	-89.70	-375.72	-174.52	15,346.52	15,160.87	185.64	82.666	
22,400.00	6,977.10	6,967.23	6,966.10	249.52	147.57	-89.70	-375.72	-174.52	15,445.52	15,259.79	185.74	83.157	
22,500.00	6,977.02	6,967.16	6,966.02	251.11	147.57	-89.70	-375.72	-174.52	15,544.54	15,358.71	185.84	83.647	
22,529.62	6,977.00	6,967.14	6,966.00	251.58	147.57	-89.70	-375.72	-174.52	15,573.87	15,388.01	185.86	83.792	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 320-APC_ISCWSA REV 2 MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	48.82	48.82	0.00	0.06	-69.28	2,416.30	-6,388.51	6,830.22				
100.00	100.00	1,246.23	1,229.65	0.25	3.53	-70.30	2,272.52	-6,346.87	6,825.15	6,821.51	3.64	1,873.054	
200.00	200.00	1,305.28	1,286.89	0.61	3.79	-70.40	2,258.69	-6,342.45	6,809.90	6,805.76	4.13	1,646.998	
300.00	300.00	1,423.24	1,401.11	0.97	4.37	-70.60	2,230.46	-6,333.95	6,794.81	6,789.85	4.96	1,369.924	
400.00	400.00	1,538.84	1,512.87	1.33	4.95	-70.80	2,202.19	-6,325.49	6,779.49	6,773.68	5.81	1,166.592	
500.00	500.00	1,594.00	1,566.21	1.68	5.21	-70.90	2,188.69	-6,321.51	6,764.33	6,757.95	6.38	1,059.669	
550.00	550.00	1,617.50	1,588.98	1.86	5.31	-70.94	2,183.10	-6,319.86	6,757.00	6,750.36	6.65	1,016.799	
600.00	600.00	1,636.91	1,607.82	2.04	5.39	-68.73	2,178.66	-6,318.53	6,749.74	6,742.85	6.89	979.018	
700.00	699.93	1,690.67	1,660.17	2.40	5.62	-69.11	2,166.96	-6,314.99	6,734.91	6,727.46	7.45	904.109	
800.00	799.68	1,782.64	1,749.79	2.77	6.01	-69.60	2,147.17	-6,309.14	6,719.26	6,711.10	8.16	823.346	
900.00	899.13	1,926.22	1,889.53	3.13	6.68	-70.28	2,115.56	-6,299.71	6,702.18	6,693.07	9.11	735.592	
1,000.00	998.15	2,023.87	1,984.26	3.49	7.15	-70.92	2,092.66	-6,293.49	6,683.77	6,673.87	9.90	674.800	
1,100.00	1,096.63	2,202.06	2,156.73	3.87	8.03	-71.88	2,049.88	-6,280.35	6,663.08	6,652.03	11.05	603.019	
1,130.50	1,126.54	2,225.00	2,178.91	3.99	8.14	-72.09	2,044.26	-6,278.63	6,656.61	6,645.34	11.27	590.614	
1,200.00	1,194.61	2,292.54	2,244.16	4.26	8.48	-72.32	2,027.54	-6,273.62	6,641.82	6,629.97	11.85	560.638	
1,300.00	1,292.57	2,369.46	2,318.58	4.66	8.85	-72.59	2,008.98	-6,267.78	6,620.76	6,608.19	12.57	526.746	
1,400.00	1,390.52	2,440.35	2,387.25	5.07	9.17	-72.84	1,992.25	-6,262.46	6,600.16	6,586.90	13.26	497.600	
1,500.00	1,488.48	2,527.77	2,471.93	5.48	9.59	-73.14	1,971.44	-6,256.17	6,579.98	6,565.93	14.06	468.147	
1,600.00	1,586.43	2,580.16	2,522.70	5.90	9.84	-73.33	1,959.11	-6,252.44	6,560.22	6,545.52	14.70	446.279	
1,700.00	1,684.38	2,641.98	2,582.82	6.31	10.11	-73.54	1,945.29	-6,248.24	6,541.21	6,525.84	15.37	425.460	
1,800.00	1,782.34	2,740.56	2,678.70	6.73	10.55	-73.87	1,923.37	-6,241.58	6,522.52	6,506.33	16.19	402.789	
1,900.00	1,880.29	2,839.50	2,774.95	7.15	10.99	-74.21	1,901.44	-6,234.97	6,504.15	6,487.13	17.02	382.110	
2,000.00	1,978.25	2,944.22	2,876.74	7.58	11.48	-74.58	1,877.95	-6,227.67	6,485.66	6,467.77	17.89	362.502	
2,100.00	2,076.20	3,062.66	2,991.64	8.00	12.05	-75.00	1,850.51	-6,219.13	6,466.97	6,448.13	18.84	343.286	
2,200.00	2,174.15	3,133.25	3,060.15	8.43	12.37	-75.25	1,834.28	-6,213.98	6,448.52	6,428.95	19.57	329.495	
2,300.00	2,272.11	3,184.00	3,109.46	8.85	12.59	-75.43	1,822.86	-6,210.44	6,430.72	6,410.50	20.22	318.044	
2,400.00	2,370.06	3,229.00	3,153.32	9.28	12.78	-75.58	1,813.20	-6,207.56	6,413.82	6,392.98	20.85	307.677	
2,500.00	2,468.02	3,260.38	3,184.01	9.71	12.90	-75.69	1,806.87	-6,205.71	6,397.89	6,376.48	21.41	298.778	
2,600.00	2,565.97	3,301.08	3,223.92	10.14	13.06	-75.82	1,799.29	-6,203.51	6,382.97	6,360.96	22.01	289.992	
2,700.00	2,663.92	3,368.00	3,289.76	10.57	13.30	-76.03	1,787.78	-6,199.99	6,368.74	6,346.06	22.68	280.778	
2,800.00	2,761.88	3,417.00	3,338.06	11.00	13.47	-76.18	1,779.88	-6,197.56	6,355.21	6,331.92	23.29	272.843	
2,900.00	2,859.83	3,447.55	3,368.22	11.43	13.57	-76.27	1,775.24	-6,196.24	6,342.66	6,318.82	23.84	266.034	
3,000.00	2,957.79	3,480.00	3,400.32	11.86	13.67	-76.37	1,770.62	-6,195.14	6,331.23	6,306.84	24.40	259.526	
3,100.00	3,055.74	3,567.18	3,486.64	12.29	13.94	-76.62	1,758.72	-6,192.55	6,320.52	6,295.42	25.10	251.783	
3,200.00	3,153.69	3,656.41	3,575.17	12.72	14.20	-76.87	1,747.91	-6,189.59	6,309.96	6,284.17	25.79	244.623	
3,300.00	3,251.65	3,706.06	3,624.52	13.15	14.32	-77.00	1,742.79	-6,187.93	6,299.90	6,273.53	26.37	238.910	
3,400.00	3,349.60	3,732.00	3,650.34	13.59	14.39	-77.07	1,740.39	-6,187.19	6,290.81	6,263.92	26.89	233.985	
3,500.00	3,447.56	3,794.00	3,712.15	14.02	14.52	-77.21	1,735.80	-6,185.80	6,282.60	6,255.13	27.47	228.742	
3,600.00	3,545.51	3,838.60	3,756.69	14.45	14.61	-77.31	1,733.47	-6,185.05	6,275.31	6,247.32	28.00	224.146	
3,700.00	3,643.46	3,908.00	3,826.01	14.88	14.73	-77.46	1,730.40	-6,184.13	6,268.66	6,240.10	28.57	219.442	
3,800.00	3,741.42	4,015.84	3,933.74	15.32	14.92	-77.70	1,725.69	-6,182.73	6,262.13	6,232.92	29.21	214.401	
3,900.00	3,839.37	4,111.05	4,028.85	15.75	15.09	-77.90	1,721.59	-6,181.51	6,255.73	6,225.90	29.83	209.737	
4,000.00	3,937.33	4,206.29	4,124.00	16.18	15.26	-78.11	1,717.56	-6,180.31	6,249.44	6,219.00	30.45	205.265	
4,100.00	4,035.28	4,301.56	4,219.18	16.62	15.43	-78.32	1,713.57	-6,179.13	6,243.27	6,212.21	31.07	200.974	
4,200.00	4,133.23	4,396.86	4,314.39	17.05	15.59	-78.52	1,709.64	-6,177.96	6,237.22	6,205.53	31.68	196.854	
4,300.00	4,231.19	4,492.19	4,409.64	17.48	15.76	-78.73	1,705.77	-6,176.81	6,231.27	6,198.97	32.30	192.895	
4,400.00	4,329.14	4,587.55	4,504.91	17.92	15.93	-78.93	1,701.96	-6,175.68	6,225.45	6,192.52	32.92	189.088	
4,500.00	4,427.10	4,682.93	4,600.22	18.35	16.10	-79.14	1,698.20	-6,174.56	6,219.73	6,186.19	33.54	185.424	
4,600.00	4,525.05	4,778.35	4,695.56	18.78	16.27	-79.34	1,694.49	-6,173.46	6,214.13	6,179.97	34.16	181.896	
4,700.00	4,623.00	4,873.79	4,790.92	19.22	16.44	-79.55	1,690.85	-6,172.38	6,208.65	6,173.87	34.78	178.497	
4,800.00	4,720.96	4,969.27	4,886.32	19.65	16.61	-79.76	1,687.26	-6,171.31	6,203.28	6,167.87	35.40	175.220	
4,900.00	4,818.91	5,064.77	4,981.76	20.09	16.78	-79.96	1,683.72	-6,170.26	6,198.01	6,161.99	36.02	172.058	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		320-APC_ISCWSA REV 2 MWD					Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
5,000.00	4,916.87	5,160.30	5,077.22	20.52	16.95	-80.17	1,680.24	-6,169.22	6,192.87	6,156.22	36.64	169.007		
5,100.00	5,014.82	5,255.86	5,172.71	20.96	17.12	-80.37	1,676.82	-6,168.21	6,187.83	6,150.57	37.26	166.059		
5,200.00	5,112.77	5,351.45	5,268.23	21.39	17.29	-80.58	1,673.45	-6,167.21	6,182.90	6,145.02	37.88	163.211		
5,300.00	5,210.73	5,447.07	5,363.79	21.82	17.46	-80.78	1,670.14	-6,166.22	6,178.09	6,139.59	38.50	160.458		
5,400.00	5,308.68	5,542.71	5,459.37	22.26	17.63	-80.99	1,666.89	-6,165.26	6,173.38	6,134.26	39.12	157.794		
5,493.23	5,400.00	5,631.90	5,548.51	22.66	17.79	-81.18	1,663.91	-6,164.37	6,169.10	6,129.40	39.70	155.388		
5,500.00	5,406.64	5,638.39	5,554.99	22.69	17.80	-81.19	1,663.70	-6,164.31	6,168.79	6,129.05	39.74	155.217		
5,600.00	5,504.69	5,734.20	5,650.75	23.12	17.97	-81.37	1,660.55	-6,163.37	6,164.38	6,124.02	40.36	152.735		
5,700.00	5,602.91	5,830.23	5,746.73	23.55	18.14	-81.54	1,657.46	-6,162.46	6,160.20	6,119.23	40.97	150.354		
5,800.00	5,701.29	5,926.48	5,842.92	23.97	18.32	-81.71	1,654.42	-6,161.55	6,156.25	6,114.68	41.58	148.069		
5,900.00	5,799.82	6,022.93	5,939.32	24.39	18.49	-81.87	1,651.43	-6,160.66	6,152.52	6,110.34	42.18	145.876		
6,000.00	5,898.50	6,119.57	6,035.91	24.79	18.66	-82.02	1,648.49	-6,159.79	6,148.99	6,106.22	42.77	143.768		
6,100.00	5,997.31	6,216.39	6,132.69	25.20	18.83	-82.17	1,645.61	-6,158.94	6,145.66	6,102.30	43.36	141.742		
6,200.00	6,096.26	6,313.39	6,229.64	25.60	19.01	-82.30	1,642.78	-6,158.09	6,142.53	6,098.59	43.94	139.793		
6,300.00	6,195.33	6,410.56	6,326.76	25.99	19.18	-82.44	1,640.01	-6,157.27	6,139.58	6,095.06	44.52	137.918		
6,400.00	6,294.51	6,507.88	6,424.05	26.37	19.36	-82.56	1,637.29	-6,156.46	6,136.81	6,091.72	45.09	136.112		
6,498.19	6,392.00	6,603.58	6,519.71	26.75	19.53	-82.68	1,634.67	-6,155.69	6,134.26	6,088.62	45.64	134.404		
6,500.00	6,393.80	6,605.35	6,521.48	26.76	19.53	-81.48	1,634.62	-6,155.67	6,134.21	6,088.56	45.65	134.373		
6,550.00	6,443.29	6,653.91	6,570.01	26.95	19.62	-58.91	1,633.32	-6,155.28	6,131.03	6,085.10	45.94	133.466		
6,600.00	6,492.24	6,701.86	6,617.94	27.16	19.70	-48.45	1,632.04	-6,154.90	6,124.29	6,078.06	46.23	132.466		
6,650.00	6,540.33	6,748.90	6,664.98	27.38	19.79	-43.09	1,630.81	-6,154.54	6,114.04	6,067.50	46.54	131.384		
6,700.00	6,587.28	6,794.77	6,710.82	27.60	19.87	-40.16	1,629.62	-6,154.18	6,100.34	6,053.50	46.84	130.229		
6,750.00	6,632.80	6,839.16	6,755.20	27.84	19.95	-38.60	1,628.48	-6,153.84	6,083.29	6,036.14	47.15	129.010		
6,800.00	6,676.60	6,881.81	6,797.83	28.09	20.02	-37.95	1,627.39	-6,153.52	6,063.00	6,015.54	47.47	127.735		
6,850.00	6,718.42	6,922.46	6,838.47	28.34	20.10	-37.97	1,626.37	-6,153.22	6,039.61	5,991.83	47.78	126.415		
6,900.00	6,758.00	6,960.85	6,876.85	28.60	20.17	-38.54	1,625.41	-6,152.93	6,013.27	5,965.18	48.08	125.055		
6,950.00	6,795.09	6,996.76	6,912.74	28.87	20.23	-39.64	1,624.53	-6,152.67	5,984.14	5,935.75	48.39	123.665		
7,000.00	6,829.46	7,029.96	6,945.93	29.14	20.29	-41.25	1,623.71	-6,152.43	5,952.42	5,903.73	48.69	122.251		
7,050.00	6,860.91	7,060.24	6,976.20	29.43	20.34	-43.42	1,622.98	-6,152.21	5,918.31	5,869.33	48.98	120.819		
7,100.00	6,889.24	7,087.41	7,003.37	29.73	20.39	-46.20	1,622.33	-6,152.02	5,882.03	5,832.76	49.27	119.377		
7,150.00	6,914.27	7,111.32	7,027.27	30.05	20.44	-49.67	1,621.75	-6,151.85	5,843.81	5,794.26	49.55	117.930		
7,200.00	6,935.85	7,131.80	7,047.74	30.37	20.47	-53.93	1,621.27	-6,151.70	5,803.89	5,754.06	49.83	116.483		
7,250.00	6,953.84	7,148.73	7,064.67	30.71	20.50	-59.10	1,620.87	-6,151.58	5,762.52	5,712.43	50.09	115.043		
7,300.00	6,968.15	7,162.01	7,077.94	31.06	20.53	-65.24	1,620.55	-6,151.49	5,719.96	5,669.61	50.35	113.614		
7,350.00	6,978.67	7,171.55	7,087.48	31.42	20.54	-72.39	1,620.33	-6,151.42	5,676.47	5,625.88	50.59	112.201		
7,400.00	6,985.34	7,177.29	7,093.21	31.79	20.55	-80.42	1,620.19	-6,151.38	5,632.33	5,581.50	50.83	110.810		
7,450.00	6,988.13	7,179.18	7,095.11	32.17	20.56	-89.08	1,620.15	-6,151.37	5,587.80	5,536.74	51.06	109.443		
7,461.13	6,988.22	7,179.08	7,095.01	32.26	20.56	-91.06	1,620.15	-6,151.37	5,577.86	5,526.76	51.11	109.142		
7,500.00	6,988.19	7,178.39	7,094.32	32.56	20.56	-91.07	1,620.17	-6,151.38	5,543.06	5,491.78	51.28	108.098		
7,600.00	6,988.12	7,176.67	7,092.59	33.37	20.55	-91.11	1,620.21	-6,151.39	5,452.72	5,401.00	51.72	105.434		
7,700.00	6,988.05	7,175.00	7,090.93	34.21	20.55	-91.16	1,620.25	-6,151.40	5,361.24	5,309.09	52.15	102.805		
7,800.00	6,987.98	7,173.40	7,089.32	35.09	20.55	-91.22	1,620.29	-6,151.41	5,268.68	5,216.10	52.57	100.218		
7,900.00	6,987.91	7,171.86	7,087.79	35.99	20.54	-91.29	1,620.32	-6,151.42	5,175.09	5,122.11	52.98	97.677		
8,000.00	6,987.83	7,170.38	7,086.31	36.93	20.54	-91.37	1,620.36	-6,151.43	5,080.55	5,027.17	53.37	95.186		
8,100.00	6,987.76	7,168.98	7,084.91	37.88	20.54	-91.48	1,620.39	-6,151.44	4,985.11	4,931.36	53.75	92.749		
8,200.00	6,987.68	7,167.64	7,083.57	38.86	20.54	-91.62	1,620.42	-6,151.45	4,888.83	4,834.73	54.10	90.368		
8,300.00	6,987.61	7,166.38	7,082.31	39.86	20.53	-91.80	1,620.45	-6,151.46	4,791.80	4,737.38	54.42	88.046		
8,400.00	6,987.53	7,165.19	7,081.12	40.87	20.53	-92.04	1,620.48	-6,151.47	4,694.09	4,639.37	54.72	85.785		
8,500.00	6,987.46	7,164.08	7,080.01	41.90	20.53	-92.39	1,620.50	-6,151.48	4,595.76	4,540.78	54.98	83.588		
8,600.00	6,987.38	7,163.04	7,078.98	42.93	20.53	-92.91	1,620.53	-6,151.48	4,496.92	4,441.71	55.21	81.455		
8,700.00	6,987.31	7,162.09	7,078.02	43.98	20.53	-93.77	1,620.55	-6,151.49	4,397.64	4,342.25	55.39	79.389		
8,800.00	6,987.23	7,161.21	7,077.14	45.03	20.52	-95.47	1,620.57	-6,151.50	4,298.03	4,242.50	55.54	77.391		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		320-APC_ISCWSA REV 2 MWD						Rule Assigned:		Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,872.16	6,987.18	7,160.62	7,076.56	45.79	20.52	-98.24	1,620.59	-6,151.50	4,226.00	4,170.39	55.61	75.993		
8,900.00	6,987.16	7,160.41	7,076.34	46.08	20.52	-98.17	1,620.59	-6,151.50	4,198.19	4,142.56	55.63	75.461		
9,000.00	6,987.09	7,159.63	7,075.56	47.16	20.52	-97.95	1,620.61	-6,151.51	4,098.31	4,042.59	55.72	73.550		
9,100.00	6,987.01	7,158.85	7,074.78	48.27	20.52	-97.73	1,620.63	-6,151.51	3,998.43	3,942.61	55.81	71.639		
9,200.00	6,986.94	7,158.07	7,074.00	49.40	20.52	-97.51	1,620.65	-6,151.52	3,898.55	3,842.64	55.91	69.729		
9,300.00	6,986.86	7,157.28	7,073.22	50.56	20.52	-97.29	1,620.66	-6,151.52	3,798.69	3,742.68	56.01	67.819		
9,400.00	6,986.79	7,156.50	7,072.44	51.75	20.52	-97.06	1,620.68	-6,151.53	3,698.83	3,642.71	56.12	65.910		
9,500.00	6,986.71	7,155.72	7,071.66	52.95	20.51	-96.84	1,620.70	-6,151.53	3,598.98	3,542.74	56.23	64.001		
9,600.00	6,986.64	7,154.94	7,070.87	54.18	20.51	-96.62	1,620.72	-6,151.54	3,499.13	3,442.78	56.35	62.094		
9,700.00	6,986.56	7,154.16	7,070.09	55.42	20.51	-96.39	1,620.74	-6,151.55	3,399.30	3,342.82	56.48	60.187		
9,800.00	6,986.49	7,153.37	7,069.31	56.69	20.51	-96.17	1,620.76	-6,151.55	3,299.47	3,242.86	56.61	58.281		
9,900.00	6,986.41	7,152.59	7,068.53	57.97	20.51	-95.94	1,620.78	-6,151.56	3,199.66	3,142.90	56.76	56.376		
10,000.00	6,986.34	7,151.81	7,067.74	59.26	20.51	-95.72	1,620.79	-6,151.56	3,099.86	3,042.95	56.91	54.473		
10,100.00	6,986.27	7,151.03	7,066.96	60.57	20.51	-95.49	1,620.81	-6,151.57	3,000.07	2,943.00	57.07	52.571		
10,200.00	6,986.19	7,150.24	7,066.18	61.90	20.50	-95.27	1,620.83	-6,151.57	2,900.29	2,843.05	57.24	50.670		
10,300.00	6,986.12	7,149.46	7,065.39	63.23	20.50	-95.04	1,620.85	-6,151.58	2,800.53	2,743.11	57.42	48.771		
10,400.00	6,986.04	7,148.67	7,064.61	64.58	20.50	-94.82	1,620.87	-6,151.58	2,700.79	2,643.17	57.62	46.873		
10,500.00	6,985.97	7,147.89	7,063.83	65.94	20.50	-94.59	1,620.89	-6,151.59	2,601.07	2,543.24	57.83	44.978		
10,600.00	6,985.89	7,147.10	7,063.04	67.32	20.50	-94.36	1,620.90	-6,151.60	2,501.37	2,443.31	58.06	43.084		
10,700.00	6,985.82	7,146.32	7,062.26	68.70	20.50	-94.14	1,620.92	-6,151.60	2,401.69	2,343.39	58.30	41.193		
10,800.00	6,985.74	7,145.53	7,061.47	70.09	20.50	-93.91	1,620.94	-6,151.61	2,302.04	2,243.47	58.57	39.304		
10,900.00	6,985.67	7,144.75	7,060.69	71.49	20.50	-93.68	1,620.96	-6,151.61	2,202.43	2,143.57	58.86	37.418		
11,000.00	6,985.59	7,143.96	7,059.90	72.90	20.49	-93.45	1,620.98	-6,151.62	2,102.85	2,043.67	59.18	35.534		
11,100.00	6,985.52	7,143.18	7,059.11	74.31	20.49	-93.23	1,621.00	-6,151.62	2,003.31	1,943.78	59.53	33.654		
11,200.00	6,985.45	7,142.39	7,058.33	75.74	20.49	-93.00	1,621.02	-6,151.63	1,903.82	1,843.91	59.91	31.778		
11,300.00	6,985.37	7,141.60	7,057.54	77.17	20.49	-92.77	1,621.03	-6,151.63	1,804.38	1,744.05	60.34	29.905		
11,400.00	6,985.30	7,140.82	7,056.75	78.61	20.49	-92.54	1,621.05	-6,151.64	1,705.02	1,644.20	60.81	28.037		
11,500.00	6,985.22	7,140.03	7,055.97	80.05	20.49	-92.31	1,621.07	-6,151.64	1,605.73	1,544.38	61.35	26.173		
11,600.00	6,985.15	7,139.24	7,055.18	81.50	20.49	-92.08	1,621.09	-6,151.65	1,506.53	1,444.57	61.96	24.316		
11,700.00	6,985.07	7,138.45	7,054.39	82.96	20.48	-91.85	1,621.11	-6,151.66	1,407.44	1,344.79	62.65	22.465		
11,800.00	6,985.00	7,137.66	7,053.60	84.42	20.48	-91.62	1,621.13	-6,151.66	1,308.50	1,245.05	63.45	20.623		
11,900.00	6,984.92	7,136.87	7,052.82	85.89	20.48	-91.39	1,621.15	-6,151.67	1,209.73	1,145.35	64.38	18.790		
12,000.00	6,984.85	7,136.09	7,052.03	87.36	20.48	-91.16	1,621.17	-6,151.67	1,111.17	1,045.69	65.48	16.969		
12,100.00	6,984.77	7,135.30	7,051.24	88.83	20.48	-90.93	1,621.18	-6,151.68	1,012.90	946.10	66.80	15.163		
12,200.00	6,984.70	7,134.51	7,050.45	90.31	20.48	-90.70	1,621.20	-6,151.68	915.01	846.60	68.41	13.376		
12,300.00	6,984.63	7,133.72	7,049.66	91.80	20.48	-90.47	1,621.22	-6,151.69	817.62	747.22	70.40	11.614		
12,400.00	6,984.55	7,132.93	7,048.87	93.29	20.47	-90.24	1,621.24	-6,151.69	720.95	648.03	72.92	9.886		
12,500.00	6,984.48	7,132.14	7,048.08	94.78	20.47	-90.01	1,621.26	-6,151.70	625.33	549.12	76.21	8.206		
12,600.00	6,984.40	7,131.35	7,047.29	96.28	20.47	-89.78	1,621.28	-6,151.71	531.31	450.71	80.60	6.592		
12,700.00	6,984.33	7,130.55	7,046.50	97.78	20.47	-89.55	1,621.30	-6,151.71	439.95	353.31	86.64	5.078		
12,800.00	6,984.25	7,129.76	7,045.71	99.28	20.47	-89.32	1,621.32	-6,151.72	353.29	258.20	95.08	3.715		
12,900.00	6,984.18	7,128.97	7,044.91	100.78	20.47	-89.09	1,621.33	-6,151.72	275.80	169.37	106.43	2.591		
13,000.00	6,984.10	7,128.18	7,044.12	102.29	20.47	-88.86	1,621.35	-6,151.73	217.54	99.75	117.79	1.847		
13,093.73	6,984.03	7,127.44	7,043.38	103.71	20.46	-88.64	1,621.37	-6,151.73	196.31	79.02	117.29	1.674 CC, ES, SF		
13,100.00	6,984.03	7,127.39	7,043.33	103.80	20.46	-88.63	1,621.37	-6,151.73	196.41	79.83	116.58	1.685		
13,200.00	6,983.95	7,126.59	7,042.54	105.32	20.46	-88.40	1,621.39	-6,151.74	223.23	125.72	97.51	2.289		
13,300.00	6,983.88	7,125.80	7,041.75	106.84	20.46	-88.16	1,621.41	-6,151.75	284.75	207.26	77.49	3.675		
13,400.00	6,983.81	7,125.01	7,040.95	108.36	20.46	-87.93	1,621.43	-6,151.75	363.78	299.50	64.28	5.659		
13,500.00	6,983.73	7,124.21	7,040.16	109.88	20.46	-87.70	1,621.45	-6,151.76	451.20	394.59	56.62	7.969		
13,600.00	6,983.66	7,123.42	7,039.37	111.40	20.46	-87.47	1,621.47	-6,151.76	542.98	490.62	52.36	10.369		
13,700.00	6,983.58	7,122.63	7,038.57	112.93	20.46	-87.24	1,621.48	-6,151.77	637.24	587.15	50.09	12.722		
13,800.00	6,983.51	7,121.83	7,037.78	114.46	20.45	-87.01	1,621.50	-6,151.77	733.02	684.08	48.94	14.978		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		320-APC_ISCWSA REV 2 MWD						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
13,900.00	6,983.43	7,121.04	7,036.98	115.99	20.45	-86.77	1,621.52	-6,151.78	829.80	781.38	48.42	17.136	
14,000.00	6,983.36	7,120.24	7,036.19	117.52	20.45	-86.54	1,621.54	-6,151.78	927.26	878.99	48.27	19.211	
14,100.00	6,983.28	7,119.45	7,035.39	119.06	20.45	-86.31	1,621.56	-6,151.79	1,025.21	976.90	48.31	21.222	
14,200.00	6,983.21	7,118.65	7,034.60	120.59	20.45	-86.08	1,621.58	-6,151.80	1,123.52	1,075.06	48.46	23.184	
14,300.00	6,983.13	7,117.86	7,033.80	122.13	20.45	-85.85	1,621.60	-6,151.80	1,222.10	1,173.43	48.67	25.108	
14,400.00	6,983.06	7,117.06	7,033.01	123.67	20.45	-85.62	1,621.62	-6,151.81	1,320.90	1,271.98	48.92	27.003	
14,500.00	6,982.99	7,116.26	7,032.21	125.21	20.44	-85.38	1,621.64	-6,151.81	1,419.86	1,370.69	49.17	28.875	
14,600.00	6,982.91	7,115.47	7,031.41	126.75	20.44	-85.15	1,621.66	-6,151.82	1,518.96	1,469.53	49.43	30.729	
14,700.00	6,982.84	7,114.67	7,030.62	128.30	20.44	-84.92	1,621.67	-6,151.82	1,618.17	1,568.49	49.69	32.568	
14,800.00	6,982.76	7,113.87	7,029.82	129.85	20.44	-84.69	1,621.69	-6,151.83	1,717.47	1,667.54	49.93	34.395	
14,900.00	6,982.69	7,113.07	7,029.02	131.39	20.44	-84.46	1,621.71	-6,151.84	1,816.85	1,766.68	50.17	36.210	
15,000.00	6,982.61	7,112.28	7,028.22	132.94	20.44	-84.23	1,621.73	-6,151.84	1,916.29	1,865.89	50.41	38.017	
15,100.00	6,982.54	7,111.48	7,027.43	134.49	20.44	-83.99	1,621.75	-6,151.85	2,015.79	1,965.16	50.63	39.814	
15,200.00	6,982.46	7,110.68	7,026.63	136.04	20.43	-83.76	1,621.77	-6,151.85	2,115.33	2,064.49	50.84	41.605	
15,300.00	6,982.39	7,109.88	7,025.83	137.60	20.43	-83.53	1,621.79	-6,151.86	2,214.92	2,163.87	51.05	43.388	
15,400.00	6,982.31	7,109.08	7,025.03	139.15	20.43	-83.30	1,621.81	-6,151.86	2,314.54	2,263.29	51.25	45.164	
15,500.00	6,982.24	7,108.28	7,024.23	140.70	20.43	-83.07	1,621.83	-6,151.87	2,414.19	2,362.75	51.44	46.935	
15,600.00	6,982.17	7,107.48	7,023.43	142.26	20.43	-82.84	1,621.85	-6,151.87	2,513.87	2,462.25	51.62	48.699	
15,700.00	6,982.09	7,106.68	7,022.63	143.82	20.43	-82.61	1,621.86	-6,151.88	2,613.57	2,561.77	51.80	50.458	
15,800.00	6,982.02	7,105.88	7,021.83	145.38	20.43	-82.38	1,621.88	-6,151.89	2,713.30	2,661.33	51.97	52.211	
15,900.00	6,981.94	7,105.08	7,021.03	146.94	20.42	-82.14	1,621.90	-6,151.89	2,813.04	2,760.91	52.13	53.959	
16,000.00	6,981.87	7,104.28	7,020.23	148.50	20.42	-81.91	1,621.92	-6,151.90	2,912.80	2,860.51	52.29	55.702	
16,100.00	6,981.79	7,103.48	7,019.43	150.06	20.42	-81.68	1,621.94	-6,151.90	3,012.58	2,960.13	52.45	57.439	
16,200.00	6,981.72	7,102.68	7,018.63	151.62	20.42	-81.45	1,621.96	-6,151.91	3,112.37	3,059.77	52.60	59.171	
16,300.00	6,981.64	7,101.87	7,017.82	153.18	20.42	-81.22	1,621.98	-6,151.91	3,212.17	3,159.43	52.75	60.898	
16,400.00	6,981.57	7,101.07	7,017.02	154.74	20.42	-80.99	1,622.00	-6,151.92	3,311.99	3,259.10	52.89	62.621	
16,500.00	6,981.49	7,100.27	7,016.22	156.31	20.42	-80.76	1,622.02	-6,151.93	3,411.82	3,358.79	53.03	64.338	
16,600.00	6,981.42	7,099.47	7,015.42	157.87	20.41	-80.53	1,622.04	-6,151.93	3,511.65	3,458.48	53.17	66.050	
16,700.00	6,981.35	7,098.66	7,014.61	159.44	20.41	-80.30	1,622.06	-6,151.94	3,611.50	3,558.20	53.30	67.757	
16,800.00	6,981.27	7,097.86	7,013.81	161.01	20.41	-80.07	1,622.08	-6,151.94	3,711.35	3,657.92	53.43	69.460	
16,900.00	6,981.20	7,097.05	7,013.01	162.58	20.41	-79.84	1,622.09	-6,151.95	3,811.21	3,757.65	53.56	71.157	
17,000.00	6,981.12	7,096.25	7,012.20	164.14	20.41	-79.62	1,622.11	-6,151.95	3,911.08	3,857.39	53.69	72.849	
17,100.00	6,981.05	7,095.45	7,011.40	165.71	20.41	-79.39	1,622.13	-6,151.96	4,010.95	3,957.14	53.81	74.537	
17,200.00	6,980.97	7,094.64	7,010.59	167.28	20.41	-79.16	1,622.15	-6,151.97	4,110.83	4,056.90	53.93	76.220	
17,300.00	6,980.90	7,093.84	7,009.79	168.85	20.40	-78.93	1,622.17	-6,151.97	4,210.72	4,156.66	54.05	77.897	
17,400.00	6,980.82	7,093.03	7,008.98	170.42	20.40	-78.70	1,622.19	-6,151.98	4,310.61	4,256.43	54.17	79.570	
17,500.00	6,980.75	7,092.23	7,008.18	172.00	20.40	-78.47	1,622.21	-6,151.98	4,410.50	4,356.21	54.29	81.238	
17,600.00	6,980.67	7,091.42	7,007.37	173.57	20.40	-78.25	1,622.23	-6,151.99	4,510.40	4,455.99	54.41	82.900	
17,700.00	6,980.60	7,090.61	7,006.57	175.14	20.40	-78.02	1,622.25	-6,151.99	4,610.31	4,555.78	54.52	84.558	
17,800.00	6,980.53	7,089.81	7,005.76	176.71	20.40	-77.79	1,622.27	-6,152.00	4,710.21	4,655.58	54.64	86.211	
17,900.00	6,980.45	7,089.00	7,004.95	178.29	20.40	-77.56	1,622.29	-6,152.01	4,810.13	4,755.38	54.75	87.859	
18,000.00	6,980.38	7,088.19	7,004.15	179.86	20.39	-77.34	1,622.31	-6,152.01	4,910.04	4,855.18	54.86	89.501	
18,100.00	6,980.30	7,087.38	7,003.34	181.44	20.39	-77.11	1,622.33	-6,152.02	5,009.96	4,954.99	54.97	91.139	
18,200.00	6,980.23	7,086.58	7,002.53	183.01	20.39	-76.88	1,622.35	-6,152.02	5,109.88	5,054.80	55.08	92.772	
18,300.00	6,980.15	7,085.77	7,001.72	184.59	20.39	-76.66	1,622.37	-6,152.03	5,209.81	5,154.62	55.19	94.400	
18,400.00	6,980.08	7,084.96	7,000.92	186.16	20.39	-76.43	1,622.38	-6,152.03	5,309.73	5,254.44	55.30	96.022	
18,500.00	6,980.00	7,084.15	7,000.11	187.74	20.39	-76.21	1,622.40	-6,152.04	5,409.66	5,354.26	55.40	97.640	
18,600.00	6,979.93	7,083.34	6,999.30	189.32	20.39	-75.98	1,622.42	-6,152.05	5,509.59	5,454.08	55.51	99.252	
18,700.00	6,979.85	7,082.53	6,998.49	190.90	20.38	-75.76	1,622.44	-6,152.05	5,609.53	5,553.91	55.62	100.860	
18,800.00	6,979.78	7,081.72	6,997.68	192.48	20.38	-75.53	1,622.46	-6,152.06	5,709.47	5,653.74	55.72	102.462	
18,900.00	6,979.71	7,080.91	6,996.87	194.05	20.38	-75.31	1,622.48	-6,152.06	5,809.40	5,753.58	55.83	104.059	
19,000.00	6,979.63	7,080.10	6,996.06	195.63	20.38	-75.09	1,622.50	-6,152.07	5,909.34	5,853.41	55.93	105.651	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #072C - OH - OH-SVY													Offset Site Error:	0.00 usft	
Survey Program:		320-APC_ISCWSA REV 2 MWD					Rule Assigned:							Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (")	Offset Wellbore Centre		Distance			Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)				
19,100.00	6,979.56	7,079.29	6,995.25	197.21	20.38	-74.86	1,622.52	-6,152.08	6,009.29	5,953.25	56.04	107.238			
19,200.00	6,979.48	7,078.48	6,994.44	198.79	20.38	-74.64	1,622.54	-6,152.08	6,109.23	6,053.09	56.14	108.820			
19,300.00	6,979.41	7,077.67	6,993.63	200.37	20.37	-74.42	1,622.56	-6,152.09	6,209.18	6,152.93	56.24	110.397			
19,400.00	6,979.33	7,076.86	6,992.82	201.95	20.37	-74.19	1,622.58	-6,152.09	6,309.13	6,252.78	56.35	111.968			
19,500.00	6,979.26	7,076.05	6,992.00	203.54	20.37	-73.97	1,622.60	-6,152.10	6,409.07	6,352.62	56.45	113.534			
19,600.00	6,979.18	7,075.23	6,991.19	205.12	20.37	-73.75	1,622.62	-6,152.10	6,509.03	6,452.47	56.55	115.096			
19,700.00	6,979.11	7,074.42	6,990.38	206.70	20.37	-73.53	1,622.64	-6,152.11	6,608.98	6,552.32	56.66	116.651			
19,800.00	6,979.03	7,073.61	6,989.57	208.28	20.37	-73.31	1,622.66	-6,152.12	6,708.93	6,652.17	56.76	118.202			
19,900.00	6,978.96	7,072.79	6,988.75	209.86	20.37	-73.09	1,622.68	-6,152.12	6,808.88	6,752.02	56.86	119.748			
20,000.00	6,978.89	7,071.98	6,987.94	211.45	20.36	-72.87	1,622.70	-6,152.13	6,908.84	6,851.88	56.96	121.288			
20,100.00	6,978.81	7,071.17	6,987.13	213.03	20.36	-72.65	1,622.72	-6,152.13	7,008.80	6,951.73	57.06	122.823			
20,200.00	6,978.74	7,070.35	6,986.31	214.61	20.36	-72.43	1,622.74	-6,152.14	7,108.76	7,051.59	57.17	124.353			
20,300.00	6,978.66	7,069.54	6,985.50	216.20	20.36	-72.21	1,622.76	-6,152.15	7,208.71	7,151.45	57.27	125.878			
20,400.00	6,978.59	7,068.72	6,984.69	217.78	20.36	-71.99	1,622.78	-6,152.15	7,308.68	7,251.31	57.37	127.397			
20,500.00	6,978.51	7,067.91	6,983.87	219.37	20.36	-71.77	1,622.79	-6,152.16	7,408.64	7,351.17	57.47	128.912			
20,600.00	6,978.44	7,067.09	6,983.06	220.95	20.36	-71.55	1,622.81	-6,152.16	7,508.60	7,451.03	57.57	130.421			
20,700.00	6,978.36	7,066.28	6,982.24	222.53	20.35	-71.34	1,622.83	-6,152.17	7,608.56	7,550.89	57.67	131.925			
20,800.00	6,978.29	7,065.46	6,981.42	224.12	20.35	-71.12	1,622.85	-6,152.17	7,708.53	7,650.75	57.78	133.423			
20,900.00	6,978.21	7,064.65	6,980.61	225.71	20.35	-70.90	1,622.87	-6,152.18	7,808.49	7,750.61	57.88	134.916			
21,000.00	6,978.14	7,063.83	6,979.79	227.29	20.35	-70.69	1,622.89	-6,152.19	7,908.46	7,850.48	57.98	136.404			
21,100.00	6,978.07	7,063.01	6,978.98	228.88	20.35	-70.47	1,622.91	-6,152.19	8,008.42	7,950.34	58.08	137.887			
21,200.00	6,977.99	7,062.19	6,978.16	230.46	20.35	-70.26	1,622.93	-6,152.20	8,108.39	8,050.21	58.18	139.365			
21,300.00	6,977.92	7,061.38	6,977.34	232.05	20.35	-70.04	1,622.95	-6,152.20	8,208.36	8,150.07	58.28	140.837			
21,400.00	6,977.84	7,060.56	6,976.52	233.64	20.34	-69.83	1,622.97	-6,152.21	8,308.33	8,249.94	58.38	142.304			
21,500.00	6,977.77	7,059.74	6,975.71	235.22	20.34	-69.61	1,622.99	-6,152.22	8,408.29	8,349.81	58.49	143.766			
21,600.00	6,977.69	7,058.92	6,974.89	236.81	20.34	-69.40	1,623.01	-6,152.22	8,508.26	8,449.68	58.59	145.223			
21,700.00	6,977.62	7,058.10	6,974.07	238.40	20.34	-69.19	1,623.03	-6,152.23	8,608.23	8,549.55	58.69	146.674			
21,800.00	6,977.54	7,057.28	6,973.25	239.99	20.34	-68.98	1,623.05	-6,152.23	8,708.21	8,649.41	58.79	148.120			
21,900.00	6,977.47	7,056.46	6,972.43	241.57	20.34	-68.76	1,623.07	-6,152.24	8,808.18	8,749.28	58.89	149.561			
22,000.00	6,977.39	7,055.64	6,971.61	243.16	20.34	-68.55	1,623.09	-6,152.24	8,908.15	8,849.15	59.00	150.997			
22,100.00	6,977.32	7,054.82	6,970.79	244.75	20.33	-68.34	1,623.11	-6,152.25	9,008.12	8,949.02	59.10	152.428			
22,200.00	6,977.25	7,054.00	6,969.97	246.34	20.33	-68.13	1,623.13	-6,152.26	9,108.10	9,048.90	59.20	153.853			
22,300.00	6,977.17	7,053.18	6,969.15	247.93	20.33	-67.92	1,623.15	-6,152.26	9,208.07	9,148.77	59.30	155.273			
22,400.00	6,977.10	7,052.36	6,968.33	249.52	20.33	-67.71	1,623.17	-6,152.27	9,308.04	9,248.64	59.41	156.688			
22,500.00	6,977.02	7,051.54	6,967.51	251.11	20.33	-67.50	1,623.19	-6,152.27	9,408.02	9,348.51	59.51	158.097			
22,529.62	6,977.00	7,051.30	6,967.26	251.58	20.33	-67.44	1,623.20	-6,152.28	9,437.63	9,378.09	59.54	158.514			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC											Offset Site Error:		0.00 usft	
Survey Program:		95-A027Ua_INC-ONLY						Rule Assigned:						Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)						
0.00	0.00	0.00	0.00	0.00	0.00	-118.29	-949.00	-1,763.23	2,004.60							
100.00	100.00	6.00	6.00	0.25	0.13	-118.29	-949.00	-1,763.23	2,002.40	2,002.02	0.38	5,285.918				
200.00	200.00	106.00	106.00	0.61	2.24	-118.29	-949.00	-1,763.23	2,002.40	1,999.55	2.85	703.219				
281.75	281.75	187.73	187.72	0.90	3.84	-118.28	-948.60	-1,763.23	2,002.21	1,997.46	4.75	421.890	CC			
300.00	300.00	204.49	204.48	0.97	4.17	-118.28	-948.61	-1,763.23	2,002.21	1,997.07	5.14	389.507				
400.00	400.00	306.02	306.00	1.33	6.15	-118.29	-949.00	-1,763.23	2,002.40	1,994.92	7.48	267.830				
500.00	500.00	406.02	406.00	1.68	8.05	-118.29	-949.00	-1,763.23	2,002.40	1,992.66	9.73	205.706				
550.00	550.00	456.02	456.00	1.86	9.00	-118.29	-949.00	-1,763.23	2,002.40	1,991.53	10.86	184.328				
600.00	600.00	506.02	506.00	2.04	9.95	-115.91	-949.00	-1,763.23	2,002.59	1,990.60	11.99	166.994				
700.00	699.93	604.84	604.81	2.40	11.83	-115.96	-948.49	-1,763.23	2,003.87	1,989.64	14.23	140.848	ES			
800.00	799.68	702.98	702.96	2.77	13.69	-116.08	-948.68	-1,763.23	2,007.03	1,990.58	16.45	122.002				
900.00	899.13	805.18	805.13	3.13	15.66	-116.28	-949.00	-1,763.23	2,011.82	1,993.03	18.78	107.108				
1,000.00	998.15	904.20	904.15	3.49	17.75	-116.52	-949.00	-1,763.23	2,018.06	1,996.81	21.24	94.990				
1,100.00	1,096.63	1,002.68	1,002.63	3.87	19.83	-116.81	-949.00	-1,763.23	2,025.95	2,002.24	23.70	85.469				
1,130.50	1,126.54	1,032.59	1,032.54	3.99	20.47	-116.91	-949.00	-1,763.23	2,028.69	2,004.24	24.45	82.960				
1,200.00	1,194.61	1,099.71	1,099.65	4.26	21.88	-117.23	-948.14	-1,763.23	2,034.73	2,008.59	26.14	77.836				
1,300.00	1,292.57	1,195.23	1,195.17	4.66	23.90	-117.72	-948.34	-1,763.23	2,044.27	2,015.72	28.55	71.597				
1,400.00	1,390.52	1,290.67	1,290.60	5.07	25.92	-118.21	-948.77	-1,763.23	2,054.09	2,023.13	30.97	66.334				
1,500.00	1,488.48	1,394.61	1,394.48	5.48	28.23	-118.73	-949.00	-1,763.23	2,063.96	2,030.29	33.67	61.293				
1,600.00	1,586.43	1,492.57	1,492.43	5.90	30.47	-119.21	-949.00	-1,763.23	2,073.86	2,037.55	36.31	57.108				
1,700.00	1,684.38	1,589.96	1,589.80	6.31	32.69	-119.65	-947.65	-1,763.23	2,083.18	2,044.24	38.94	53.492				
1,800.00	1,782.34	1,683.25	1,683.09	6.73	34.82	-120.10	-947.89	-1,763.23	2,093.50	2,052.02	41.48	50.469				
1,900.00	1,880.29	1,776.40	1,776.23	7.15	36.95	-120.56	-948.51	-1,763.23	2,104.19	2,060.17	44.01	47.807				
2,000.00	1,978.25	1,884.50	1,884.25	7.58	39.43	-121.08	-949.00	-1,763.23	2,114.92	2,068.01	46.90	45.092				
2,100.00	2,076.20	1,982.45	1,982.20	8.00	41.68	-121.54	-949.00	-1,763.23	2,125.53	2,075.97	49.56	42.886				
2,200.00	2,174.15	2,079.78	2,079.52	8.43	43.92	-121.96	-947.69	-1,763.23	2,135.53	2,083.33	52.21	40.904				
2,300.00	2,272.11	2,172.55	2,172.27	8.85	46.05	-122.39	-947.93	-1,763.23	2,146.56	2,091.81	54.75	39.208				
2,400.00	2,370.06	2,265.17	2,264.88	9.28	48.18	-122.83	-948.56	-1,763.23	2,157.96	2,100.68	57.28	37.671				
2,500.00	2,468.02	2,374.38	2,374.02	9.71	50.75	-123.33	-949.00	-1,763.23	2,169.35	2,109.08	60.27	35.994				
2,600.00	2,565.97	2,472.34	2,471.97	10.14	53.10	-123.76	-949.00	-1,763.23	2,180.63	2,117.60	63.02	34.600				
2,700.00	2,663.92	2,569.70	2,569.32	10.57	55.43	-124.16	-947.65	-1,763.23	2,191.21	2,125.45	65.77	33.319				
2,800.00	2,761.88	2,662.24	2,661.85	11.00	57.65	-124.57	-947.87	-1,763.23	2,202.88	2,134.50	68.39	32.211				
2,900.00	2,859.83	2,754.64	2,754.24	11.43	59.86	-124.98	-948.48	-1,763.23	2,214.92	2,143.92	71.01	31.193				
3,000.00	2,957.79	2,864.30	2,863.79	11.86	62.55	-125.46	-949.00	-1,763.23	2,226.99	2,152.89	74.10	30.053				
3,100.00	3,055.74	2,962.25	2,961.74	12.29	64.99	-125.87	-949.00	-1,763.23	2,238.89	2,161.93	76.96	29.093				
3,200.00	3,153.69	3,060.21	3,059.69	12.72	67.44	-126.28	-949.00	-1,763.23	2,250.90	2,171.09	79.81	28.203				
3,300.00	3,251.65	3,154.07	3,153.53	13.15	69.79	-126.64	-947.24	-1,763.23	2,261.90	2,179.34	82.56	27.397				
3,400.00	3,349.60	3,245.82	3,245.26	13.59	72.08	-127.02	-947.69	-1,763.23	2,274.45	2,189.19	85.25	26.679				
3,500.00	3,447.56	3,337.41	3,336.84	14.02	74.37	-127.41	-948.53	-1,763.23	2,287.37	2,199.43	87.94	26.010				
3,600.00	3,545.51	3,452.22	3,451.51	14.45	76.88	-127.88	-949.00	-1,763.23	2,300.08	2,209.21	90.87	25.312				
3,700.00	3,643.46	3,550.17	3,549.46	14.88	78.87	-128.27	-949.00	-1,763.23	2,312.65	2,219.38	93.26	24.797				
3,800.00	3,741.42	3,648.13	3,647.42	15.32	80.86	-128.65	-949.00	-1,763.23	2,325.32	2,229.66	95.66	24.308				
3,900.00	3,839.37	3,746.08	3,745.37	15.75	82.85	-129.03	-949.00	-1,763.23	2,338.10	2,240.05	98.05	23.845				
4,000.00	3,937.33	3,844.03	3,843.33	16.18	84.85	-129.41	-949.00	-1,763.23	2,350.99	2,250.54	100.45	23.405				
4,100.00	4,035.28	3,941.99	3,941.28	16.62	86.84	-129.78	-949.00	-1,763.23	2,363.97	2,261.13	102.84	22.986				
4,200.00	4,133.23	4,039.94	4,039.23	17.05	88.83	-130.15	-949.00	-1,763.23	2,377.05	2,271.82	105.24	22.588				
4,300.00	4,231.19	4,137.90	4,137.19	17.48	90.82	-130.51	-949.00	-1,763.23	2,390.23	2,282.61	107.63	22.208				
4,400.00	4,329.14	4,235.85	4,235.14	17.92	92.81	-130.87	-949.00	-1,763.23	2,403.51	2,293.49	110.02	21.846				
4,500.00	4,427.10	4,333.80	4,333.10	18.35	94.81	-131.23	-949.00	-1,763.23	2,416.88	2,304.47	112.41	21.500				
4,600.00	4,525.05	4,431.76	4,431.05	18.78	96.80	-131.58	-949.00	-1,763.23	2,430.35	2,315.54	114.81	21.169				
4,700.00	4,623.00	4,529.71	4,529.00	19.22	98.79	-131.93	-949.00	-1,763.23	2,443.91	2,326.71	117.20	20.853				
4,800.00	4,720.96	4,627.67	4,626.96	19.65	100.78	-132.28	-949.00	-1,763.23	2,457.55	2,337.97	119.59	20.550				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 95-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
4,900.00	4,818.91	4,725.62	4,724.91	20.09	102.77	-132.62	-949.00	-1,763.23	2,471.29	2,349.31	121.98	20.260	
5,000.00	4,916.87	4,786.00	4,785.10	20.52	104.00	-132.83	-949.00	-1,763.23	2,485.40	2,361.84	123.56	20.115 SF	
5,100.00	5,014.82	4,786.00	4,785.10	20.96	104.00	-132.83	-949.00	-1,763.23	2,502.70	2,378.98	123.73	20.228	
5,200.00	5,112.77	4,786.00	4,785.10	21.39	104.00	-132.83	-949.00	-1,763.23	2,523.85	2,400.14	123.71	20.401	
5,300.00	5,210.73	4,786.00	4,785.10	21.82	104.00	-132.83	-949.00	-1,763.23	2,548.75	2,425.23	123.52	20.634	
5,400.00	5,308.68	4,786.00	4,785.10	22.26	104.00	-132.83	-949.00	-1,763.23	2,577.29	2,454.11	123.18	20.923	
5,493.23	5,400.00	4,786.00	4,785.10	22.66	104.00	-132.83	-949.00	-1,763.23	2,607.08	2,484.35	122.73	21.243	
5,500.00	5,406.64	4,786.00	4,785.10	22.69	104.00	-132.84	-949.00	-1,763.23	2,609.36	2,486.67	122.69	21.268	
5,600.00	5,504.69	4,786.00	4,785.10	23.12	104.00	-132.97	-949.00	-1,763.23	2,644.51	2,522.44	122.07	21.665	
5,700.00	5,602.91	4,786.00	4,785.10	23.55	104.00	-133.12	-949.00	-1,763.23	2,682.37	2,561.06	121.31	22.111	
5,800.00	5,701.29	4,786.00	4,785.10	23.97	104.00	-133.28	-949.00	-1,763.23	2,722.85	2,602.40	120.45	22.606	
5,900.00	5,799.82	4,786.00	4,785.10	24.39	104.00	-133.46	-949.00	-1,763.23	2,765.82	2,646.33	119.49	23.148	
6,000.00	5,898.50	4,786.00	4,785.10	24.79	104.00	-133.64	-949.00	-1,763.23	2,811.15	2,692.72	118.43	23.736	
6,100.00	5,997.31	4,786.00	4,785.10	25.20	104.00	-133.84	-949.00	-1,763.23	2,858.75	2,741.44	117.30	24.371	
6,200.00	6,096.26	4,786.00	4,785.10	25.60	104.00	-134.04	-949.00	-1,763.23	2,908.48	2,792.37	116.11	25.050	
6,300.00	6,195.33	4,786.00	4,785.10	25.99	104.00	-134.26	-949.00	-1,763.23	2,960.24	2,845.39	114.85	25.774	
6,400.00	6,294.51	4,786.00	4,785.10	26.37	104.00	-134.49	-949.00	-1,763.23	3,013.93	2,900.37	113.56	26.541	
6,498.19	6,392.00	4,786.00	4,785.10	26.75	104.00	-134.72	-949.00	-1,763.23	3,068.41	2,956.16	112.25	27.336	
6,500.00	6,393.80	4,786.00	4,785.10	26.76	104.00	-133.41	-949.00	-1,763.23	3,069.43	2,957.21	112.22	27.351	
6,550.00	6,443.29	4,786.00	4,785.10	26.95	104.00	-107.73	-949.00	-1,763.23	3,097.43	2,985.88	111.55	27.768	
6,600.00	6,492.24	4,786.00	4,785.10	27.16	104.00	-94.13	-949.00	-1,763.23	3,125.00	3,014.13	110.88	28.184	
6,650.00	6,540.33	4,786.00	4,785.10	27.38	104.00	-85.60	-949.00	-1,763.23	3,151.99	3,041.78	110.22	28.598	
6,700.00	6,587.28	4,786.00	4,785.10	27.60	104.00	-79.49	-949.00	-1,763.23	3,178.25	3,068.68	109.57	29.005	
6,750.00	6,632.80	4,786.00	4,785.10	27.84	104.00	-74.74	-949.00	-1,763.23	3,203.63	3,094.68	108.95	29.405	
6,800.00	6,676.60	4,786.00	4,785.10	28.09	104.00	-70.86	-949.00	-1,763.23	3,228.00	3,119.65	108.35	29.793	
6,850.00	6,718.42	4,786.00	4,785.10	28.34	104.00	-67.60	-949.00	-1,763.23	3,251.23	3,143.46	107.77	30.167	
6,900.00	6,758.00	4,786.00	4,785.10	28.60	104.00	-64.81	-949.00	-1,763.23	3,273.21	3,165.98	107.24	30.523	
6,950.00	6,795.09	4,786.00	4,785.10	28.87	104.00	-62.40	-949.00	-1,763.23	3,293.83	3,187.09	106.74	30.859	
7,000.00	6,829.46	4,786.00	4,785.10	29.14	104.00	-60.32	-949.00	-1,763.23	3,312.99	3,206.70	106.29	31.170	
7,050.00	6,860.91	4,786.00	4,785.10	29.43	104.00	-58.52	-949.00	-1,763.23	3,330.59	3,224.70	105.89	31.455	
7,100.00	6,889.24	4,786.00	4,785.10	29.73	104.00	-56.98	-949.00	-1,763.23	3,346.55	3,241.01	105.54	31.709	
7,150.00	6,914.27	4,786.00	4,785.10	30.05	104.00	-55.66	-949.00	-1,763.23	3,360.80	3,255.54	105.26	31.930	
7,200.00	6,935.85	4,786.00	4,785.10	30.37	104.00	-54.55	-949.00	-1,763.23	3,373.27	3,268.23	105.04	32.115	
7,250.00	6,953.84	4,786.00	4,785.10	30.71	104.00	-53.64	-949.00	-1,763.23	3,383.90	3,279.02	104.89	32.262	
7,300.00	6,968.15	4,786.00	4,785.10	31.06	104.00	-52.91	-949.00	-1,763.23	3,392.66	3,287.85	104.81	32.370	
7,350.00	6,978.67	4,786.00	4,785.10	31.42	104.00	-52.36	-949.00	-1,763.23	3,399.49	3,294.68	104.81	32.436	
7,400.00	6,985.34	4,786.00	4,785.10	31.79	104.00	-51.98	-949.00	-1,763.23	3,404.36	3,299.49	104.88	32.460	
7,450.00	6,988.13	4,786.00	4,785.10	32.17	104.00	-51.77	-949.00	-1,763.23	3,407.27	3,302.24	105.03	32.442	
7,461.13	6,988.22	4,786.00	4,785.10	32.26	104.00	-51.74	-949.00	-1,763.23	3,407.64	3,302.57	105.07	32.432	
7,500.00	6,988.19	4,786.00	4,785.10	32.56	104.00	-51.76	-949.00	-1,763.23	3,408.80	3,303.57	105.23	32.393	
7,600.00	6,988.12	4,786.00	4,785.10	33.37	104.00	-51.80	-949.00	-1,763.23	3,411.91	3,306.23	105.67	32.287	
7,700.00	6,988.05	4,786.00	4,785.10	34.21	104.00	-51.84	-949.00	-1,763.23	3,415.20	3,309.05	106.14	32.176	
7,800.00	6,987.98	4,786.00	4,785.10	35.09	104.00	-51.88	-949.00	-1,763.23	3,418.67	3,312.03	106.64	32.059	
7,900.00	6,987.91	4,786.00	4,785.10	35.99	104.00	-51.93	-949.00	-1,763.23	3,422.32	3,315.17	107.15	31.939	
8,000.00	6,987.83	4,786.00	4,785.10	36.93	104.00	-51.98	-949.00	-1,763.23	3,426.14	3,318.45	107.69	31.816	
8,100.00	6,987.76	4,786.00	4,785.10	37.88	104.00	-52.03	-949.00	-1,763.23	3,430.12	3,321.89	108.23	31.692	
8,200.00	6,987.68	4,786.00	4,785.10	38.86	104.00	-52.08	-949.00	-1,763.23	3,434.27	3,325.48	108.80	31.566	
8,300.00	6,987.61	4,786.00	4,785.10	39.86	104.00	-52.13	-949.00	-1,763.23	3,438.57	3,329.21	109.37	31.441	
8,400.00	6,987.53	4,786.00	4,785.10	40.87	104.00	-52.19	-949.00	-1,763.23	3,443.03	3,333.08	109.94	31.317	
8,500.00	6,987.46	4,786.00	4,785.10	41.90	104.00	-52.25	-949.00	-1,763.23	3,447.62	3,337.10	110.52	31.194	
8,600.00	6,987.38	4,786.00	4,785.10	42.93	104.00	-52.31	-949.00	-1,763.23	3,452.35	3,341.25	111.10	31.073	
8,700.00	6,987.31	4,786.00	4,785.10	43.98	104.00	-52.37	-949.00	-1,763.23	3,457.22	3,345.53	111.68	30.956	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		95-A027Ua_INC-ONLY					Rule Assigned:		Offset Well Error:		0.00 usft			
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Warning						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.23	4,786.00	4,785.10	45.03	104.00	-52.43	-949.00	-1,763.23	3,462.21	3,349.95	112.26	30.842		
8,872.16	6,987.18	4,786.00	4,785.10	45.79	104.00	-52.48	-949.00	-1,763.23	3,465.88	3,353.21	112.67	30.762		
8,900.00	6,987.16	4,786.00	4,785.10	46.08	104.00	-52.48	-949.00	-1,763.23	3,467.42	3,354.59	112.83	30.733		
9,000.00	6,987.09	4,786.00	4,785.10	47.16	104.00	-52.48	-949.00	-1,763.23	3,474.78	3,361.36	113.43	30.635		
9,100.00	6,987.01	4,786.00	4,785.10	48.27	104.00	-52.48	-949.00	-1,763.23	3,485.01	3,370.94	114.07	30.553		
9,200.00	6,986.94	4,786.00	4,785.10	49.40	104.00	-52.48	-949.00	-1,763.23	3,498.06	3,383.31	114.74	30.486		
9,300.00	6,986.86	4,786.00	4,785.10	50.56	104.00	-52.48	-949.00	-1,763.23	3,513.91	3,398.46	115.45	30.437		
9,400.00	6,986.79	4,786.00	4,785.10	51.75	104.00	-52.48	-949.00	-1,763.23	3,532.52	3,416.33	116.18	30.405		
9,500.00	6,986.71	4,786.00	4,785.10	52.95	104.00	-52.48	-949.00	-1,763.23	3,553.85	3,436.90	116.94	30.390		
9,600.00	6,986.64	4,786.00	4,785.10	54.18	104.00	-52.48	-949.00	-1,763.23	3,577.84	3,460.13	117.72	30.394		
9,700.00	6,986.56	4,786.00	4,785.10	55.42	104.00	-52.48	-949.00	-1,763.23	3,604.45	3,485.95	118.50	30.416		
9,800.00	6,986.49	4,786.00	4,785.10	56.69	104.00	-52.48	-949.00	-1,763.23	3,633.62	3,514.32	119.30	30.457		
9,900.00	6,986.41	4,786.00	4,785.10	57.97	104.00	-52.48	-949.00	-1,763.23	3,665.29	3,545.19	120.11	30.517		
10,000.00	6,986.34	4,786.00	4,785.10	59.26	104.00	-52.48	-949.00	-1,763.23	3,699.39	3,578.48	120.91	30.596		
10,100.00	6,986.27	4,786.00	4,785.10	60.57	104.00	-52.48	-949.00	-1,763.23	3,735.86	3,614.14	121.72	30.693		
10,200.00	6,986.19	4,786.00	4,785.10	61.90	104.00	-52.48	-949.00	-1,763.23	3,774.62	3,652.11	122.52	30.809		
10,300.00	6,986.12	4,786.00	4,785.10	63.23	104.00	-52.48	-949.00	-1,763.23	3,815.61	3,692.31	123.31	30.944		
10,400.00	6,986.04	4,786.00	4,785.10	64.58	104.00	-52.48	-949.00	-1,763.23	3,858.76	3,734.67	124.09	31.097		
10,500.00	6,985.97	4,786.00	4,785.10	65.94	104.00	-52.48	-949.00	-1,763.23	3,904.00	3,779.14	124.86	31.268		
10,600.00	6,985.89	4,786.00	4,785.10	67.32	104.00	-52.48	-949.00	-1,763.23	3,951.24	3,825.63	125.61	31.456		
10,700.00	6,985.82	4,786.00	4,785.10	68.70	104.00	-52.48	-949.00	-1,763.23	4,000.43	3,874.08	126.35	31.662		
10,800.00	6,985.74	4,786.00	4,785.10	70.09	104.00	-52.48	-949.00	-1,763.23	4,051.49	3,924.42	127.07	31.884		
10,900.00	6,985.67	4,786.00	4,785.10	71.49	104.00	-52.48	-949.00	-1,763.23	4,104.36	3,976.58	127.77	32.122		
11,000.00	6,985.59	4,786.00	4,785.10	72.90	104.00	-52.48	-949.00	-1,763.23	4,158.95	4,030.50	128.46	32.376		
11,100.00	6,985.52	4,786.00	4,785.10	74.31	104.00	-52.48	-949.00	-1,763.23	4,215.21	4,086.09	129.12	32.646		
11,200.00	6,985.45	4,786.00	4,785.10	75.74	104.00	-52.48	-949.00	-1,763.23	4,273.07	4,143.31	129.76	32.930		
11,300.00	6,985.37	4,786.00	4,785.10	77.17	104.00	-52.48	-949.00	-1,763.23	4,332.47	4,202.09	130.38	33.229		
11,400.00	6,985.30	4,786.00	4,785.10	78.61	104.00	-52.48	-949.00	-1,763.23	4,393.34	4,262.35	130.98	33.541		
11,500.00	6,985.22	4,786.00	4,785.10	80.05	104.00	-52.48	-949.00	-1,763.23	4,455.62	4,324.06	131.57	33.866		
11,600.00	6,985.15	4,786.00	4,785.10	81.50	104.00	-52.48	-949.00	-1,763.23	4,519.26	4,387.13	132.13	34.204		
11,700.00	6,985.07	4,786.00	4,785.10	82.96	104.00	-52.48	-949.00	-1,763.23	4,584.20	4,451.53	132.66	34.555		
11,800.00	6,985.00	4,786.00	4,785.10	84.42	104.00	-52.48	-949.00	-1,763.23	4,650.37	4,517.19	133.18	34.917		
11,900.00	6,984.92	4,786.00	4,785.10	85.89	104.00	-52.48	-949.00	-1,763.23	4,717.75	4,584.06	133.69	35.290		
12,000.00	6,984.85	4,786.00	4,785.10	87.36	104.00	-52.48	-949.00	-1,763.23	4,786.26	4,652.09	134.17	35.674		
12,100.00	6,984.77	4,786.00	4,785.10	88.83	104.00	-52.48	-949.00	-1,763.23	4,855.86	4,721.23	134.63	36.068		
12,200.00	6,984.70	4,786.00	4,785.10	90.31	104.00	-52.48	-949.00	-1,763.23	4,926.51	4,791.44	135.08	36.472		
12,300.00	6,984.63	4,786.00	4,785.10	91.80	104.00	-52.48	-949.00	-1,763.23	4,998.17	4,862.66	135.50	36.886		
12,400.00	6,984.55	4,786.00	4,785.10	93.29	104.00	-52.48	-949.00	-1,763.23	5,070.78	4,934.87	135.91	37.309		
12,500.00	6,984.48	4,786.00	4,785.10	94.78	104.00	-52.48	-949.00	-1,763.23	5,144.31	5,008.00	136.31	37.740		
12,600.00	6,984.40	4,786.00	4,785.10	96.28	104.00	-52.48	-949.00	-1,763.23	5,218.72	5,082.04	136.69	38.180		
12,700.00	6,984.33	4,786.00	4,785.10	97.78	104.00	-52.48	-949.00	-1,763.23	5,293.98	5,156.93	137.05	38.627		
12,800.00	6,984.25	4,786.00	4,785.10	99.28	104.00	-52.48	-949.00	-1,763.23	5,370.04	5,232.64	137.40	39.082		
12,900.00	6,984.18	4,786.00	4,785.10	100.78	104.00	-52.48	-949.00	-1,763.23	5,446.88	5,309.14	137.74	39.544		
13,000.00	6,984.10	4,786.00	4,785.10	102.29	104.00	-52.48	-949.00	-1,763.23	5,524.46	5,386.39	138.06	40.014		
13,100.00	6,984.03	4,786.00	4,785.10	103.80	104.00	-52.48	-949.00	-1,763.23	5,602.75	5,464.37	138.38	40.489		
13,200.00	6,983.95	4,786.00	4,785.10	105.32	104.00	-52.48	-949.00	-1,763.23	5,681.72	5,543.04	138.68	40.971		
13,300.00	6,983.88	4,786.00	4,785.10	106.84	104.00	-52.48	-949.00	-1,763.23	5,761.34	5,622.38	138.96	41.459		
13,400.00	6,983.81	4,786.00	4,785.10	108.36	104.00	-52.48	-949.00	-1,763.23	5,841.59	5,702.35	139.24	41.953		
13,500.00	6,983.73	4,786.00	4,785.10	109.88	104.00	-52.48	-949.00	-1,763.23	5,922.44	5,782.93	139.51	42.452		
13,600.00	6,983.66	4,786.00	4,785.10	111.40	104.00	-52.48	-949.00	-1,763.23	6,003.87	5,864.11	139.77	42.957		
13,700.00	6,983.58	4,786.00	4,785.10	112.93	104.00	-52.48	-949.00	-1,763.23	6,085.85	5,945.84	140.01	43.466		
13,800.00	6,983.51	4,786.00	4,785.10	114.46	104.00	-52.48	-949.00	-1,763.23	6,168.37	6,028.11	140.25	43.981		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		95-A027Ua_INC-ONLY					Offset		Semi Major Axis		Rule Assigned:		Warning		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
13,900.00	6,983.43	4,786.00	4,785.10	115.99	104.00	-52.48	-949.00	-1,763.23	6,251.39	6,110.91	140.48	44.499				
14,000.00	6,983.36	4,786.00	4,785.10	117.52	104.00	-52.48	-949.00	-1,763.23	6,334.90	6,194.20	140.70	45.023				
14,100.00	6,983.28	4,786.00	4,785.10	119.06	104.00	-52.48	-949.00	-1,763.23	6,418.89	6,277.97	140.92	45.550				
14,200.00	6,983.21	4,786.00	4,785.10	120.59	104.00	-52.48	-949.00	-1,763.23	6,503.33	6,362.20	141.13	46.081				
14,300.00	6,983.13	4,786.00	4,785.10	122.13	104.00	-52.48	-949.00	-1,763.23	6,588.20	6,446.88	141.33	46.616				
14,400.00	6,983.06	4,786.00	4,785.10	123.67	104.00	-52.48	-949.00	-1,763.23	6,673.50	6,531.98	141.52	47.155				
14,500.00	6,982.99	4,786.00	4,785.10	125.21	104.00	-52.48	-949.00	-1,763.23	6,759.19	6,617.48	141.71	47.697				
14,600.00	6,982.91	4,786.00	4,785.10	126.75	104.00	-52.48	-949.00	-1,763.23	6,845.28	6,703.39	141.89	48.243				
14,700.00	6,982.84	4,786.00	4,785.10	128.30	104.00	-52.48	-949.00	-1,763.23	6,931.74	6,789.67	142.07	48.791				
14,800.00	6,982.76	4,786.00	4,785.10	129.85	104.00	-52.48	-949.00	-1,763.23	7,018.56	6,876.32	142.24	49.343				
14,900.00	6,982.69	4,786.00	4,785.10	131.39	104.00	-52.48	-949.00	-1,763.23	7,105.72	6,963.31	142.41	49.897				
15,000.00	6,982.61	4,786.00	4,785.10	132.94	104.00	-52.48	-949.00	-1,763.23	7,193.22	7,050.65	142.57	50.455				
15,100.00	6,982.54	4,786.00	4,785.10	134.49	104.00	-52.48	-949.00	-1,763.23	7,281.04	7,138.31	142.72	51.014				
15,200.00	6,982.46	4,786.00	4,785.10	136.04	104.00	-52.48	-949.00	-1,763.23	7,369.17	7,226.29	142.88	51.577				
15,300.00	6,982.39	4,786.00	4,785.10	137.60	104.00	-52.48	-949.00	-1,763.23	7,457.60	7,314.57	143.03	52.142				
15,400.00	6,982.31	4,786.00	4,785.10	139.15	104.00	-52.48	-949.00	-1,763.23	7,546.32	7,403.15	143.17	52.708				
15,500.00	6,982.24	4,786.00	4,785.10	140.70	104.00	-52.48	-949.00	-1,763.23	7,635.32	7,492.01	143.31	53.278				
15,600.00	6,982.17	4,786.00	4,785.10	142.26	104.00	-52.48	-949.00	-1,763.23	7,724.59	7,581.14	143.45	53.849				
15,700.00	6,982.09	4,786.00	4,785.10	143.82	104.00	-52.48	-949.00	-1,763.23	7,814.11	7,670.53	143.58	54.422				
15,800.00	6,982.02	4,786.00	4,785.10	145.38	104.00	-52.48	-949.00	-1,763.23	7,903.89	7,760.18	143.72	54.997				
15,900.00	6,981.94	4,786.00	4,785.10	146.94	104.00	-52.48	-949.00	-1,763.23	7,993.91	7,850.07	143.84	55.574				
16,000.00	6,981.87	4,786.00	4,785.10	148.50	104.00	-52.48	-949.00	-1,763.23	8,084.17	7,940.20	143.97	56.152				
16,100.00	6,981.79	4,786.00	4,785.10	150.06	104.00	-52.48	-949.00	-1,763.23	8,174.65	8,030.56	144.09	56.732				
16,200.00	6,981.72	4,786.00	4,785.10	151.62	104.00	-52.48	-949.00	-1,763.23	8,265.35	8,121.14	144.21	57.314				
16,300.00	6,981.64	4,786.00	4,785.10	153.18	104.00	-52.48	-949.00	-1,763.23	8,356.27	8,211.94	144.33	57.897				
16,400.00	6,981.57	4,786.00	4,785.10	154.74	104.00	-52.48	-949.00	-1,763.23	8,447.39	8,302.94	144.45	58.481				
16,500.00	6,981.49	4,786.00	4,785.10	156.31	104.00	-52.48	-949.00	-1,763.23	8,538.70	8,394.14	144.56	59.067				
16,600.00	6,981.42	4,786.00	4,785.10	157.87	104.00	-52.48	-949.00	-1,763.23	8,630.21	8,485.54	144.67	59.653				
16,700.00	6,981.35	4,786.00	4,785.10	159.44	104.00	-52.48	-949.00	-1,763.23	8,721.91	8,577.13	144.78	60.242				
16,800.00	6,981.27	4,786.00	4,785.10	161.01	104.00	-52.48	-949.00	-1,763.23	8,813.79	8,668.90	144.89	60.831				
16,900.00	6,981.20	4,786.00	4,785.10	162.58	104.00	-52.48	-949.00	-1,763.23	8,905.84	8,760.84	145.00	61.421				
17,000.00	6,981.12	4,786.00	4,785.10	164.14	104.00	-52.48	-949.00	-1,763.23	8,998.06	8,852.96	145.10	62.012				
17,100.00	6,981.05	4,786.00	4,785.10	165.71	104.00	-52.48	-949.00	-1,763.23	9,090.45	8,945.25	145.21	62.604				
17,200.00	6,980.97	4,786.00	4,785.10	167.28	104.00	-52.48	-949.00	-1,763.23	9,183.00	9,037.69	145.31	63.197				
17,300.00	6,980.90	4,786.00	4,785.10	168.85	104.00	-52.48	-949.00	-1,763.23	9,275.70	9,130.29	145.41	63.791				
17,400.00	6,980.82	4,786.00	4,785.10	170.42	104.00	-52.48	-949.00	-1,763.23	9,368.55	9,223.04	145.51	64.386				
17,500.00	6,980.75	4,786.00	4,785.10	172.00	104.00	-52.48	-949.00	-1,763.23	9,461.55	9,315.94	145.61	64.981				
17,600.00	6,980.67	4,786.00	4,785.10	173.57	104.00	-52.48	-949.00	-1,763.23	9,554.68	9,408.98	145.70	65.577				
17,700.00	6,980.60	4,786.00	4,785.10	175.14	104.00	-52.48	-949.00	-1,763.23	9,647.96	9,502.16	145.80	66.173				
17,800.00	6,980.53	4,786.00	4,785.10	176.71	104.00	-52.48	-949.00	-1,763.23	9,741.37	9,595.48	145.89	66.771				
17,900.00	6,980.45	4,786.00	4,785.10	178.29	104.00	-52.48	-949.00	-1,763.23	9,834.91	9,688.92	145.99	67.368				
18,000.00	6,980.38	4,786.00	4,785.10	179.86	104.00	-52.48	-949.00	-1,763.23	9,928.57	9,782.49	146.08	67.966				
18,100.00	6,980.30	4,786.00	4,785.10	181.44	104.00	-52.48	-949.00	-1,763.23	10,022.36	9,876.19	146.17	68.565				
18,200.00	6,980.23	4,786.00	4,785.10	183.01	104.00	-52.48	-949.00	-1,763.23	10,116.26	9,970.00	146.26	69.164				
18,300.00	6,980.15	4,786.00	4,785.10	184.59	104.00	-52.48	-949.00	-1,763.23	10,210.29	10,063.93	146.36	69.764				
18,400.00	6,980.08	4,786.00	4,785.10	186.16	104.00	-52.48	-949.00	-1,763.23	10,304.42	10,157.97	146.45	70.363				
18,500.00	6,980.00	4,786.00	4,785.10	187.74	104.00	-52.48	-949.00	-1,763.23	10,398.66	10,252.13	146.54	70.964				
18,600.00	6,979.93	4,786.00	4,785.10	189.32	104.00	-52.48	-949.00	-1,763.23	10,493.01	10,346.39	146.62	71.564				
18,700.00	6,979.85	4,786.00	4,785.10	190.90	104.00	-52.48	-949.00	-1,763.23	10,587.47	10,440.76	146.71	72.165				
18,800.00	6,979.78	4,786.00	4,785.10	192.48	104.00	-52.48	-949.00	-1,763.23	10,682.02	10,535.22	146.80	72.765				
18,900.00	6,979.71	4,786.00	4,785.10	194.05	104.00	-52.48	-949.00	-1,763.23	10,776.68	10,629.79	146.89	73.367				
19,000.00	6,979.63	4,786.00	4,785.10	195.63	104.00	-52.48	-949.00	-1,763.23	10,871.43	10,724.45	146.98	73.968				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #080A - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program: 95-A027Ua_INC-ONLY				Offset			Semi Major Axis		Offset Wellbore Centre		Rule Assigned:			Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
19,100.00	6,979.56	4,786.00	4,785.10	197.21	104.00	-52.48	-949.00	-1,763.23	10,966.27	10,819.21	147.06	74.569			
19,200.00	6,979.48	4,786.00	4,785.10	198.79	104.00	-52.48	-949.00	-1,763.23	11,061.20	10,914.05	147.15	75.170			
19,300.00	6,979.41	4,786.00	4,785.10	200.37	104.00	-52.48	-949.00	-1,763.23	11,156.22	11,008.99	147.23	75.772			
19,400.00	6,979.33	4,786.00	4,785.10	201.95	104.00	-52.48	-949.00	-1,763.23	11,251.33	11,104.01	147.32	76.373			
19,500.00	6,979.26	4,786.00	4,785.10	203.54	104.00	-52.48	-949.00	-1,763.23	11,346.52	11,199.12	147.41	76.975			
19,600.00	6,979.18	4,786.00	4,785.10	205.12	104.00	-52.48	-949.00	-1,763.23	11,441.80	11,294.31	147.49	77.577			
19,700.00	6,979.11	4,786.00	4,785.10	206.70	104.00	-52.48	-949.00	-1,763.23	11,537.15	11,389.58	147.58	78.178			
19,800.00	6,979.03	4,786.00	4,785.10	208.28	104.00	-52.48	-949.00	-1,763.23	11,632.58	11,484.92	147.66	78.779			
19,900.00	6,978.96	4,786.00	4,785.10	209.86	104.00	-52.48	-949.00	-1,763.23	11,728.09	11,580.35	147.74	79.381			
20,000.00	6,978.89	4,786.00	4,785.10	211.45	104.00	-52.48	-949.00	-1,763.23	11,823.67	11,675.85	147.83	79.982			
20,100.00	6,978.81	4,786.00	4,785.10	213.03	104.00	-52.48	-949.00	-1,763.23	11,919.33	11,771.42	147.91	80.583			
20,200.00	6,978.74	4,786.00	4,785.10	214.61	104.00	-52.48	-949.00	-1,763.23	12,015.06	11,867.06	148.00	81.184			
20,300.00	6,978.66	4,786.00	4,785.10	216.20	104.00	-52.48	-949.00	-1,763.23	12,110.85	11,962.77	148.08	81.785			
20,400.00	6,978.59	4,786.00	4,785.10	217.78	104.00	-52.48	-949.00	-1,763.23	12,206.71	12,058.55	148.17	82.386			
20,500.00	6,978.51	4,786.00	4,785.10	219.37	104.00	-52.48	-949.00	-1,763.23	12,302.64	12,154.39	148.25	82.986			
20,600.00	6,978.44	4,786.00	4,785.10	220.95	104.00	-52.48	-949.00	-1,763.23	12,398.63	12,250.30	148.33	83.586			
20,700.00	6,978.36	4,786.00	4,785.10	222.53	104.00	-52.48	-949.00	-1,763.23	12,494.69	12,346.27	148.42	84.186			
20,800.00	6,978.29	4,786.00	4,785.10	224.12	104.00	-52.48	-949.00	-1,763.23	12,590.81	12,442.31	148.50	84.786			
20,900.00	6,978.21	4,786.00	4,785.10	225.71	104.00	-52.48	-949.00	-1,763.23	12,686.98	12,538.40	148.58	85.386			
21,000.00	6,978.14	4,786.00	4,785.10	227.29	104.00	-52.48	-949.00	-1,763.23	12,783.22	12,634.55	148.67	85.985			
21,100.00	6,978.07	4,786.00	4,785.10	228.88	104.00	-52.48	-949.00	-1,763.23	12,879.51	12,730.76	148.75	86.584			
21,200.00	6,977.99	4,786.00	4,785.10	230.46	104.00	-52.48	-949.00	-1,763.23	12,975.86	12,827.02	148.84	87.182			
21,300.00	6,977.92	4,786.00	4,785.10	232.05	104.00	-52.48	-949.00	-1,763.23	13,072.26	12,923.34	148.92	87.781			
21,400.00	6,977.84	4,786.00	4,785.10	233.64	104.00	-52.48	-949.00	-1,763.23	13,168.72	13,019.72	149.00	88.379			
21,500.00	6,977.77	4,786.00	4,785.10	235.22	104.00	-52.48	-949.00	-1,763.23	13,265.23	13,116.14	149.09	88.976			
21,600.00	6,977.69	4,786.00	4,785.10	236.81	104.00	-52.48	-949.00	-1,763.23	13,361.79	13,212.62	149.17	89.573			
21,700.00	6,977.62	4,786.00	4,785.10	238.40	104.00	-52.48	-949.00	-1,763.23	13,458.40	13,309.15	149.26	90.170			
21,800.00	6,977.54	4,786.00	4,785.10	239.99	104.00	-52.48	-949.00	-1,763.23	13,555.06	13,405.72	149.34	90.766			
21,900.00	6,977.47	4,786.00	4,785.10	241.57	104.00	-52.48	-949.00	-1,763.23	13,651.77	13,502.35	149.42	91.362			
22,000.00	6,977.39	4,786.00	4,785.10	243.16	104.00	-52.48	-949.00	-1,763.23	13,748.53	13,599.02	149.51	91.958			
22,100.00	6,977.32	4,786.00	4,785.10	244.75	104.00	-52.48	-949.00	-1,763.23	13,845.33	13,695.74	149.59	92.553			
22,200.00	6,977.25	4,786.00	4,785.10	246.34	104.00	-52.48	-949.00	-1,763.23	13,942.18	13,792.50	149.68	93.148			
22,300.00	6,977.17	4,786.00	4,785.10	247.93	104.00	-52.48	-949.00	-1,763.23	14,039.07	13,889.31	149.76	93.742			
22,400.00	6,977.10	4,786.00	4,785.10	249.52	104.00	-52.48	-949.00	-1,763.23	14,136.00	13,986.16	149.85	94.335			
22,500.00	6,977.02	4,786.00	4,785.10	251.11	104.00	-52.48	-949.00	-1,763.23	14,232.98	14,083.05	149.93	94.929			
22,529.62	6,977.00	4,786.00	4,785.10	251.58	104.00	-52.48	-949.00	-1,763.23	14,261.71	14,111.75	149.96	95.104			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 165-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	53.13	2,859.68	3,813.54	4,770.23				
100.00	100.00	0.00	0.00	0.25	0.00	53.13	2,859.68	3,813.54	4,767.40	4,767.14	0.25	N/A	
200.00	200.00	15.00	15.00	0.61	0.28	53.13	2,859.68	3,813.54	4,766.64	4,765.75	0.89	5,374.709	
300.00	300.00	115.00	115.00	0.97	2.13	53.13	2,859.68	3,813.54	4,766.64	4,763.55	3.09	1,540.730	
400.00	400.00	215.00	215.00	1.33	4.10	53.13	2,859.68	3,813.54	4,766.64	4,761.21	5.43	878.519	
500.00	500.00	318.41	318.41	1.68	6.27	53.13	2,859.92	3,813.54	4,766.79	4,758.83	7.95	599.263	
550.00	550.00	374.19	374.19	1.86	7.44	53.13	2,859.80	3,813.54	4,766.72	4,757.42	9.30	512.319	
600.00	600.00	415.04	415.00	2.04	8.31	55.53	2,859.68	3,813.54	4,766.39	4,756.04	10.35	460.490	
700.00	699.93	514.97	514.93	2.40	10.52	55.60	2,859.68	3,813.54	4,764.42	4,751.50	12.92	368.822	
800.00	799.68	614.72	614.68	2.77	12.72	55.73	2,859.68	3,813.54	4,760.48	4,744.99	15.48	307.473	
900.00	899.13	714.17	714.13	3.13	14.92	55.93	2,859.68	3,813.54	4,754.58	4,736.54	18.04	263.507	
1,000.00	998.15	814.20	814.12	3.49	17.13	56.18	2,862.28	3,813.54	4,748.31	4,727.69	20.62	230.248	
1,100.00	1,096.63	922.75	922.66	3.87	19.53	56.53	2,862.05	3,813.54	4,738.46	4,715.06	23.40	202.516	
1,130.50	1,126.54	955.69	955.60	3.99	20.26	56.66	2,861.90	3,813.54	4,735.04	4,710.80	24.24	195.313	
1,200.00	1,194.61	1,030.61	1,030.51	4.26	21.91	56.82	2,861.43	3,813.54	4,727.00	4,700.83	26.17	180.653	
1,300.00	1,292.57	1,138.29	1,138.17	4.66	24.29	57.05	2,860.43	3,813.54	4,715.31	4,686.37	28.93	162.963	
1,400.00	1,390.52	1,205.72	1,205.52	5.07	25.77	57.19	2,859.68	3,813.54	4,703.67	4,672.86	30.81	152.674	
1,500.00	1,488.48	1,303.68	1,303.48	5.48	27.69	57.40	2,859.68	3,813.54	4,692.64	4,659.52	33.12	141.665	
1,600.00	1,586.43	1,401.63	1,401.43	5.90	29.61	57.60	2,859.68	3,813.54	4,681.67	4,646.22	35.44	132.085	
1,700.00	1,684.38	1,501.86	1,501.65	6.31	31.57	57.80	2,860.54	3,813.54	4,671.25	4,633.44	37.81	123.542	
1,800.00	1,782.34	1,606.67	1,606.46	6.73	33.62	58.03	2,860.31	3,813.54	4,660.28	4,620.01	40.27	115.728	
1,900.00	1,880.29	1,711.37	1,711.16	7.15	35.67	58.25	2,859.82	3,813.54	4,649.23	4,606.50	42.73	108.811	
2,000.00	1,978.25	1,793.49	1,793.25	7.58	37.38	58.43	2,859.68	3,813.54	4,638.39	4,593.55	44.85	103.424	
2,100.00	2,076.20	1,891.45	1,891.20	8.00	39.46	58.64	2,859.68	3,813.54	4,627.73	4,580.39	47.34	97.745	
2,200.00	2,174.15	1,989.40	1,989.15	8.43	41.55	58.85	2,859.68	3,813.54	4,617.13	4,567.29	49.84	92.634	
2,300.00	2,272.11	2,089.68	2,089.43	8.85	43.68	59.05	2,860.68	3,813.54	4,607.15	4,554.76	52.39	87.938	
2,400.00	2,370.06	2,193.15	2,192.89	9.28	45.88	59.28	2,860.48	3,813.54	4,596.57	4,541.56	55.01	83.563	
2,500.00	2,468.02	2,296.52	2,296.26	9.71	48.08	59.51	2,860.05	3,813.54	4,585.93	4,528.31	57.62	79.585	
2,600.00	2,565.97	2,381.31	2,380.97	10.14	49.86	59.70	2,859.68	3,813.54	4,575.37	4,515.54	59.83	76.475	
2,700.00	2,663.92	2,479.27	2,478.92	10.57	51.87	59.91	2,859.68	3,813.54	4,565.09	4,502.84	62.25	73.336	
2,800.00	2,761.88	2,577.22	2,576.88	11.00	53.87	60.13	2,859.68	3,813.54	4,554.88	4,490.21	64.67	70.432	
2,900.00	2,859.83	2,676.40	2,676.04	11.43	55.90	60.33	2,861.33	3,813.54	4,545.62	4,478.50	67.12	67.726	
3,000.00	2,957.79	2,783.73	2,783.36	11.86	58.09	60.57	2,861.07	3,813.54	4,535.41	4,465.68	69.73	65.041	
3,100.00	3,055.74	2,890.91	2,890.53	12.29	60.28	60.82	2,860.40	3,813.54	4,525.06	4,452.72	72.34	62.551	
3,200.00	3,153.69	2,969.11	2,968.69	12.72	61.87	61.00	2,859.68	3,813.54	4,514.70	4,440.33	74.36	60.713	
3,300.00	3,251.65	3,067.07	3,066.65	13.15	63.72	61.22	2,859.68	3,813.54	4,504.82	4,428.19	76.63	58.784	
3,400.00	3,349.60	3,165.02	3,164.60	13.59	65.57	61.44	2,859.68	3,813.54	4,495.01	4,416.10	78.90	56.968	
3,500.00	3,447.56	3,262.97	3,262.56	14.02	67.42	61.66	2,859.68	3,813.54	4,485.27	4,404.09	81.18	55.253	
3,600.00	3,545.51	3,360.93	3,360.51	14.45	69.27	61.89	2,859.68	3,813.54	4,475.60	4,392.15	83.45	53.632	
3,700.00	3,643.46	3,458.88	3,458.46	14.88	71.11	62.11	2,859.68	3,813.54	4,466.00	4,380.28	85.72	52.098	
3,800.00	3,741.42	3,556.84	3,556.42	15.32	72.96	62.34	2,859.68	3,813.54	4,456.47	4,368.47	88.00	50.644	
3,900.00	3,839.37	3,654.79	3,654.37	15.75	74.81	62.56	2,859.68	3,813.54	4,447.01	4,356.74	90.27	49.263	
4,000.00	3,937.33	3,752.74	3,752.33	16.18	76.66	62.79	2,859.68	3,813.54	4,437.62	4,345.07	92.55	47.950	
4,100.00	4,035.28	3,851.34	3,850.91	16.62	78.52	63.00	2,861.48	3,813.54	4,429.20	4,334.37	94.83	46.705	
4,200.00	4,133.23	3,950.43	3,950.00	17.05	80.39	63.23	2,861.43	3,813.54	4,419.92	4,322.79	97.13	45.505	
4,300.00	4,231.19	4,049.49	4,049.07	17.48	82.26	63.46	2,861.32	3,813.54	4,410.69	4,311.26	99.43	44.361	
4,400.00	4,329.14	4,148.54	4,148.11	17.92	84.12	63.70	2,861.17	3,813.54	4,401.51	4,299.79	101.72	43.269	
4,500.00	4,427.10	4,247.57	4,247.14	18.35	85.99	63.94	2,860.96	3,813.54	4,392.38	4,288.36	104.02	42.226	
4,600.00	4,525.05	4,346.58	4,346.14	18.78	87.86	64.17	2,860.70	3,813.54	4,383.30	4,276.98	106.32	41.228	
4,700.00	4,623.00	4,445.56	4,445.13	19.22	89.73	64.41	2,860.38	3,813.54	4,374.27	4,265.65	108.62	40.273	
4,800.00	4,720.96	4,544.53	4,544.09	19.65	91.59	64.65	2,860.02	3,813.54	4,365.29	4,254.38	110.91	39.358	
4,900.00	4,818.91	4,643.43	4,643.91	20.09	93.30	64.87	2,859.68	3,813.54	4,356.39	4,243.35	113.05	38.536	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		165-A027Ua_INC-ONLY					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
5,000.00	4,916.87	4,732.39	4,731.87	20.52	95.23	65.11	2,859.68	3,813.54	4,347.74	4,232.33	115.41	37.673				
5,100.00	5,014.82	4,830.34	4,829.82	20.96	97.15	65.35	2,859.68	3,813.54	4,339.16	4,221.40	117.77	36.845				
5,200.00	5,112.77	4,928.29	4,927.77	21.39	99.08	65.58	2,859.68	3,813.54	4,330.66	4,210.54	120.13	36.051				
5,300.00	5,210.73	5,026.25	5,025.73	21.82	101.01	65.82	2,859.68	3,813.54	4,322.24	4,199.75	122.49	35.287				
5,400.00	5,308.68	5,124.20	5,123.68	22.26	102.94	66.06	2,859.68	3,813.54	4,313.89	4,189.04	124.85	34.553				
5,493.23	5,400.00	5,216.59	5,216.06	22.66	104.76	66.27	2,861.44	3,813.54	4,306.97	4,179.90	127.07	33.894				
5,500.00	5,406.64	5,223.39	5,222.85	22.69	104.89	66.28	2,861.44	3,813.54	4,306.41	4,179.18	127.23	33.846				
5,600.00	5,504.69	5,323.74	5,323.20	23.12	106.87	66.49	2,861.32	3,813.54	4,298.36	4,168.72	129.64	33.156				
5,700.00	5,602.91	5,424.21	5,423.68	23.55	108.85	66.69	2,861.07	3,813.54	4,290.67	4,158.63	132.04	32.495				
5,800.00	5,701.29	5,524.81	5,524.27	23.97	110.83	66.88	2,860.70	3,813.54	4,283.35	4,148.91	134.44	31.860				
5,900.00	5,799.82	5,625.53	5,624.99	24.39	112.81	67.07	2,860.21	3,813.54	4,276.38	4,139.54	136.84	31.251				
6,000.00	5,898.50	5,714.11	5,713.50	24.79	114.55	67.22	2,859.68	3,813.54	4,269.77	4,130.77	139.00	30.718				
6,100.00	5,997.31	5,812.93	5,812.31	25.20	116.57	67.38	2,859.68	3,813.54	4,263.78	4,122.36	141.42	30.149				
6,200.00	6,096.26	5,911.87	5,911.26	25.60	118.60	67.53	2,859.68	3,813.54	4,258.18	4,114.34	143.84	29.603				
6,300.00	6,195.33	6,010.94	6,010.33	25.99	120.62	67.68	2,859.68	3,813.54	4,252.95	4,106.69	146.26	29.077				
6,400.00	6,294.51	6,110.12	6,109.51	26.37	122.65	67.81	2,859.68	3,813.54	4,248.09	4,099.41	148.68	28.572				
6,498.19	6,392.00	6,207.61	6,207.00	26.75	124.64	67.94	2,859.68	3,813.54	4,243.67	4,092.62	151.05	28.095				
6,500.00	6,393.80	6,209.41	6,208.80	26.76	124.68	69.15	2,859.68	3,813.54	4,243.59	4,092.50	151.09	28.086				
6,543.50	6,436.89	6,252.50	6,251.89	26.93	125.56	90.00	2,859.68	3,813.54	4,242.68	4,090.54	152.15	27.886	CC			
6,550.00	6,443.29	6,258.90	6,258.29	26.95	125.69	92.07	2,859.68	3,813.54	4,242.70	4,090.40	152.30	27.857	ES			
6,600.00	6,492.24	6,307.85	6,307.24	27.16	126.69	102.88	2,859.68	3,813.54	4,244.22	4,090.70	153.52	27.646				
6,650.00	6,540.33	6,355.94	6,355.33	27.38	127.67	108.61	2,859.68	3,813.54	4,248.15	4,093.41	154.74	27.454				
6,700.00	6,587.28	6,402.90	6,402.28	27.60	128.63	111.94	2,859.68	3,813.54	4,254.49	4,098.54	155.94	27.282				
6,750.00	6,632.80	6,448.41	6,447.80	27.84	129.56	113.92	2,859.68	3,813.54	4,263.24	4,106.10	157.14	27.131				
6,800.00	6,676.60	6,492.22	6,491.60	28.09	130.46	115.04	2,859.68	3,813.54	4,274.38	4,116.07	158.31	27.001				
6,850.00	6,718.42	6,534.03	6,533.42	28.34	131.31	115.54	2,859.68	3,813.54	4,287.88	4,128.43	159.45	26.892				
6,900.00	6,758.00	6,573.61	6,573.00	28.60	132.12	115.56	2,859.68	3,813.54	4,303.70	4,143.14	160.55	26.805				
6,950.00	6,795.09	6,610.70	6,610.09	28.87	132.88	115.17	2,859.68	3,813.54	4,321.77	4,160.15	161.62	26.741				
7,000.00	6,829.46	6,645.07	6,644.46	29.14	133.58	114.40	2,859.68	3,813.54	4,342.03	4,179.40	162.64	26.698				
7,050.00	6,860.91	6,676.52	6,675.91	29.43	134.23	113.26	2,859.68	3,813.54	4,364.39	4,200.79	163.60	26.677	SF			
7,100.00	6,889.24	6,704.85	6,704.24	29.73	134.81	111.77	2,859.68	3,813.54	4,388.74	4,224.24	164.51	26.678				
7,150.00	6,914.27	6,729.88	6,729.27	30.05	135.32	109.91	2,859.68	3,813.54	4,414.97	4,249.62	165.35	26.700				
7,200.00	6,935.85	6,751.46	6,750.85	30.37	135.76	107.69	2,859.68	3,813.54	4,442.93	4,276.81	166.13	26.744				
7,250.00	6,953.84	6,769.46	6,768.84	30.71	136.13	105.08	2,859.68	3,813.54	4,472.48	4,305.65	166.83	26.808				
7,300.00	6,968.15	6,783.76	6,783.15	31.06	136.42	102.09	2,859.68	3,813.54	4,503.45	4,335.99	167.46	26.893				
7,350.00	6,978.67	6,794.28	6,793.67	31.42	136.63	98.71	2,859.68	3,813.54	4,535.65	4,367.64	168.01	26.997				
7,400.00	6,985.34	6,800.96	6,800.34	31.79	136.77	94.98	2,859.68	3,813.54	4,568.89	4,400.41	168.47	27.119				
7,450.00	6,988.13	6,803.74	6,803.13	32.17	136.83	90.91	2,859.68	3,813.54	4,602.96	4,434.10	168.85	27.260				
7,461.13	6,988.22	6,803.83	6,803.22	32.26	136.83	89.96	2,859.68	3,813.54	4,610.63	4,441.70	168.93	27.293				
7,500.00	6,988.19	6,803.81	6,803.19	32.56	136.83	89.96	2,859.68	3,813.54	4,637.76	4,468.58	169.17	27.414				
7,600.00	6,988.12	6,803.73	6,803.12	33.37	136.83	89.96	2,859.68	3,813.54	4,709.98	4,540.19	169.79	27.740				
7,700.00	6,988.05	6,803.66	6,803.05	34.21	136.82	89.95	2,859.68	3,813.54	4,785.52	4,615.13	170.39	28.086				
7,800.00	6,987.98	6,803.59	6,802.98	35.09	136.82	89.94	2,859.68	3,813.54	4,864.13	4,693.17	170.96	28.453				
7,900.00	6,987.91	6,803.52	6,802.91	35.99	136.82	89.94	2,859.68	3,813.54	4,945.57	4,774.08	171.49	28.839				
8,000.00	6,987.83	6,803.44	6,802.83	36.93	136.82	89.93	2,859.68	3,813.54	5,029.60	4,857.61	171.99	29.243				
8,100.00	6,987.76	6,803.37	6,802.76	37.88	136.82	89.92	2,859.68	3,813.54	5,116.01	4,943.55	172.46	29.666				
8,200.00	6,987.68	6,803.30	6,802.68	38.86	136.82	89.91	2,859.68	3,813.54	5,204.56	5,031.67	172.88	30.104				
8,300.00	6,987.61	6,803.22	6,802.61	39.86	136.82	89.90	2,859.68	3,813.54	5,295.04	5,121.77	173.27	30.559				
8,400.00	6,987.53	6,803.15	6,802.53	40.87	136.81	89.89	2,859.68	3,813.54	5,387.25	5,213.63	173.62	31.028				
8,500.00	6,987.46	6,803.07	6,802.46	41.90	136.81	89.88	2,859.68	3,813.54	5,481.00	5,307.06	173.94	31.511				
8,600.00	6,987.38	6,803.00	6,802.38	42.93	136.81	89.86	2,859.68	3,813.54	5,576.09	5,401.88	174.22	32.007				
8,700.00	6,987.31	6,802.92	6,802.31	43.98	136.81	89.83	2,859.68	3,813.54	5,672.35	5,497.89	174.46	32.514				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		165-A027Ua_INC-ONLY				Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
8,800.00	6,987.23	6,802.85	6,802.23	45.03	136.81	89.80	2,859.68	3,813.54	5,769.59	5,594.93	174.66	33.033			
8,872.16	6,987.18	6,802.79	6,802.18	45.79	136.81	89.78	2,859.68	3,813.54	5,840.29	5,665.50	174.79	33.413			
8,900.00	6,987.16	6,802.77	6,802.16	46.08	136.81	89.77	2,859.68	3,813.54	5,867.64	5,692.81	174.84	33.561			
9,000.00	6,987.09	6,802.70	6,802.09	47.16	136.81	89.77	2,859.68	3,813.54	5,965.93	5,790.93	175.00	34.092			
9,100.00	6,987.01	6,802.62	6,802.01	48.27	136.80	89.77	2,859.68	3,813.54	6,064.27	5,889.12	175.15	34.623			
9,200.00	6,986.94	6,802.55	6,801.94	49.40	136.80	89.76	2,859.68	3,813.54	6,162.67	5,987.36	175.31	35.154			
9,300.00	6,986.86	6,802.47	6,801.86	50.56	136.80	89.76	2,859.68	3,813.54	6,261.11	6,085.66	175.46	35.685			
9,400.00	6,986.79	6,802.40	6,801.79	51.75	136.80	89.75	2,859.68	3,813.54	6,359.61	6,184.01	175.60	36.216			
9,500.00	6,986.71	6,802.33	6,801.71	52.95	136.80	89.75	2,859.68	3,813.54	6,458.15	6,282.41	175.74	36.747			
9,600.00	6,986.64	6,802.25	6,801.64	54.18	136.80	89.75	2,859.68	3,813.54	6,556.74	6,380.85	175.88	37.279			
9,700.00	6,986.56	6,802.18	6,801.56	55.42	136.79	89.74	2,859.68	3,813.54	6,655.36	6,479.34	176.02	37.810			
9,800.00	6,986.49	6,802.10	6,801.49	56.69	136.79	89.74	2,859.68	3,813.54	6,754.03	6,577.88	176.15	38.342			
9,900.00	6,986.41	6,802.03	6,801.41	57.97	136.79	89.74	2,859.68	3,813.54	6,852.74	6,676.45	176.29	38.873			
10,000.00	6,986.34	6,801.95	6,801.34	59.26	136.79	89.73	2,859.68	3,813.54	6,951.48	6,775.07	176.41	39.404			
10,100.00	6,986.27	6,801.88	6,801.27	60.57	136.79	89.73	2,859.68	3,813.54	7,050.26	6,873.72	176.54	39.936			
10,200.00	6,986.19	6,801.80	6,801.19	61.90	136.79	89.72	2,859.68	3,813.54	7,149.07	6,972.41	176.66	40.467			
10,300.00	6,986.12	6,801.73	6,801.12	63.23	136.79	89.72	2,859.68	3,813.54	7,247.92	7,071.13	176.78	40.999			
10,400.00	6,986.04	6,801.65	6,801.04	64.58	136.78	89.72	2,859.68	3,813.54	7,346.80	7,169.89	176.90	41.530			
10,500.00	6,985.97	6,801.58	6,800.97	65.94	136.78	89.71	2,859.68	3,813.54	7,445.70	7,268.68	177.02	42.061			
10,600.00	6,985.89	6,801.51	6,800.89	67.32	136.78	89.71	2,859.68	3,813.54	7,544.64	7,367.50	177.14	42.592			
10,700.00	6,985.82	6,801.43	6,800.82	68.70	136.78	89.70	2,859.68	3,813.54	7,643.60	7,466.35	177.25	43.123			
10,800.00	6,985.74	6,801.36	6,800.74	70.09	136.78	89.70	2,859.68	3,813.54	7,742.59	7,565.23	177.36	43.654			
10,900.00	6,985.67	6,801.28	6,800.67	71.49	136.78	89.70	2,859.68	3,813.54	7,841.61	7,664.14	177.47	44.185			
11,000.00	6,985.59	6,801.21	6,800.59	72.90	136.77	89.69	2,859.68	3,813.54	7,940.65	7,763.07	177.58	44.716			
11,100.00	6,985.52	6,801.13	6,800.52	74.31	136.77	89.69	2,859.68	3,813.54	8,039.71	7,862.02	177.69	45.247			
11,200.00	6,985.45	6,801.06	6,800.45	75.74	136.77	89.68	2,859.68	3,813.54	8,138.80	7,961.01	177.79	45.777			
11,300.00	6,985.37	6,800.98	6,800.37	77.17	136.77	89.68	2,859.68	3,813.54	8,237.91	8,060.01	177.90	46.308			
11,400.00	6,985.30	6,800.91	6,800.30	78.61	136.77	89.68	2,859.68	3,813.54	8,337.04	8,159.04	178.00	46.838			
11,500.00	6,985.22	6,800.83	6,800.22	80.05	136.77	89.67	2,859.68	3,813.54	8,436.19	8,258.09	178.10	47.368			
11,600.00	6,985.15	6,800.76	6,800.15	81.50	136.77	89.67	2,859.68	3,813.54	8,535.36	8,357.16	178.20	47.898			
11,700.00	6,985.07	6,800.69	6,800.07	82.96	136.76	89.66	2,859.68	3,813.54	8,634.55	8,456.25	178.30	48.428			
11,800.00	6,985.00	6,800.61	6,800.00	84.42	136.76	89.66	2,859.68	3,813.54	8,733.76	8,555.36	178.39	48.957			
11,900.00	6,984.92	6,800.54	6,799.92	85.89	136.76	89.66	2,859.68	3,813.54	8,832.98	8,654.49	178.49	49.487			
12,000.00	6,984.85	6,800.46	6,799.85	87.36	136.76	89.65	2,859.68	3,813.54	8,932.23	8,753.64	178.59	50.016			
12,100.00	6,984.77	6,800.39	6,799.77	88.83	136.76	89.65	2,859.68	3,813.54	9,031.49	8,852.80	178.68	50.545			
12,200.00	6,984.70	6,800.31	6,799.70	90.31	136.76	89.64	2,859.68	3,813.54	9,130.76	8,951.99	178.77	51.074			
12,300.00	6,984.63	6,800.24	6,799.63	91.80	136.75	89.64	2,859.68	3,813.54	9,230.05	9,051.19	178.87	51.603			
12,400.00	6,984.55	6,800.16	6,799.55	93.29	136.75	89.64	2,859.68	3,813.54	9,329.36	9,150.40	178.96	52.131			
12,500.00	6,984.48	6,800.09	6,799.48	94.78	136.75	89.63	2,859.68	3,813.54	9,428.68	9,249.63	179.05	52.660			
12,600.00	6,984.40	6,800.01	6,799.40	96.28	136.75	89.63	2,859.68	3,813.54	9,528.02	9,348.88	179.14	53.188			
12,700.00	6,984.33	6,799.94	6,799.33	97.78	136.75	89.63	2,859.68	3,813.54	9,627.37	9,448.14	179.23	53.715			
12,800.00	6,984.25	6,799.87	6,799.25	99.28	136.75	89.62	2,859.68	3,813.54	9,726.73	9,547.41	179.32	54.243			
12,900.00	6,984.18	6,799.79	6,799.18	100.78	136.75	89.62	2,859.68	3,813.54	9,826.11	9,646.70	179.41	54.770			
13,000.00	6,984.10	6,799.72	6,799.10	102.29	136.74	89.61	2,859.68	3,813.54	9,925.49	9,746.00	179.49	55.297			
13,100.00	6,984.03	6,799.64	6,799.03	103.80	136.74	89.61	2,859.68	3,813.54	10,024.89	9,845.31	179.58	55.824			
13,200.00	6,983.95	6,799.57	6,798.95	105.32	136.74	89.61	2,859.68	3,813.54	10,124.31	9,944.64	179.67	56.351			
13,300.00	6,983.88	6,799.49	6,798.88	106.84	136.74	89.60	2,859.68	3,813.54	10,223.73	10,043.98	179.75	56.877			
13,400.00	6,983.81	6,799.42	6,798.81	108.36	136.74	89.60	2,859.68	3,813.54	10,323.17	10,143.33	179.84	57.403			
13,500.00	6,983.73	6,799.34	6,798.73	109.88	136.74	89.59	2,859.68	3,813.54	10,422.61	10,242.69	179.92	57.929			
13,600.00	6,983.66	6,799.27	6,798.66	111.40	136.74	89.59	2,859.68	3,813.54	10,522.07	10,342.06	180.01	58.454			
13,700.00	6,983.58	6,799.19	6,798.58	112.93	136.73	89.59	2,859.68	3,813.54	10,621.53	10,441.44	180.09	58.979			
13,800.00	6,983.51	6,799.12	6,798.51	114.46	136.73	89.58	2,859.68	3,813.54	10,721.01	10,540.84	180.17	59.504			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		165-A027Ua_INC-ONLY				Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
13,900.00	6,983.43	6,799.05	6,798.43	115.99	136.73	89.58	2,859.68	3,813.54	10,820.50	10,640.24	180.26	60.029			
14,000.00	6,983.36	6,798.97	6,798.36	117.52	136.73	89.57	2,859.68	3,813.54	10,919.99	10,739.65	180.34	60.553			
14,100.00	6,983.28	6,798.90	6,798.28	119.06	136.73	89.57	2,859.68	3,813.54	11,019.50	10,839.08	180.42	61.077			
14,200.00	6,983.21	6,798.82	6,798.21	120.59	136.73	89.57	2,859.68	3,813.54	11,119.01	10,938.51	180.50	61.601			
14,300.00	6,983.13	6,798.75	6,798.13	122.13	136.72	89.56	2,859.68	3,813.54	11,218.53	11,037.95	180.58	62.124			
14,400.00	6,983.06	6,798.67	6,798.06	123.67	136.72	89.56	2,859.68	3,813.54	11,318.06	11,137.40	180.66	62.647			
14,500.00	6,982.99	6,798.60	6,797.99	125.21	136.72	89.55	2,859.68	3,813.54	11,417.60	11,236.86	180.74	63.170			
14,600.00	6,982.91	6,798.52	6,797.91	126.75	136.72	89.55	2,859.68	3,813.54	11,517.15	11,336.32	180.82	63.692			
14,700.00	6,982.84	6,798.45	6,797.84	128.30	136.72	89.55	2,859.68	3,813.54	11,616.70	11,435.80	180.91	64.214			
14,800.00	6,982.76	6,798.37	6,797.76	129.85	136.72	89.54	2,859.68	3,813.54	11,716.26	11,535.28	180.99	64.736			
14,900.00	6,982.69	6,798.30	6,797.69	131.39	136.72	89.54	2,859.68	3,813.54	11,815.83	11,634.77	181.06	65.257			
15,000.00	6,982.61	6,798.23	6,797.61	132.94	136.71	89.54	2,859.68	3,813.54	11,915.41	11,734.26	181.14	65.778			
15,100.00	6,982.54	6,798.15	6,797.54	134.49	136.71	89.53	2,859.68	3,813.54	12,014.99	11,833.77	181.22	66.299			
15,200.00	6,982.46	6,798.08	6,797.46	136.04	136.71	89.53	2,859.68	3,813.54	12,114.58	11,933.28	181.30	66.819			
15,300.00	6,982.39	6,798.00	6,797.39	137.60	136.71	89.52	2,859.68	3,813.54	12,214.18	12,032.80	181.38	67.339			
15,400.00	6,982.31	6,797.93	6,797.31	139.15	136.71	89.52	2,859.68	3,813.54	12,313.78	12,132.32	181.46	67.859			
15,500.00	6,982.24	6,797.85	6,797.24	140.70	136.71	89.52	2,859.68	3,813.54	12,413.39	12,231.85	181.54	68.378			
15,600.00	6,982.17	6,797.78	6,797.17	142.26	136.70	89.51	2,859.68	3,813.54	12,513.01	12,331.39	181.62	68.897			
15,700.00	6,982.09	6,797.70	6,797.09	143.82	136.70	89.51	2,859.68	3,813.54	12,612.63	12,430.94	181.70	69.416			
15,800.00	6,982.02	6,797.63	6,797.02	145.38	136.70	89.50	2,859.68	3,813.54	12,712.26	12,530.49	181.78	69.934			
15,900.00	6,981.94	6,797.55	6,796.94	146.94	136.70	89.50	2,859.68	3,813.54	12,811.90	12,630.04	181.85	70.452			
16,000.00	6,981.87	6,797.48	6,796.87	148.50	136.70	89.50	2,859.68	3,813.54	12,911.54	12,729.60	181.93	70.969			
16,100.00	6,981.79	6,797.41	6,796.79	150.06	136.70	89.49	2,859.68	3,813.54	13,011.18	12,829.17	182.01	71.486			
16,200.00	6,981.72	6,797.33	6,796.72	151.62	136.70	89.49	2,859.68	3,813.54	13,110.83	12,928.74	182.09	72.003			
16,300.00	6,981.64	6,797.26	6,796.64	153.18	136.69	89.48	2,859.68	3,813.54	13,210.49	13,028.32	182.17	72.519			
16,400.00	6,981.57	6,797.18	6,796.57	154.74	136.69	89.48	2,859.68	3,813.54	13,310.15	13,127.90	182.24	73.034			
16,500.00	6,981.49	6,797.11	6,796.49	156.31	136.69	89.48	2,859.68	3,813.54	13,409.81	13,227.49	182.32	73.550			
16,600.00	6,981.42	6,797.03	6,796.42	157.87	136.69	89.47	2,859.68	3,813.54	13,509.49	13,327.09	182.40	74.065			
16,700.00	6,981.35	6,796.96	6,796.35	159.44	136.69	89.47	2,859.68	3,813.54	13,609.16	13,426.68	182.48	74.579			
16,800.00	6,981.27	6,796.88	6,796.27	161.01	136.69	89.46	2,859.68	3,813.54	13,708.84	13,526.29	182.56	75.094			
16,900.00	6,981.20	6,796.81	6,796.20	162.58	136.68	89.46	2,859.68	3,813.54	13,808.53	13,625.89	182.63	75.607			
17,000.00	6,981.12	6,796.73	6,796.12	164.14	136.68	89.46	2,859.68	3,813.54	13,908.22	13,725.51	182.71	76.121			
17,100.00	6,981.05	6,796.66	6,796.05	165.71	136.68	89.45	2,859.68	3,813.54	14,007.91	13,825.12	182.79	76.634			
17,200.00	6,980.97	6,796.59	6,795.97	167.28	136.68	89.45	2,859.68	3,813.54	14,107.61	13,924.74	182.87	77.146			
17,300.00	6,980.90	6,796.51	6,795.90	168.85	136.68	89.45	2,859.68	3,813.54	14,207.31	14,024.37	182.95	77.658			
17,400.00	6,980.82	6,796.44	6,795.82	170.42	136.68	89.44	2,859.68	3,813.54	14,307.02	14,124.00	183.02	78.170			
17,500.00	6,980.75	6,796.36	6,795.75	172.00	136.68	89.44	2,859.68	3,813.54	14,406.73	14,223.63	183.10	78.681			
17,600.00	6,980.67	6,796.29	6,795.67	173.57	136.67	89.43	2,859.68	3,813.54	14,506.45	14,323.27	183.18	79.192			
17,700.00	6,980.60	6,796.21	6,795.60	175.14	136.67	89.43	2,859.68	3,813.54	14,606.17	14,422.91	183.26	79.702			
17,800.00	6,980.53	6,796.14	6,795.53	176.71	136.67	89.43	2,859.68	3,813.54	14,705.89	14,522.55	183.34	80.212			
17,900.00	6,980.45	6,796.06	6,795.45	178.29	136.67	89.42	2,859.68	3,813.54	14,805.61	14,622.20	183.42	80.722			
18,000.00	6,980.38	6,795.99	6,795.38	179.86	136.67	89.42	2,859.68	3,813.54	14,905.34	14,721.85	183.49	81.231			
18,100.00	6,980.30	6,795.91	6,795.30	181.44	136.67	89.41	2,859.68	3,813.54	15,005.08	14,821.51	183.57	81.739			
18,200.00	6,980.23	6,795.84	6,795.23	183.01	136.67	89.41	2,859.68	3,813.54	15,104.82	14,921.16	183.65	82.247			
18,300.00	6,980.15	6,795.77	6,795.15	184.59	136.66	89.41	2,859.68	3,813.54	15,204.56	15,020.83	183.73	82.755			
18,400.00	6,980.08	6,795.69	6,795.08	186.16	136.66	89.40	2,859.68	3,813.54	15,304.30	15,120.49	183.81	83.262			
18,500.00	6,980.00	6,795.62	6,795.00	187.74	136.66	89.40	2,859.68	3,813.54	15,404.05	15,220.16	183.89	83.769			
18,600.00	6,979.93	6,795.54	6,794.93	189.32	136.66	89.39	2,859.68	3,813.54	15,503.80	15,319.83	183.97	84.275			
18,700.00	6,979.85	6,795.47	6,794.85	190.90	136.66	89.39	2,859.68	3,813.54	15,603.55	15,419.51	184.05	84.781			
18,800.00	6,979.78	6,795.39	6,794.78	192.48	136.66	89.39	2,859.68	3,813.54	15,703.31	15,519.18	184.12	85.286			
18,900.00	6,979.71	6,795.32	6,794.71	194.05	136.65	89.38	2,859.68	3,813.54	15,803.07	15,618.86	184.20	85.791			
19,000.00	6,979.63	6,795.24	6,794.63	195.63	136.65	89.38	2,859.68	3,813.54	15,902.83	15,718.55	184.28	86.295			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #107 - OH - OH-INC											Offset Site Error: 0.00 usft				
Survey Program: 165-A027Ua_INC-ONLY				Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
19,100.00	6,979.56	6,795.17	6,794.56	197.21	136.65	89.37	2,859.68	3,813.54	16,002.60	15,818.23	184.36	86.799			
19,200.00	6,979.48	6,795.09	6,794.48	198.79	136.65	89.37	2,859.68	3,813.54	16,102.37	15,917.92	184.44	87.303			
19,300.00	6,979.41	6,795.02	6,794.41	200.37	136.65	89.37	2,859.68	3,813.54	16,202.14	16,017.62	184.52	87.806			
19,400.00	6,979.33	6,794.95	6,794.33	201.95	136.65	89.36	2,859.68	3,813.54	16,301.91	16,117.31	184.60	88.308			
19,500.00	6,979.26	6,794.87	6,794.26	203.54	136.65	89.36	2,859.68	3,813.54	16,401.69	16,217.01	184.68	88.810			
19,600.00	6,979.18	6,794.80	6,794.18	205.12	136.64	89.36	2,859.68	3,813.54	16,501.47	16,316.71	184.76	89.312			
19,700.00	6,979.11	6,794.72	6,794.11	206.70	136.64	89.35	2,859.68	3,813.54	16,601.25	16,416.41	184.84	89.813			
19,800.00	6,979.03	6,794.65	6,794.03	208.28	136.64	89.35	2,859.68	3,813.54	16,701.04	16,516.11	184.92	90.313			
19,900.00	6,978.96	6,794.57	6,793.96	209.86	136.64	89.34	2,859.68	3,813.54	16,800.83	16,615.82	185.00	90.813			
20,000.00	6,978.89	6,794.50	6,793.89	211.45	136.64	89.34	2,859.68	3,813.54	16,900.62	16,715.53	185.09	91.313			
20,100.00	6,978.81	6,794.42	6,793.81	213.03	136.64	89.34	2,859.68	3,813.54	17,000.41	16,815.24	185.17	91.812			
20,200.00	6,978.74	6,794.35	6,793.74	214.61	136.63	89.33	2,859.68	3,813.54	17,100.20	16,914.96	185.25	92.310			
20,300.00	6,978.66	6,794.27	6,793.66	216.20	136.63	89.33	2,859.68	3,813.54	17,200.00	17,014.67	185.33	92.808			
20,400.00	6,978.59	6,794.20	6,793.59	217.78	136.63	89.32	2,859.68	3,813.54	17,299.80	17,114.39	185.41	93.306			
20,500.00	6,978.51	6,794.13	6,793.51	219.37	136.63	89.32	2,859.68	3,813.54	17,399.60	17,214.11	185.49	93.803			
20,600.00	6,978.44	6,794.05	6,793.44	220.95	136.63	89.32	2,859.68	3,813.54	17,499.41	17,313.84	185.57	94.299			
20,700.00	6,978.36	6,793.98	6,793.36	222.53	136.63	89.31	2,859.68	3,813.54	17,599.22	17,413.56	185.65	94.795			
20,800.00	6,978.29	6,793.90	6,793.29	224.12	136.63	89.31	2,859.68	3,813.54	17,699.02	17,513.29	185.74	95.291			
20,900.00	6,978.21	6,793.83	6,793.21	225.71	136.62	89.30	2,859.68	3,813.54	17,798.84	17,613.02	185.82	95.786			
21,000.00	6,978.14	6,793.75	6,793.14	227.29	136.62	89.30	2,859.68	3,813.54	17,898.65	17,712.75	185.90	96.280			
21,100.00	6,978.07	6,793.68	6,793.07	228.88	136.62	89.30	2,859.68	3,813.54	17,998.46	17,812.48	185.98	96.774			
21,200.00	6,977.99	6,793.60	6,792.99	230.46	136.62	89.29	2,859.68	3,813.54	18,098.28	17,912.21	186.07	97.268			
21,300.00	6,977.92	6,793.53	6,792.92	232.05	136.62	89.29	2,859.68	3,813.54	18,198.10	18,011.95	186.15	97.761			
21,400.00	6,977.84	6,793.45	6,792.84	233.64	136.62	89.28	2,859.68	3,813.54	18,297.92	18,111.69	186.23	98.253			
21,500.00	6,977.77	6,793.38	6,792.77	235.22	136.61	89.28	2,859.68	3,813.54	18,397.74	18,211.43	186.32	98.745			
21,600.00	6,977.69	6,793.31	6,792.69	236.81	136.61	89.28	2,859.68	3,813.54	18,497.57	18,311.17	186.40	99.236			
21,700.00	6,977.62	6,793.23	6,792.62	238.40	136.61	89.27	2,859.68	3,813.54	18,597.40	18,410.91	186.48	99.727			
21,800.00	6,977.54	6,793.16	6,792.54	239.99	136.61	89.27	2,859.68	3,813.54	18,697.22	18,510.66	186.57	100.217			
21,900.00	6,977.47	6,793.08	6,792.47	241.57	136.61	89.27	2,859.68	3,813.54	18,797.06	18,610.40	186.65	100.707			
22,000.00	6,977.39	6,793.01	6,792.39	243.16	136.61	89.26	2,859.68	3,813.54	18,896.89	18,710.15	186.74	101.196			
22,100.00	6,977.32	6,792.93	6,792.32	244.75	136.61	89.26	2,859.68	3,813.54	18,996.72	18,809.90	186.82	101.685			
22,200.00	6,977.25	6,792.86	6,792.25	246.34	136.60	89.25	2,859.68	3,813.54	19,096.56	18,909.65	186.90	102.173			
22,300.00	6,977.17	6,792.78	6,792.17	247.93	136.60	89.25	2,859.68	3,813.54	19,196.40	19,009.41	186.99	102.661			
22,400.00	6,977.10	6,792.71	6,792.10	249.52	136.60	89.25	2,859.68	3,813.54	19,296.23	19,109.16	187.07	103.148			
22,500.00	6,977.02	6,792.63	6,792.02	251.11	136.60	89.24	2,859.68	3,813.54	19,396.08	19,208.92	187.16	103.634			
22,529.62	6,977.00	6,792.61	6,792.00	251.58	136.60	89.24	2,859.68	3,813.54	19,425.64	19,238.46	187.18	103.778			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 107-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-102.87	-1,149.97	-5,032.89	5,163.60				
100.00	100.00	0.00	0.00	0.25	0.00	-102.87	-1,149.97	-5,032.89	5,162.59	5,162.34	0.25	N/A	
134.01	134.01	32.01	32.01	0.37	0.20	-102.87	-1,149.97	-5,032.89	5,162.59	5,162.02	0.57	9,051.819	
200.00	200.00	98.00	98.00	0.61	0.61	-102.87	-1,149.97	-5,032.89	5,162.59	5,161.38	1.21	4,254.267	
268.00	268.00	166.00	166.99	0.85	1.17	-102.87	-1,149.78	-5,032.89	5,162.55	5,160.56	1.99	2,590.806	
300.00	300.00	194.38	194.38	0.97	1.40	-102.87	-1,149.82	-5,032.89	5,162.56	5,160.22	2.34	2,207.868	
400.00	400.00	298.01	298.00	1.33	2.23	-102.87	-1,149.97	-5,032.89	5,162.59	5,159.09	3.50	1,475.460	
417.56	417.56	315.56	315.55	1.39	2.37	-102.87	-1,149.87	-5,032.89	5,162.57	5,158.88	3.69	1,397.209	
500.00	500.00	395.78	395.77	1.68	3.00	-102.87	-1,149.95	-5,032.89	5,162.59	5,157.99	4.60	1,122.720	
550.00	550.00	448.02	448.00	1.86	3.84	-102.87	-1,149.97	-5,032.89	5,162.59	5,156.98	5.61	920.301	
600.00	600.00	498.01	498.00	2.04	4.74	-100.49	-1,149.97	-5,032.89	5,162.67	5,155.99	6.69	772.059	
700.00	699.93	597.95	597.93	2.40	6.55	-100.51	-1,149.97	-5,032.89	5,163.31	5,154.47	8.84	584.100	
800.00	799.68	696.54	696.52	2.77	8.33	-100.56	-1,149.17	-5,032.89	5,164.41	5,153.44	10.97	470.790	
900.00	899.13	793.05	793.02	3.13	10.08	-100.63	-1,149.38	-5,032.89	5,166.39	5,153.32	13.07	395.407	
1,000.00	998.15	889.08	889.05	3.49	11.81	-100.73	-1,149.84	-5,032.89	5,169.10	5,153.94	15.16	340.954	
1,100.00	1,096.63	994.69	994.63	3.87	13.24	-100.86	-1,149.97	-5,032.89	5,172.43	5,155.48	16.95	305.156	
1,130.50	1,126.54	1,024.59	1,024.54	3.99	13.61	-100.90	-1,149.97	-5,032.89	5,173.58	5,156.15	17.43	296.763	
1,200.00	1,194.61	1,092.67	1,092.61	4.26	14.45	-101.05	-1,149.97	-5,032.89	5,176.30	5,157.76	18.54	279.236	
1,300.00	1,292.57	1,187.72	1,187.65	4.66	15.63	-101.25	-1,149.39	-5,032.89	5,180.13	5,160.03	20.10	257.759	
1,400.00	1,390.52	1,281.84	1,281.77	5.07	16.80	-101.46	-1,149.75	-5,032.89	5,184.27	5,162.62	21.65	239.452	
1,500.00	1,488.48	1,386.56	1,386.48	5.48	17.62	-101.69	-1,149.97	-5,032.89	5,188.44	5,165.58	22.86	226.955	
1,600.00	1,586.43	1,484.18	1,484.09	5.90	18.15	-101.90	-1,149.63	-5,032.89	5,192.55	5,168.78	23.78	218.395	
1,700.00	1,684.38	1,578.64	1,578.55	6.31	18.66	-102.11	-1,149.78	-5,032.89	5,196.86	5,172.19	24.68	210.594	
1,800.00	1,782.34	1,680.43	1,680.34	6.73	19.29	-102.33	-1,149.97	-5,032.89	5,201.26	5,175.55	25.70	202.366	
1,900.00	1,880.29	1,778.38	1,778.29	7.15	19.99	-102.54	-1,149.97	-5,032.89	5,205.68	5,178.89	26.79	194.304	
2,000.00	1,978.25	1,875.99	1,875.89	7.58	20.68	-102.75	-1,149.73	-5,032.89	5,210.11	5,182.23	27.88	186.878	
2,100.00	2,076.20	1,972.59	1,972.50	8.00	21.36	-102.96	-1,149.80	-5,032.89	5,214.70	5,185.73	28.96	180.050	
2,200.00	2,174.15	2,072.26	2,072.15	8.43	22.06	-103.18	-1,149.97	-5,032.89	5,219.38	5,189.32	30.06	173.637	
2,300.00	2,272.11	2,170.22	2,170.11	8.85	22.41	-103.39	-1,149.97	-5,032.89	5,224.10	5,193.30	30.79	169.642	
2,400.00	2,370.06	2,263.02	2,262.91	9.28	22.74	-103.58	-1,149.68	-5,032.89	5,228.81	5,197.29	31.51	165.917	
2,500.00	2,468.02	2,366.15	2,366.02	9.71	23.12	-103.81	-1,149.97	-5,032.89	5,233.75	5,201.47	32.28	162.152	
2,600.00	2,565.97	2,464.11	2,463.97	10.14	23.50	-104.02	-1,149.97	-5,032.89	5,238.68	5,205.65	33.03	158.591	
2,700.00	2,663.92	2,557.21	2,557.06	10.57	23.85	-104.21	-1,149.32	-5,032.89	5,243.50	5,209.73	33.77	155.261	
2,800.00	2,761.88	2,648.05	2,647.89	11.00	24.20	-104.41	-1,149.81	-5,032.89	5,248.73	5,214.23	34.50	152.117	
2,900.00	2,859.83	2,758.02	2,757.83	11.43	25.41	-104.64	-1,149.97	-5,032.89	5,253.92	5,217.80	36.12	145.462	
3,000.00	2,957.79	2,855.98	2,855.79	11.86	26.64	-104.85	-1,149.97	-5,032.89	5,259.14	5,221.39	37.75	139.300	
3,100.00	3,055.74	2,953.93	2,953.74	12.29	27.86	-105.06	-1,149.97	-5,032.89	5,264.44	5,225.05	39.39	133.650	
3,200.00	3,153.69	3,049.63	3,049.42	12.72	29.06	-105.25	-1,148.57	-5,032.89	5,269.37	5,228.37	41.00	128.529	
3,300.00	3,251.65	3,143.49	3,143.28	13.15	30.23	-105.45	-1,148.81	-5,032.89	5,274.89	5,232.30	42.58	123.874	
3,400.00	3,349.60	3,237.26	3,237.05	13.59	31.41	-105.65	-1,149.29	-5,032.89	5,280.55	5,236.38	44.17	119.560	
3,500.00	3,447.56	3,345.81	3,345.56	14.02	33.14	-105.89	-1,149.97	-5,032.89	5,286.33	5,240.02	46.31	114.148	
3,600.00	3,545.51	3,443.76	3,443.51	14.45	36.30	-106.09	-1,149.97	-5,032.89	5,291.98	5,242.07	49.91	106.030	
3,700.00	3,643.46	3,541.71	3,541.46	14.88	39.46	-106.30	-1,149.97	-5,032.89	5,297.70	5,244.19	53.51	99.006	
3,800.00	3,741.42	3,639.67	3,639.42	15.32	42.62	-106.50	-1,149.97	-5,032.89	5,303.49	5,246.39	57.11	92.869	
3,900.00	3,839.37	3,737.62	3,737.37	15.75	45.78	-106.71	-1,149.97	-5,032.89	5,309.35	5,248.65	60.71	87.460	
4,000.00	3,937.33	3,835.58	3,835.33	16.18	48.94	-106.91	-1,149.97	-5,032.89	5,315.29	5,250.98	64.30	82.658	
4,100.00	4,035.28	3,932.73	3,932.48	16.62	52.08	-107.10	-1,148.78	-5,032.89	5,320.88	5,253.01	67.88	78.390	
4,200.00	4,133.23	4,029.28	4,029.03	17.05	55.19	-107.30	-1,148.86	-5,032.89	5,326.98	5,255.55	71.43	74.577	
4,300.00	4,231.19	4,125.80	4,125.55	17.48	58.31	-107.50	-1,149.02	-5,032.89	5,333.17	5,258.18	74.98	71.127	
4,400.00	4,329.14	4,222.30	4,222.04	17.92	61.42	-107.70	-1,149.24	-5,032.89	5,339.45	5,260.92	78.53	67.991	
4,500.00	4,427.10	4,318.76	4,318.50	18.35	64.53	-107.91	-1,149.54	-5,032.89	5,345.83	5,263.75	82.08	65.129	
4,600.00	4,525.05	4,415.19	4,414.93	18.78	67.64	-108.11	-1,149.92	-5,032.89	5,352.31	5,266.68	85.63	62.506	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		107-MWD OWSG Rev5					Rule Assigned:			Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,700.00	4,623.00	4,521.35	4,521.00	19.22	68.63	-108.33	-1,149.97	-5,032.89	5,358.73	5,271.71	87.02	61.578		
4,800.00	4,720.96	4,619.31	4,618.96	19.65	69.26	-108.53	-1,149.97	-5,032.89	5,365.22	5,277.16	88.06	60.928		
4,900.00	4,818.91	4,709.80	4,709.44	20.09	69.85	-108.70	-1,149.27	-5,032.89	5,371.51	5,282.47	89.04	60.324		
5,000.00	4,916.87	4,799.78	4,799.42	20.52	70.43	-108.89	-1,149.80	-5,032.89	5,378.34	5,288.31	90.03	59.742		
5,100.00	5,014.82	4,913.20	4,912.82	20.96	72.08	-109.12	-1,149.97	-5,032.89	5,385.06	5,292.97	92.09	58.474		
5,200.00	5,112.77	5,011.16	5,010.77	21.39	73.69	-109.32	-1,149.97	-5,032.89	5,391.81	5,297.69	94.12	57.287		
5,300.00	5,210.73	5,109.11	5,108.73	21.82	75.30	-109.52	-1,149.97	-5,032.89	5,398.63	5,302.48	96.15	56.151		
5,400.00	5,308.68	5,207.06	5,206.68	22.26	76.91	-109.72	-1,149.97	-5,032.89	5,405.51	5,307.34	98.17	55.062		
5,493.23	5,400.00	5,298.38	5,298.00	22.66	78.42	-109.90	-1,149.97	-5,032.89	5,411.98	5,311.92	100.06	54.088		
5,500.00	5,406.64	5,305.02	5,304.64	22.69	78.53	-109.92	-1,149.97	-5,032.89	5,412.45	5,312.26	100.20	54.019		
5,600.00	5,504.69	5,402.91	5,402.52	23.12	80.14	-110.13	-1,148.72	-5,032.89	5,418.81	5,316.60	102.22	53.012		
5,700.00	5,602.91	5,499.57	5,499.18	23.55	81.73	-110.34	-1,148.77	-5,032.89	5,425.43	5,321.22	104.21	52.061		
5,800.00	5,701.29	5,596.35	5,595.96	23.97	83.32	-110.54	-1,148.88	-5,032.89	5,431.83	5,325.62	106.21	51.144		
5,900.00	5,799.82	5,693.27	5,692.88	24.39	84.92	-110.74	-1,149.07	-5,032.89	5,438.00	5,329.80	108.20	50.261		
6,000.00	5,898.50	5,790.30	5,789.91	24.79	86.51	-110.92	-1,149.32	-5,032.89	5,443.94	5,333.75	110.18	49.408		
6,100.00	5,997.31	5,887.45	5,887.06	25.20	88.11	-111.10	-1,149.66	-5,032.89	5,449.63	5,337.47	112.17	48.586		
6,200.00	6,096.26	5,994.71	5,994.26	25.60	91.01	-111.28	-1,149.97	-5,032.89	5,455.04	5,339.58	115.45	47.249		
6,300.00	6,195.33	6,093.78	6,093.33	25.99	96.43	-111.44	-1,149.97	-5,032.89	5,460.04	5,338.77	121.27	45.024		
6,400.00	6,294.51	6,192.96	6,192.51	26.37	101.86	-111.58	-1,149.97	-5,032.89	5,464.75	5,337.66	127.08	43.001		
6,498.19	6,392.00	6,290.45	6,290.00	26.75	107.19	-111.71	-1,149.97	-5,032.89	5,469.08	5,336.28	132.80	41.184		
6,500.00	6,393.80	6,292.25	6,291.80	26.76	107.29	-110.51	-1,149.97	-5,032.89	5,469.16	5,336.26	132.90	41.152		
6,550.00	6,443.29	6,341.74	6,341.29	26.95	110.00	-87.76	-1,149.97	-5,032.89	5,470.01	5,334.20	135.81	40.278		
6,600.00	6,492.24	6,390.69	6,390.24	27.16	112.67	-77.19	-1,149.97	-5,032.89	5,468.48	5,329.78	138.70	39.427		
6,650.00	6,540.33	6,438.78	6,438.33	27.38	115.30	-71.75	-1,149.97	-5,032.89	5,464.61	5,323.05	141.56	38.603		
6,700.00	6,587.28	6,485.73	6,485.28	27.60	117.87	-68.78	-1,149.97	-5,032.89	5,458.42	5,314.05	144.37	37.808		
6,750.00	6,632.80	6,531.25	6,530.80	27.84	120.36	-67.20	-1,149.97	-5,032.89	5,449.99	5,302.88	147.12	37.045		
6,800.00	6,676.60	6,575.06	6,574.60	28.09	122.76	-66.53	-1,149.97	-5,032.89	5,439.40	5,289.62	149.78	36.316		
6,850.00	6,718.42	6,616.87	6,616.42	28.34	125.04	-66.49	-1,149.97	-5,032.89	5,426.75	5,274.40	152.35	35.621		
6,900.00	6,758.00	6,656.45	6,656.00	28.60	127.21	-66.95	-1,149.97	-5,032.89	5,412.14	5,257.33	154.80	34.961		
6,950.00	6,795.09	6,693.54	6,693.09	28.87	129.24	-67.81	-1,149.97	-5,032.89	5,395.70	5,238.57	157.13	34.338		
7,000.00	6,829.46	6,727.91	6,727.46	29.14	131.12	-69.02	-1,149.97	-5,032.89	5,377.58	5,218.26	159.33	33.752		
7,050.00	6,860.91	6,759.36	6,758.91	29.43	132.84	-70.53	-1,149.97	-5,032.89	5,357.92	5,196.55	161.37	33.203		
7,100.00	6,889.24	6,787.69	6,787.24	29.73	134.39	-72.31	-1,149.97	-5,032.89	5,336.88	5,173.63	163.26	32.690		
7,150.00	6,914.27	6,812.72	6,812.27	30.05	135.76	-74.32	-1,149.97	-5,032.89	5,314.63	5,149.66	164.97	32.216		
7,200.00	6,935.85	6,834.30	6,833.85	30.37	136.94	-76.52	-1,149.97	-5,032.89	5,291.34	5,124.83	166.51	31.779		
7,250.00	6,953.84	6,852.30	6,851.84	30.71	137.92	-78.90	-1,149.97	-5,032.89	5,267.17	5,099.31	167.86	31.379		
7,300.00	6,968.15	6,866.60	6,866.15	31.06	138.70	-81.41	-1,149.97	-5,032.89	5,242.31	5,073.30	169.01	31.017		
7,350.00	6,978.67	6,877.12	6,876.67	31.42	139.28	-84.03	-1,149.97	-5,032.89	5,216.93	5,046.96	169.97	30.693		
7,400.00	6,985.34	6,883.80	6,883.34	31.79	139.65	-86.71	-1,149.97	-5,032.89	5,191.21	5,020.48	170.73	30.406		
7,450.00	6,988.13	6,886.58	6,886.13	32.17	139.80	-89.42	-1,149.97	-5,032.89	5,165.30	4,994.03	171.27	30.158		
7,461.13	6,988.22	6,886.67	6,886.22	32.26	139.80	-90.02	-1,149.97	-5,032.89	5,159.53	4,988.16	171.37	30.108		
7,500.00	6,988.19	6,886.64	6,886.19	32.56	139.80	-90.02	-1,149.97	-5,032.89	5,139.25	4,967.58	171.68	29.935		
7,600.00	6,988.12	6,886.57	6,886.12	33.37	139.80	-90.03	-1,149.97	-5,032.89	5,086.00	4,913.50	172.50	29.484		
7,700.00	6,988.05	6,886.50	6,886.05	34.21	139.79	-90.03	-1,149.97	-5,032.89	5,031.21	4,857.86	173.35	29.024		
7,800.00	6,987.98	6,886.43	6,885.98	35.09	139.79	-90.03	-1,149.97	-5,032.89	4,974.88	4,800.66	174.22	28.554		
7,900.00	6,987.91	6,886.36	6,885.91	35.99	139.79	-90.03	-1,149.97	-5,032.89	4,917.05	4,741.92	175.12	28.078		
8,000.00	6,987.83	6,886.28	6,885.83	36.93	139.78	-90.03	-1,149.97	-5,032.89	4,857.72	4,681.67	176.04	27.594		
8,100.00	6,987.76	6,886.21	6,885.76	37.88	139.78	-90.03	-1,149.97	-5,032.89	4,796.91	4,619.93	176.98	27.104		
8,200.00	6,987.68	6,886.14	6,885.68	38.86	139.77	-90.03	-1,149.97	-5,032.89	4,734.65	4,556.72	177.93	26.609		
8,300.00	6,987.61	6,886.06	6,885.61	39.86	139.77	-90.04	-1,149.97	-5,032.89	4,670.96	4,492.06	178.90	26.109		
8,400.00	6,987.53	6,885.99	6,885.53	40.87	139.76	-90.04	-1,149.97	-5,032.89	4,605.84	4,425.97	179.88	25.606		
8,500.00	6,987.46	6,885.91	6,885.46	41.90	139.76	-90.04	-1,149.97	-5,032.89	4,539.33	4,358.47	180.86	25.099		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 107-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,600.00	6,987.38	6,885.84	6,885.38	42.93	139.76	-90.04	-1,149.97	-5,032.89	4,471.44	4,289.59	181.85	24.589	
8,700.00	6,987.31	6,885.76	6,885.31	43.98	139.75	-90.04	-1,149.97	-5,032.89	4,402.20	4,219.36	182.84	24.076	
8,800.00	6,987.23	6,885.69	6,885.23	45.03	139.75	-90.04	-1,149.97	-5,032.89	4,331.62	4,147.78	183.84	23.562	
8,872.16	6,987.18	6,885.63	6,885.18	45.79	139.75	-90.04	-1,149.97	-5,032.89	4,279.88	4,095.32	184.56	23.190	
8,900.00	6,987.16	6,885.61	6,885.16	46.08	139.74	-90.04	-1,149.97	-5,032.89	4,259.82	4,074.99	184.84	23.046	
9,000.00	6,987.09	6,885.54	6,885.09	47.16	139.74	-90.04	-1,149.97	-5,032.89	4,188.54	4,002.67	185.86	22.536	
9,100.00	6,987.01	6,885.46	6,885.01	48.27	139.74	-90.04	-1,149.97	-5,032.89	4,118.44	3,931.52	186.92	22.033	
9,200.00	6,986.94	6,885.39	6,884.94	49.40	139.73	-90.04	-1,149.97	-5,032.89	4,049.60	3,861.58	188.02	21.538	
9,300.00	6,986.86	6,885.31	6,884.86	50.56	139.73	-90.04	-1,149.97	-5,032.89	3,982.09	3,792.93	189.16	21.052	
9,400.00	6,986.79	6,885.24	6,884.79	51.75	139.72	-90.04	-1,149.97	-5,032.89	3,915.96	3,725.63	190.33	20.575	
9,500.00	6,986.71	6,885.16	6,884.71	52.95	139.72	-90.04	-1,149.97	-5,032.89	3,851.29	3,659.75	191.54	20.107	
9,600.00	6,986.64	6,885.09	6,884.64	54.18	139.72	-90.03	-1,149.97	-5,032.89	3,788.16	3,595.38	192.78	19.650	
9,700.00	6,986.56	6,885.01	6,884.56	55.42	139.71	-90.03	-1,149.97	-5,032.89	3,726.65	3,532.59	194.06	19.204	
9,800.00	6,986.49	6,884.94	6,884.49	56.69	139.71	-90.03	-1,149.97	-5,032.89	3,666.83	3,471.46	195.37	18.769	
9,900.00	6,986.41	6,884.87	6,884.41	57.97	139.70	-90.03	-1,149.97	-5,032.89	3,608.79	3,412.08	196.71	18.346	
10,000.00	6,986.34	6,884.79	6,884.34	59.26	139.70	-90.03	-1,149.97	-5,032.89	3,552.62	3,354.54	198.08	17.935	
10,100.00	6,986.27	6,884.72	6,884.27	60.57	139.70	-90.03	-1,149.97	-5,032.89	3,498.40	3,298.93	199.47	17.538	
10,200.00	6,986.19	6,884.64	6,884.19	61.90	139.69	-90.03	-1,149.97	-5,032.89	3,446.23	3,245.35	200.89	17.155	
10,300.00	6,986.12	6,884.57	6,884.12	63.23	139.69	-90.02	-1,149.97	-5,032.89	3,396.21	3,193.89	202.32	16.786	
10,400.00	6,986.04	6,884.49	6,884.04	64.58	139.68	-90.02	-1,149.97	-5,032.89	3,348.43	3,144.66	203.77	16.432	
10,500.00	6,985.97	6,884.42	6,883.97	65.94	139.68	-90.02	-1,149.97	-5,032.89	3,302.98	3,097.76	205.23	16.094	
10,600.00	6,985.89	6,884.34	6,883.89	67.32	139.68	-90.02	-1,149.97	-5,032.89	3,259.97	3,053.28	206.69	15.772	
10,700.00	6,985.82	6,884.27	6,883.82	68.70	139.67	-90.02	-1,149.97	-5,032.89	3,219.50	3,011.35	208.15	15.467	
10,800.00	6,985.74	6,884.19	6,883.74	70.09	139.67	-90.02	-1,149.97	-5,032.89	3,181.65	2,972.04	209.60	15.179	
10,900.00	6,985.67	6,884.12	6,883.67	71.49	139.66	-90.02	-1,149.97	-5,032.89	3,146.52	2,935.48	211.04	14.909	
11,000.00	6,985.59	6,884.05	6,883.59	72.90	139.66	-90.01	-1,149.97	-5,032.89	3,114.21	2,901.75	212.46	14.658	
11,100.00	6,985.52	6,883.97	6,883.52	74.31	139.65	-90.01	-1,149.97	-5,032.89	3,084.81	2,870.96	213.85	14.425	
11,200.00	6,985.45	6,883.90	6,883.45	75.74	139.65	-90.01	-1,149.97	-5,032.89	3,058.40	2,843.19	215.21	14.211	
11,300.00	6,985.37	6,883.82	6,883.37	77.17	139.65	-90.01	-1,149.97	-5,032.89	3,035.05	2,818.53	216.52	14.017	
11,400.00	6,985.30	6,883.75	6,883.30	78.61	139.64	-90.01	-1,149.97	-5,032.89	3,014.84	2,797.05	217.78	13.843	
11,500.00	6,985.22	6,883.67	6,883.22	80.05	139.64	-90.01	-1,149.97	-5,032.89	2,997.83	2,778.83	218.99	13.689	
11,600.00	6,985.15	6,883.60	6,883.15	81.50	139.63	-90.01	-1,149.97	-5,032.89	2,984.07	2,763.94	220.14	13.556	
11,700.00	6,985.07	6,883.52	6,883.07	82.96	139.63	-90.00	-1,149.97	-5,032.89	2,973.62	2,752.41	221.21	13.443	
11,800.00	6,985.00	6,883.45	6,883.00	84.42	139.63	-90.00	-1,149.97	-5,032.89	2,966.50	2,744.29	222.21	13.350	
11,900.00	6,984.92	6,883.37	6,882.92	85.89	139.62	-90.00	-1,149.97	-5,032.89	2,962.75	2,739.62	223.13	13.278	
11,961.38	6,984.88	6,883.33	6,882.88	86.79	139.62	-90.00	-1,149.97	-5,032.89	2,962.11	2,738.46	223.65	13.244 CC	
12,000.00	6,984.85	6,883.30	6,882.85	87.36	139.62	-90.00	-1,149.97	-5,032.89	2,962.36	2,738.40	223.96	13.227 ES	
12,100.00	6,984.77	6,883.23	6,882.77	88.83	139.61	-90.00	-1,149.97	-5,032.89	2,965.35	2,740.64	224.71	13.196	
12,200.00	6,984.70	6,883.15	6,882.70	90.31	139.61	-90.00	-1,149.97	-5,032.89	2,971.71	2,746.34	225.37	13.186 SF	
12,300.00	6,984.63	6,883.08	6,882.63	91.80	139.61	-90.00	-1,149.97	-5,032.89	2,981.40	2,755.47	225.93	13.196	
12,400.00	6,984.55	6,883.00	6,882.55	93.29	139.60	-89.99	-1,149.97	-5,032.89	2,994.41	2,768.00	226.41	13.226	
12,500.00	6,984.48	6,882.93	6,882.48	94.78	139.60	-89.99	-1,149.97	-5,032.89	3,010.68	2,783.89	226.80	13.275	
12,600.00	6,984.40	6,882.85	6,882.40	96.28	139.59	-89.99	-1,149.97	-5,032.89	3,030.17	2,803.08	227.09	13.343	
12,700.00	6,984.33	6,882.78	6,882.33	97.78	139.59	-89.99	-1,149.97	-5,032.89	3,052.81	2,825.51	227.30	13.431	
12,800.00	6,984.25	6,882.70	6,882.25	99.28	139.59	-89.99	-1,149.97	-5,032.89	3,078.54	2,851.11	227.43	13.536	
12,900.00	6,984.18	6,882.63	6,882.18	100.78	139.58	-89.99	-1,149.97	-5,032.89	3,107.27	2,879.79	227.48	13.660	
13,000.00	6,984.10	6,882.55	6,882.10	102.29	139.58	-89.99	-1,149.97	-5,032.89	3,138.92	2,911.47	227.45	13.801	
13,100.00	6,984.03	6,882.48	6,882.03	103.80	139.57	-89.98	-1,149.97	-5,032.89	3,173.41	2,946.06	227.35	13.958	
13,200.00	6,983.95	6,882.41	6,881.95	105.32	139.57	-89.98	-1,149.97	-5,032.89	3,210.65	2,983.46	227.19	14.132	
13,300.00	6,983.88	6,882.33	6,881.88	106.84	139.57	-89.98	-1,149.97	-5,032.89	3,250.54	3,023.58	226.96	14.322	
13,400.00	6,983.81	6,882.26	6,881.81	108.36	139.56	-89.98	-1,149.97	-5,032.89	3,292.98	3,066.30	226.68	14.527	
13,500.00	6,983.73	6,882.18	6,881.73	109.88	139.56	-89.98	-1,149.97	-5,032.89	3,337.88	3,111.53	226.35	14.746	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		107-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
13,600.00	6,983.66	6,882.11	6,881.66	111.40	139.55	-89.98	-1,149.97	-5,032.89	3,385.14	3,159.16	225.98	14.980	
13,700.00	6,983.58	6,882.03	6,881.58	112.93	139.55	-89.97	-1,149.97	-5,032.89	3,434.66	3,209.10	225.56	15.227	
13,800.00	6,983.51	6,881.96	6,881.51	114.46	139.54	-89.97	-1,149.97	-5,032.89	3,486.35	3,261.23	225.12	15.487	
13,900.00	6,983.43	6,881.88	6,881.43	115.99	139.54	-89.97	-1,149.97	-5,032.89	3,540.11	3,315.47	224.64	15.759	
14,000.00	6,983.36	6,881.81	6,881.36	117.52	139.54	-89.97	-1,149.97	-5,032.89	3,595.84	3,371.71	224.13	16.044	
14,100.00	6,983.28	6,881.73	6,881.28	119.06	139.53	-89.97	-1,149.97	-5,032.89	3,653.47	3,429.86	223.60	16.339	
14,200.00	6,983.21	6,881.66	6,881.21	120.59	139.53	-89.97	-1,149.97	-5,032.89	3,712.89	3,489.83	223.06	16.646	
14,300.00	6,983.13	6,881.59	6,881.13	122.13	139.52	-89.97	-1,149.97	-5,032.89	3,774.02	3,551.53	222.50	16.962	
14,400.00	6,983.06	6,881.51	6,881.06	123.67	139.52	-89.96	-1,149.97	-5,032.89	3,836.79	3,614.87	221.92	17.289	
14,500.00	6,982.99	6,881.44	6,880.99	125.21	139.52	-89.96	-1,149.97	-5,032.89	3,901.12	3,679.77	221.34	17.625	
14,600.00	6,982.91	6,881.36	6,880.91	126.75	139.51	-89.96	-1,149.97	-5,032.89	3,966.92	3,746.16	220.76	17.970	
14,700.00	6,982.84	6,881.29	6,880.84	128.30	139.51	-89.96	-1,149.97	-5,032.89	4,034.12	3,813.96	220.17	18.323	
14,800.00	6,982.76	6,881.21	6,880.76	129.85	139.50	-89.96	-1,149.97	-5,032.89	4,102.67	3,883.09	219.57	18.685	
14,900.00	6,982.69	6,881.14	6,880.69	131.39	139.50	-89.96	-1,149.97	-5,032.89	4,172.48	3,953.50	218.98	19.054	
15,000.00	6,982.61	6,881.06	6,880.61	132.94	139.50	-89.96	-1,149.97	-5,032.89	4,243.50	4,025.11	218.39	19.431	
15,100.00	6,982.54	6,880.99	6,880.54	134.49	139.49	-89.95	-1,149.97	-5,032.89	4,315.68	4,097.87	217.81	19.814	
15,200.00	6,982.46	6,880.91	6,880.46	136.04	139.49	-89.95	-1,149.97	-5,032.89	4,388.94	4,171.71	217.22	20.205	
15,300.00	6,982.39	6,880.84	6,880.39	137.60	139.48	-89.95	-1,149.97	-5,032.89	4,463.24	4,246.59	216.65	20.601	
15,400.00	6,982.31	6,880.77	6,880.31	139.15	139.48	-89.95	-1,149.97	-5,032.89	4,538.53	4,322.45	216.08	21.004	
15,500.00	6,982.24	6,880.69	6,880.24	140.70	139.48	-89.95	-1,149.97	-5,032.89	4,614.75	4,399.24	215.52	21.412	
15,600.00	6,982.17	6,880.62	6,880.17	142.26	139.47	-89.95	-1,149.97	-5,032.89	4,691.87	4,476.91	214.96	21.826	
15,700.00	6,982.09	6,880.54	6,880.09	143.82	139.47	-89.95	-1,149.97	-5,032.89	4,769.84	4,555.42	214.42	22.245	
15,800.00	6,982.02	6,880.47	6,880.02	145.38	139.46	-89.94	-1,149.97	-5,032.89	4,848.62	4,634.74	213.88	22.669	
15,900.00	6,981.94	6,880.39	6,879.94	146.94	139.46	-89.94	-1,149.97	-5,032.89	4,928.17	4,714.81	213.36	23.098	
16,000.00	6,981.87	6,880.32	6,879.87	148.50	139.45	-89.94	-1,149.97	-5,032.89	5,008.45	4,795.61	212.84	23.531	
16,100.00	6,981.79	6,880.24	6,879.79	150.06	139.45	-89.94	-1,149.97	-5,032.89	5,089.43	4,877.09	212.34	23.968	
16,200.00	6,981.72	6,880.17	6,879.72	151.62	139.45	-89.94	-1,149.97	-5,032.89	5,171.08	4,959.23	211.84	24.410	
16,300.00	6,981.64	6,880.09	6,879.64	153.18	139.44	-89.94	-1,149.97	-5,032.89	5,253.36	5,042.00	211.36	24.855	
16,400.00	6,981.57	6,880.02	6,879.57	154.74	139.44	-89.94	-1,149.97	-5,032.89	5,336.24	5,125.36	210.89	25.304	
16,500.00	6,981.49	6,879.95	6,879.49	156.31	139.43	-89.93	-1,149.97	-5,032.89	5,419.70	5,209.28	210.42	25.756	
16,600.00	6,981.42	6,879.87	6,879.42	157.87	139.43	-89.93	-1,149.97	-5,032.89	5,503.72	5,293.75	209.97	26.212	
16,700.00	6,981.35	6,879.80	6,879.35	159.44	139.43	-89.93	-1,149.97	-5,032.89	5,588.26	5,378.73	209.53	26.671	
16,800.00	6,981.27	6,879.72	6,879.27	161.01	139.42	-89.93	-1,149.97	-5,032.89	5,673.30	5,464.21	209.10	27.132	
16,900.00	6,981.20	6,879.65	6,879.20	162.58	139.42	-89.93	-1,149.97	-5,032.89	5,758.83	5,550.15	208.68	27.597	
17,000.00	6,981.12	6,879.57	6,879.12	164.14	139.41	-89.93	-1,149.97	-5,032.89	5,844.81	5,636.55	208.26	28.064	
17,100.00	6,981.05	6,879.50	6,879.05	165.71	139.41	-89.93	-1,149.97	-5,032.89	5,931.23	5,723.37	207.86	28.534	
17,200.00	6,980.97	6,879.42	6,878.97	167.28	139.41	-89.92	-1,149.97	-5,032.89	6,018.08	5,810.61	207.47	29.007	
17,300.00	6,980.90	6,879.35	6,878.90	168.85	139.40	-89.92	-1,149.97	-5,032.89	6,105.33	5,898.23	207.09	29.481	
17,400.00	6,980.82	6,879.27	6,878.82	170.42	139.40	-89.92	-1,149.97	-5,032.89	6,192.96	5,986.24	206.72	29.958	
17,500.00	6,980.75	6,879.20	6,878.75	172.00	139.39	-89.92	-1,149.97	-5,032.89	6,280.96	6,074.60	206.36	30.437	
17,600.00	6,980.67	6,879.13	6,878.67	173.57	139.39	-89.92	-1,149.97	-5,032.89	6,369.31	6,163.31	206.01	30.918	
17,700.00	6,980.60	6,879.05	6,878.60	175.14	139.39	-89.92	-1,149.97	-5,032.89	6,458.01	6,252.34	205.67	31.401	
17,800.00	6,980.53	6,878.98	6,878.53	176.71	139.38	-89.92	-1,149.97	-5,032.89	6,547.03	6,341.70	205.33	31.885	
17,900.00	6,980.45	6,878.90	6,878.45	178.29	139.38	-89.91	-1,149.97	-5,032.89	6,636.37	6,431.36	205.01	32.371	
18,000.00	6,980.38	6,878.83	6,878.38	179.86	139.37	-89.91	-1,149.97	-5,032.89	6,726.00	6,521.31	204.69	32.859	
18,100.00	6,980.30	6,878.75	6,878.30	181.44	139.37	-89.91	-1,149.97	-5,032.89	6,815.92	6,611.54	204.38	33.349	
18,200.00	6,980.23	6,878.68	6,878.23	183.01	139.37	-89.91	-1,149.97	-5,032.89	6,906.12	6,702.04	204.08	33.840	
18,300.00	6,980.15	6,878.60	6,878.15	184.59	139.36	-89.91	-1,149.97	-5,032.89	6,996.59	6,792.80	203.79	34.332	
18,400.00	6,980.08	6,878.53	6,878.08	186.16	139.36	-89.91	-1,149.97	-5,032.89	7,087.31	6,883.80	203.51	34.826	
18,500.00	6,980.00	6,878.45	6,878.00	187.74	139.35	-89.91	-1,149.97	-5,032.89	7,178.28	6,975.05	203.23	35.321	
18,600.00	6,979.93	6,878.38	6,877.93	189.32	139.35	-89.90	-1,149.97	-5,032.89	7,269.48	7,066.52	202.96	35.817	
18,700.00	6,979.85	6,878.31	6,877.85	190.90	139.34	-89.90	-1,149.97	-5,032.89	7,360.92	7,158.22	202.70	36.314	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #108 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		107-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
18,800.00	6,979.78	6,878.23	6,877.78	192.48	139.34	-89.90	-1,149.97	-5,032.89	7,452.57	7,250.12	202.45	36.812		
18,900.00	6,979.71	6,878.16	6,877.71	194.05	139.34	-89.90	-1,149.97	-5,032.89	7,544.44	7,342.24	202.20	37.311		
19,000.00	6,979.63	6,878.08	6,877.63	195.63	139.33	-89.90	-1,149.97	-5,032.89	7,636.51	7,434.55	201.96	37.811		
19,100.00	6,979.56	6,878.01	6,877.56	197.21	139.33	-89.90	-1,149.97	-5,032.89	7,728.78	7,527.05	201.73	38.313		
19,200.00	6,979.48	6,877.93	6,877.48	198.79	139.32	-89.90	-1,149.97	-5,032.89	7,821.24	7,619.73	201.50	38.814		
19,300.00	6,979.41	6,877.86	6,877.41	200.37	139.32	-89.89	-1,149.97	-5,032.89	7,913.88	7,712.60	201.28	39.317		
19,400.00	6,979.33	6,877.78	6,877.33	201.95	139.32	-89.89	-1,149.97	-5,032.89	8,006.70	7,805.63	201.07	39.821		
19,500.00	6,979.26	6,877.71	6,877.26	203.54	139.31	-89.89	-1,149.97	-5,032.89	8,099.69	7,898.83	200.86	40.325		
19,600.00	6,979.18	6,877.63	6,877.18	205.12	139.31	-89.89	-1,149.97	-5,032.89	8,192.84	7,992.18	200.66	40.829		
19,700.00	6,979.11	6,877.56	6,877.11	206.70	139.30	-89.89	-1,149.97	-5,032.89	8,286.16	8,085.69	200.46	41.335		
19,800.00	6,979.03	6,877.49	6,877.03	208.28	139.30	-89.89	-1,149.97	-5,032.89	8,379.62	8,179.35	200.27	41.841		
19,900.00	6,978.96	6,877.41	6,876.96	209.86	139.30	-89.89	-1,149.97	-5,032.89	8,473.24	8,273.15	200.09	42.347		
20,000.00	6,978.89	6,877.34	6,876.89	211.45	139.29	-89.88	-1,149.97	-5,032.89	8,567.00	8,367.09	199.91	42.854		
20,100.00	6,978.81	6,877.26	6,876.81	213.03	139.29	-89.88	-1,149.97	-5,032.89	8,660.90	8,461.17	199.74	43.362		
20,200.00	6,978.74	6,877.19	6,876.74	214.61	139.28	-89.88	-1,149.97	-5,032.89	8,754.94	8,555.37	199.57	43.870		
20,300.00	6,978.66	6,877.11	6,876.66	216.20	139.28	-89.88	-1,149.97	-5,032.89	8,849.11	8,649.71	199.40	44.378		
20,400.00	6,978.59	6,877.04	6,876.59	217.78	139.28	-89.88	-1,149.97	-5,032.89	8,943.40	8,744.16	199.24	44.887		
20,500.00	6,978.51	6,876.96	6,876.51	219.37	139.27	-89.88	-1,149.97	-5,032.89	9,037.82	8,838.73	199.09	45.396		
20,600.00	6,978.44	6,876.89	6,876.44	220.95	139.27	-89.88	-1,149.97	-5,032.89	9,132.35	8,933.41	198.94	45.905		
20,700.00	6,978.36	6,876.81	6,876.36	222.53	139.26	-89.87	-1,149.97	-5,032.89	9,227.00	9,028.21	198.80	46.415		
20,800.00	6,978.29	6,876.74	6,876.29	224.12	139.26	-89.87	-1,149.97	-5,032.89	9,321.77	9,123.11	198.65	46.924		
20,900.00	6,978.21	6,876.67	6,876.21	225.71	139.26	-89.87	-1,149.97	-5,032.89	9,416.64	9,218.12	198.52	47.434		
21,000.00	6,978.14	6,876.59	6,876.14	227.29	139.25	-89.87	-1,149.97	-5,032.89	9,511.61	9,313.23	198.39	47.945		
21,100.00	6,978.07	6,876.52	6,876.07	228.88	139.25	-89.87	-1,149.97	-5,032.89	9,606.69	9,408.43	198.26	48.455		
21,200.00	6,977.99	6,876.44	6,875.99	230.46	139.24	-89.87	-1,149.97	-5,032.89	9,701.87	9,503.73	198.14	48.966		
21,300.00	6,977.92	6,876.37	6,875.92	232.05	139.24	-89.87	-1,149.97	-5,032.89	9,797.14	9,599.12	198.02	49.476		
21,400.00	6,977.84	6,876.29	6,875.84	233.64	139.23	-89.86	-1,149.97	-5,032.89	9,892.51	9,694.61	197.90	49.987		
21,500.00	6,977.77	6,876.22	6,875.77	235.22	139.23	-89.86	-1,149.97	-5,032.89	9,987.96	9,790.17	197.79	50.498		
21,600.00	6,977.69	6,876.14	6,875.69	236.81	139.23	-89.86	-1,149.97	-5,032.89	10,083.51	9,885.83	197.68	51.009		
21,700.00	6,977.62	6,876.07	6,875.62	238.40	139.22	-89.86	-1,149.97	-5,032.89	10,179.14	9,981.56	197.58	51.520		
21,800.00	6,977.54	6,875.99	6,875.54	239.99	139.22	-89.86	-1,149.97	-5,032.89	10,274.85	10,077.38	197.48	52.031		
21,900.00	6,977.47	6,875.92	6,875.47	241.57	139.21	-89.86	-1,149.97	-5,032.89	10,370.65	10,173.27	197.38	52.542		
22,000.00	6,977.39	6,875.85	6,875.39	243.16	139.21	-89.86	-1,149.97	-5,032.89	10,466.52	10,269.24	197.28	53.053		
22,100.00	6,977.32	6,875.77	6,875.32	244.75	139.21	-89.85	-1,149.97	-5,032.89	10,562.47	10,365.28	197.19	53.564		
22,200.00	6,977.25	6,875.70	6,875.25	246.34	139.20	-89.85	-1,149.97	-5,032.89	10,658.49	10,461.39	197.11	54.075		
22,300.00	6,977.17	6,875.62	6,875.17	247.93	139.20	-89.85	-1,149.97	-5,032.89	10,754.59	10,557.57	197.02	54.586		
22,400.00	6,977.10	6,875.55	6,875.10	249.52	139.19	-89.85	-1,149.97	-5,032.89	10,850.76	10,653.82	196.94	55.097		
22,500.00	6,977.02	6,875.47	6,875.02	251.11	139.19	-89.85	-1,149.97	-5,032.89	10,946.99	10,750.13	196.86	55.607		
22,529.62	6,977.00	6,875.45	6,875.00	251.58	139.19	-89.85	-1,149.97	-5,032.89	10,975.51	10,778.67	196.84	55.758		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 117-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Rule Assigned:		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+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	-95.47	-761.81	-7,958.98	7,995.87				
100.00	100.00	9.00	9.00	0.25	0.18	-95.47	-761.81	-7,958.98	7,995.35	7,994.93	0.43	N/A	
200.00	200.00	109.00	109.00	0.61	2.15	-95.47	-761.81	-7,958.98	7,995.35	7,992.60	2.76	2,900.368	
300.00	300.00	209.00	209.00	0.97	4.61	-95.47	-761.81	-7,958.98	7,995.35	7,989.78	5.57	1,434.511	
400.00	400.00	309.00	309.00	1.33	7.11	-95.47	-761.81	-7,958.98	7,995.35	7,986.92	8.43	948.116	
435.83	435.83	343.96	343.95	1.45	7.98	-95.46	-761.20	-7,958.98	7,995.30	7,985.86	9.44	847.368	
500.00	500.00	406.51	406.50	1.68	9.55	-95.46	-761.33	-7,958.98	7,995.31	7,984.08	11.23	711.968	
550.00	550.00	455.26	455.24	1.86	10.76	-95.47	-761.53	-7,958.98	7,995.33	7,982.70	12.63	633.137	
600.00	600.00	509.14	509.00	2.04	12.15	-93.09	-761.81	-7,958.98	7,995.38	7,981.19	14.19	563.458	
700.00	699.93	609.08	608.93	2.40	15.21	-93.11	-761.81	-7,958.98	7,995.57	7,977.95	17.62	453.889	
800.00	799.68	699.33	699.14	2.77	17.99	-93.14	-761.09	-7,958.98	7,995.88	7,975.14	20.75	385.432	
900.00	899.13	808.44	808.13	3.13	21.06	-93.21	-761.81	-7,958.98	7,996.53	7,972.35	24.18	330.715	
1,000.00	998.15	903.62	903.28	3.49	23.57	-93.28	-760.80	-7,958.98	7,997.23	7,970.17	27.06	295.533	
1,100.00	1,096.63	1,006.04	1,005.63	3.87	26.23	-93.40	-761.81	-7,958.98	7,998.36	7,968.26	30.10	265.702	
1,130.50	1,126.54	1,035.95	1,035.54	3.99	26.92	-93.43	-761.81	-7,958.98	7,998.72	7,967.81	30.91	258.774	
1,200.00	1,194.61	1,104.03	1,103.61	4.26	28.49	-93.53	-761.81	-7,958.98	7,999.59	7,966.83	32.75	244.245	
1,300.00	1,292.57	1,201.98	1,201.57	4.66	30.75	-93.67	-761.81	-7,958.98	8,000.88	7,965.47	35.41	225.951	
1,400.00	1,390.52	1,297.80	1,297.36	5.07	32.95	-93.80	-760.52	-7,958.98	8,002.08	7,964.05	38.02	210.450	
1,500.00	1,488.48	1,392.02	1,391.58	5.48	35.13	-93.94	-760.95	-7,958.98	8,003.51	7,962.91	40.61	197.104	
1,600.00	1,586.43	1,495.96	1,495.43	5.90	37.51	-94.09	-761.81	-7,958.98	8,005.05	7,961.64	43.41	184.411	
1,700.00	1,684.38	1,593.92	1,593.38	6.31	39.67	-94.23	-761.81	-7,958.98	8,006.54	7,960.55	45.98	174.116	
1,800.00	1,782.34	1,691.87	1,691.34	6.73	41.83	-94.37	-761.81	-7,958.98	8,008.08	7,959.52	48.56	164.906	
1,900.00	1,880.29	1,787.75	1,787.20	7.15	43.94	-94.50	-760.50	-7,958.98	8,009.51	7,958.42	51.09	156.757	
2,000.00	1,978.25	1,881.59	1,881.04	7.58	46.01	-94.64	-760.89	-7,958.98	8,011.20	7,957.62	53.59	149.504	
2,100.00	2,076.20	1,975.29	1,974.72	8.00	48.07	-94.78	-761.67	-7,958.98	8,012.99	7,956.92	56.07	142.901	
2,200.00	2,174.15	2,083.78	2,083.15	8.43	50.27	-94.94	-761.81	-7,958.98	8,014.75	7,956.05	58.70	136.543	
2,300.00	2,272.11	2,181.74	2,181.11	8.85	52.23	-95.08	-761.81	-7,958.98	8,016.54	7,955.45	61.09	131.235	
2,400.00	2,370.06	2,277.35	2,276.71	9.28	54.15	-95.21	-760.86	-7,958.98	8,018.25	7,954.83	63.43	126.416	
2,500.00	2,468.02	2,371.39	2,370.75	9.71	56.03	-95.34	-761.23	-7,958.98	8,020.20	7,954.46	65.74	122.001	
2,600.00	2,565.97	2,475.65	2,474.97	10.14	58.12	-95.50	-761.81	-7,958.98	8,022.22	7,953.96	68.26	117.527	
2,700.00	2,663.92	2,573.61	2,572.92	10.57	60.10	-95.64	-761.81	-7,958.98	8,024.21	7,953.55	70.66	113.559	
2,800.00	2,761.88	2,671.56	2,670.88	11.00	62.07	-95.78	-761.81	-7,958.98	8,026.25	7,953.19	73.06	109.852	
2,900.00	2,859.83	2,767.62	2,766.93	11.43	64.01	-95.91	-761.03	-7,958.98	8,028.23	7,952.80	75.43	106.434	
3,000.00	2,957.79	2,862.62	2,861.93	11.86	65.92	-96.05	-761.30	-7,958.98	8,030.41	7,952.64	77.77	103.254	
3,100.00	3,055.74	2,965.48	2,964.74	12.29	67.99	-96.20	-761.81	-7,958.98	8,032.68	7,952.41	80.27	100.070	
3,200.00	3,153.69	3,063.44	3,062.69	12.72	69.88	-96.34	-761.81	-7,958.98	8,034.92	7,952.33	82.59	97.287	
3,300.00	3,251.65	3,161.39	3,160.65	13.15	71.76	-96.48	-761.81	-7,958.98	8,037.21	7,952.30	84.91	94.657	
3,400.00	3,349.60	3,258.59	3,257.83	13.59	73.64	-96.61	-760.59	-7,958.98	8,039.36	7,952.15	87.21	92.181	
3,500.00	3,447.56	3,352.74	3,351.99	14.02	75.45	-96.74	-760.78	-7,958.98	8,041.78	7,952.32	89.46	89.893	
3,600.00	3,545.51	3,446.79	3,446.03	14.45	77.27	-96.88	-761.25	-7,958.98	8,044.30	7,952.60	91.70	87.721	
3,700.00	3,643.46	3,553.26	3,552.46	14.88	79.38	-97.03	-761.81	-7,958.98	8,046.88	7,952.62	94.25	85.376	
3,800.00	3,741.42	3,650.58	3,649.78	15.32	81.45	-97.17	-761.55	-7,958.98	8,049.37	7,952.62	96.75	83.197	
3,900.00	3,839.37	3,743.77	3,742.98	15.75	83.43	-97.30	-761.76	-7,958.98	8,052.00	7,952.84	99.16	81.201	
4,000.00	3,937.33	3,847.16	3,846.33	16.18	86.89	-97.45	-761.81	-7,958.98	8,054.64	7,951.59	103.05	78.163	
4,100.00	4,035.28	3,945.11	3,944.28	16.62	90.32	-97.59	-761.81	-7,958.98	8,057.33	7,950.42	106.91	75.362	
4,200.00	4,133.23	4,040.42	4,039.56	17.05	93.66	-97.71	-760.21	-7,958.98	8,059.78	7,949.10	110.69	72.816	
4,300.00	4,231.19	4,131.40	4,130.54	17.48	96.85	-97.85	-760.59	-7,958.98	8,062.64	7,948.33	114.31	70.534	
4,400.00	4,329.14	4,222.23	4,221.34	17.92	100.04	-97.98	-761.41	-7,958.98	8,065.64	7,947.71	117.92	68.397	
4,500.00	4,427.10	4,328.87	4,327.38	18.35	104.75	-98.13	-760.73	-7,958.98	8,068.38	7,945.31	123.08	65.556	
4,600.00	4,525.05	4,431.95	4,430.11	18.78	109.77	-98.27	-760.89	-7,958.98	8,071.34	7,942.82	128.52	62.802	
4,700.00	4,623.00	4,528.40	4,526.31	19.22	114.40	-98.41	-760.99	-7,958.98	8,074.34	7,940.76	133.58	60.444	
4,800.00	4,720.96	4,632.24	4,629.96	19.65	119.47	-98.56	-761.81	-7,958.98	8,077.53	7,938.44	139.08	58.076	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		117-A027Ua_INC-ONLY					Rule Assigned:		Offset Well Error:		0.00 usft			
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Warning						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,900.00	4,818.91	4,730.57	4,727.91	20.09	124.38	-98.70	-761.81	-7,958.98	8,080.61	7,936.18	144.43	55.947		
5,000.00	4,916.87	4,828.78	4,825.87	20.52	129.31	-98.84	-761.81	-7,958.98	8,083.74	7,933.95	149.79	53.968		
5,100.00	5,014.82	4,904.16	4,901.17	20.96	133.04	-98.94	-760.72	-7,958.98	8,086.73	7,932.78	153.95	52.527		
5,200.00	5,112.77	5,017.75	5,014.40	21.39	138.78	-99.10	-760.69	-7,958.98	8,089.92	7,929.80	160.12	50.523		
5,300.00	5,210.73	5,123.37	5,119.73	21.82	144.08	-99.25	-761.81	-7,958.98	8,093.43	7,927.57	165.86	48.797		
5,400.00	5,308.68	5,221.32	5,217.68	22.26	148.91	-99.39	-761.81	-7,958.98	8,096.75	7,925.63	171.12	47.317		
5,493.23	5,400.00	5,307.72	5,303.92	22.66	153.17	-99.48	-757.78	-7,958.98	8,099.05	7,923.27	175.78	46.075		
5,500.00	5,406.64	5,312.88	5,309.08	22.69	153.42	-99.49	-757.80	-7,958.98	8,099.29	7,923.23	176.06	46.002		
5,600.00	5,504.69	5,388.98	5,385.11	23.12	157.17	-99.62	-758.58	-7,958.98	8,102.83	7,922.59	180.24	44.956		
5,700.00	5,602.91	5,516.62	5,511.91	23.55	163.45	-99.82	-761.81	-7,958.98	8,106.70	7,919.76	186.94	43.365		
5,800.00	5,701.29	5,615.00	5,610.29	23.97	168.11	-99.96	-761.81	-7,958.98	8,109.83	7,917.81	192.02	42.235		
5,900.00	5,799.82	5,713.53	5,708.82	24.39	172.77	-100.09	-761.81	-7,958.98	8,112.85	7,915.75	197.10	41.162		
6,000.00	5,898.50	5,812.21	5,807.50	24.79	177.45	-100.22	-761.81	-7,958.98	8,115.74	7,913.57	202.17	40.142		
6,100.00	5,997.31	5,911.02	5,906.31	25.20	182.13	-100.34	-761.81	-7,958.98	8,118.51	7,911.25	207.26	39.172		
6,200.00	6,096.26	5,949.00	5,943.35	25.60	183.92	-100.39	-761.81	-7,958.98	8,121.39	7,911.95	209.44	38.777		
6,300.00	6,195.33	5,949.00	5,943.35	25.99	183.92	-100.41	-761.81	-7,958.98	8,125.25	7,915.46	209.79	38.731		
6,400.00	6,294.51	5,949.00	5,943.35	26.37	183.92	-100.43	-761.81	-7,958.98	8,130.18	7,920.08	210.10	38.697		
6,498.19	6,392.00	5,949.00	5,943.35	26.75	183.92	-100.46	-761.81	-7,958.98	8,136.07	7,925.70	210.37	38.675		
6,500.00	6,393.80	5,949.00	5,943.35	26.76	183.92	-99.25	-761.81	-7,958.98	8,136.18	7,925.81	210.38	38.674		
6,550.00	6,443.29	5,949.00	5,943.35	26.95	183.92	-76.38	-761.81	-7,958.98	8,138.02	7,927.51	210.51	38.659		
6,600.00	6,492.24	5,949.00	5,943.35	27.16	183.92	-65.65	-761.81	-7,958.98	8,137.21	7,926.56	210.65	38.629		
6,650.00	6,540.33	5,949.00	5,943.35	27.38	183.92	-60.00	-761.81	-7,958.98	8,133.75	7,922.95	210.80	38.586		
6,700.00	6,587.28	5,949.00	5,943.35	27.60	183.92	-56.79	-761.81	-7,958.98	8,127.66	7,916.71	210.95	38.529		
6,750.00	6,632.80	5,949.00	5,943.35	27.84	183.92	-54.94	-761.81	-7,958.98	8,118.97	7,907.86	211.11	38.459		
6,800.00	6,676.60	5,949.00	5,943.35	28.09	183.92	-53.96	-761.81	-7,958.98	8,107.72	7,896.45	211.27	38.376		
6,850.00	6,718.42	5,949.00	5,943.35	28.34	183.92	-53.60	-761.81	-7,958.98	8,093.99	7,882.54	211.44	38.280		
6,900.00	6,758.00	5,949.00	5,943.35	28.60	183.92	-53.73	-761.81	-7,958.98	8,077.83	7,866.21	211.62	38.171		
6,950.00	6,795.09	5,949.00	5,943.35	28.87	183.92	-54.27	-761.81	-7,958.98	8,059.33	7,847.53	211.81	38.050		
7,000.00	6,829.46	5,949.00	5,943.35	29.14	183.92	-55.19	-761.81	-7,958.98	8,038.60	7,826.60	212.00	37.918		
7,050.00	6,860.91	5,949.00	5,943.35	29.43	183.92	-56.46	-761.81	-7,958.98	8,015.74	7,803.53	212.20	37.774		
7,100.00	6,889.24	5,949.00	5,943.35	29.73	183.92	-58.07	-761.81	-7,958.98	7,990.87	7,778.45	212.42	37.618		
7,150.00	6,914.27	5,949.00	5,943.35	30.05	183.92	-60.04	-761.81	-7,958.98	7,964.14	7,751.50	212.64	37.453		
7,200.00	6,935.85	5,949.00	5,943.35	30.37	183.92	-62.35	-761.81	-7,958.98	7,935.69	7,722.80	212.88	37.277		
7,250.00	6,953.84	5,949.00	5,943.35	30.71	183.92	-65.02	-761.81	-7,958.98	7,905.67	7,692.53	213.13	37.093		
7,300.00	6,968.15	5,949.00	5,943.35	31.06	183.92	-68.05	-761.81	-7,958.98	7,874.25	7,660.85	213.40	36.899		
7,350.00	6,978.67	5,949.00	5,943.35	31.42	183.92	-71.43	-761.81	-7,958.98	7,841.62	7,627.94	213.68	36.699		
7,400.00	6,985.34	5,949.00	5,943.35	31.79	183.92	-75.16	-761.81	-7,958.98	7,807.96	7,593.99	213.97	36.491		
7,450.00	6,988.13	5,949.00	5,943.35	32.17	183.92	-79.20	-761.81	-7,958.98	7,773.46	7,559.19	214.27	36.278		
7,461.13	6,988.22	5,949.00	5,943.35	32.26	183.92	-80.14	-761.81	-7,958.98	7,765.69	7,551.35	214.34	36.230		
7,500.00	6,988.19	5,949.00	5,943.35	32.56	183.92	-80.01	-761.81	-7,958.98	7,738.36	7,523.77	214.59	36.062		
7,600.00	6,988.12	5,949.00	5,943.35	33.37	183.92	-79.65	-761.81	-7,958.98	7,666.81	7,451.58	215.23	35.622		
7,700.00	6,988.05	5,949.00	5,943.35	34.21	183.92	-79.26	-761.81	-7,958.98	7,593.51	7,377.63	215.87	35.176		
7,800.00	6,987.98	5,949.00	5,943.35	35.09	183.92	-78.83	-761.81	-7,958.98	7,518.50	7,301.98	216.53	34.723		
7,900.00	6,987.91	5,949.00	5,943.35	35.99	183.92	-78.36	-761.81	-7,958.98	7,441.83	7,224.65	217.19	34.265		
8,000.00	6,987.83	5,949.00	5,943.35	36.93	183.92	-77.84	-761.81	-7,958.98	7,363.54	7,145.69	217.84	33.802		
8,100.00	6,987.76	5,949.00	5,943.35	37.88	183.92	-77.27	-761.81	-7,958.98	7,283.66	7,065.17	218.49	33.336		
8,200.00	6,987.68	5,949.00	5,943.35	38.86	183.92	-76.64	-761.81	-7,958.98	7,202.25	6,983.11	219.14	32.866		
8,300.00	6,987.61	5,949.00	5,943.35	39.86	183.92	-75.94	-761.81	-7,958.98	7,119.36	6,899.58	219.77	32.394		
8,400.00	6,987.53	5,949.00	5,943.35	40.87	183.92	-75.15	-761.81	-7,958.98	7,035.03	6,814.64	220.39	31.920		
8,500.00	6,987.46	5,949.00	5,943.35	41.90	183.92	-74.28	-761.81	-7,958.98	6,949.32	6,728.32	221.00	31.445		
8,600.00	6,987.38	5,949.00	5,943.35	42.93	183.92	-73.29	-761.81	-7,958.98	6,862.28	6,640.70	221.59	30.969		
8,700.00	6,987.31	5,949.00	5,943.35	43.98	183.92	-72.18	-761.81	-7,958.98	6,773.98	6,551.83	222.15	30.493		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		117-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,800.00	6,987.23	5,949.00	5,943.35	45.03	183.92	-70.91	-761.81	-7,958.98	6,684.46	6,461.77	222.69	30.017		
8,872.16	6,987.18	5,949.00	5,943.35	45.79	183.92	-69.88	-761.81	-7,958.98	6,619.15	6,396.09	223.06	29.674		
8,900.00	6,987.16	5,949.00	5,943.35	46.08	183.92	-69.88	-761.81	-7,958.98	6,593.84	6,370.64	223.20	29.542		
9,000.00	6,987.09	5,949.00	5,943.35	47.16	183.92	-69.88	-761.81	-7,958.98	6,503.13	6,279.42	223.72	29.069		
9,100.00	6,987.01	5,949.00	5,943.35	48.27	183.92	-69.88	-761.81	-7,958.98	6,412.70	6,188.45	224.25	28.596		
9,200.00	6,986.94	5,949.00	5,943.35	49.40	183.92	-69.88	-761.81	-7,958.98	6,322.56	6,097.75	224.81	28.124		
9,300.00	6,986.86	5,949.00	5,943.35	50.56	183.92	-69.88	-761.81	-7,958.98	6,232.71	6,007.33	225.38	27.654		
9,400.00	6,986.79	5,949.00	5,943.35	51.75	183.92	-69.88	-761.81	-7,958.98	6,143.19	5,917.21	225.98	27.185		
9,500.00	6,986.71	5,949.00	5,943.35	52.95	183.92	-69.88	-761.81	-7,958.98	6,053.98	5,827.39	226.59	26.718		
9,600.00	6,986.64	5,949.00	5,943.35	54.18	183.92	-69.88	-761.81	-7,958.98	5,965.12	5,737.89	227.23	26.251		
9,700.00	6,986.56	5,949.00	5,943.35	55.42	183.92	-69.88	-761.81	-7,958.98	5,876.62	5,648.73	227.89	25.787		
9,800.00	6,986.49	5,949.00	5,943.35	56.69	183.92	-69.88	-761.81	-7,958.98	5,788.50	5,559.92	228.57	25.324		
9,900.00	6,986.41	5,949.00	5,943.35	57.97	183.92	-69.88	-761.81	-7,958.98	5,700.76	5,471.48	229.28	24.863		
10,000.00	6,986.34	5,949.00	5,943.35	59.26	183.92	-69.88	-761.81	-7,958.98	5,613.44	5,383.42	230.02	24.405		
10,100.00	6,986.27	5,949.00	5,943.35	60.57	183.92	-69.88	-761.81	-7,958.98	5,526.54	5,295.77	230.77	23.948		
10,200.00	6,986.19	5,949.00	5,943.35	61.90	183.92	-69.88	-761.81	-7,958.98	5,440.10	5,208.54	231.56	23.493		
10,300.00	6,986.12	5,949.00	5,943.35	63.23	183.92	-69.88	-761.81	-7,958.98	5,354.13	5,121.76	232.37	23.041		
10,400.00	6,986.04	5,949.00	5,943.35	64.58	183.92	-69.88	-761.81	-7,958.98	5,268.65	5,035.44	233.21	22.592		
10,500.00	6,985.97	5,949.00	5,943.35	65.94	183.92	-69.88	-761.81	-7,958.98	5,183.69	4,949.61	234.08	22.145		
10,600.00	6,985.89	5,949.00	5,943.35	67.32	183.92	-69.88	-761.81	-7,958.98	5,099.28	4,864.30	234.98	21.701		
10,700.00	6,985.82	5,949.00	5,943.35	68.70	183.92	-69.88	-761.81	-7,958.98	5,015.44	4,779.54	235.90	21.260		
10,800.00	6,985.74	5,949.00	5,943.35	70.09	183.92	-69.88	-761.81	-7,958.98	4,932.20	4,695.34	236.86	20.823		
10,900.00	6,985.67	5,949.00	5,943.35	71.49	183.92	-69.88	-761.81	-7,958.98	4,849.60	4,611.75	237.86	20.389		
11,000.00	6,985.59	5,949.00	5,943.35	72.90	183.92	-69.88	-761.81	-7,958.98	4,767.66	4,528.78	238.88	19.958		
11,100.00	6,985.52	5,949.00	5,943.35	74.31	183.92	-69.88	-761.81	-7,958.98	4,686.43	4,446.49	239.94	19.532		
11,200.00	6,985.45	5,949.00	5,943.35	75.74	183.92	-69.88	-761.81	-7,958.98	4,605.93	4,364.90	241.03	19.109		
11,300.00	6,985.37	5,949.00	5,943.35	77.17	183.92	-69.88	-761.81	-7,958.98	4,526.21	4,284.06	242.16	18.691		
11,400.00	6,985.30	5,949.00	5,943.35	78.61	183.92	-69.88	-761.81	-7,958.98	4,447.31	4,203.99	243.32	18.278		
11,500.00	6,985.22	5,949.00	5,943.35	80.05	183.92	-69.88	-761.81	-7,958.98	4,369.28	4,124.76	244.52	17.869		
11,600.00	6,985.15	5,949.00	5,943.35	81.50	183.92	-69.88	-761.81	-7,958.98	4,292.15	4,046.40	245.75	17.465		
11,700.00	6,985.07	5,949.00	5,943.35	82.96	183.92	-69.88	-761.81	-7,958.98	4,215.99	3,968.96	247.03	17.067		
11,800.00	6,985.00	5,949.00	5,943.35	84.42	183.92	-69.88	-761.81	-7,958.98	4,140.84	3,892.51	248.34	16.674		
11,900.00	6,984.92	5,949.00	5,943.35	85.89	183.92	-69.88	-761.81	-7,958.98	4,066.76	3,817.08	249.68	16.288		
12,000.00	6,984.85	5,949.00	5,943.35	87.36	183.92	-69.88	-761.81	-7,958.98	3,993.81	3,742.75	251.07	15.907		
12,100.00	6,984.77	5,949.00	5,943.35	88.83	183.92	-69.88	-761.81	-7,958.98	3,922.06	3,669.57	252.49	15.534		
12,200.00	6,984.70	5,949.00	5,943.35	90.31	183.92	-69.88	-761.81	-7,958.98	3,851.56	3,597.61	253.95	15.167		
12,300.00	6,984.63	5,949.00	5,943.35	91.80	183.92	-69.88	-761.81	-7,958.98	3,782.40	3,526.95	255.44	14.807		
12,400.00	6,984.55	5,949.00	5,943.35	93.29	183.92	-69.88	-761.81	-7,958.98	3,714.64	3,457.66	256.97	14.455		
12,500.00	6,984.48	5,949.00	5,943.35	94.78	183.92	-69.88	-761.81	-7,958.98	3,648.36	3,389.82	258.54	14.112		
12,600.00	6,984.40	5,949.00	5,943.35	96.28	183.92	-69.88	-761.81	-7,958.98	3,583.64	3,323.51	260.13	13.776		
12,700.00	6,984.33	5,949.00	5,943.35	97.78	183.92	-69.88	-761.81	-7,958.98	3,520.58	3,258.83	261.76	13.450		
12,800.00	6,984.25	5,949.00	5,943.35	99.28	183.92	-69.88	-761.81	-7,958.98	3,459.26	3,195.85	263.41	13.133		
12,900.00	6,984.18	5,949.00	5,943.35	100.78	183.92	-69.88	-761.81	-7,958.98	3,399.78	3,134.69	265.08	12.825		
13,000.00	6,984.10	5,949.00	5,943.35	102.29	183.92	-69.88	-761.81	-7,958.98	3,342.23	3,075.44	266.78	12.528		
13,100.00	6,984.03	5,949.00	5,943.35	103.80	183.92	-69.88	-761.81	-7,958.98	3,286.71	3,018.22	268.50	12.241		
13,200.00	6,983.95	5,949.00	5,943.35	105.32	183.92	-69.88	-761.81	-7,958.98	3,233.34	2,963.11	270.22	11.965		
13,300.00	6,983.88	5,949.00	5,943.35	106.84	183.92	-69.88	-761.81	-7,958.98	3,182.21	2,910.26	271.95	11.701		
13,400.00	6,983.81	5,949.00	5,943.35	108.36	183.92	-69.88	-761.81	-7,958.98	3,133.44	2,859.75	273.69	11.449		
13,500.00	6,983.73	5,949.00	5,943.35	109.88	183.92	-69.88	-761.81	-7,958.98	3,087.14	2,811.73	275.41	11.209		
13,600.00	6,983.66	5,949.00	5,943.35	111.40	183.92	-69.88	-761.81	-7,958.98	3,043.43	2,766.30	277.13	10.982		
13,700.00	6,983.58	5,949.00	5,943.35	112.93	183.92	-69.88	-761.81	-7,958.98	3,002.40	2,723.58	278.82	10.768		
13,800.00	6,983.51	5,949.00	5,943.35	114.46	183.92	-69.88	-761.81	-7,958.98	2,964.19	2,683.71	280.49	10.568		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		117-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,900.00	6,983.43	5,949.00	5,943.35	115.99	183.92	-69.88	-761.81	-7,958.98	2,928.89	2,646.78	282.11	10.382		
14,000.00	6,983.36	5,949.00	5,943.35	117.52	183.92	-69.88	-761.81	-7,958.98	2,896.62	2,612.93	283.69	10.210		
14,100.00	6,983.28	5,949.00	5,943.35	119.06	183.92	-69.88	-761.81	-7,958.98	2,867.47	2,582.26	285.21	10.054		
14,200.00	6,983.21	5,949.00	5,943.35	120.59	183.92	-69.88	-761.81	-7,958.98	2,841.55	2,554.88	286.67	9.912		
14,300.00	6,983.13	5,949.00	5,943.35	122.13	183.92	-69.88	-761.81	-7,958.98	2,818.93	2,530.88	288.06	9.786		
14,400.00	6,983.06	5,949.00	5,943.35	123.67	183.92	-69.88	-761.81	-7,958.98	2,799.71	2,510.35	289.36	9.676		
14,500.00	6,982.99	5,949.00	5,943.35	125.21	183.92	-69.88	-761.81	-7,958.98	2,783.95	2,493.38	290.57	9.581		
14,600.00	6,982.91	5,949.00	5,943.35	126.75	183.92	-69.88	-761.81	-7,958.98	2,771.71	2,480.03	291.68	9.503		
14,700.00	6,982.84	5,949.00	5,943.35	128.30	183.92	-69.88	-761.81	-7,958.98	2,763.04	2,470.35	292.68	9.440		
14,800.00	6,982.76	5,949.00	5,943.35	129.85	183.92	-69.88	-761.81	-7,958.98	2,757.96	2,464.38	293.58	9.394		
14,890.03	6,982.70	5,949.00	5,943.35	131.24	183.92	-69.88	-761.81	-7,958.98	2,756.49	2,462.21	294.28	9.367	CC	
14,900.00	6,982.69	5,949.00	5,943.35	131.39	183.92	-69.88	-761.81	-7,958.98	2,756.51	2,462.16	294.35	9.365	ES	
15,000.00	6,982.61	5,949.00	5,943.35	132.94	183.92	-69.88	-761.81	-7,958.98	2,758.68	2,463.67	295.01	9.351	SF	
15,100.00	6,982.54	5,949.00	5,943.35	134.49	183.92	-69.88	-761.81	-7,958.98	2,764.48	2,468.93	295.55	9.354		
15,200.00	6,982.46	5,949.00	5,943.35	136.04	183.92	-69.88	-761.81	-7,958.98	2,773.87	2,477.91	295.96	9.373		
15,300.00	6,982.39	5,949.00	5,943.35	137.60	183.92	-69.88	-761.81	-7,958.98	2,786.81	2,490.56	296.25	9.407		
15,400.00	6,982.31	5,949.00	5,943.35	139.15	183.92	-69.88	-761.81	-7,958.98	2,803.27	2,506.85	296.42	9.457		
15,500.00	6,982.24	5,949.00	5,943.35	140.70	183.92	-69.88	-761.81	-7,958.98	2,823.17	2,526.71	296.47	9.523		
15,600.00	6,982.17	5,949.00	5,943.35	142.26	183.92	-69.88	-761.81	-7,958.98	2,846.45	2,550.05	296.41	9.603		
15,700.00	6,982.09	5,949.00	5,943.35	143.82	183.92	-69.88	-761.81	-7,958.98	2,873.03	2,576.79	296.24	9.698		
15,800.00	6,982.02	5,949.00	5,943.35	145.38	183.92	-69.88	-761.81	-7,958.98	2,902.81	2,606.84	295.97	9.808		
15,900.00	6,981.94	5,949.00	5,943.35	146.94	183.92	-69.88	-761.81	-7,958.98	2,935.69	2,640.09	295.60	9.931		
16,000.00	6,981.87	5,949.00	5,943.35	148.50	183.92	-69.88	-761.81	-7,958.98	2,971.58	2,676.43	295.14	10.068		
16,100.00	6,981.79	5,949.00	5,943.35	150.06	183.92	-69.88	-761.81	-7,958.98	3,010.36	2,715.75	294.61	10.218		
16,200.00	6,981.72	5,949.00	5,943.35	151.62	183.92	-69.88	-761.81	-7,958.98	3,051.93	2,757.93	294.00	10.381		
16,300.00	6,981.64	5,949.00	5,943.35	153.18	183.92	-69.88	-761.81	-7,958.98	3,096.17	2,802.84	293.33	10.555		
16,400.00	6,981.57	5,949.00	5,943.35	154.74	183.92	-69.88	-761.81	-7,958.98	3,142.97	2,850.37	292.59	10.742		
16,500.00	6,981.49	5,949.00	5,943.35	156.31	183.92	-69.88	-761.81	-7,958.98	3,192.22	2,900.41	291.81	10.939		
16,600.00	6,981.42	5,949.00	5,943.35	157.87	183.92	-69.88	-761.81	-7,958.98	3,243.80	2,952.82	290.98	11.148		
16,700.00	6,981.35	5,949.00	5,943.35	159.44	183.92	-69.88	-761.81	-7,958.98	3,297.61	3,007.49	290.12	11.366		
16,800.00	6,981.27	5,949.00	5,943.35	161.01	183.92	-69.88	-761.81	-7,958.98	3,353.54	3,064.32	289.22	11.595		
16,900.00	6,981.20	5,949.00	5,943.35	162.58	183.92	-69.88	-761.81	-7,958.98	3,411.48	3,123.18	288.30	11.833		
17,000.00	6,981.12	5,949.00	5,943.35	164.14	183.92	-69.88	-761.81	-7,958.98	3,471.34	3,183.98	287.36	12.080		
17,100.00	6,981.05	5,949.00	5,943.35	165.71	183.92	-69.88	-761.81	-7,958.98	3,533.02	3,246.61	286.41	12.336		
17,200.00	6,980.97	5,949.00	5,943.35	167.28	183.92	-69.88	-761.81	-7,958.98	3,596.41	3,310.97	285.44	12.599		
17,300.00	6,980.90	5,949.00	5,943.35	168.85	183.92	-69.88	-761.81	-7,958.98	3,661.45	3,376.97	284.47	12.871		
17,400.00	6,980.82	5,949.00	5,943.35	170.42	183.92	-69.88	-761.81	-7,958.98	3,728.03	3,444.53	283.50	13.150		
17,500.00	6,980.75	5,949.00	5,943.35	172.00	183.92	-69.88	-761.81	-7,958.98	3,796.07	3,513.55	282.53	13.436		
17,600.00	6,980.67	5,949.00	5,943.35	173.57	183.92	-69.88	-761.81	-7,958.98	3,865.51	3,583.95	281.56	13.729		
17,700.00	6,980.60	5,949.00	5,943.35	175.14	183.92	-69.88	-761.81	-7,958.98	3,936.26	3,655.67	280.60	14.028		
17,800.00	6,980.53	5,949.00	5,943.35	176.71	183.92	-69.88	-761.81	-7,958.98	4,008.26	3,728.62	279.64	14.333		
17,900.00	6,980.45	5,949.00	5,943.35	178.29	183.92	-69.88	-761.81	-7,958.98	4,081.44	3,802.74	278.70	14.645		
18,000.00	6,980.38	5,949.00	5,943.35	179.86	183.92	-69.88	-761.81	-7,958.98	4,155.74	3,877.97	277.77	14.961		
18,100.00	6,980.30	5,949.00	5,943.35	181.44	183.92	-69.88	-761.81	-7,958.98	4,231.09	3,954.24	276.85	15.283		
18,200.00	6,980.23	5,949.00	5,943.35	183.01	183.92	-69.88	-761.81	-7,958.98	4,307.45	4,031.50	275.95	15.610		
18,300.00	6,980.15	5,949.00	5,943.35	184.59	183.92	-69.88	-761.81	-7,958.98	4,384.76	4,109.70	275.06	15.941		
18,400.00	6,980.08	5,949.00	5,943.35	186.16	183.92	-69.88	-761.81	-7,958.98	4,462.97	4,188.78	274.19	16.277		
18,500.00	6,980.00	5,949.00	5,943.35	187.74	183.92	-69.88	-761.81	-7,958.98	4,542.04	4,268.71	273.33	16.617		
18,600.00	6,979.93	5,949.00	5,943.35	189.32	183.92	-69.88	-761.81	-7,958.98	4,621.91	4,349.42	272.49	16.962		
18,700.00	6,979.85	5,949.00	5,943.35	190.90	183.92	-69.88	-761.81	-7,958.98	4,702.56	4,430.89	271.67	17.310		
18,800.00	6,979.78	5,949.00	5,943.35	192.48	183.92	-69.88	-761.81	-7,958.98	4,783.94	4,513.07	270.87	17.661		
18,900.00	6,979.71	5,949.00	5,943.35	194.05	183.92	-69.88	-761.81	-7,958.98	4,866.01	4,595.93	270.09	18.017		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		117-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
19,000.00	6,979.63	5,949.00	5,943.35	195.63	183.92	-69.88	-761.81	-7,958.98	4,948.74	4,679.42	269.32	18.375	
19,100.00	6,979.56	5,949.00	5,943.35	197.21	183.92	-69.88	-761.81	-7,958.98	5,032.10	4,763.53	268.57	18.737	
19,200.00	6,979.48	5,949.00	5,943.35	198.79	183.92	-69.88	-761.81	-7,958.98	5,116.06	4,848.22	267.84	19.101	
19,300.00	6,979.41	5,949.00	5,943.35	200.37	183.92	-69.88	-761.81	-7,958.98	5,200.58	4,933.45	267.13	19.468	
19,400.00	6,979.33	5,949.00	5,943.35	201.95	183.92	-69.88	-761.81	-7,958.98	5,285.64	5,019.21	266.43	19.838	
19,500.00	6,979.26	5,949.00	5,943.35	203.54	183.92	-69.88	-761.81	-7,958.98	5,371.22	5,105.47	265.76	20.211	
19,600.00	6,979.18	5,949.00	5,943.35	205.12	183.92	-69.88	-761.81	-7,958.98	5,457.29	5,192.19	265.10	20.586	
19,700.00	6,979.11	5,949.00	5,943.35	206.70	183.92	-69.88	-761.81	-7,958.98	5,543.83	5,279.37	264.45	20.963	
19,800.00	6,979.03	5,949.00	5,943.35	208.28	183.92	-69.88	-761.81	-7,958.98	5,630.81	5,366.98	263.83	21.343	
19,900.00	6,978.96	5,949.00	5,943.35	209.86	183.92	-69.88	-761.81	-7,958.98	5,718.22	5,455.00	263.22	21.724	
20,000.00	6,978.89	5,949.00	5,943.35	211.45	183.92	-69.88	-761.81	-7,958.98	5,806.03	5,543.41	262.63	22.108	
20,100.00	6,978.81	5,949.00	5,943.35	213.03	183.92	-69.88	-761.81	-7,958.98	5,894.23	5,632.19	262.05	22.493	
20,200.00	6,978.74	5,949.00	5,943.35	214.61	183.92	-69.88	-761.81	-7,958.98	5,982.81	5,721.32	261.49	22.880	
20,300.00	6,978.66	5,949.00	5,943.35	216.20	183.92	-69.88	-761.81	-7,958.98	6,071.74	5,810.80	260.94	23.269	
20,400.00	6,978.59	5,949.00	5,943.35	217.78	183.92	-69.88	-761.81	-7,958.98	6,161.00	5,900.60	260.41	23.659	
20,500.00	6,978.51	5,949.00	5,943.35	219.37	183.92	-69.88	-761.81	-7,958.98	6,250.60	5,990.71	259.89	24.051	
20,600.00	6,978.44	5,949.00	5,943.35	220.95	183.92	-69.88	-761.81	-7,958.98	6,340.50	6,081.12	259.38	24.444	
20,700.00	6,978.36	5,949.00	5,943.35	222.53	183.92	-69.88	-761.81	-7,958.98	6,430.70	6,171.81	258.90	24.839	
20,800.00	6,978.29	5,949.00	5,943.35	224.12	183.92	-69.88	-761.81	-7,958.98	6,521.19	6,262.77	258.42	25.235	
20,900.00	6,978.21	5,949.00	5,943.35	225.71	183.92	-69.88	-761.81	-7,958.98	6,611.95	6,354.00	257.96	25.632	
21,000.00	6,978.14	5,949.00	5,943.35	227.29	183.92	-69.88	-761.81	-7,958.98	6,702.98	6,445.47	257.51	26.030	
21,100.00	6,978.07	5,949.00	5,943.35	228.88	183.92	-69.88	-761.81	-7,958.98	6,794.26	6,537.19	257.07	26.430	
21,200.00	6,977.99	5,949.00	5,943.35	230.46	183.92	-69.88	-761.81	-7,958.98	6,885.78	6,629.13	256.64	26.830	
21,300.00	6,977.92	5,949.00	5,943.35	232.05	183.92	-69.88	-761.81	-7,958.98	6,977.53	6,721.30	256.23	27.232	
21,400.00	6,977.84	5,949.00	5,943.35	233.64	183.92	-69.88	-761.81	-7,958.98	7,069.51	6,813.68	255.83	27.634	
21,500.00	6,977.77	5,949.00	5,943.35	235.22	183.92	-69.88	-761.81	-7,958.98	7,161.70	6,906.26	255.43	28.037	
21,600.00	6,977.69	5,949.00	5,943.35	236.81	183.92	-69.88	-761.81	-7,958.98	7,254.09	6,999.04	255.05	28.441	
21,700.00	6,977.62	5,949.00	5,943.35	238.40	183.92	-69.88	-761.81	-7,958.98	7,346.69	7,092.01	254.69	28.846	
21,800.00	6,977.54	5,949.00	5,943.35	239.99	183.92	-69.88	-761.81	-7,958.98	7,439.48	7,185.15	254.33	29.252	
21,900.00	6,977.47	5,949.00	5,943.35	241.57	183.92	-69.88	-761.81	-7,958.98	7,532.45	7,278.48	253.98	29.658	
22,000.00	6,977.39	5,949.00	5,943.35	243.16	183.92	-69.88	-761.81	-7,958.98	7,625.61	7,371.97	253.64	30.065	
22,100.00	6,977.32	5,949.00	5,943.35	244.75	183.92	-69.88	-761.81	-7,958.98	7,718.93	7,465.62	253.31	30.472	
22,200.00	6,977.25	5,949.00	5,943.35	246.34	183.92	-69.88	-761.81	-7,958.98	7,812.42	7,559.43	252.99	30.881	
22,300.00	6,977.17	5,949.00	5,943.35	247.93	183.92	-69.88	-761.81	-7,958.98	7,906.06	7,653.39	252.68	31.289	
22,400.00	6,977.10	5,949.00	5,943.35	249.52	183.92	-69.88	-761.81	-7,958.98	7,999.86	7,747.49	252.38	31.698	
22,500.00	6,977.02	5,949.00	5,943.35	251.11	183.92	-69.88	-761.81	-7,958.98	8,093.81	7,841.73	252.08	32.108	
22,529.62	6,977.00	5,949.00	5,943.35	251.58	183.92	-69.88	-761.81	-7,958.98	8,121.66	7,869.67	252.00	32.229	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 245-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-96.87	-1,124.50	-9,338.31	9,406.23				
100.00	100.00	7.00	7.00	0.25	0.12	-96.87	-1,124.50	-9,338.31	9,405.77	9,405.40	0.38	N/A	
200.00	200.00	107.00	107.00	0.61	1.90	-96.87	-1,124.50	-9,338.31	9,405.77	9,403.27	2.51	3,754.456	
300.00	300.00	207.00	207.00	0.97	3.67	-96.87	-1,124.50	-9,338.31	9,405.77	9,401.14	4.64	2,029.155	
400.00	400.00	307.00	307.00	1.33	5.44	-96.87	-1,124.50	-9,338.31	9,405.77	9,399.01	6.77	1,390.262	
456.81	456.81	363.81	363.81	1.53	6.45	-96.87	-1,124.37	-9,338.31	9,405.76	9,397.78	7.98	1,179.317	
500.00	500.00	406.12	406.12	1.68	7.20	-96.87	-1,124.39	-9,338.31	9,405.76	9,396.88	8.88	1,059.211	
550.00	550.00	455.10	455.10	1.86	8.06	-96.87	-1,124.45	-9,338.31	9,405.77	9,395.84	9.93	947.489	
600.00	600.00	507.00	507.00	2.04	9.00	-94.48	-1,124.50	-9,338.31	9,405.81	9,394.77	11.04	851.894	
700.00	699.93	606.93	606.93	2.40	10.83	-94.50	-1,124.50	-9,338.31	9,406.08	9,392.85	13.23	710.923	
800.00	799.68	705.29	705.29	2.77	12.63	-94.53	-1,124.39	-9,338.31	9,406.62	9,391.23	15.39	611.110	
900.00	899.13	806.14	806.13	3.13	14.50	-94.58	-1,124.50	-9,338.31	9,407.47	9,389.84	17.62	533.775	
1,000.00	998.15	905.17	905.15	3.49	16.37	-94.64	-1,124.50	-9,338.31	9,408.60	9,388.73	19.86	473.697	
1,100.00	1,096.63	1,003.64	1,003.63	3.87	18.23	-94.71	-1,124.50	-9,338.31	9,410.03	9,387.93	22.10	425.793	
1,130.50	1,126.54	1,033.02	1,033.00	3.99	18.78	-94.73	-1,123.69	-9,338.31	9,410.43	9,387.66	22.77	413.238	
1,200.00	1,194.61	1,099.01	1,098.99	4.26	20.03	-94.81	-1,123.78	-9,338.31	9,411.63	9,387.34	24.29	387.456	
1,300.00	1,292.57	1,193.88	1,193.85	4.66	21.82	-94.93	-1,124.11	-9,338.31	9,413.42	9,386.94	26.48	355.480	
1,400.00	1,390.52	1,297.57	1,297.52	5.07	23.78	-95.06	-1,124.50	-9,338.31	9,415.26	9,386.42	28.85	326.392	
1,500.00	1,488.48	1,395.52	1,395.48	5.48	25.63	-95.18	-1,124.50	-9,338.31	9,417.10	9,385.98	31.11	302.655	
1,600.00	1,586.43	1,493.47	1,493.43	5.90	27.49	-95.30	-1,124.50	-9,338.31	9,418.97	9,385.59	33.39	282.115	
1,700.00	1,684.38	1,589.65	1,589.61	6.31	29.32	-95.41	-1,124.01	-9,338.31	9,420.82	9,385.20	35.63	264.420	
1,800.00	1,782.34	1,685.36	1,685.31	6.73	31.13	-95.53	-1,124.23	-9,338.31	9,422.82	9,384.95	37.86	248.868	
1,900.00	1,880.29	1,787.37	1,787.29	7.15	33.13	-95.66	-1,124.50	-9,338.31	9,424.86	9,384.57	40.28	233.969	
2,000.00	1,978.25	1,885.32	1,885.25	7.58	35.22	-95.78	-1,124.50	-9,338.31	9,426.90	9,384.11	42.79	220.299	
2,100.00	2,076.20	1,983.27	1,983.20	8.00	37.30	-95.90	-1,124.50	-9,338.31	9,428.99	9,383.69	45.30	208.138	
2,200.00	2,174.15	2,078.71	2,078.63	8.43	39.34	-96.01	-1,123.75	-9,338.31	9,431.01	9,383.25	47.76	197.469	
2,300.00	2,272.11	2,173.13	2,173.05	8.85	41.35	-96.12	-1,124.03	-9,338.31	9,433.23	9,383.03	50.20	187.926	
2,400.00	2,370.06	2,277.24	2,277.06	9.28	43.57	-96.25	-1,124.50	-9,338.31	9,435.51	9,382.67	52.85	178.544	
2,500.00	2,468.02	2,375.19	2,375.02	9.71	45.69	-96.37	-1,124.50	-9,338.31	9,437.77	9,382.38	55.40	170.370	
2,600.00	2,565.97	2,473.14	2,472.97	10.14	47.81	-96.49	-1,124.50	-9,338.31	9,440.07	9,382.13	57.95	162.914	
2,700.00	2,663.92	2,566.25	2,566.05	10.57	49.83	-96.60	-1,122.99	-9,338.31	9,442.18	9,381.79	60.39	156.353	
2,800.00	2,761.88	2,656.84	2,656.63	11.00	51.79	-96.71	-1,123.51	-9,338.31	9,444.65	9,381.87	62.78	150.439	
2,900.00	2,859.83	2,767.10	2,766.83	11.43	54.16	-96.85	-1,124.50	-9,338.31	9,447.23	9,381.65	65.58	144.061	
3,000.00	2,957.79	2,865.06	2,864.79	11.86	56.16	-96.97	-1,124.50	-9,338.31	9,449.70	9,381.69	68.01	138.955	
3,100.00	3,055.74	2,963.01	2,962.74	12.29	58.15	-97.09	-1,124.50	-9,338.31	9,452.21	9,381.78	70.43	134.200	
3,200.00	3,153.69	3,058.41	3,058.13	12.72	60.10	-97.20	-1,123.74	-9,338.31	9,454.64	9,381.83	72.81	129.854	
3,300.00	3,251.65	3,152.30	3,152.02	13.15	62.02	-97.31	-1,124.01	-9,338.31	9,457.28	9,382.13	75.16	125.836	
3,400.00	3,349.60	3,256.93	3,256.60	13.59	64.14	-97.44	-1,124.50	-9,338.31	9,460.00	9,382.29	77.71	121.732	
3,500.00	3,447.56	3,354.89	3,354.56	14.02	66.07	-97.56	-1,124.50	-9,338.31	9,462.68	9,382.61	80.07	118.176	
3,600.00	3,545.51	3,452.84	3,452.51	14.45	68.00	-97.68	-1,124.50	-9,338.31	9,465.41	9,382.97	82.43	114.825	
3,700.00	3,643.46	3,550.10	3,549.76	14.88	69.92	-97.79	-1,123.23	-9,338.31	9,467.94	9,383.16	84.78	111.676	
3,800.00	3,741.42	3,643.26	3,642.92	15.32	71.75	-97.90	-1,123.40	-9,338.31	9,470.78	9,383.73	87.05	108.801	
3,900.00	3,839.37	3,736.32	3,735.97	15.75	73.58	-98.02	-1,123.83	-9,338.31	9,473.71	9,384.40	89.31	106.075	
4,000.00	3,937.33	3,844.71	3,844.33	16.18	75.72	-98.15	-1,124.50	-9,338.31	9,476.72	9,384.84	91.88	103.144	
4,100.00	4,035.28	3,942.66	3,942.28	16.62	77.65	-98.27	-1,124.50	-9,338.31	9,479.65	9,385.41	94.24	100.591	
4,200.00	4,133.23	4,040.62	4,040.23	17.05	79.58	-98.39	-1,124.50	-9,338.31	9,482.62	9,386.02	96.60	98.163	
4,300.00	4,231.19	4,136.12	4,135.73	17.48	81.46	-98.50	-1,124.04	-9,338.31	9,485.55	9,386.64	98.91	95.897	
4,400.00	4,329.14	4,230.82	4,230.43	17.92	83.33	-98.61	-1,124.25	-9,338.31	9,488.65	9,387.44	101.21	93.751	
4,500.00	4,427.10	4,334.52	4,334.10	18.35	85.39	-98.74	-1,124.50	-9,338.31	9,491.80	9,388.09	103.71	91.521	
4,600.00	4,525.05	4,432.47	4,432.05	18.78	87.39	-98.86	-1,124.50	-9,338.31	9,494.94	9,388.80	106.14	89.455	
4,700.00	4,623.00	4,530.43	4,530.00	19.22	89.39	-98.97	-1,124.50	-9,338.31	9,498.12	9,389.55	108.57	87.481	
4,800.00	4,720.96	4,623.23	4,622.80	19.65	91.29	-99.08	-1,123.52	-9,338.31	9,501.15	9,390.25	110.90	85.674	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC												Offset Site Error:	0.00 usft	
Survey Program:		245-A027Ua_INC-ONLY				Rule Assigned:							Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor	
4,900.00	4,818.91	4,714.89	4,714.45	20.09	93.16	-99.19	-1,123.92	-9,338.31	9,504.50	9,391.30	113.20	83.961		
5,000.00	4,916.87	4,824.35	4,823.87	20.52	95.35	-99.33	-1,124.50	-9,338.31	9,507.92	9,392.09	115.83	82.088		
5,100.00	5,014.82	4,922.30	4,921.82	20.96	97.21	-99.44	-1,124.50	-9,338.31	9,511.27	9,393.15	118.12	80.523		
5,200.00	5,112.77	5,020.26	5,019.77	21.39	99.07	-99.56	-1,124.50	-9,338.31	9,514.66	9,394.25	120.41	79.019		
5,300.00	5,210.73	5,114.47	5,113.98	21.82	100.86	-99.67	-1,123.75	-9,338.31	9,517.93	9,395.30	122.63	77.615		
5,400.00	5,308.68	5,207.40	5,206.91	22.26	102.62	-99.78	-1,124.04	-9,338.31	9,521.46	9,396.64	124.83	76.278		
5,493.23	5,400.00	5,307.51	5,307.00	22.66	104.55	-99.90	-1,124.50	-9,338.31	9,524.83	9,397.68	127.15	74.910		
5,500.00	5,406.64	5,314.15	5,313.64	22.69	104.68	-99.91	-1,124.50	-9,338.31	9,525.07	9,397.76	127.32	74.815		
5,600.00	5,504.69	5,412.20	5,411.69	23.12	106.68	-100.04	-1,124.50	-9,338.31	9,528.54	9,398.80	129.75	73.440		
5,700.00	5,602.91	5,510.42	5,509.91	23.55	108.69	-100.17	-1,124.50	-9,338.31	9,531.90	9,399.72	132.17	72.117		
5,800.00	5,701.29	5,606.32	5,605.80	23.97	110.64	-100.29	-1,124.00	-9,338.31	9,535.02	9,400.47	134.55	70.867		
5,900.00	5,799.82	5,701.25	5,700.73	24.39	112.58	-100.40	-1,124.19	-9,338.31	9,538.17	9,401.28	136.90	69.674		
6,000.00	5,898.50	5,806.07	5,805.50	24.79	114.79	-100.51	-1,124.50	-9,338.31	9,541.22	9,401.71	139.51	68.390		
6,100.00	5,997.31	5,904.89	5,904.31	25.20	117.16	-100.62	-1,124.50	-9,338.31	9,544.07	9,401.78	142.29	67.075		
6,200.00	6,096.26	6,000.00	5,999.35	25.60	119.45	-100.71	-1,124.50	-9,338.31	9,546.78	9,401.81	144.97	65.853		
6,300.00	6,195.33	6,000.00	5,999.35	25.99	119.45	-100.73	-1,124.50	-9,338.31	9,549.90	9,404.55	145.35	65.704		
6,400.00	6,294.51	6,000.00	5,999.35	26.37	119.45	-100.75	-1,124.50	-9,338.31	9,553.90	9,408.20	145.70	65.572		
6,498.19	6,392.00	6,000.00	5,999.35	26.75	119.45	-100.77	-1,124.50	-9,338.31	9,558.69	9,412.66	146.03	65.457		
6,500.00	6,393.80	6,000.00	5,999.35	26.76	119.45	-99.57	-1,124.50	-9,338.31	9,558.78	9,412.75	146.04	65.455		
6,550.00	6,443.29	6,000.00	5,999.35	26.95	119.45	-76.73	-1,124.50	-9,338.31	9,560.00	9,413.80	146.20	65.388		
6,600.00	6,492.24	6,000.00	5,999.35	27.16	119.45	-66.03	-1,124.50	-9,338.31	9,558.54	9,412.15	146.38	65.298		
6,650.00	6,540.33	6,000.00	5,999.35	27.38	119.45	-60.43	-1,124.50	-9,338.31	9,554.40	9,407.83	146.57	65.186		
6,700.00	6,587.28	6,000.00	5,999.35	27.60	119.45	-57.27	-1,124.50	-9,338.31	9,547.61	9,400.84	146.77	65.052		
6,750.00	6,632.80	6,000.00	5,999.35	27.84	119.45	-55.46	-1,124.50	-9,338.31	9,538.20	9,391.23	146.97	64.897		
6,800.00	6,676.60	6,000.00	5,999.35	28.09	119.45	-54.54	-1,124.50	-9,338.31	9,526.23	9,379.04	147.19	64.721		
6,850.00	6,718.42	6,000.00	5,999.35	28.34	119.45	-54.24	-1,124.50	-9,338.31	9,511.75	9,364.34	147.41	64.526		
6,900.00	6,758.00	6,000.00	5,999.35	28.60	119.45	-54.44	-1,124.50	-9,338.31	9,494.85	9,347.21	147.64	64.311		
6,950.00	6,795.09	6,000.00	5,999.35	28.87	119.45	-55.06	-1,124.50	-9,338.31	9,475.62	9,327.75	147.88	64.078		
7,000.00	6,829.46	6,000.00	5,999.35	29.14	119.45	-56.06	-1,124.50	-9,338.31	9,454.16	9,306.04	148.12	63.828		
7,050.00	6,860.91	6,000.00	5,999.35	29.43	119.45	-57.43	-1,124.50	-9,338.31	9,430.60	9,282.22	148.37	63.560		
7,100.00	6,889.24	6,000.00	5,999.35	29.73	119.45	-59.15	-1,124.50	-9,338.31	9,405.05	9,256.42	148.63	63.276		
7,150.00	6,914.27	6,000.00	5,999.35	30.05	119.45	-61.22	-1,124.50	-9,338.31	9,377.67	9,228.76	148.90	62.978		
7,200.00	6,935.85	6,000.00	5,999.35	30.37	119.45	-63.66	-1,124.50	-9,338.31	9,348.60	9,199.41	149.18	62.665		
7,250.00	6,953.84	6,000.00	5,999.35	30.71	119.45	-66.46	-1,124.50	-9,338.31	9,318.01	9,168.54	149.47	62.340		
7,300.00	6,968.15	6,000.00	5,999.35	31.06	119.45	-69.62	-1,124.50	-9,338.31	9,286.08	9,136.31	149.77	62.004		
7,350.00	6,978.67	6,000.00	5,999.35	31.42	119.45	-73.14	-1,124.50	-9,338.31	9,252.98	9,102.91	150.07	61.658		
7,400.00	6,985.34	6,000.00	5,999.35	31.79	119.45	-77.00	-1,124.50	-9,338.31	9,218.92	9,068.54	150.38	61.304		
7,450.00	6,988.13	6,000.00	5,999.35	32.17	119.45	-81.16	-1,124.50	-9,338.31	9,184.08	9,033.39	150.70	60.944		
7,461.13	6,988.22	6,000.00	5,999.35	32.26	119.45	-82.12	-1,124.50	-9,338.31	9,176.25	9,025.48	150.77	60.863		
7,500.00	6,988.19	6,000.00	5,999.35	32.56	119.45	-82.02	-1,124.50	-9,338.31	9,148.69	8,997.67	151.02	60.579		
7,600.00	6,988.12	6,000.00	5,999.35	33.37	119.45	-81.72	-1,124.50	-9,338.31	9,076.48	8,924.80	151.67	59.842		
7,700.00	6,988.05	6,000.00	5,999.35	34.21	119.45	-81.40	-1,124.50	-9,338.31	9,002.43	8,850.09	152.34	59.096		
7,800.00	6,987.98	6,000.00	5,999.35	35.09	119.45	-81.05	-1,124.50	-9,338.31	8,926.58	8,773.57	153.00	58.342		
7,900.00	6,987.91	6,000.00	5,999.35	35.99	119.45	-80.66	-1,124.50	-9,338.31	8,848.98	8,695.31	153.67	57.583		
8,000.00	6,987.83	6,000.00	5,999.35	36.93	119.45	-80.23	-1,124.50	-9,338.31	8,769.68	8,615.34	154.34	56.821		
8,100.00	6,987.76	6,000.00	5,999.35	37.88	119.45	-79.75	-1,124.50	-9,338.31	8,688.73	8,533.73	155.00	56.057		
8,200.00	6,987.68	6,000.00	5,999.35	38.86	119.45	-79.22	-1,124.50	-9,338.31	8,606.18	8,450.53	155.65	55.292		
8,300.00	6,987.61	6,000.00	5,999.35	39.86	119.45	-78.62	-1,124.50	-9,338.31	8,522.10	8,365.81	156.29	54.528		
8,400.00	6,987.53	6,000.00	5,999.35	40.87	119.45	-77.95	-1,124.50	-9,338.31	8,436.53	8,279.61	156.91	53.765		
8,500.00	6,987.46	6,000.00	5,999.35	41.90	119.45	-77.20	-1,124.50	-9,338.31	8,349.53	8,192.01	157.52	53.006		
8,600.00	6,987.38	6,000.00	5,999.35	42.93	119.45	-76.34	-1,124.50	-9,338.31	8,261.18	8,103.08	158.11	52.251		
8,700.00	6,987.31	6,000.00	5,999.35	43.98	119.45	-75.35	-1,124.50	-9,338.31	8,171.54	8,012.87	158.67	51.501		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		245-A027Ua_INC-ONLY				Rule Assigned:								Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)				
8,800.00	6,987.23	6,000.00	5,999.35	45.03	119.45	-74.20	-1,124.50	-9,338.31	8,080.67	7,921.46	159.20	50.756			
8,872.16	6,987.18	6,000.00	5,999.35	45.79	119.45	-73.26	-1,124.50	-9,338.31	8,014.37	7,854.80	159.57	50.224			
8,900.00	6,987.16	6,000.00	5,999.35	46.08	119.45	-73.26	-1,124.50	-9,338.31	7,988.69	7,828.97	159.71	50.019			
9,000.00	6,987.09	6,000.00	5,999.35	47.16	119.45	-73.26	-1,124.50	-9,338.31	7,896.56	7,736.33	160.22	49.284			
9,100.00	6,987.01	6,000.00	5,999.35	48.27	119.45	-73.26	-1,124.50	-9,338.31	7,804.62	7,643.87	160.75	48.551			
9,200.00	6,986.94	6,000.00	5,999.35	49.40	119.45	-73.26	-1,124.50	-9,338.31	7,712.89	7,551.59	161.30	47.818			
9,300.00	6,986.86	6,000.00	5,999.35	50.56	119.45	-73.26	-1,124.50	-9,338.31	7,621.36	7,459.50	161.86	47.087			
9,400.00	6,986.79	6,000.00	5,999.35	51.75	119.45	-73.26	-1,124.50	-9,338.31	7,530.05	7,367.61	162.44	46.357			
9,500.00	6,986.71	6,000.00	5,999.35	52.95	119.45	-73.26	-1,124.50	-9,338.31	7,438.96	7,275.92	163.03	45.628			
9,600.00	6,986.64	6,000.00	5,999.35	54.18	119.45	-73.26	-1,124.50	-9,338.31	7,348.10	7,184.45	163.65	44.901			
9,700.00	6,986.56	6,000.00	5,999.35	55.42	119.45	-73.26	-1,124.50	-9,338.31	7,257.48	7,093.20	164.29	44.176			
9,800.00	6,986.49	6,000.00	5,999.35	56.69	119.45	-73.26	-1,124.50	-9,338.31	7,167.12	7,002.18	164.94	43.452			
9,900.00	6,986.41	6,000.00	5,999.35	57.97	119.45	-73.26	-1,124.50	-9,338.31	7,077.01	6,911.39	165.62	42.731			
10,000.00	6,986.34	6,000.00	5,999.35	59.26	119.45	-73.26	-1,124.50	-9,338.31	6,987.17	6,820.86	166.31	42.012			
10,100.00	6,986.27	6,000.00	5,999.35	60.57	119.45	-73.26	-1,124.50	-9,338.31	6,897.61	6,730.58	167.03	41.295			
10,200.00	6,986.19	6,000.00	5,999.35	61.90	119.45	-73.26	-1,124.50	-9,338.31	6,808.34	6,640.57	167.77	40.581			
10,300.00	6,986.12	6,000.00	5,999.35	63.23	119.45	-73.26	-1,124.50	-9,338.31	6,719.38	6,550.84	168.53	39.869			
10,400.00	6,986.04	6,000.00	5,999.35	64.58	119.45	-73.26	-1,124.50	-9,338.31	6,630.73	6,461.41	169.32	39.161			
10,500.00	6,985.97	6,000.00	5,999.35	65.94	119.45	-73.26	-1,124.50	-9,338.31	6,542.40	6,372.27	170.13	38.455			
10,600.00	6,985.89	6,000.00	5,999.35	67.32	119.45	-73.26	-1,124.50	-9,338.31	6,454.42	6,283.45	170.97	37.753			
10,700.00	6,985.82	6,000.00	5,999.35	68.70	119.45	-73.26	-1,124.50	-9,338.31	6,366.79	6,194.96	171.83	37.054			
10,800.00	6,985.74	6,000.00	5,999.35	70.09	119.45	-73.26	-1,124.50	-9,338.31	6,279.53	6,106.82	172.71	36.358			
10,900.00	6,985.67	6,000.00	5,999.35	71.49	119.45	-73.26	-1,124.50	-9,338.31	6,192.66	6,019.03	173.63	35.666			
11,000.00	6,985.59	6,000.00	5,999.35	72.90	119.45	-73.26	-1,124.50	-9,338.31	6,106.18	5,931.62	174.57	34.979			
11,100.00	6,985.52	6,000.00	5,999.35	74.31	119.45	-73.26	-1,124.50	-9,338.31	6,020.13	5,844.59	175.54	34.295			
11,200.00	6,985.45	6,000.00	5,999.35	75.74	119.45	-73.26	-1,124.50	-9,338.31	5,934.51	5,757.98	176.54	33.616			
11,300.00	6,985.37	6,000.00	5,999.35	77.17	119.45	-73.26	-1,124.50	-9,338.31	5,849.36	5,671.79	177.57	32.942			
11,400.00	6,985.30	6,000.00	5,999.35	78.61	119.45	-73.26	-1,124.50	-9,338.31	5,764.67	5,586.05	178.63	32.272			
11,500.00	6,985.22	6,000.00	5,999.35	80.05	119.45	-73.26	-1,124.50	-9,338.31	5,680.49	5,500.77	179.72	31.608			
11,600.00	6,985.15	6,000.00	5,999.35	81.50	119.45	-73.26	-1,124.50	-9,338.31	5,596.82	5,415.98	180.84	30.949			
11,700.00	6,985.07	6,000.00	5,999.35	82.96	119.45	-73.26	-1,124.50	-9,338.31	5,513.70	5,331.71	182.00	30.295			
11,800.00	6,985.00	6,000.00	5,999.35	84.42	119.45	-73.26	-1,124.50	-9,338.31	5,431.15	5,247.96	183.19	29.648			
11,900.00	6,984.92	6,000.00	5,999.35	85.89	119.45	-73.26	-1,124.50	-9,338.31	5,349.20	5,164.78	184.41	29.006			
12,000.00	6,984.85	6,000.00	5,999.35	87.36	119.45	-73.26	-1,124.50	-9,338.31	5,267.86	5,082.19	185.68	28.371			
12,100.00	6,984.77	6,000.00	5,999.35	88.83	119.45	-73.26	-1,124.50	-9,338.31	5,187.19	5,000.21	186.97	27.743			
12,200.00	6,984.70	6,000.00	5,999.35	90.31	119.45	-73.26	-1,124.50	-9,338.31	5,107.19	4,918.88	188.31	27.121			
12,300.00	6,984.63	6,000.00	5,999.35	91.80	119.45	-73.26	-1,124.50	-9,338.31	5,027.91	4,838.23	189.68	26.507			
12,400.00	6,984.55	6,000.00	5,999.35	93.29	119.45	-73.26	-1,124.50	-9,338.31	4,949.38	4,758.29	191.09	25.900			
12,500.00	6,984.48	6,000.00	5,999.35	94.78	119.45	-73.26	-1,124.50	-9,338.31	4,871.64	4,679.10	192.54	25.302			
12,600.00	6,984.40	6,000.00	5,999.35	96.28	119.45	-73.26	-1,124.50	-9,338.31	4,794.72	4,600.69	194.03	24.711			
12,700.00	6,984.33	6,000.00	5,999.35	97.78	119.45	-73.26	-1,124.50	-9,338.31	4,718.67	4,523.11	195.56	24.129			
12,800.00	6,984.25	6,000.00	5,999.35	99.28	119.45	-73.26	-1,124.50	-9,338.31	4,643.53	4,446.40	197.13	23.555			
12,900.00	6,984.18	6,000.00	5,999.35	100.78	119.45	-73.26	-1,124.50	-9,338.31	4,569.34	4,370.59	198.74	22.991			
13,000.00	6,984.10	6,000.00	5,999.35	102.29	119.45	-73.26	-1,124.50	-9,338.31	4,496.15	4,295.75	200.39	22.437			
13,100.00	6,984.03	6,000.00	5,999.35	103.80	119.45	-73.26	-1,124.50	-9,338.31	4,424.00	4,221.92	202.08	21.892			
13,200.00	6,983.95	6,000.00	5,999.35	105.32	119.45	-73.26	-1,124.50	-9,338.31	4,352.97	4,149.15	203.82	21.357			
13,300.00	6,983.88	6,000.00	5,999.35	106.84	119.45	-73.26	-1,124.50	-9,338.31	4,283.08	4,077.50	205.59	20.833			
13,400.00	6,983.81	6,000.00	5,999.35	108.36	119.45	-73.26	-1,124.50	-9,338.31	4,214.41	4,007.02	207.40	20.320			
13,500.00	6,983.73	6,000.00	5,999.35	109.88	119.45	-73.26	-1,124.50	-9,338.31	4,147.02	3,937.77	209.25	19.819			
13,600.00	6,983.66	6,000.00	5,999.35	111.40	119.45	-73.26	-1,124.50	-9,338.31	4,080.97	3,869.83	211.13	19.329			
13,700.00	6,983.58	6,000.00	5,999.35	112.93	119.45	-73.26	-1,124.50	-9,338.31	4,016.31	3,803.26	213.05	18.851			
13,800.00	6,983.51	6,000.00	5,999.35	114.46	119.45	-73.26	-1,124.50	-9,338.31	3,953.13	3,738.13	215.01	18.386			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		245-A027Ua_INC-ONLY					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
13,900.00	6,983.43	6,000.00	5,999.35	115.99	119.45	-73.26	-1,124.50	-9,338.31	3,891.50	3,674.50	216.99	17.934				
14,000.00	6,983.36	6,000.00	5,999.35	117.52	119.45	-73.26	-1,124.50	-9,338.31	3,831.48	3,612.48	219.01	17.495				
14,100.00	6,983.28	6,000.00	5,999.35	119.06	119.45	-73.26	-1,124.50	-9,338.31	3,773.16	3,552.12	221.04	17.070				
14,200.00	6,983.21	6,000.00	5,999.35	120.59	119.45	-73.26	-1,124.50	-9,338.31	3,716.62	3,493.51	223.10	16.659				
14,300.00	6,983.13	6,000.00	5,999.35	122.13	119.45	-73.26	-1,124.50	-9,338.31	3,661.93	3,436.75	225.18	16.262				
14,400.00	6,983.06	6,000.00	5,999.35	123.67	119.45	-73.26	-1,124.50	-9,338.31	3,609.18	3,381.92	227.27	15.881				
14,500.00	6,982.99	6,000.00	5,999.35	125.21	119.45	-73.26	-1,124.50	-9,338.31	3,558.47	3,329.11	229.36	15.515				
14,600.00	6,982.91	6,000.00	5,999.35	126.75	119.45	-73.26	-1,124.50	-9,338.31	3,509.87	3,278.42	231.45	15.164				
14,700.00	6,982.84	6,000.00	5,999.35	128.30	119.45	-73.26	-1,124.50	-9,338.31	3,463.48	3,229.94	233.54	14.830				
14,800.00	6,982.76	6,000.00	5,999.35	129.85	119.45	-73.26	-1,124.50	-9,338.31	3,419.38	3,183.76	235.62	14.512				
14,900.00	6,982.69	6,000.00	5,999.35	131.39	119.45	-73.26	-1,124.50	-9,338.31	3,377.67	3,140.00	237.67	14.211				
15,000.00	6,982.61	6,000.00	5,999.35	132.94	119.45	-73.26	-1,124.50	-9,338.31	3,338.44	3,098.74	239.70	13.928				
15,100.00	6,982.54	6,000.00	5,999.35	134.49	119.45	-73.26	-1,124.50	-9,338.31	3,301.77	3,060.08	241.69	13.661				
15,200.00	6,982.46	6,000.00	5,999.35	136.04	119.45	-73.26	-1,124.50	-9,338.31	3,267.74	3,024.11	243.63	13.413				
15,300.00	6,982.39	6,000.00	5,999.35	137.60	119.45	-73.26	-1,124.50	-9,338.31	3,236.46	2,990.94	245.52	13.182				
15,400.00	6,982.31	6,000.00	5,999.35	139.15	119.45	-73.26	-1,124.50	-9,338.31	3,207.98	2,960.64	247.34	12.970				
15,500.00	6,982.24	6,000.00	5,999.35	140.70	119.45	-73.26	-1,124.50	-9,338.31	3,182.39	2,933.31	249.08	12.776				
15,600.00	6,982.17	6,000.00	5,999.35	142.26	119.45	-73.26	-1,124.50	-9,338.31	3,159.77	2,909.02	250.75	12.601				
15,700.00	6,982.09	6,000.00	5,999.35	143.82	119.45	-73.26	-1,124.50	-9,338.31	3,140.16	2,887.85	252.32	12.445				
15,800.00	6,982.02	6,000.00	5,999.35	145.38	119.45	-73.26	-1,124.50	-9,338.31	3,123.64	2,869.85	253.78	12.308				
15,900.00	6,981.94	6,000.00	5,999.35	146.94	119.45	-73.26	-1,124.50	-9,338.31	3,110.24	2,855.10	255.14	12.190				
16,000.00	6,981.87	6,000.00	5,999.35	148.50	119.45	-73.26	-1,124.50	-9,338.31	3,100.01	2,843.63	256.39	12.091				
16,100.00	6,981.79	6,000.00	5,999.35	150.06	119.45	-73.26	-1,124.50	-9,338.31	3,092.99	2,835.48	257.51	12.011				
16,200.00	6,981.72	6,000.00	5,999.35	151.62	119.45	-73.26	-1,124.50	-9,338.31	3,089.19	2,830.68	258.50	11.950				
16,267.54	6,981.67	6,000.00	5,999.35	152.67	119.45	-73.26	-1,124.50	-9,338.31	3,088.45	2,829.35	259.10	11.920	CC			
16,300.00	6,981.64	6,000.00	5,999.35	153.18	119.45	-73.26	-1,124.50	-9,338.31	3,088.62	2,829.26	259.36	11.908	ES			
16,400.00	6,981.57	6,000.00	5,999.35	154.74	119.45	-73.26	-1,124.50	-9,338.31	3,091.29	2,831.20	260.09	11.885				
16,500.00	6,981.49	6,000.00	5,999.35	156.31	119.45	-73.26	-1,124.50	-9,338.31	3,097.18	2,836.50	260.68	11.881	SF			
16,600.00	6,981.42	6,000.00	5,999.35	157.87	119.45	-73.26	-1,124.50	-9,338.31	3,106.29	2,845.16	261.14	11.895				
16,700.00	6,981.35	6,000.00	5,999.35	159.44	119.45	-73.26	-1,124.50	-9,338.31	3,118.58	2,857.13	261.45	11.928				
16,800.00	6,981.27	6,000.00	5,999.35	161.01	119.45	-73.26	-1,124.50	-9,338.31	3,134.01	2,872.37	261.64	11.978				
16,900.00	6,981.20	6,000.00	5,999.35	162.58	119.45	-73.26	-1,124.50	-9,338.31	3,152.54	2,890.85	261.69	12.047				
17,000.00	6,981.12	6,000.00	5,999.35	164.14	119.45	-73.26	-1,124.50	-9,338.31	3,174.12	2,912.49	261.62	12.132				
17,100.00	6,981.05	6,000.00	5,999.35	165.71	119.45	-73.26	-1,124.50	-9,338.31	3,198.67	2,937.24	261.43	12.235				
17,200.00	6,980.97	6,000.00	5,999.35	167.28	119.45	-73.26	-1,124.50	-9,338.31	3,226.14	2,965.02	261.12	12.355				
17,300.00	6,980.90	6,000.00	5,999.35	168.85	119.45	-73.26	-1,124.50	-9,338.31	3,256.45	2,995.75	260.71	12.491				
17,400.00	6,980.82	6,000.00	5,999.35	170.42	119.45	-73.26	-1,124.50	-9,338.31	3,289.53	3,029.34	260.19	12.643				
17,500.00	6,980.75	6,000.00	5,999.35	172.00	119.45	-73.26	-1,124.50	-9,338.31	3,325.28	3,065.70	259.58	12.810				
17,600.00	6,980.67	6,000.00	5,999.35	173.57	119.45	-73.26	-1,124.50	-9,338.31	3,363.62	3,104.74	258.88	12.993				
17,700.00	6,980.60	6,000.00	5,999.35	175.14	119.45	-73.26	-1,124.50	-9,338.31	3,404.48	3,146.37	258.11	13.190				
17,800.00	6,980.53	6,000.00	5,999.35	176.71	119.45	-73.26	-1,124.50	-9,338.31	3,447.75	3,190.49	257.26	13.402				
17,900.00	6,980.45	6,000.00	5,999.35	178.29	119.45	-73.26	-1,124.50	-9,338.31	3,493.34	3,236.99	256.35	13.627				
18,000.00	6,980.38	6,000.00	5,999.35	179.86	119.45	-73.26	-1,124.50	-9,338.31	3,541.18	3,285.79	255.39	13.866				
18,100.00	6,980.30	6,000.00	5,999.35	181.44	119.45	-73.26	-1,124.50	-9,338.31	3,591.16	3,336.79	254.37	14.118				
18,200.00	6,980.23	6,000.00	5,999.35	183.01	119.45	-73.26	-1,124.50	-9,338.31	3,643.20	3,389.88	253.32	14.382				
18,300.00	6,980.15	6,000.00	5,999.35	184.59	119.45	-73.26	-1,124.50	-9,338.31	3,697.22	3,444.99	252.23	14.658				
18,400.00	6,980.08	6,000.00	5,999.35	186.16	119.45	-73.26	-1,124.50	-9,338.31	3,753.12	3,502.01	251.11	14.946				
18,500.00	6,980.00	6,000.00	5,999.35	187.74	119.45	-73.26	-1,124.50	-9,338.31	3,810.83	3,560.86	249.97	15.245				
18,600.00	6,979.93	6,000.00	5,999.35	189.32	119.45	-73.26	-1,124.50	-9,338.31	3,870.26	3,621.45	248.81	15.555				
18,700.00	6,979.85	6,000.00	5,999.35	190.90	119.45	-73.26	-1,124.50	-9,338.31	3,931.33	3,683.70	247.64	15.875				
18,800.00	6,979.78	6,000.00	5,999.35	192.48	119.45	-73.26	-1,124.50	-9,338.31	3,993.98	3,747.53	246.45	16.206				
18,900.00	6,979.71	6,000.00	5,999.35	194.05	119.45	-73.26	-1,124.50	-9,338.31	4,058.12	3,812.86	245.27	16.546				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 245-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,000.00	6,979.63	6,000.00	5,999.35	195.63	119.45	-73.26	-1,124.50	-9,338.31	4,123.69	3,879.62	244.08	16.895	
19,100.00	6,979.56	6,000.00	5,999.35	197.21	119.45	-73.26	-1,124.50	-9,338.31	4,190.63	3,947.74	242.89	17.253	
19,200.00	6,979.48	6,000.00	5,999.35	198.79	119.45	-73.26	-1,124.50	-9,338.31	4,258.85	4,017.15	241.70	17.620	
19,300.00	6,979.41	6,000.00	5,999.35	200.37	119.45	-73.26	-1,124.50	-9,338.31	4,328.32	4,087.79	240.53	17.995	
19,400.00	6,979.33	6,000.00	5,999.35	201.95	119.45	-73.26	-1,124.50	-9,338.31	4,398.96	4,159.60	239.36	18.378	
19,500.00	6,979.26	6,000.00	5,999.35	203.54	119.45	-73.26	-1,124.50	-9,338.31	4,470.72	4,232.51	238.20	18.768	
19,600.00	6,979.18	6,000.00	5,999.35	205.12	119.45	-73.26	-1,124.50	-9,338.31	4,543.55	4,306.48	237.06	19.166	
19,700.00	6,979.11	6,000.00	5,999.35	206.70	119.45	-73.26	-1,124.50	-9,338.31	4,617.39	4,381.46	235.93	19.571	
19,800.00	6,979.03	6,000.00	5,999.35	208.28	119.45	-73.26	-1,124.50	-9,338.31	4,692.21	4,457.39	234.82	19.982	
19,900.00	6,978.96	6,000.00	5,999.35	209.86	119.45	-73.26	-1,124.50	-9,338.31	4,767.94	4,534.22	233.72	20.400	
20,000.00	6,978.89	6,000.00	5,999.35	211.45	119.45	-73.26	-1,124.50	-9,338.31	4,844.56	4,611.92	232.64	20.824	
20,100.00	6,978.81	6,000.00	5,999.35	213.03	119.45	-73.26	-1,124.50	-9,338.31	4,922.02	4,690.44	231.58	21.254	
20,200.00	6,978.74	6,000.00	5,999.35	214.61	119.45	-73.26	-1,124.50	-9,338.31	5,000.28	4,769.74	230.54	21.689	
20,300.00	6,978.66	6,000.00	5,999.35	216.20	119.45	-73.26	-1,124.50	-9,338.31	5,079.30	4,849.78	229.52	22.130	
20,400.00	6,978.59	6,000.00	5,999.35	217.78	119.45	-73.26	-1,124.50	-9,338.31	5,159.05	4,930.53	228.51	22.577	
20,500.00	6,978.51	6,000.00	5,999.35	219.37	119.45	-73.26	-1,124.50	-9,338.31	5,239.49	5,011.96	227.53	23.028	
20,600.00	6,978.44	6,000.00	5,999.35	220.95	119.45	-73.26	-1,124.50	-9,338.31	5,320.60	5,094.03	226.57	23.484	
20,700.00	6,978.36	6,000.00	5,999.35	222.53	119.45	-73.26	-1,124.50	-9,338.31	5,402.34	5,176.71	225.62	23.944	
20,800.00	6,978.29	6,000.00	5,999.35	224.12	119.45	-73.26	-1,124.50	-9,338.31	5,484.68	5,259.98	224.70	24.409	
20,900.00	6,978.21	6,000.00	5,999.35	225.71	119.45	-73.26	-1,124.50	-9,338.31	5,567.60	5,343.81	223.79	24.878	
21,000.00	6,978.14	6,000.00	5,999.35	227.29	119.45	-73.26	-1,124.50	-9,338.31	5,651.08	5,428.17	222.91	25.352	
21,100.00	6,978.07	6,000.00	5,999.35	228.88	119.45	-73.26	-1,124.50	-9,338.31	5,735.08	5,513.04	222.04	25.829	
21,200.00	6,977.99	6,000.00	5,999.35	230.46	119.45	-73.26	-1,124.50	-9,338.31	5,819.60	5,598.40	221.20	26.309	
21,300.00	6,977.92	6,000.00	5,999.35	232.05	119.45	-73.26	-1,124.50	-9,338.31	5,904.59	5,684.22	220.37	26.794	
21,400.00	6,977.84	6,000.00	5,999.35	233.64	119.45	-73.26	-1,124.50	-9,338.31	5,990.05	5,770.48	219.57	27.281	
21,500.00	6,977.77	6,000.00	5,999.35	235.22	119.45	-73.26	-1,124.50	-9,338.31	6,075.95	5,857.17	218.78	27.772	
21,600.00	6,977.69	6,000.00	5,999.35	236.81	119.45	-73.26	-1,124.50	-9,338.31	6,162.28	5,944.27	218.01	28.266	
21,700.00	6,977.62	6,000.00	5,999.35	238.40	119.45	-73.26	-1,124.50	-9,338.31	6,249.01	6,031.76	217.25	28.764	
21,800.00	6,977.54	6,000.00	5,999.35	239.99	119.45	-73.26	-1,124.50	-9,338.31	6,336.14	6,119.62	216.52	29.264	
21,900.00	6,977.47	6,000.00	5,999.35	241.57	119.45	-73.26	-1,124.50	-9,338.31	6,423.64	6,207.84	215.80	29.766	
22,000.00	6,977.39	6,000.00	5,999.35	243.16	119.45	-73.26	-1,124.50	-9,338.31	6,511.50	6,296.40	215.10	30.272	
22,100.00	6,977.32	6,000.00	5,999.35	244.75	119.45	-73.26	-1,124.50	-9,338.31	6,599.71	6,385.29	214.42	30.779	
22,200.00	6,977.25	6,000.00	5,999.35	246.34	119.45	-73.26	-1,124.50	-9,338.31	6,688.24	6,474.49	213.75	31.290	
22,300.00	6,977.17	6,000.00	5,999.35	247.93	119.45	-73.26	-1,124.50	-9,338.31	6,777.10	6,564.00	213.10	31.802	
22,400.00	6,977.10	6,000.00	5,999.35	249.52	119.45	-73.26	-1,124.50	-9,338.31	6,866.27	6,653.80	212.47	32.317	
22,500.00	6,977.02	6,000.00	5,999.35	251.11	119.45	-73.26	-1,124.50	-9,338.31	6,955.72	6,743.88	211.85	32.834	
22,529.62	6,977.00	6,000.00	5,999.35	251.58	119.45	-73.26	-1,124.50	-9,338.31	6,982.27	6,770.60	211.67	32.987	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 520-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	44.00	44.00	0.00	0.94	-93.28	-645.40	-11,275.38	11,293.84				
100.00	100.00	144.00	144.00	0.25	3.06	-93.28	-645.40	-11,275.38	11,293.84	11,290.52	3.32	3,406.004	
200.00	200.00	244.00	244.00	0.61	5.19	-93.28	-645.40	-11,275.38	11,293.84	11,288.04	5.80	1,946.334	
300.00	300.00	344.00	344.00	0.97	7.32	-93.28	-645.40	-11,275.38	11,293.84	11,285.55	8.29	1,362.447	
400.00	400.00	444.00	444.00	1.33	9.45	-93.28	-645.40	-11,275.38	11,293.84	11,283.06	10.78	1,048.042	
500.00	500.00	544.03	544.00	1.68	11.58	-93.28	-645.40	-11,275.38	11,293.84	11,280.57	13.26	851.500	
550.00	550.00	594.03	594.00	1.86	12.64	-93.28	-645.40	-11,275.38	11,293.84	11,279.33	14.51	778.517	
600.00	600.00	644.02	644.00	2.04	13.71	-90.89	-645.40	-11,275.38	11,293.85	11,278.09	15.75	717.068	
700.00	699.93	743.96	743.93	2.40	15.83	-90.91	-645.40	-11,275.38	11,293.90	11,275.67	18.23	619.369	
800.00	799.68	841.71	841.67	2.77	17.91	-90.94	-644.48	-11,275.38	11,293.96	11,273.29	20.67	546.298	
900.00	899.13	938.77	938.72	3.13	19.98	-90.99	-644.95	-11,275.38	11,294.16	11,271.06	23.10	488.889	
1,000.00	998.15	1,042.25	1,042.15	3.49	22.26	-91.06	-645.40	-11,275.38	11,294.44	11,268.69	25.75	438.540	
1,100.00	1,096.63	1,140.73	1,140.63	3.87	24.54	-91.14	-645.40	-11,275.38	11,294.78	11,266.37	28.41	397.608	
1,130.50	1,126.54	1,170.63	1,170.54	3.99	25.23	-91.16	-645.40	-11,275.38	11,294.90	11,265.69	29.22	386.611	
1,200.00	1,194.61	1,238.71	1,238.61	4.26	26.80	-91.23	-645.40	-11,275.38	11,295.20	11,264.14	31.06	363.664	
1,300.00	1,292.57	1,334.40	1,334.29	4.66	29.00	-91.33	-644.44	-11,275.38	11,295.60	11,261.93	33.67	335.503	
1,400.00	1,390.52	1,429.77	1,429.65	5.07	31.20	-91.43	-644.89	-11,275.38	11,296.12	11,259.85	36.27	311.407	
1,500.00	1,488.48	1,532.70	1,532.48	5.48	33.65	-91.53	-645.40	-11,275.38	11,296.69	11,257.56	39.13	288.682	
1,600.00	1,586.43	1,630.65	1,630.43	5.90	36.10	-91.63	-645.40	-11,275.38	11,297.26	11,255.26	42.00	268.994	
1,700.00	1,684.38	1,728.60	1,728.38	6.31	38.55	-91.73	-645.40	-11,275.38	11,297.86	11,252.99	44.87	251.806	
1,800.00	1,782.34	1,823.18	1,822.93	6.73	40.92	-91.82	-643.92	-11,275.38	11,298.39	11,250.74	47.65	237.091	
1,900.00	1,880.29	1,916.87	1,916.61	7.15	43.27	-91.92	-644.52	-11,275.38	11,299.11	11,248.69	50.42	224.096	
2,000.00	1,978.25	2,022.64	2,022.25	7.58	45.94	-92.03	-645.40	-11,275.38	11,299.88	11,246.36	53.52	211.130	
2,100.00	2,076.20	2,120.59	2,120.20	8.00	48.50	-92.13	-645.40	-11,275.38	11,300.63	11,244.13	56.51	199.991	
2,200.00	2,174.15	2,218.54	2,218.15	8.43	51.06	-92.23	-645.40	-11,275.38	11,301.41	11,241.92	59.49	189.966	
2,300.00	2,272.11	2,312.87	2,312.45	8.85	53.53	-92.32	-643.94	-11,275.38	11,302.11	11,239.73	62.38	181.171	
2,400.00	2,370.06	2,405.99	2,405.56	9.28	55.96	-92.42	-644.53	-11,275.38	11,303.02	11,237.77	65.25	173.239	
2,500.00	2,468.02	2,512.60	2,512.02	9.71	58.70	-92.53	-645.40	-11,275.38	11,303.98	11,235.57	68.41	165.249	
2,600.00	2,565.97	2,610.56	2,609.97	10.14	61.06	-92.63	-645.40	-11,275.38	11,304.90	11,233.70	71.20	158.771	
2,700.00	2,663.92	2,708.51	2,707.92	10.57	63.43	-92.73	-645.40	-11,275.38	11,305.86	11,231.86	74.00	152.782	
2,800.00	2,761.88	2,802.76	2,802.14	11.00	65.71	-92.82	-643.54	-11,275.38	11,306.69	11,229.98	76.71	147.399	
2,900.00	2,859.83	2,894.90	2,894.26	11.43	67.94	-92.92	-644.12	-11,275.38	11,307.78	11,228.41	79.37	142.477	
3,000.00	2,957.79	3,002.53	3,001.79	11.86	70.53	-93.03	-645.40	-11,275.38	11,308.96	11,226.57	82.39	137.261	
3,100.00	3,055.74	3,100.48	3,099.74	12.29	72.60	-93.13	-645.40	-11,275.38	11,310.07	11,225.17	84.89	133.227	
3,200.00	3,153.69	3,198.43	3,197.69	12.72	74.68	-93.23	-645.40	-11,275.38	11,311.21	11,223.81	87.40	129.425	
3,300.00	3,251.65	3,296.39	3,295.65	13.15	76.75	-93.33	-645.40	-11,275.38	11,312.38	11,222.48	89.90	125.834	
3,400.00	3,349.60	3,393.59	3,392.84	13.59	78.80	-93.42	-643.81	-11,275.38	11,313.43	11,221.04	92.39	122.457	
3,500.00	3,447.56	3,488.87	3,488.11	14.02	80.82	-93.52	-643.97	-11,275.38	11,314.69	11,219.86	94.83	119.311	
3,600.00	3,545.51	3,584.05	3,583.29	14.45	82.83	-93.62	-644.36	-11,275.38	11,316.01	11,218.73	97.28	116.326	
3,700.00	3,643.46	3,679.16	3,678.39	14.88	84.84	-93.72	-644.96	-11,275.38	11,317.40	11,217.67	99.72	113.489	
3,800.00	3,741.42	3,786.27	3,785.42	15.32	87.32	-93.83	-645.40	-11,275.38	11,318.79	11,216.16	102.64	110.281	
3,900.00	3,839.37	3,884.22	3,883.37	15.75	89.79	-93.93	-645.40	-11,275.38	11,320.18	11,214.65	105.54	107.264	
4,000.00	3,937.33	3,982.18	3,981.33	16.18	92.26	-94.03	-645.40	-11,275.38	11,321.61	11,213.17	108.44	104.408	
4,100.00	4,035.28	4,080.13	4,079.28	16.62	94.73	-94.13	-645.40	-11,275.38	11,323.07	11,211.73	111.34	101.701	
4,200.00	4,133.23	4,178.09	4,177.23	17.05	97.19	-94.23	-645.40	-11,275.38	11,324.57	11,210.33	114.24	99.132	
4,300.00	4,231.19	4,276.04	4,275.19	17.48	99.66	-94.33	-645.40	-11,275.38	11,326.10	11,208.96	117.14	96.691	
4,400.00	4,329.14	4,373.99	4,373.14	17.92	102.13	-94.43	-645.40	-11,275.38	11,327.66	11,207.63	120.04	94.367	
4,500.00	4,427.10	4,471.95	4,471.10	18.35	104.60	-94.52	-645.40	-11,275.38	11,329.27	11,206.33	122.94	92.154	
4,600.00	4,525.05	4,569.90	4,569.05	18.78	107.06	-94.62	-645.40	-11,275.38	11,330.91	11,205.07	125.84	90.043	
4,700.00	4,623.00	4,667.86	4,667.00	19.22	109.53	-94.72	-645.40	-11,275.38	11,332.58	11,203.84	128.74	88.027	
4,800.00	4,720.96	4,765.55	4,764.66	19.65	111.99	-94.80	-640.98	-11,275.38	11,333.73	11,202.09	131.63	86.100	
4,900.00	4,818.91	4,862.30	4,861.40	20.09	114.43	-94.90	-641.04	-11,275.38	11,335.47	11,200.97	134.50	84.276	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		520-A027Ua_INC-ONLY				Rule Assigned:								Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)		
5,000.00	4,916.87	4,959.01	4,958.11	20.52	116.86	-95.00	-641.18	-11,275.38	11,337.26	11,199.89	137.37	82.528			
5,100.00	5,014.82	5,055.69	5,054.78	20.96	119.30	-95.10	-641.40	-11,275.38	11,339.10	11,198.86	140.24	80.853			
5,200.00	5,112.77	5,152.34	5,151.43	21.39	121.73	-95.20	-641.70	-11,275.38	11,340.99	11,197.87	143.11	79.246			
5,300.00	5,210.73	5,248.96	5,248.04	21.82	124.17	-95.30	-642.08	-11,275.38	11,342.92	11,196.94	145.98	77.703			
5,400.00	5,308.68	5,345.54	5,344.62	22.26	126.60	-95.40	-642.54	-11,275.38	11,344.90	11,196.05	148.85	76.219			
5,493.23	5,400.00	5,435.56	5,434.63	22.66	128.87	-95.49	-643.04	-11,275.38	11,346.79	11,195.27	151.52	74.888			
5,500.00	5,406.64	5,442.10	5,441.17	22.69	129.03	-95.50	-643.08	-11,275.38	11,346.93	11,195.22	151.71	74.793			
5,600.00	5,504.69	5,538.72	5,537.79	23.12	131.47	-95.61	-643.70	-11,275.38	11,348.96	11,194.38	154.58	73.420			
5,700.00	5,602.91	5,635.49	5,634.55	23.55	133.91	-95.71	-644.40	-11,275.38	11,350.95	11,193.51	157.44	72.098			
5,800.00	5,701.29	5,732.39	5,731.44	23.97	136.35	-95.81	-645.19	-11,275.38	11,352.89	11,192.60	160.30	70.824			
5,900.00	5,799.82	5,845.39	5,843.82	24.39	139.58	-95.92	-645.40	-11,275.38	11,354.69	11,190.74	163.94	69.260			
6,000.00	5,898.50	5,944.07	5,942.50	24.79	142.49	-96.01	-645.40	-11,275.38	11,356.39	11,189.13	167.27	67.894			
6,100.00	5,997.31	6,042.89	6,041.31	25.20	145.41	-96.09	-645.40	-11,275.38	11,358.03	11,187.44	170.59	66.582			
6,200.00	6,096.26	6,141.83	6,140.26	25.60	148.33	-96.17	-645.40	-11,275.38	11,359.59	11,185.68	173.91	65.320			
6,300.00	6,195.33	6,240.90	6,239.33	25.99	151.26	-96.25	-645.40	-11,275.38	11,361.08	11,183.85	177.23	64.105			
6,400.00	6,294.51	6,340.08	6,338.51	26.37	154.19	-96.32	-645.40	-11,275.38	11,362.48	11,181.94	180.54	62.936			
6,498.19	6,392.00	6,437.57	6,436.00	26.75	157.07	-96.38	-645.40	-11,275.38	11,363.78	11,179.99	183.79	61.829			
6,500.00	6,393.80	6,439.37	6,437.80	26.76	157.12	-95.18	-645.40	-11,275.38	11,363.80	11,179.95	183.85	61.809			
6,550.00	6,443.29	6,488.86	6,487.29	26.95	158.59	-72.51	-645.40	-11,275.38	11,362.77	11,177.26	185.51	61.251			
6,600.00	6,492.24	6,537.81	6,536.24	27.16	160.03	-62.00	-645.40	-11,275.38	11,358.62	11,171.45	187.17	60.687			
6,650.00	6,540.33	6,585.90	6,584.33	27.38	161.45	-56.61	-645.40	-11,275.38	11,351.38	11,162.57	188.81	60.121			
6,700.00	6,587.28	6,632.85	6,631.28	27.60	162.84	-53.68	-645.40	-11,275.38	11,341.11	11,150.68	190.43	59.556			
6,750.00	6,632.80	6,678.37	6,676.80	27.84	164.18	-52.15	-645.40	-11,275.38	11,327.87	11,135.86	192.01	58.995			
6,800.00	6,676.60	6,722.17	6,720.60	28.09	165.48	-51.54	-645.40	-11,275.38	11,311.77	11,118.21	193.56	58.442			
6,850.00	6,718.42	6,763.99	6,762.42	28.34	166.71	-51.61	-645.40	-11,275.38	11,292.90	11,097.85	195.05	57.898			
6,900.00	6,758.00	6,803.57	6,802.00	28.60	167.88	-52.22	-645.40	-11,275.38	11,271.39	11,074.91	196.48	57.367			
6,950.00	6,795.09	6,840.66	6,839.09	28.87	168.98	-53.32	-645.40	-11,275.38	11,247.39	11,049.54	197.84	56.850			
7,000.00	6,829.46	6,875.03	6,873.46	29.14	169.99	-54.88	-645.40	-11,275.38	11,221.05	11,021.92	199.13	56.350			
7,050.00	6,860.91	6,906.48	6,904.91	29.43	170.92	-56.88	-645.40	-11,275.38	11,192.55	10,992.21	200.34	55.868			
7,100.00	6,889.24	6,934.81	6,933.24	29.73	171.76	-59.34	-645.40	-11,275.38	11,162.06	10,960.61	201.46	55.406			
7,150.00	6,914.27	6,959.84	6,958.27	30.05	172.50	-62.25	-645.40	-11,275.38	11,129.80	10,927.32	202.49	54.966			
7,200.00	6,935.85	6,981.42	6,979.85	30.37	173.14	-65.63	-645.40	-11,275.38	11,095.96	10,892.55	203.41	54.549			
7,250.00	6,953.84	6,999.41	6,997.84	30.71	173.67	-69.48	-645.40	-11,275.38	11,060.77	10,856.53	204.24	54.156			
7,300.00	6,968.15	7,013.72	7,012.15	31.06	174.09	-73.78	-645.40	-11,275.38	11,024.44	10,819.48	204.96	53.789			
7,350.00	6,978.67	7,024.24	7,022.67	31.42	174.40	-78.49	-645.40	-11,275.38	10,987.20	10,781.63	205.56	53.449			
7,400.00	6,985.34	7,030.92	7,029.34	31.79	174.60	-83.54	-645.40	-11,275.38	10,949.28	10,743.22	206.06	53.137			
7,450.00	6,988.13	7,033.70	7,032.13	32.17	174.68	-88.85	-645.40	-11,275.38	10,910.92	10,704.49	206.44	52.853			
7,461.13	6,988.22	7,033.79	7,032.22	32.26	174.68	-90.05	-645.40	-11,275.38	10,902.35	10,695.84	206.51	52.794			
7,500.00	6,988.19	7,033.76	7,032.19	32.56	174.68	-90.05	-645.40	-11,275.38	10,872.25	10,665.52	206.74	52.590			
7,600.00	6,988.12	7,033.69	7,032.12	33.37	174.68	-90.05	-645.40	-11,275.38	10,793.56	10,586.22	207.34	52.059			
7,700.00	6,988.05	7,033.62	7,032.05	34.21	174.68	-90.06	-645.40	-11,275.38	10,713.09	10,505.16	207.93	51.521			
7,800.00	6,987.98	7,033.55	7,031.98	35.09	174.68	-90.06	-645.40	-11,275.38	10,630.91	10,422.38	208.53	50.980			
7,900.00	6,987.91	7,033.48	7,031.91	35.99	174.67	-90.07	-645.40	-11,275.38	10,547.07	10,337.95	209.12	50.435			
8,000.00	6,987.83	7,033.40	7,031.83	36.93	174.67	-90.07	-645.40	-11,275.38	10,461.65	10,251.94	209.71	49.887			
8,100.00	6,987.76	7,033.33	7,031.76	37.88	174.67	-90.08	-645.40	-11,275.38	10,374.70	10,164.42	210.27	49.339			
8,200.00	6,987.68	7,033.25	7,031.68	38.86	174.67	-90.08	-645.40	-11,275.38	10,286.29	10,075.46	210.83	48.790			
8,300.00	6,987.61	7,033.18	7,031.61	39.86	174.66	-90.09	-645.40	-11,275.38	10,196.50	9,985.14	211.36	48.242			
8,400.00	6,987.53	7,033.11	7,031.53	40.87	174.66	-90.10	-645.40	-11,275.38	10,105.41	9,893.53	211.88	47.695			
8,500.00	6,987.46	7,033.03	7,031.46	41.90	174.66	-90.11	-645.40	-11,275.38	10,013.08	9,800.71	212.37	47.150			
8,600.00	6,987.38	7,032.96	7,031.38	42.93	174.66	-90.12	-645.40	-11,275.38	9,919.59	9,706.76	212.83	46.609			
8,700.00	6,987.31	7,032.88	7,031.31	43.98	174.66	-90.13	-645.40	-11,275.38	9,825.04	9,611.78	213.26	46.071			
8,800.00	6,987.23	7,032.81	7,031.23	45.03	174.65	-90.15	-645.40	-11,275.38	9,729.50	9,515.84	213.66	45.538			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		520-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,872.16	6,987.18	7,032.75	7,031.18	45.79	174.65	-90.16	-645.40	-11,275.38	9,660.00	9,446.07	213.93	45.156		
8,900.00	6,987.16	7,032.73	7,031.16	46.08	174.65	-90.16	-645.40	-11,275.38	9,633.09	9,419.07	214.03	45.009		
9,000.00	6,987.09	7,032.66	7,031.09	47.16	174.65	-90.16	-645.40	-11,275.38	9,536.52	9,322.13	214.39	44.482		
9,100.00	6,987.01	7,032.58	7,031.01	48.27	174.65	-90.16	-645.40	-11,275.38	9,440.02	9,225.26	214.76	43.956		
9,200.00	6,986.94	7,032.51	7,030.94	49.40	174.64	-90.15	-645.40	-11,275.38	9,343.59	9,128.45	215.15	43.429		
9,300.00	6,986.86	7,032.43	7,030.86	50.56	174.64	-90.15	-645.40	-11,275.38	9,247.24	9,031.70	215.54	42.903		
9,400.00	6,986.79	7,032.36	7,030.79	51.75	174.64	-90.15	-645.40	-11,275.38	9,150.97	8,935.02	215.95	42.376		
9,500.00	6,986.71	7,032.28	7,030.71	52.95	174.64	-90.15	-645.40	-11,275.38	9,054.78	8,838.42	216.36	41.850		
9,600.00	6,986.64	7,032.21	7,030.64	54.18	174.64	-90.15	-645.40	-11,275.38	8,958.67	8,741.88	216.79	41.324		
9,700.00	6,986.56	7,032.13	7,030.56	55.42	174.63	-90.15	-645.40	-11,275.38	8,862.65	8,645.41	217.23	40.798		
9,800.00	6,986.49	7,032.06	7,030.49	56.69	174.63	-90.14	-645.40	-11,275.38	8,766.71	8,549.03	217.68	40.273		
9,900.00	6,986.41	7,031.99	7,030.41	57.97	174.63	-90.14	-645.40	-11,275.38	8,670.87	8,452.72	218.15	39.747		
10,000.00	6,986.34	7,031.91	7,030.34	59.26	174.63	-90.14	-645.40	-11,275.38	8,575.12	8,356.50	218.63	39.222		
10,100.00	6,986.27	7,031.84	7,030.27	60.57	174.62	-90.14	-645.40	-11,275.38	8,479.47	8,260.35	219.12	38.698		
10,200.00	6,986.19	7,031.76	7,030.19	61.90	174.62	-90.14	-645.40	-11,275.38	8,383.93	8,164.30	219.63	38.174		
10,300.00	6,986.12	7,031.69	7,030.12	63.23	174.62	-90.14	-645.40	-11,275.38	8,288.49	8,068.34	220.15	37.650		
10,400.00	6,986.04	7,031.61	7,030.04	64.58	174.62	-90.13	-645.40	-11,275.38	8,193.15	7,972.47	220.68	37.127		
10,500.00	6,985.97	7,031.54	7,029.97	65.94	174.62	-90.13	-645.40	-11,275.38	8,097.93	7,876.70	221.23	36.604		
10,600.00	6,985.89	7,031.46	7,029.89	67.32	174.61	-90.13	-645.40	-11,275.38	8,002.83	7,781.03	221.80	36.082		
10,700.00	6,985.82	7,031.39	7,029.82	68.70	174.61	-90.13	-645.40	-11,275.38	7,907.84	7,685.46	222.38	35.560		
10,800.00	6,985.74	7,031.31	7,029.74	70.09	174.61	-90.13	-645.40	-11,275.38	7,812.98	7,590.01	222.98	35.039		
10,900.00	6,985.67	7,031.24	7,029.67	71.49	174.61	-90.13	-645.40	-11,275.38	7,718.26	7,494.66	223.59	34.519		
11,000.00	6,985.59	7,031.17	7,029.59	72.90	174.60	-90.12	-645.40	-11,275.38	7,623.66	7,399.44	224.23	34.000		
11,100.00	6,985.52	7,031.09	7,029.52	74.31	174.60	-90.12	-645.40	-11,275.38	7,529.21	7,304.33	224.88	33.482		
11,200.00	6,985.45	7,031.02	7,029.45	75.74	174.60	-90.12	-645.40	-11,275.38	7,434.90	7,209.35	225.55	32.964		
11,300.00	6,985.37	7,030.94	7,029.37	77.17	174.60	-90.12	-645.40	-11,275.38	7,340.74	7,114.50	226.24	32.447		
11,400.00	6,985.30	7,030.87	7,029.30	78.61	174.60	-90.12	-645.40	-11,275.38	7,246.74	7,019.79	226.95	31.931		
11,500.00	6,985.22	7,030.79	7,029.22	80.05	174.59	-90.12	-645.40	-11,275.38	7,152.90	6,925.22	227.68	31.417		
11,600.00	6,985.15	7,030.72	7,029.15	81.50	174.59	-90.11	-645.40	-11,275.38	7,059.23	6,830.80	228.43	30.903		
11,700.00	6,985.07	7,030.64	7,029.07	82.96	174.59	-90.11	-645.40	-11,275.38	6,965.74	6,736.53	229.20	30.391		
11,800.00	6,985.00	7,030.57	7,029.00	84.42	174.59	-90.11	-645.40	-11,275.38	6,872.42	6,642.42	230.00	29.880		
11,900.00	6,984.92	7,030.49	7,028.92	85.89	174.59	-90.11	-645.40	-11,275.38	6,779.30	6,548.48	230.82	29.370		
12,000.00	6,984.85	7,030.42	7,028.85	87.36	174.58	-90.11	-645.40	-11,275.38	6,686.38	6,454.71	231.67	28.862		
12,100.00	6,984.77	7,030.35	7,028.77	88.83	174.58	-90.10	-645.40	-11,275.38	6,593.67	6,361.13	232.54	28.355		
12,200.00	6,984.70	7,030.27	7,028.70	90.31	174.58	-90.10	-645.40	-11,275.38	6,501.17	6,267.73	233.44	27.849		
12,300.00	6,984.63	7,030.20	7,028.63	91.80	174.58	-90.10	-645.40	-11,275.38	6,408.90	6,174.53	234.37	27.346		
12,400.00	6,984.55	7,030.12	7,028.55	93.29	174.57	-90.10	-645.40	-11,275.38	6,316.86	6,081.54	235.32	26.844		
12,500.00	6,984.48	7,030.05	7,028.48	94.78	174.57	-90.10	-645.40	-11,275.38	6,225.07	5,988.76	236.31	26.343		
12,600.00	6,984.40	7,029.97	7,028.40	96.28	174.57	-90.10	-645.40	-11,275.38	6,133.53	5,896.21	237.32	25.845		
12,700.00	6,984.33	7,029.90	7,028.33	97.78	174.57	-90.09	-645.40	-11,275.38	6,042.26	5,803.90	238.37	25.349		
12,800.00	6,984.25	7,029.82	7,028.25	99.28	174.57	-90.09	-645.40	-11,275.38	5,951.28	5,711.83	239.45	24.854		
12,900.00	6,984.18	7,029.75	7,028.18	100.78	174.56	-90.09	-645.40	-11,275.38	5,860.58	5,620.03	240.56	24.362		
13,000.00	6,984.10	7,029.67	7,028.10	102.29	174.56	-90.09	-645.40	-11,275.38	5,770.20	5,528.49	241.71	23.873		
13,100.00	6,984.03	7,029.60	7,028.03	103.80	174.56	-90.09	-645.40	-11,275.38	5,680.14	5,437.24	242.89	23.385		
13,200.00	6,983.95	7,029.53	7,027.95	105.32	174.56	-90.09	-645.40	-11,275.38	5,590.41	5,346.30	244.12	22.901		
13,300.00	6,983.88	7,029.45	7,027.88	106.84	174.55	-90.08	-645.40	-11,275.38	5,501.04	5,255.66	245.38	22.419		
13,400.00	6,983.81	7,029.38	7,027.81	108.36	174.55	-90.08	-645.40	-11,275.38	5,412.04	5,165.36	246.68	21.939		
13,500.00	6,983.73	7,029.30	7,027.73	109.88	174.55	-90.08	-645.40	-11,275.38	5,323.43	5,075.41	248.03	21.463		
13,600.00	6,983.66	7,029.23	7,027.66	111.40	174.55	-90.08	-645.40	-11,275.38	5,235.24	4,985.82	249.42	20.990		
13,700.00	6,983.58	7,029.15	7,027.58	112.93	174.55	-90.08	-645.40	-11,275.38	5,147.47	4,896.62	250.85	20.520		
13,800.00	6,983.51	7,029.08	7,027.51	114.46	174.54	-90.08	-645.40	-11,275.38	5,060.16	4,807.82	252.33	20.053		
13,900.00	6,983.43	7,029.00	7,027.43	115.99	174.54	-90.07	-645.40	-11,275.38	4,973.32	4,719.46	253.86	19.590		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		520-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
14,000.00	6,983.36	7,028.93	7,027.36	117.52	174.54	-90.07	-645.40	-11,275.38	4,886.99	4,631.55	255.45	19.131		
14,100.00	6,983.28	7,028.85	7,027.28	119.06	174.54	-90.07	-645.40	-11,275.38	4,801.19	4,544.11	257.08	18.676		
14,200.00	6,983.21	7,028.78	7,027.21	120.59	174.53	-90.07	-645.40	-11,275.38	4,715.95	4,457.18	258.77	18.225		
14,300.00	6,983.13	7,028.71	7,027.13	122.13	174.53	-90.07	-645.40	-11,275.38	4,631.30	4,370.79	260.51	17.778		
14,400.00	6,983.06	7,028.63	7,027.06	123.67	174.53	-90.07	-645.40	-11,275.38	4,547.27	4,284.96	262.31	17.335		
14,500.00	6,982.99	7,028.56	7,026.99	125.21	174.53	-90.06	-645.40	-11,275.38	4,463.90	4,199.73	264.18	16.898		
14,600.00	6,982.91	7,028.48	7,026.91	126.75	174.53	-90.06	-645.40	-11,275.38	4,381.23	4,115.13	266.10	16.465		
14,700.00	6,982.84	7,028.41	7,026.84	128.30	174.52	-90.06	-645.40	-11,275.38	4,299.29	4,031.21	268.08	16.037		
14,800.00	6,982.76	7,028.33	7,026.76	129.85	174.52	-90.06	-645.40	-11,275.38	4,218.14	3,948.00	270.13	15.615		
14,900.00	6,982.69	7,028.26	7,026.69	131.39	174.52	-90.06	-645.40	-11,275.38	4,137.80	3,865.56	272.25	15.199		
15,000.00	6,982.61	7,028.18	7,026.61	132.94	174.52	-90.06	-645.40	-11,275.38	4,058.35	3,783.91	274.43	14.788		
15,100.00	6,982.54	7,028.11	7,026.54	134.49	174.51	-90.05	-645.40	-11,275.38	3,979.81	3,703.13	276.69	14.384		
15,200.00	6,982.46	7,028.03	7,026.46	136.04	174.51	-90.05	-645.40	-11,275.38	3,902.26	3,623.26	279.01	13.986		
15,300.00	6,982.39	7,027.96	7,026.39	137.60	174.51	-90.05	-645.40	-11,275.38	3,825.76	3,544.36	281.40	13.595		
15,400.00	6,982.31	7,027.89	7,026.31	139.15	174.51	-90.05	-645.40	-11,275.38	3,750.36	3,466.49	283.87	13.212		
15,500.00	6,982.24	7,027.81	7,026.24	140.70	174.51	-90.05	-645.40	-11,275.38	3,676.13	3,389.73	286.40	12.836		
15,600.00	6,982.17	7,027.74	7,026.17	142.26	174.50	-90.04	-645.40	-11,275.38	3,603.15	3,314.14	289.01	12.467		
15,700.00	6,982.09	7,027.66	7,026.09	143.82	174.50	-90.04	-645.40	-11,275.38	3,531.49	3,239.80	291.69	12.107		
15,800.00	6,982.02	7,027.59	7,026.02	145.38	174.50	-90.04	-645.40	-11,275.38	3,461.24	3,166.81	294.43	11.756		
15,900.00	6,981.94	7,027.51	7,025.94	146.94	174.50	-90.04	-645.40	-11,275.38	3,392.48	3,095.24	297.24	11.413		
16,000.00	6,981.87	7,027.44	7,025.87	148.50	174.49	-90.04	-645.40	-11,275.38	3,325.31	3,025.19	300.12	11.080		
16,100.00	6,981.79	7,027.36	7,025.79	150.06	174.49	-90.04	-645.40	-11,275.38	3,259.82	2,956.77	303.05	10.757		
16,200.00	6,981.72	7,027.29	7,025.72	151.62	174.49	-90.03	-645.40	-11,275.38	3,196.12	2,890.08	306.03	10.444		
16,300.00	6,981.64	7,027.21	7,025.64	153.18	174.49	-90.03	-645.40	-11,275.38	3,134.31	2,825.24	309.07	10.141		
16,400.00	6,981.57	7,027.14	7,025.57	154.74	174.49	-90.03	-645.40	-11,275.38	3,074.52	2,762.38	312.14	9.850		
16,500.00	6,981.49	7,027.07	7,025.49	156.31	174.48	-90.03	-645.40	-11,275.38	3,016.85	2,701.61	315.24	9.570		
16,600.00	6,981.42	7,026.99	7,025.42	157.87	174.48	-90.03	-645.40	-11,275.38	2,961.44	2,643.08	318.36	9.302		
16,700.00	6,981.35	7,026.92	7,025.35	159.44	174.48	-90.03	-645.40	-11,275.38	2,908.42	2,586.93	321.49	9.047		
16,800.00	6,981.27	7,026.84	7,025.27	161.01	174.48	-90.02	-645.40	-11,275.38	2,857.91	2,533.30	324.61	8.804		
16,900.00	6,981.20	7,026.77	7,025.20	162.58	174.47	-90.02	-645.40	-11,275.38	2,810.05	2,482.35	327.70	8.575		
17,000.00	6,981.12	7,026.69	7,025.12	164.14	174.47	-90.02	-645.40	-11,275.38	2,764.98	2,434.23	330.75	8.360		
17,100.00	6,981.05	7,026.62	7,025.05	165.71	174.47	-90.02	-645.40	-11,275.38	2,722.85	2,389.11	333.74	8.159		
17,200.00	6,980.97	7,026.54	7,024.97	167.28	174.47	-90.02	-645.40	-11,275.38	2,683.77	2,347.13	336.64	7.972		
17,300.00	6,980.90	7,026.47	7,024.90	168.85	174.47	-90.02	-645.40	-11,275.38	2,647.90	2,308.46	339.44	7.801		
17,400.00	6,980.82	7,026.39	7,024.82	170.42	174.46	-90.01	-645.40	-11,275.38	2,615.36	2,273.25	342.12	7.645		
17,500.00	6,980.75	7,026.32	7,024.75	172.00	174.46	-90.01	-645.40	-11,275.38	2,586.29	2,241.65	344.63	7.504		
17,600.00	6,980.67	7,026.25	7,024.67	173.57	174.46	-90.01	-645.40	-11,275.38	2,560.79	2,213.81	346.98	7.380		
17,700.00	6,980.60	7,026.17	7,024.60	175.14	174.46	-90.01	-645.40	-11,275.38	2,538.97	2,189.85	349.12	7.272		
17,800.00	6,980.53	7,026.10	7,024.53	176.71	174.46	-90.01	-645.40	-11,275.38	2,520.94	2,169.89	351.05	7.181		
17,900.00	6,980.45	7,026.02	7,024.45	178.29	174.45	-90.01	-645.40	-11,275.38	2,506.77	2,154.02	352.74	7.107		
18,000.00	6,980.38	7,025.95	7,024.38	179.86	174.45	-90.00	-645.40	-11,275.38	2,496.52	2,142.35	354.17	7.049		
18,100.00	6,980.30	7,025.87	7,024.30	181.44	174.45	-90.00	-645.40	-11,275.38	2,490.25	2,134.92	355.34	7.008		
18,200.00	6,980.23	7,025.80	7,024.23	183.01	174.45	-90.00	-645.40	-11,275.38	2,487.99	2,131.77	356.23	6.984		
18,206.26	6,980.22	7,025.79	7,024.22	183.11	174.45	-90.00	-645.40	-11,275.38	2,487.99	2,131.71	356.27	6.983 CC, ES		
18,300.00	6,980.15	7,025.72	7,024.15	184.59	174.44	-90.00	-645.40	-11,275.38	2,489.75	2,132.92	356.83	6.977 SF		
18,400.00	6,980.08	7,025.65	7,024.08	186.16	174.44	-90.00	-645.40	-11,275.38	2,495.52	2,138.37	357.15	6.987		
18,500.00	6,980.00	7,025.57	7,024.00	187.74	174.44	-89.99	-645.40	-11,275.38	2,505.27	2,148.09	357.18	7.014		
18,600.00	6,979.93	7,025.50	7,023.93	189.32	174.44	-89.99	-645.40	-11,275.38	2,518.95	2,162.01	356.94	7.057		
18,700.00	6,979.85	7,025.43	7,023.85	190.90	174.44	-89.99	-645.40	-11,275.38	2,536.50	2,180.07	356.43	7.116		
18,800.00	6,979.78	7,025.35	7,023.78	192.48	174.43	-89.99	-645.40	-11,275.38	2,557.85	2,202.18	355.67	7.192		
18,900.00	6,979.71	7,025.28	7,023.71	194.05	174.43	-89.99	-645.40	-11,275.38	2,582.90	2,228.23	354.67	7.283		
19,000.00	6,979.63	7,025.20	7,023.63	195.63	174.43	-89.99	-645.40	-11,275.38	2,611.53	2,258.08	353.45	7.389		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149B - OH - OH-INC												Offset Site Error: 0.00 usft	
Survey Program:		520-A027Ua_INC-ONLY						Rule Assigned:		Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
19,100.00	6,979.56	7,025.13	7,023.56	197.21	174.43	-89.98	-645.40	-11,275.38	2,643.64	2,291.61	352.04	7.510	
19,200.00	6,979.48	7,025.05	7,023.48	198.79	174.42	-89.98	-645.40	-11,275.38	2,679.10	2,328.66	350.44	7.645	
19,300.00	6,979.41	7,024.98	7,023.41	200.37	174.42	-89.98	-645.40	-11,275.38	2,717.78	2,369.09	348.69	7.794	
19,400.00	6,979.33	7,024.90	7,023.33	201.95	174.42	-89.98	-645.40	-11,275.38	2,759.55	2,412.74	346.81	7.957	
19,500.00	6,979.26	7,024.83	7,023.26	203.54	174.42	-89.98	-645.40	-11,275.38	2,804.25	2,459.44	344.81	8.133	
19,600.00	6,979.18	7,024.75	7,023.18	205.12	174.42	-89.98	-645.40	-11,275.38	2,851.77	2,509.05	342.72	8.321	
19,700.00	6,979.11	7,024.68	7,023.11	206.70	174.41	-89.97	-645.40	-11,275.38	2,901.95	2,561.41	340.55	8.521	
19,800.00	6,979.03	7,024.61	7,023.03	208.28	174.41	-89.97	-645.40	-11,275.38	2,954.67	2,616.35	338.32	8.733	
19,900.00	6,978.96	7,024.53	7,022.96	209.86	174.41	-89.97	-645.40	-11,275.38	3,009.79	2,673.74	336.05	8.956	
20,000.00	6,978.89	7,024.46	7,022.89	211.45	174.41	-89.97	-645.40	-11,275.38	3,067.18	2,733.43	333.75	9.190	
20,100.00	6,978.81	7,024.38	7,022.81	213.03	174.40	-89.97	-645.40	-11,275.38	3,126.71	2,795.28	331.43	9.434	
20,200.00	6,978.74	7,024.31	7,022.74	214.61	174.40	-89.97	-645.40	-11,275.38	3,188.27	2,859.16	329.11	9.688	
20,300.00	6,978.66	7,024.23	7,022.66	216.20	174.40	-89.96	-645.40	-11,275.38	3,251.74	2,924.94	326.80	9.950	
20,400.00	6,978.59	7,024.16	7,022.59	217.78	174.40	-89.96	-645.40	-11,275.38	3,317.01	2,992.51	324.50	10.222	
20,500.00	6,978.51	7,024.08	7,022.51	219.37	174.40	-89.96	-645.40	-11,275.38	3,383.98	3,061.76	322.22	10.502	
20,600.00	6,978.44	7,024.01	7,022.44	220.95	174.39	-89.96	-645.40	-11,275.38	3,452.54	3,132.57	319.97	10.790	
20,700.00	6,978.36	7,023.93	7,022.36	222.53	174.39	-89.96	-645.40	-11,275.38	3,522.61	3,204.86	317.76	11.086	
20,800.00	6,978.29	7,023.86	7,022.29	224.12	174.39	-89.96	-645.40	-11,275.38	3,594.10	3,278.52	315.58	11.389	
20,900.00	6,978.21	7,023.79	7,022.21	225.71	174.39	-89.95	-645.40	-11,275.38	3,666.92	3,353.48	313.44	11.699	
21,000.00	6,978.14	7,023.71	7,022.14	227.29	174.38	-89.95	-645.40	-11,275.38	3,741.00	3,429.65	311.35	12.016	
21,100.00	6,978.07	7,023.64	7,022.07	228.88	174.38	-89.95	-645.40	-11,275.38	3,816.26	3,506.96	309.30	12.338	
21,200.00	6,977.99	7,023.56	7,021.99	230.46	174.38	-89.95	-645.40	-11,275.38	3,892.63	3,585.33	307.30	12.667	
21,300.00	6,977.92	7,023.49	7,021.92	232.05	174.38	-89.95	-645.40	-11,275.38	3,970.05	3,664.70	305.35	13.002	
21,400.00	6,977.84	7,023.41	7,021.84	233.64	174.38	-89.95	-645.40	-11,275.38	4,048.46	3,745.01	303.45	13.342	
21,500.00	6,977.77	7,023.34	7,021.77	235.22	174.37	-89.94	-645.40	-11,275.38	4,127.81	3,826.21	301.60	13.687	
21,600.00	6,977.69	7,023.26	7,021.69	236.81	174.37	-89.94	-645.40	-11,275.38	4,208.03	3,908.24	299.79	14.036	
21,700.00	6,977.62	7,023.19	7,021.62	238.40	174.37	-89.94	-645.40	-11,275.38	4,289.09	3,991.05	298.04	14.391	
21,800.00	6,977.54	7,023.11	7,021.54	239.99	174.37	-89.94	-645.40	-11,275.38	4,370.93	4,074.59	296.34	14.750	
21,900.00	6,977.47	7,023.04	7,021.47	241.57	174.36	-89.94	-645.40	-11,275.38	4,453.51	4,158.83	294.68	15.113	
22,000.00	6,977.39	7,022.97	7,021.39	243.16	174.36	-89.93	-645.40	-11,275.38	4,536.80	4,243.72	293.08	15.480	
22,100.00	6,977.32	7,022.89	7,021.32	244.75	174.36	-89.93	-645.40	-11,275.38	4,620.74	4,329.23	291.52	15.851	
22,200.00	6,977.25	7,022.82	7,021.25	246.34	174.36	-89.93	-645.40	-11,275.38	4,705.32	4,415.32	290.00	16.225	
22,300.00	6,977.17	7,022.74	7,021.17	247.93	174.36	-89.93	-645.40	-11,275.38	4,790.49	4,501.96	288.53	16.603	
22,400.00	6,977.10	7,022.67	7,021.10	249.52	174.35	-89.93	-645.40	-11,275.38	4,876.22	4,589.12	287.10	16.984	
22,500.00	6,977.02	7,022.59	7,021.02	251.11	174.35	-89.93	-645.40	-11,275.38	4,962.49	4,676.77	285.72	17.368	
22,529.62	6,977.00	7,022.57	7,021.00	251.58	174.35	-89.93	-645.40	-11,275.38	4,988.13	4,702.81	285.32	17.483	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:		0.00 usft	
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	2,721.27	2,549.64	0.00	15.54	-93.73	-572.79	-8,774.63	9,176.94					
100.00	100.00	2,738.00	2,565.17	0.25	15.64	-93.71	-568.24	-8,770.38	9,148.77	9,133.07	15.70	582.621		
200.00	200.00	2,738.00	2,565.17	0.61	15.64	-93.71	-568.24	-8,770.38	9,121.50	9,105.63	15.87	574.622		
300.00	300.00	2,738.00	2,565.17	0.97	15.64	-93.71	-568.24	-8,770.38	9,095.25	9,079.12	16.13	563.810		
400.00	400.00	2,800.00	2,623.28	1.33	16.00	-93.61	-552.06	-8,756.08	9,069.75	9,052.95	16.80	539.798		
500.00	500.00	2,800.00	2,623.28	1.68	16.00	-93.61	-552.06	-8,756.08	9,044.92	9,027.80	17.12	528.356		
550.00	550.00	2,800.00	2,623.28	1.86	16.00	-93.61	-552.06	-8,756.08	9,032.89	9,015.61	17.28	522.681		
600.00	600.00	2,800.00	2,623.28	2.04	16.00	-91.46	-552.06	-8,756.08	9,021.13	9,003.69	17.45	517.076		
700.00	699.93	2,837.40	2,658.73	2.40	16.20	-91.89	-543.07	-8,748.23	8,998.23	8,980.23	18.00	499.870		
800.00	799.68	2,988.00	2,802.59	2.77	16.95	-92.23	-512.36	-8,716.01	8,975.33	8,956.22	19.11	469.691		
900.00	899.13	2,988.00	2,802.59	3.13	16.95	-92.69	-512.36	-8,716.01	8,953.02	8,933.56	19.45	460.250		
1,000.00	998.15	3,019.00	2,832.38	3.49	17.09	-93.12	-506.56	-8,709.70	8,931.73	8,911.77	19.95	447.609		
1,100.00	1,096.63	3,036.67	2,849.43	3.87	17.17	-93.54	-503.45	-8,706.28	8,911.50	8,891.10	20.40	436.832		
1,130.50	1,126.54	3,051.00	2,863.28	3.99	17.23	-93.66	-501.01	-8,703.55	8,905.53	8,884.95	20.58	432.719		
1,200.00	1,194.61	3,103.03	2,913.60	4.26	17.45	-93.68	-492.28	-8,693.61	8,891.99	8,870.90	21.08	421.780		
1,300.00	1,292.57	3,145.00	2,954.24	4.66	17.63	-93.69	-485.23	-8,685.84	8,873.01	8,851.35	21.66	409.609		
1,400.00	1,390.52	3,175.00	2,983.33	5.07	17.75	-93.70	-480.28	-8,680.44	8,854.67	8,832.48	22.19	399.076		
1,500.00	1,488.48	3,206.00	3,013.49	5.48	17.86	-93.72	-475.50	-8,675.07	8,837.10	8,814.38	22.72	388.947		
1,600.00	1,586.43	3,237.00	3,043.73	5.90	17.98	-93.73	-471.05	-8,669.89	8,820.26	8,797.01	23.25	379.306		
1,700.00	1,684.38	3,269.00	3,075.01	6.31	18.09	-93.75	-466.71	-8,664.76	8,804.18	8,780.39	23.79	370.065		
1,800.00	1,782.34	3,301.00	3,106.36	6.73	18.19	-93.77	-462.54	-8,659.87	8,788.86	8,764.53	24.33	361.274		
1,900.00	1,880.29	3,333.00	3,137.76	7.15	18.30	-93.78	-458.44	-8,655.25	8,774.34	8,749.48	24.86	352.910		
2,000.00	1,978.25	3,362.00	3,166.25	7.58	18.38	-93.80	-454.71	-8,651.33	8,760.63	8,735.25	25.38	345.114		
2,100.00	2,076.20	3,394.00	3,197.72	8.00	18.48	-93.82	-450.67	-8,647.13	8,747.58	8,721.67	25.92	337.508		
2,200.00	2,174.15	3,426.00	3,229.25	8.43	18.57	-93.84	-446.94	-8,643.15	8,735.32	8,708.87	26.45	330.263		
2,300.00	2,272.11	3,458.00	3,260.86	8.85	18.65	-93.86	-443.65	-8,639.45	8,723.89	8,696.91	26.98	323.372		
2,400.00	2,370.06	3,471.08	3,273.81	9.28	18.68	-93.87	-442.44	-8,638.03	8,713.31	8,685.88	27.43	317.638		
2,500.00	2,468.02	3,488.00	3,290.58	9.71	18.72	-93.89	-440.98	-8,636.34	8,703.69	8,675.79	27.90	311.975		
2,600.00	2,565.97	3,519.00	3,321.36	10.14	18.78	-93.92	-438.53	-8,633.57	8,695.03	8,666.62	28.41	306.046		
2,700.00	2,663.92	3,519.00	3,321.36	10.57	18.78	-93.92	-438.53	-8,633.57	8,687.24	8,658.42	28.81	301.506		
2,800.00	2,761.88	3,550.00	3,352.18	11.00	18.84	-93.94	-436.19	-8,631.21	8,680.34	8,651.02	29.32	296.092		
2,900.00	2,859.83	3,582.00	3,384.03	11.43	18.90	-93.97	-433.86	-8,629.22	8,674.42	8,644.61	29.82	290.939		
3,000.00	2,957.79	3,582.00	3,384.03	11.86	18.90	-93.97	-433.86	-8,629.22	8,669.35	8,639.14	30.21	286.952		
3,100.00	3,055.74	3,613.00	3,414.93	12.29	18.94	-94.00	-431.84	-8,627.66	8,665.18	8,634.48	30.70	282.274		
3,200.00	3,153.69	3,644.00	3,445.86	12.72	18.98	-94.03	-430.33	-8,626.47	8,661.98	8,630.80	31.18	277.838		
3,300.00	3,251.65	3,644.00	3,445.86	13.15	18.98	-94.03	-430.33	-8,626.47	8,659.66	8,628.09	31.57	274.335		
3,400.00	3,349.60	3,676.00	3,477.84	13.59	19.01	-94.07	-429.62	-8,625.65	8,658.30	8,626.26	32.04	270.222		
3,496.83	3,444.45	3,691.00	3,492.84	14.00	19.01	-94.09	-429.55	-8,625.41	8,657.88	8,625.43	32.45	266.808		
3,500.00	3,447.56	3,691.00	3,492.84	14.02	19.01	-94.09	-429.55	-8,625.41	8,657.88	8,625.42	32.46	266.708		
3,600.00	3,545.51	3,725.38	3,527.22	14.45	19.00	-94.14	-429.72	-8,625.07	8,658.33	8,625.42	32.91	263.117		
3,700.00	3,643.46	3,769.00	3,570.84	14.88	18.99	-94.20	-430.07	-8,624.91	8,659.50	8,626.17	33.33	259.845		
3,800.00	3,741.42	3,819.85	3,621.69	15.32	19.00	-94.27	-430.16	-8,625.12	8,661.36	8,627.69	33.68	257.203		
3,900.00	3,839.37	3,915.91	3,717.75	15.75	28.62	-94.39	-430.26	-8,625.61	8,663.44	8,619.59	43.85	197.581		
4,000.00	3,937.33	4,011.49	3,813.33	16.18	40.81	-94.52	-430.35	-8,626.12	8,665.59	8,609.04	56.55	153.249		
4,100.00	4,035.28	4,107.07	3,908.90	16.62	53.03	-94.65	-430.46	-8,626.65	8,667.81	8,598.57	69.23	125.197		
4,200.00	4,133.23	4,202.64	4,004.47	17.05	65.25	-94.78	-430.56	-8,627.21	8,670.10	8,588.19	81.92	105.841		
4,300.00	4,231.19	4,298.21	4,100.04	17.48	77.49	-94.90	-430.68	-8,627.80	8,672.47	8,577.87	94.60	91.679		
4,400.00	4,329.14	4,393.78	4,195.61	17.92	89.72	-95.03	-430.79	-8,628.41	8,674.91	8,567.64	107.28	80.866		
4,500.00	4,427.10	4,489.34	4,291.17	18.35	101.96	-95.16	-430.92	-8,629.04	8,677.42	8,557.47	119.95	72.340		
4,600.00	4,525.05	4,584.91	4,386.73	18.78	114.19	-95.28	-431.04	-8,629.70	8,680.01	8,547.38	132.63	65.445		
4,700.00	4,623.00	4,680.47	4,482.29	19.22	126.43	-95.41	-431.17	-8,630.39	8,682.67	8,537.36	145.31	59.753		
4,800.00	4,720.96	4,776.03	4,577.85	19.65	138.67	-95.54	-431.31	-8,631.11	8,685.41	8,527.42	157.99	54.976		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5				Rule Assigned:				Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4,900.00	4,818.91	4,871.59	4,673.41	20.09	150.91	-95.66	-431.45	-8,631.84	8,688.21	8,517.55	170.66	50.909	
5,000.00	4,916.87	4,967.15	4,768.96	20.52	163.15	-95.79	-431.60	-8,632.61	8,691.09	8,507.75	183.34	47.404	
5,100.00	5,014.82	5,062.70	4,864.51	20.96	175.39	-95.92	-431.75	-8,633.40	8,694.04	8,498.03	196.02	44.354	
5,200.00	5,112.77	5,158.26	4,960.06	21.39	187.63	-96.04	-431.91	-8,634.21	8,697.07	8,488.38	208.69	41.674	
5,300.00	5,210.73	5,253.81	5,055.61	21.82	199.87	-96.17	-432.07	-8,635.06	8,700.17	8,478.80	221.37	39.302	
5,400.00	5,308.68	5,349.36	5,151.15	22.26	212.11	-96.29	-432.24	-8,635.92	8,703.34	8,469.30	234.04	37.187	
5,493.23	5,400.00	5,438.43	5,240.22	22.66	223.51	-96.41	-432.39	-8,636.75	8,706.36	8,460.50	245.86	35.412	
5,500.00	5,406.64	5,444.90	5,246.70	22.69	224.34	-96.42	-432.41	-8,636.81	8,706.58	8,459.86	246.72	35.289	
5,600.00	5,504.69	5,540.54	5,342.33	23.12	236.59	-96.56	-432.58	-8,637.73	8,709.84	8,450.44	259.40	33.576	
5,700.00	5,602.91	5,636.35	5,438.13	23.55	248.87	-96.69	-432.76	-8,638.68	8,713.07	8,440.97	272.10	32.021	
5,800.00	5,701.29	5,732.31	5,534.09	23.97	261.16	-96.82	-432.95	-8,639.65	8,716.27	8,431.45	284.82	30.603	
5,900.00	5,799.82	5,828.42	5,630.19	24.39	273.47	-96.95	-433.14	-8,640.65	8,719.42	8,421.87	297.55	29.305	
6,000.00	5,898.50	5,924.66	5,726.43	24.79	285.80	-97.06	-433.34	-8,641.68	8,722.52	8,412.23	310.29	28.111	
6,100.00	5,997.31	6,021.05	5,822.81	25.20	298.14	-97.17	-433.54	-8,642.74	8,725.57	8,402.53	323.04	27.011	
6,200.00	6,096.26	6,117.56	5,919.31	25.60	310.51	-97.28	-433.75	-8,643.82	8,728.57	8,392.77	335.80	25.993	
6,300.00	6,195.33	6,214.19	6,015.93	25.99	322.89	-97.38	-433.96	-8,644.93	8,731.50	8,382.93	348.57	25.049	
6,400.00	6,294.51	6,310.93	6,112.67	26.37	335.28	-97.48	-434.18	-8,646.07	8,734.37	8,373.02	361.35	24.171	
6,498.19	6,392.00	6,406.01	6,207.75	26.75	347.46	-97.56	-434.40	-8,647.21	8,737.12	8,363.21	373.91	23.367	
6,500.00	6,393.80	6,407.77	6,209.51	26.76	347.68	-96.36	-434.41	-8,647.24	8,737.17	8,363.03	374.14	23.353	
6,550.00	6,443.29	6,456.06	6,257.79	26.95	353.87	-73.66	-434.52	-8,647.83	8,736.91	8,356.38	380.53	22.960	
6,600.00	6,492.24	6,503.86	6,305.58	27.16	359.99	-63.12	-434.63	-8,648.42	8,733.58	8,346.72	386.86	22.576	
6,650.00	6,540.33	6,550.86	6,352.59	27.38	366.01	-57.70	-434.75	-8,649.01	8,727.22	8,334.12	393.10	22.201	
6,700.00	6,587.28	6,596.79	6,398.51	27.60	371.90	-54.76	-434.86	-8,649.59	8,717.88	8,318.65	399.22	21.837	
6,750.00	6,632.80	6,641.36	6,443.08	27.84	377.61	-53.21	-434.97	-8,650.16	8,705.61	8,300.44	405.18	21.486	
6,800.00	6,676.60	6,684.30	6,486.01	28.09	383.11	-52.57	-435.07	-8,650.71	8,690.52	8,279.59	410.93	21.149	
6,850.00	6,718.42	6,725.34	6,527.05	28.34	388.36	-52.61	-435.18	-8,651.24	8,672.70	8,256.25	416.44	20.826	
6,900.00	6,758.00	6,764.23	6,565.93	28.60	393.35	-53.19	-435.27	-8,651.75	8,652.28	8,230.58	421.69	20.518	
6,950.00	6,795.09	6,800.73	6,602.43	28.87	398.02	-54.25	-435.37	-8,652.24	8,629.39	8,202.75	426.64	20.226	
7,000.00	6,829.46	6,834.62	6,636.31	29.14	402.36	-55.75	-435.45	-8,652.69	8,604.19	8,172.93	431.26	19.951	
7,050.00	6,860.91	6,865.68	6,667.38	29.43	406.34	-57.68	-435.53	-8,653.10	8,576.86	8,141.33	435.53	19.693	
7,100.00	6,889.24	6,893.73	6,695.42	29.73	409.93	-60.03	-435.60	-8,653.48	8,547.56	8,108.15	439.41	19.452	
7,150.00	6,914.27	6,918.59	6,720.28	30.05	413.12	-62.81	-435.67	-8,653.82	8,516.50	8,073.61	442.89	19.229	
7,200.00	6,935.85	6,940.11	6,741.80	30.37	415.88	-66.03	-435.73	-8,654.11	8,483.88	8,037.93	445.95	19.024	
7,250.00	6,953.84	6,958.16	6,759.85	30.71	418.19	-69.66	-435.77	-8,654.36	8,449.90	8,001.34	448.56	18.838	
7,300.00	6,968.15	6,972.62	6,774.30	31.06	420.04	-73.69	-435.81	-8,654.56	8,414.79	7,964.07	450.72	18.670	
7,350.00	6,978.67	6,983.40	6,785.09	31.42	421.42	-78.09	-435.84	-8,654.71	8,378.77	7,926.36	452.41	18.520	
7,400.00	6,985.34	6,990.44	6,792.12	31.79	422.32	-82.79	-435.86	-8,654.81	8,342.06	7,888.44	453.62	18.390	
7,450.00	6,988.13	6,993.69	6,795.37	32.17	422.74	-87.72	-435.87	-8,654.85	8,304.89	7,850.54	454.35	18.279	
7,461.13	6,988.22	6,993.89	6,795.58	32.26	422.77	-88.83	-435.87	-8,654.85	8,296.58	7,842.13	454.45	18.256	
7,500.00	6,988.19	6,994.28	6,795.97	32.56	422.82	-88.82	-435.87	-8,654.86	8,267.40	7,812.66	454.74	18.180	
7,600.00	6,988.12	6,995.30	6,796.99	33.37	422.95	-88.78	-435.87	-8,654.87	8,191.10	7,735.60	455.51	17.982	
7,700.00	6,988.05	6,996.35	6,798.04	34.21	423.08	-88.74	-435.87	-8,654.89	8,113.08	7,656.80	456.28	17.781	
7,800.00	6,987.98	6,997.43	6,799.11	35.09	423.22	-88.70	-435.88	-8,654.90	8,033.38	7,576.31	457.06	17.576	
7,900.00	6,987.91	6,998.53	6,800.21	35.99	423.36	-88.65	-435.88	-8,654.92	7,952.04	7,494.19	457.85	17.368	
8,000.00	6,987.83	6,999.66	6,801.34	36.93	423.50	-88.59	-435.88	-8,654.93	7,869.13	7,410.49	458.63	17.158	
8,100.00	6,987.76	7,000.81	6,802.49	37.88	423.65	-88.53	-435.89	-8,654.95	7,784.68	7,325.27	459.41	16.945	
8,200.00	6,987.68	7,001.98	6,803.66	38.86	423.80	-88.46	-435.89	-8,654.97	7,698.76	7,238.57	460.19	16.730	
8,300.00	6,987.61	7,003.17	6,804.85	39.86	423.95	-88.39	-435.89	-8,654.98	7,611.42	7,150.47	460.95	16.512	
8,400.00	6,987.53	7,004.38	6,806.06	40.87	424.11	-88.30	-435.90	-8,655.00	7,522.72	7,061.02	461.70	16.294	
8,500.00	6,987.46	7,005.60	6,807.29	41.90	424.27	-88.19	-435.90	-8,655.02	7,432.73	6,970.29	462.43	16.073	
8,600.00	6,987.38	7,006.85	6,808.53	42.93	424.42	-88.07	-435.90	-8,655.03	7,341.50	6,878.35	463.15	15.851	
8,700.00	6,987.31	7,008.11	6,809.79	43.98	424.59	-87.93	-435.91	-8,655.05	7,249.10	6,785.26	463.84	15.629	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5					Rule Assigned:			Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.23	7,009.38	6,811.06	45.03	424.75	-87.76	-435.91	-8,655.07	7,155.60	6,691.10	464.50	15.405		
8,872.16	6,987.18	7,010.30	6,811.98	45.79	424.87	-87.62	-435.91	-8,655.08	7,087.49	6,622.53	464.97	15.243		
8,900.00	6,987.16	7,010.66	6,812.34	46.08	424.91	-87.63	-435.91	-8,655.09	7,061.12	6,595.98	465.14	15.181		
9,000.00	6,987.09	7,011.94	6,813.63	47.16	425.08	-87.66	-435.92	-8,655.10	6,966.49	6,500.71	465.78	14.957		
9,100.00	6,987.01	7,013.23	6,814.91	48.27	425.24	-87.69	-435.92	-8,655.12	6,872.01	6,405.57	466.44	14.733		
9,200.00	6,986.94	7,014.52	6,816.20	49.40	425.41	-87.73	-435.92	-8,655.14	6,777.70	6,310.58	467.12	14.510		
9,300.00	6,986.86	7,015.80	6,817.49	50.56	425.57	-87.76	-435.93	-8,655.16	6,683.54	6,215.73	467.81	14.287		
9,400.00	6,986.79	7,017.09	6,818.77	51.75	425.74	-87.79	-435.93	-8,655.17	6,589.56	6,121.04	468.52	14.065		
9,500.00	6,986.71	7,018.38	6,820.06	52.95	425.90	-87.82	-435.93	-8,655.19	6,495.76	6,026.50	469.25	13.843		
9,600.00	6,986.64	7,019.67	6,821.35	54.18	426.07	-87.86	-435.94	-8,655.21	6,402.14	5,932.14	470.01	13.621		
9,700.00	6,986.56	7,020.96	6,822.64	55.42	426.23	-87.89	-435.94	-8,655.23	6,308.72	5,837.94	470.78	13.401		
9,800.00	6,986.49	7,022.25	6,823.93	56.69	426.40	-87.92	-435.94	-8,655.25	6,215.51	5,743.93	471.57	13.180		
9,900.00	6,986.41	7,023.54	6,825.22	57.97	426.56	-87.95	-435.95	-8,655.26	6,122.51	5,650.11	472.39	12.961		
10,000.00	6,986.34	7,024.84	6,826.52	59.26	426.73	-87.99	-435.95	-8,655.28	6,029.73	5,556.50	473.23	12.742		
10,100.00	6,986.27	7,026.13	6,827.81	60.57	426.89	-88.02	-435.95	-8,655.30	5,937.19	5,463.09	474.10	12.523		
10,200.00	6,986.19	7,027.42	6,829.10	61.90	427.06	-88.05	-435.96	-8,655.32	5,844.89	5,369.90	474.99	12.305		
10,300.00	6,986.12	7,028.72	6,830.40	63.23	427.23	-88.08	-435.96	-8,655.34	5,752.85	5,276.94	475.91	12.088		
10,400.00	6,986.04	7,030.01	6,831.69	64.58	427.39	-88.12	-435.96	-8,655.35	5,661.08	5,184.22	476.85	11.872		
10,500.00	6,985.97	7,031.31	6,832.99	65.94	427.56	-88.15	-435.97	-8,655.37	5,569.59	5,091.76	477.83	11.656		
10,600.00	6,985.89	7,032.61	6,834.29	67.32	427.72	-88.18	-435.97	-8,655.39	5,478.40	4,999.57	478.83	11.441		
10,700.00	6,985.82	7,033.90	6,835.58	68.70	427.89	-88.22	-435.97	-8,655.41	5,387.52	4,907.65	479.87	11.227		
10,800.00	6,985.74	7,035.20	6,836.88	70.09	428.06	-88.25	-435.98	-8,655.43	5,296.97	4,816.03	480.94	11.014		
10,900.00	6,985.67	7,036.50	6,838.18	71.49	428.22	-88.28	-435.98	-8,655.44	5,206.77	4,724.73	482.04	10.802		
11,000.00	6,985.59	7,037.80	6,839.48	72.90	428.39	-88.31	-435.98	-8,655.46	5,116.93	4,633.75	483.17	10.590		
11,100.00	6,985.52	7,039.10	6,840.78	74.31	428.56	-88.35	-435.99	-8,655.48	5,027.47	4,543.12	484.35	10.380		
11,200.00	6,985.45	7,040.40	6,842.08	75.74	428.72	-88.38	-435.99	-8,655.50	4,938.41	4,452.86	485.56	10.171		
11,300.00	6,985.37	7,041.70	6,843.38	77.17	428.89	-88.41	-435.99	-8,655.52	4,849.79	4,362.98	486.81	9.962		
11,400.00	6,985.30	7,043.01	6,844.68	78.61	429.06	-88.45	-436.00	-8,655.54	4,761.61	4,273.51	488.10	9.755		
11,500.00	6,985.22	7,044.31	6,845.99	80.05	429.22	-88.48	-436.00	-8,655.55	4,673.91	4,184.48	489.43	9.550		
11,600.00	6,985.15	7,045.61	6,847.29	81.50	429.39	-88.51	-436.01	-8,655.57	4,586.71	4,095.90	490.81	9.345		
11,700.00	6,985.07	7,046.92	6,848.60	82.96	429.56	-88.54	-436.01	-8,655.59	4,500.05	4,007.81	492.24	9.142		
11,800.00	6,985.00	7,048.22	6,849.90	84.42	429.72	-88.58	-436.01	-8,655.61	4,413.94	3,920.23	493.71	8.940		
11,900.00	6,984.92	7,049.53	6,851.21	85.89	429.89	-88.61	-436.02	-8,655.63	4,328.44	3,833.20	495.24	8.740		
12,000.00	6,984.85	7,050.84	6,852.51	87.36	430.06	-88.64	-436.02	-8,655.64	4,243.57	3,746.76	496.81	8.542		
12,100.00	6,984.77	7,052.14	6,853.82	88.83	430.23	-88.68	-436.02	-8,655.66	4,159.37	3,660.93	498.44	8.345		
12,200.00	6,984.70	7,053.45	6,855.13	90.31	430.39	-88.71	-436.03	-8,655.68	4,075.88	3,575.76	500.12	8.150		
12,300.00	6,984.63	7,054.76	6,856.44	91.80	430.56	-88.74	-436.03	-8,655.70	3,993.15	3,491.29	501.87	7.957		
12,400.00	6,984.55	7,056.07	6,857.75	93.29	430.73	-88.78	-436.03	-8,655.72	3,911.23	3,407.57	503.67	7.766		
12,500.00	6,984.48	7,057.38	6,859.06	94.78	430.90	-88.81	-436.04	-8,655.74	3,830.17	3,324.64	505.53	7.577		
12,600.00	6,984.40	7,058.69	6,860.37	96.28	431.07	-88.84	-436.04	-8,655.75	3,750.02	3,242.57	507.45	7.390		
12,700.00	6,984.33	7,060.00	6,861.68	97.78	431.23	-88.88	-436.04	-8,655.77	3,670.85	3,161.40	509.44	7.206		
12,800.00	6,984.25	7,061.32	6,862.99	99.28	431.40	-88.91	-436.05	-8,655.79	3,592.71	3,081.21	511.50	7.024		
12,900.00	6,984.18	7,062.63	6,864.31	100.78	431.57	-88.94	-436.05	-8,655.81	3,515.68	3,002.06	513.62	6.845		
13,000.00	6,984.10	7,063.94	6,865.62	102.29	431.74	-88.97	-436.05	-8,655.83	3,439.84	2,924.03	515.81	6.669		
13,100.00	6,984.03	7,065.26	6,866.93	103.80	431.91	-89.01	-436.06	-8,655.85	3,365.25	2,847.19	518.06	6.496		
13,200.00	6,983.95	7,066.57	6,868.25	105.32	432.08	-89.04	-436.06	-8,655.87	3,292.01	2,771.63	520.38	6.326		
13,300.00	6,983.88	7,067.89	6,869.57	106.84	432.24	-89.07	-436.07	-8,655.88	3,220.21	2,697.44	522.77	6.160		
13,400.00	6,983.81	7,069.21	6,870.88	108.36	432.41	-89.11	-436.07	-8,655.90	3,149.95	2,624.72	525.23	5.997		
13,500.00	6,983.73	7,070.53	6,872.20	109.88	432.58	-89.14	-436.07	-8,655.92	3,081.34	2,553.59	527.75	5.839		
13,600.00	6,983.66	7,071.84	6,873.52	111.40	432.75	-89.17	-436.08	-8,655.94	3,014.47	2,484.15	530.33	5.684		
13,700.00	6,983.58	7,073.16	6,874.84	112.93	432.92	-89.21	-436.08	-8,655.96	2,949.49	2,416.53	532.96	5.534		
13,800.00	6,983.51	7,074.48	6,876.16	114.46	433.09	-89.24	-436.08	-8,655.98	2,886.50	2,350.86	535.64	5.389		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
13,900.00	6,983.43	7,075.80	6,877.48	115.99	433.26	-89.27	-436.09	-8,655.99	2,825.65	2,287.28	538.37	5.249		
14,000.00	6,983.36	7,077.12	6,878.80	117.52	433.43	-89.31	-436.09	-8,656.01	2,767.08	2,225.94	541.13	5.113		
14,100.00	6,983.28	7,078.45	6,880.12	119.06	433.60	-89.34	-436.09	-8,656.03	2,710.93	2,167.01	543.92	4.984		
14,200.00	6,983.21	7,079.77	6,881.44	120.59	433.77	-89.37	-436.10	-8,656.05	2,657.35	2,110.63	546.72	4.861		
14,300.00	6,983.13	7,081.09	6,882.77	122.13	433.94	-89.41	-436.10	-8,656.07	2,606.52	2,057.00	549.51	4.743		
14,400.00	6,983.06	7,082.42	6,884.09	123.67	434.11	-89.44	-436.10	-8,656.09	2,558.58	2,006.29	552.29	4.633		
14,500.00	6,982.99	7,083.74	6,885.42	125.21	434.28	-89.48	-436.11	-8,656.11	2,513.70	1,958.67	555.03	4.529		
14,600.00	6,982.91	7,085.07	6,886.74	126.75	434.44	-89.51	-436.11	-8,656.12	2,472.06	1,914.34	557.72	4.432		
14,700.00	6,982.84	7,086.40	6,888.07	128.30	434.61	-89.54	-436.12	-8,656.14	2,433.82	1,873.49	560.33	4.344		
14,800.00	6,982.76	7,087.72	6,889.40	129.85	434.78	-89.58	-436.12	-8,656.16	2,399.14	1,836.30	562.83	4.263		
14,900.00	6,982.69	7,089.05	6,890.72	131.39	434.95	-89.61	-436.12	-8,656.18	2,368.17	1,802.95	565.22	4.190		
15,000.00	6,982.61	7,090.38	6,892.05	132.94	435.13	-89.64	-436.13	-8,656.20	2,341.07	1,773.62	567.45	4.126		
15,100.00	6,982.54	7,091.71	6,893.38	134.49	435.30	-89.68	-436.13	-8,656.22	2,317.97	1,748.45	569.52	4.070		
15,200.00	6,982.46	7,093.04	6,894.71	136.04	435.47	-89.71	-436.13	-8,656.24	2,298.99	1,727.60	571.39	4.024		
15,300.00	6,982.39	7,094.37	6,896.04	137.60	435.64	-89.74	-436.14	-8,656.26	2,284.23	1,711.19	573.04	3.986		
15,400.00	6,982.31	7,095.70	6,897.37	139.15	435.81	-89.78	-436.14	-8,656.27	2,273.78	1,699.31	574.47	3.958		
15,500.00	6,982.24	7,097.03	6,898.71	140.70	435.98	-89.81	-436.14	-8,656.29	2,267.69	1,692.04	575.65	3.939		
15,588.24	6,982.17	7,098.21	6,899.88	142.08	436.13	-89.84	-436.15	-8,656.31	2,265.98	1,689.50	576.48	3.931 CC		
15,600.00	6,982.17	7,098.37	6,900.04	142.26	436.15	-89.84	-436.15	-8,656.31	2,266.01	1,689.43	576.57	3.930 ES, SF		
15,700.00	6,982.09	7,099.70	6,901.37	143.82	436.32	-89.88	-436.15	-8,656.33	2,268.73	1,691.49	577.23	3.930		
15,800.00	6,982.02	7,101.04	6,902.71	145.38	436.49	-89.91	-436.15	-8,656.35	2,275.85	1,698.21	577.63	3.940		
15,900.00	6,981.94	7,102.37	6,904.04	146.94	436.66	-89.95	-436.16	-8,656.37	2,287.32	1,709.54	577.78	3.959		
16,000.00	6,981.87	7,103.71	6,905.38	148.50	436.83	-89.98	-436.16	-8,656.39	2,303.08	1,725.41	577.67	3.987		
16,100.00	6,981.79	7,105.05	6,906.72	150.06	437.00	-90.01	-436.17	-8,656.41	2,323.04	1,745.72	577.32	4.024		
16,200.00	6,981.72	7,106.38	6,908.05	151.62	437.18	-90.05	-436.17	-8,656.43	2,347.09	1,770.34	576.75	4.070		
16,300.00	6,981.64	7,107.72	6,909.39	153.18	437.35	-90.08	-436.17	-8,656.44	2,375.11	1,799.14	575.97	4.124		
16,400.00	6,981.57	7,109.06	6,910.73	154.74	437.52	-90.12	-436.18	-8,656.46	2,406.96	1,831.95	575.01	4.186		
16,500.00	6,981.49	7,110.40	6,912.07	156.31	437.69	-90.15	-436.18	-8,656.48	2,442.50	1,868.61	573.88	4.256		
16,600.00	6,981.42	7,111.74	6,913.41	157.87	437.86	-90.18	-436.18	-8,656.50	2,481.55	1,908.94	572.61	4.334		
16,700.00	6,981.35	7,113.08	6,914.75	159.44	438.03	-90.22	-436.19	-8,656.52	2,523.97	1,952.75	571.22	4.419		
16,800.00	6,981.27	7,114.43	6,916.10	161.01	438.21	-90.25	-436.19	-8,656.54	2,569.58	1,999.85	569.73	4.510		
16,900.00	6,981.20	7,115.77	6,917.44	162.58	438.38	-90.28	-436.19	-8,656.56	2,618.21	2,050.06	568.15	4.608		
17,000.00	6,981.12	7,117.11	6,918.78	164.14	438.55	-90.32	-436.20	-8,656.58	2,669.71	2,103.19	566.52	4.713		
17,100.00	6,981.05	7,118.46	6,920.13	165.71	438.72	-90.35	-436.20	-8,656.60	2,723.90	2,159.07	564.83	4.823		
17,200.00	6,980.97	7,119.80	6,921.47	167.28	438.89	-90.39	-436.21	-8,656.62	2,780.64	2,217.52	563.12	4.938		
17,300.00	6,980.90	7,121.15	6,922.82	168.85	439.07	-90.42	-436.21	-8,656.63	2,839.76	2,278.38	561.38	5.059		
17,400.00	6,980.82	7,122.50	6,924.16	170.42	439.24	-90.45	-436.21	-8,656.65	2,901.12	2,341.48	559.64	5.184		
17,500.00	6,980.75	7,123.84	6,925.51	172.00	439.41	-90.49	-436.22	-8,656.67	2,964.59	2,406.68	557.91	5.314		
17,600.00	6,980.67	7,125.19	6,926.86	173.57	439.58	-90.52	-436.22	-8,656.69	3,030.03	2,473.84	556.19	5.448		
17,700.00	6,980.60	7,126.54	6,928.21	175.14	439.76	-90.56	-436.22	-8,656.71	3,097.32	2,542.83	554.49	5.586		
17,800.00	6,980.53	7,127.89	6,929.56	176.71	439.93	-90.59	-436.23	-8,656.73	3,166.33	2,613.51	552.82	5.728		
17,900.00	6,980.45	7,129.24	6,930.91	178.29	440.10	-90.63	-436.23	-8,656.75	3,236.96	2,685.78	551.18	5.873		
18,000.00	6,980.38	7,130.59	6,932.26	179.86	440.28	-90.66	-436.24	-8,656.77	3,309.10	2,759.53	549.57	6.021		
18,100.00	6,980.30	7,131.94	6,933.61	181.44	440.45	-90.69	-436.24	-8,656.79	3,382.67	2,834.66	548.00	6.173		
18,200.00	6,980.23	7,133.30	6,934.97	183.01	440.62	-90.73	-436.24	-8,656.81	3,457.56	2,911.08	546.48	6.327		
18,300.00	6,980.15	7,134.65	6,936.32	184.59	440.80	-90.76	-436.25	-8,656.83	3,533.69	2,988.69	545.00	6.484		
18,400.00	6,980.08	7,136.00	6,937.67	186.16	440.97	-90.80	-436.25	-8,656.85	3,610.98	3,067.42	543.57	6.643		
18,500.00	6,980.00	7,137.36	6,939.03	187.74	441.14	-90.83	-436.25	-8,656.86	3,689.37	3,147.19	542.18	6.805		
18,600.00	6,979.93	7,138.72	6,940.38	189.32	441.32	-90.86	-436.26	-8,656.88	3,768.78	3,227.95	540.83	6.968		
18,700.00	6,979.85	7,140.07	6,941.74	190.90	441.49	-90.90	-436.26	-8,656.90	3,849.15	3,309.61	539.53	7.134		
18,800.00	6,979.78	7,141.43	6,943.10	192.48	441.66	-90.93	-436.26	-8,656.92	3,930.42	3,392.14	538.28	7.302		
18,900.00	6,979.71	7,142.79	6,944.46	194.05	441.84	-90.97	-436.27	-8,656.94	4,012.53	3,475.46	537.07	7.471		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #149C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		327-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
19,000.00	6,979.63	7,144.15	6,945.81	195.63	442.01	-91.00	-436.27	-8,656.96	4,095.44	3,559.53	535.91	7.642		
19,100.00	6,979.56	7,145.51	6,947.17	197.21	442.19	-91.04	-436.28	-8,656.98	4,179.10	3,644.31	534.79	7.814		
19,200.00	6,979.48	7,146.87	6,948.53	198.79	442.36	-91.07	-436.28	-8,657.00	4,263.46	3,729.75	533.71	7.988		
19,300.00	6,979.41	7,148.23	6,949.90	200.37	442.54	-91.11	-436.28	-8,657.02	4,348.48	3,815.81	532.68	8.163		
19,400.00	6,979.33	7,149.59	6,951.26	201.95	442.71	-91.14	-436.29	-8,657.04	4,434.13	3,902.45	531.68	8.340		
19,500.00	6,979.26	7,150.95	6,952.62	203.54	442.88	-91.17	-436.29	-8,657.06	4,520.37	3,989.64	530.72	8.517		
19,600.00	6,979.18	7,152.32	6,953.98	205.12	443.06	-91.21	-436.29	-8,657.08	4,607.16	4,077.35	529.81	8.696		
19,700.00	6,979.11	7,153.68	6,955.35	206.70	443.23	-91.24	-436.30	-8,657.10	4,694.48	4,165.55	528.93	8.875		
19,800.00	6,979.03	7,155.05	6,956.71	208.28	443.41	-91.28	-436.30	-8,657.12	4,782.29	4,254.21	528.08	9.056		
19,900.00	6,978.96	7,156.41	6,958.08	209.86	443.58	-91.31	-436.31	-8,657.14	4,870.58	4,343.31	527.27	9.237		
20,000.00	6,978.89	7,157.78	6,959.45	211.45	443.76	-91.35	-436.31	-8,657.16	4,959.31	4,432.81	526.50	9.419		
20,100.00	6,978.81	7,159.15	6,960.81	213.03	443.93	-91.38	-436.31	-8,657.18	5,048.46	4,522.70	525.75	9.602		
20,200.00	6,978.74	7,160.52	6,962.18	214.61	444.11	-91.42	-436.32	-8,657.19	5,138.01	4,612.96	525.04	9.786		
20,300.00	6,978.66	7,161.88	6,963.55	216.20	444.29	-91.45	-436.32	-8,657.21	5,227.93	4,703.57	524.36	9.970		
20,400.00	6,978.59	7,163.25	6,964.92	217.78	444.46	-91.48	-436.32	-8,657.23	5,318.22	4,794.51	523.71	10.155		
20,500.00	6,978.51	7,164.63	6,966.29	219.37	444.64	-91.52	-436.33	-8,657.25	5,408.85	4,885.76	523.08	10.340		
20,600.00	6,978.44	7,166.00	6,967.66	220.95	444.81	-91.55	-436.33	-8,657.27	5,499.80	4,977.31	522.49	10.526		
20,700.00	6,978.36	7,167.37	6,969.03	222.53	444.99	-91.59	-436.34	-8,657.29	5,591.06	5,069.15	521.92	10.713		
20,800.00	6,978.29	7,168.74	6,970.41	224.12	445.16	-91.62	-436.34	-8,657.31	5,682.62	5,161.25	521.37	10.899		
20,900.00	6,978.21	7,170.12	6,971.78	225.71	445.34	-91.66	-436.34	-8,657.33	5,774.45	5,253.60	520.85	11.087		
21,000.00	6,978.14	7,171.49	6,973.15	227.29	445.52	-91.69	-436.35	-8,657.35	5,866.55	5,346.20	520.35	11.274		
21,100.00	6,978.07	7,172.87	6,974.53	228.88	445.69	-91.73	-436.35	-8,657.37	5,958.91	5,439.03	519.88	11.462		
21,200.00	6,977.99	7,174.24	6,975.91	230.46	445.87	-91.76	-436.35	-8,657.39	6,051.51	5,532.08	519.43	11.650		
21,300.00	6,977.92	7,175.62	6,977.28	232.05	446.04	-91.80	-436.36	-8,657.41	6,144.34	5,625.34	519.00	11.839		
21,400.00	6,977.84	7,177.00	6,978.66	233.64	446.22	-91.83	-436.36	-8,657.43	6,237.39	5,718.81	518.59	12.028		
21,500.00	6,977.77	7,178.37	6,980.04	235.22	446.40	-91.87	-436.37	-8,657.45	6,330.65	5,812.46	518.19	12.217		
21,600.00	6,977.69	7,179.75	6,981.42	236.81	446.57	-91.90	-436.37	-8,657.47	6,424.12	5,906.30	517.82	12.406		
21,700.00	6,977.62	7,181.13	6,982.80	238.40	446.75	-91.94	-436.37	-8,657.49	6,517.78	6,000.31	517.47	12.596		
21,800.00	6,977.54	7,182.51	6,984.18	239.99	446.93	-91.97	-436.38	-8,657.51	6,611.62	6,094.49	517.13	12.785		
21,900.00	6,977.47	7,183.90	6,985.56	241.57	447.10	-92.01	-436.38	-8,657.53	6,705.65	6,188.83	516.81	12.975		
22,000.00	6,977.39	7,185.28	6,986.94	243.16	447.28	-92.04	-436.38	-8,657.55	6,799.84	6,283.33	516.51	13.165		
22,100.00	6,977.32	7,186.66	6,988.32	244.75	447.46	-92.08	-436.39	-8,657.57	6,894.20	6,377.97	516.22	13.355		
22,200.00	6,977.25	7,188.04	6,989.71	246.34	447.64	-92.11	-436.39	-8,657.59	6,988.71	6,472.76	515.95	13.545		
22,300.00	6,977.17	7,189.43	6,991.09	247.93	447.81	-92.15	-436.40	-8,657.61	7,083.37	6,567.68	515.70	13.736		
22,400.00	6,977.10	7,190.82	6,992.48	249.52	447.99	-92.18	-436.40	-8,657.63	7,178.18	6,662.73	515.45	13.926		
22,500.00	6,977.02	7,192.20	6,993.86	251.11	448.17	-92.22	-436.40	-8,657.65	7,273.13	6,757.90	515.23	14.116		
22,529.62	6,977.00	7,192.61	6,994.27	251.58	448.22	-92.23	-436.41	-8,657.65	7,301.27	6,786.11	515.16	14.173		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 497-MWD OWSG Rev5												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-75.04	2,253.45	-8,435.35	8,731.38				
100.00	100.00	38.00	38.00	0.25	1.20	-75.04	2,253.45	-8,435.35	8,731.16	8,729.71	1.45	6,002.218	
200.00	200.00	138.00	138.00	0.61	4.37	-75.04	2,253.45	-8,435.35	8,731.16	8,726.18	4.98	1,753.140	
300.00	300.00	238.00	238.00	0.97	7.54	-75.04	2,253.45	-8,435.35	8,731.16	8,722.66	8.51	1,026.478	
400.00	400.00	338.00	338.00	1.33	10.71	-75.04	2,253.45	-8,435.35	8,731.16	8,719.13	12.03	725.687	
500.00	500.00	438.00	438.00	1.68	13.87	-75.04	2,253.45	-8,435.35	8,731.16	8,715.61	15.56	561.228	
550.00	550.00	488.00	488.00	1.86	15.46	-75.04	2,253.45	-8,435.35	8,731.16	8,713.84	17.32	504.107	
600.00	600.00	497.00	497.00	2.04	15.74	-72.66	2,253.45	-8,435.35	8,731.13	8,713.35	17.78	490.954	
700.00	699.93	546.42	546.42	2.40	15.79	-72.67	2,253.98	-8,435.56	8,730.81	8,712.63	18.17	480.381	
800.00	799.68	578.55	578.54	2.77	15.80	-72.69	2,254.66	-8,435.90	8,730.21	8,711.67	18.54	470.849	
900.00	899.13	623.07	623.04	3.13	15.82	-72.74	2,255.64	-8,436.63	8,729.24	8,710.33	18.91	461.553	
1,000.00	998.15	639.03	638.99	3.49	15.82	-72.77	2,256.00	-8,436.96	8,727.98	8,708.70	19.28	452.719	
1,100.00	1,096.63	670.04	669.98	3.87	15.83	-72.83	2,256.74	-8,438.00	8,726.64	8,706.98	19.66	443.890	
1,130.50	1,126.54	670.04	669.98	3.99	15.83	-72.84	2,256.74	-8,438.00	8,726.19	8,706.42	19.77	441.288	
1,200.00	1,194.61	700.74	700.64	4.26	15.84	-72.87	2,257.43	-8,439.34	8,725.35	8,705.30	20.05	435.159	
1,286.84	1,279.68	700.74	700.64	4.61	15.84	-72.87	2,257.43	-8,439.34	8,724.92	8,704.53	20.39	427.983	
1,300.00	1,292.57	700.74	700.64	4.66	15.84	-72.87	2,257.43	-8,439.34	8,724.93	8,704.49	20.44	426.918	
1,400.00	1,390.52	731.10	730.94	5.07	15.85	-72.91	2,258.24	-8,441.03	8,725.36	8,704.52	20.84	418.630	
1,500.00	1,488.48	778.78	778.51	5.48	15.87	-72.97	2,258.99	-8,444.20	8,726.47	8,705.21	21.27	410.334	
1,600.00	1,586.43	793.71	793.39	5.90	15.87	-72.99	2,259.16	-8,445.40	8,728.55	8,706.88	21.67	402.782	
1,700.00	1,684.38	808.05	807.67	6.31	15.88	-73.01	2,259.32	-8,446.69	8,731.61	8,709.53	22.08	395.538	
1,800.00	1,782.34	837.57	837.03	6.73	15.89	-73.05	2,259.53	-8,449.64	8,735.59	8,713.10	22.49	388.429	
1,900.00	1,880.29	887.61	886.80	7.15	15.91	-73.12	2,259.91	-8,454.85	8,740.17	8,717.26	22.92	381.416	
2,000.00	1,978.25	887.61	886.80	7.58	15.91	-73.12	2,259.91	-8,454.85	8,745.67	8,722.36	23.31	375.211	
2,100.00	2,076.20	918.16	917.14	8.00	15.92	-73.16	2,260.42	-8,458.46	8,752.04	8,728.32	23.72	368.901	
2,200.00	2,174.15	940.11	938.90	8.43	15.93	-73.19	2,260.77	-8,461.30	8,759.34	8,735.21	24.13	362.963	
2,300.00	2,272.11	1,001.41	999.61	8.85	15.97	-73.28	2,261.59	-8,469.72	8,767.37	8,742.79	24.58	356.696	
2,400.00	2,370.06	1,011.83	1,009.93	9.28	15.97	-73.29	2,261.74	-8,471.16	8,776.03	8,751.06	24.98	351.359	
2,500.00	2,468.02	1,043.02	1,040.75	9.71	16.00	-73.34	2,262.04	-8,475.92	8,785.62	8,760.22	25.40	345.872	
2,600.00	2,565.97	1,043.02	1,040.75	10.14	16.00	-73.34	2,262.04	-8,475.92	8,796.19	8,770.40	25.78	341.143	
2,700.00	2,663.92	1,043.02	1,040.75	10.57	16.00	-73.34	2,262.04	-8,475.92	8,807.88	8,781.71	26.16	336.638	
2,800.00	2,761.88	1,074.75	1,071.93	11.00	16.03	-73.38	2,262.44	-8,481.79	8,820.59	8,794.00	26.59	331.695	
2,900.00	2,859.83	1,074.75	1,071.93	11.43	16.03	-73.38	2,262.44	-8,481.79	8,834.17	8,807.20	26.97	327.601	
3,000.00	2,957.79	1,089.73	1,086.60	11.86	16.05	-73.40	2,262.71	-8,484.82	8,848.79	8,821.43	27.36	323.440	
3,100.00	3,055.74	1,105.75	1,102.26	12.29	16.06	-73.43	2,263.01	-8,488.16	8,864.31	8,836.56	27.75	319.445	
3,200.00	3,153.69	1,120.08	1,116.24	12.72	16.07	-73.45	2,263.33	-8,491.27	8,880.76	8,852.63	28.13	315.652	
3,300.00	3,251.65	1,136.35	1,132.08	13.15	16.09	-73.47	2,263.83	-8,494.97	8,898.19	8,869.67	28.52	311.996	
3,400.00	3,349.60	1,168.18	1,163.01	13.59	16.12	-73.52	2,264.79	-8,502.41	8,916.43	8,887.51	28.93	308.231	
3,500.00	3,447.56	1,183.70	1,178.07	14.02	16.13	-73.54	2,265.20	-8,506.15	8,935.47	8,906.16	29.31	304.889	
3,600.00	3,545.51	1,199.00	1,192.87	14.45	16.15	-73.56	2,265.67	-8,510.00	8,955.45	8,925.77	29.68	301.700	
3,700.00	3,643.46	1,230.05	1,222.84	14.88	16.18	-73.61	2,266.38	-8,518.11	8,976.28	8,946.20	30.09	298.348	
3,800.00	3,741.42	1,261.54	1,253.19	15.32	16.21	-73.66	2,266.87	-8,526.48	8,997.74	8,967.25	30.49	295.129	
3,900.00	3,839.37	1,275.95	1,267.05	15.75	16.22	-73.68	2,267.07	-8,530.43	9,020.04	8,989.19	30.86	292.321	
4,000.00	3,937.33	1,292.54	1,282.93	16.18	16.24	-73.70	2,267.22	-8,535.22	9,043.33	9,012.10	31.23	289.599	
4,100.00	4,035.28	1,292.54	1,282.93	16.62	16.24	-73.70	2,267.22	-8,535.22	9,067.51	9,035.95	31.56	287.321	
4,200.00	4,133.23	1,323.84	1,312.75	17.05	16.28	-73.76	2,267.45	-8,544.74	9,092.58	9,060.62	31.96	284.504	
4,300.00	4,231.19	1,342.16	1,330.15	17.48	16.31	-73.79	2,267.56	-8,550.47	9,118.45	9,086.13	32.32	282.087	
4,400.00	4,329.14	1,373.48	1,359.83	17.92	16.34	-73.84	2,267.61	-8,560.47	9,145.05	9,112.34	32.72	279.514	
4,500.00	4,427.10	1,385.50	1,371.20	18.35	16.36	-73.86	2,267.67	-8,564.35	9,172.41	9,139.34	33.06	277.422	
4,600.00	4,525.05	1,414.27	1,398.31	18.78	16.39	-73.91	2,267.95	-8,573.97	9,200.65	9,167.20	33.45	275.072	
4,700.00	4,623.00	1,414.27	1,398.31	19.22	16.39	-73.91	2,267.95	-8,573.97	9,229.69	9,195.94	33.76	273.412	
4,800.00	4,720.96	1,443.67	1,425.89	19.65	16.43	-73.95	2,268.22	-8,584.17	9,259.51	9,225.37	34.14	271.218	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 497-MWD OWSG Rev5								Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
4,900.00	4,818.91	1,443.67	1,425.89	20.09	16.43	-73.95	2,268.22	-8,584.17	9,290.23	9,255.79	34.44	269.737	
5,000.00	4,916.87	1,475.04	1,455.07	20.52	16.48	-74.01	2,268.59	-8,595.66	9,321.84	9,287.01	34.83	267.630	
5,100.00	5,014.82	1,475.04	1,455.07	20.96	16.48	-74.01	2,268.59	-8,595.66	9,354.18	9,319.06	35.12	266.314	
5,200.00	5,112.77	1,475.04	1,455.07	21.39	16.48	-74.01	2,268.59	-8,595.66	9,387.49	9,352.07	35.41	265.081	
5,300.00	5,210.73	1,488.94	1,467.89	21.82	16.51	-74.03	2,268.87	-8,601.05	9,421.66	9,385.91	35.74	263.584	
5,400.00	5,308.68	1,505.65	1,483.22	22.26	16.54	-74.05	2,269.33	-8,607.67	9,456.65	9,420.57	36.08	262.091	
5,493.23	5,400.00	1,518.12	1,494.62	22.66	16.56	-74.07	2,269.65	-8,612.70	9,489.97	9,453.59	36.38	260.854	
5,500.00	5,406.64	1,519.52	1,495.90	22.69	16.56	-74.09	2,269.68	-8,613.27	9,492.41	9,456.01	36.40	260.755	
5,600.00	5,504.69	1,537.35	1,512.16	23.12	16.59	-74.31	2,269.90	-8,620.59	9,529.04	9,492.30	36.73	259.416	
5,700.00	5,602.91	1,567.98	1,539.96	23.55	16.64	-74.56	2,269.75	-8,633.44	9,566.55	9,529.45	37.10	257.884	
5,800.00	5,701.29	1,583.46	1,553.96	23.97	16.66	-74.78	2,269.54	-8,640.05	9,604.97	9,567.57	37.40	256.797	
5,900.00	5,799.82	1,598.26	1,567.29	24.39	16.69	-75.01	2,269.40	-8,646.47	9,644.35	9,606.65	37.70	255.823	
6,000.00	5,898.50	1,616.04	1,583.26	24.79	16.72	-75.26	2,269.32	-8,654.29	9,684.66	9,646.66	38.00	254.862	
6,100.00	5,997.31	1,629.61	1,595.41	25.20	16.74	-75.49	2,269.33	-8,660.33	9,725.87	9,687.59	38.28	254.091	
6,200.00	6,096.26	1,660.93	1,623.35	25.60	16.80	-75.76	2,269.29	-8,674.48	9,767.91	9,729.30	38.61	252.969	
6,300.00	6,195.33	1,688.20	1,647.59	25.99	16.85	-76.03	2,269.16	-8,686.97	9,810.75	9,771.81	38.93	251.984	
6,400.00	6,294.51	1,722.18	1,677.68	26.37	16.92	-76.31	2,269.10	-8,702.76	9,854.38	9,815.10	39.28	250.899	
6,498.19	6,392.00	1,738.08	1,691.72	26.75	16.96	-76.57	2,269.10	-8,710.23	9,897.95	9,858.41	39.53	250.364	
6,500.00	6,393.80	1,738.50	1,692.09	26.76	16.96	-75.34	2,269.10	-8,710.43	9,898.76	9,859.22	39.54	250.351	
6,550.00	6,443.29	1,752.80	1,704.68	26.95	16.99	-52.00	2,269.11	-8,717.20	9,919.41	9,879.71	39.70	249.884	
6,600.00	6,492.24	1,752.80	1,704.68	27.16	16.99	-40.75	2,269.11	-8,717.20	9,936.76	9,896.96	39.80	249.661	
6,650.00	6,540.33	1,752.80	1,704.68	27.38	16.99	-34.53	2,269.11	-8,717.20	9,950.75	9,910.84	39.91	249.309	
6,700.00	6,587.28	1,752.80	1,704.68	27.60	16.99	-30.69	2,269.11	-8,717.20	9,961.32	9,921.29	40.03	248.832	
6,750.00	6,632.80	1,784.13	1,732.06	27.84	17.06	-28.19	2,269.53	-8,732.43	9,968.33	9,928.04	40.29	247.412	
6,800.00	6,676.60	1,784.13	1,732.06	28.09	17.06	-26.42	2,269.53	-8,732.43	9,971.76	9,931.34	40.42	246.705	
6,850.00	6,718.42	1,784.13	1,732.06	28.34	17.06	-25.18	2,269.53	-8,732.43	9,971.65	9,931.10	40.55	245.896	
6,900.00	6,758.00	1,815.08	1,758.94	28.60	17.14	-24.38	2,270.21	-8,747.75	9,967.93	9,927.11	40.82	244.175	
6,950.00	6,795.09	1,832.28	1,773.87	28.87	17.19	-23.87	2,270.45	-8,756.29	9,960.57	9,919.54	41.04	242.727	
7,000.00	6,829.46	1,846.38	1,786.06	29.14	17.23	-23.59	2,270.58	-8,763.37	9,949.71	9,908.48	41.24	241.278	
7,050.00	6,860.91	1,846.38	1,786.06	29.43	17.23	-23.51	2,270.58	-8,763.37	9,935.39	9,894.01	41.38	240.116	
7,100.00	6,889.24	1,846.38	1,786.06	29.73	17.23	-23.62	2,270.58	-8,763.37	9,917.73	9,876.21	41.52	238.884	
7,150.00	6,914.27	1,846.38	1,786.06	30.05	17.23	-23.94	2,270.58	-8,763.37	9,896.82	9,855.16	41.66	237.586	
7,200.00	6,935.85	1,877.09	1,812.41	30.37	17.33	-24.56	2,271.18	-8,779.12	9,872.71	9,830.77	41.94	235.420	
7,250.00	6,953.84	1,877.09	1,812.41	30.71	17.33	-25.32	2,271.18	-8,779.12	9,845.53	9,803.45	42.07	234.012	
7,300.00	6,968.15	1,877.09	1,812.41	31.06	17.33	-26.34	2,271.18	-8,779.12	9,815.48	9,773.27	42.21	232.560	
7,350.00	6,978.67	1,908.06	1,838.86	31.42	17.45	-27.79	2,271.68	-8,795.22	9,782.68	9,740.19	42.48	230.267	
7,400.00	6,985.34	1,909.21	1,839.85	31.79	17.45	-29.50	2,271.70	-8,795.82	9,747.30	9,704.68	42.62	228.716	
7,450.00	6,988.13	1,909.21	1,839.85	32.17	17.45	-31.65	2,271.70	-8,795.82	9,709.59	9,666.85	42.74	227.169	
7,461.13	6,988.22	1,909.21	1,839.85	32.26	17.45	-32.20	2,271.70	-8,795.82	9,700.90	9,658.13	42.77	226.808	
7,500.00	6,988.19	1,909.21	1,839.85	32.56	17.45	-31.36	2,271.70	-8,795.82	9,670.32	9,627.46	42.86	225.620	
7,600.00	6,988.12	1,924.84	1,853.16	33.37	17.52	-29.21	2,271.82	-8,804.01	9,591.01	9,547.85	43.16	222.214	
7,700.00	6,988.05	1,938.67	1,864.84	34.21	17.58	-26.95	2,272.12	-8,811.40	9,511.13	9,467.69	43.44	218.932	
7,800.00	6,987.98	1,938.67	1,864.84	35.09	17.58	-24.50	2,272.12	-8,811.40	9,430.59	9,386.94	43.64	216.079	
7,900.00	6,987.91	1,938.67	1,864.84	35.99	17.58	-21.96	2,272.12	-8,811.40	9,349.56	9,305.73	43.83	213.313	
8,000.00	6,987.83	1,938.67	1,864.84	36.93	17.58	-19.34	2,272.12	-8,811.40	9,268.13	9,224.13	44.00	210.639	
8,100.00	6,987.76	1,955.03	1,878.56	37.88	17.65	-16.71	2,272.54	-8,820.30	9,186.29	9,142.05	44.24	207.646	
8,200.00	6,987.68	1,970.00	1,891.02	38.86	17.72	-13.99	2,272.87	-8,828.59	9,104.24	9,059.78	44.45	204.798	
8,300.00	6,987.61	1,970.00	1,891.02	39.86	17.72	-11.17	2,272.87	-8,828.59	9,021.98	8,977.41	44.57	202.428	
8,400.00	6,987.53	1,990.12	1,907.69	40.87	17.81	-8.36	2,273.25	-8,839.85	8,939.63	8,894.86	44.77	199.680	
8,500.00	6,987.46	2,001.36	1,916.99	41.90	17.86	-5.50	2,273.43	-8,846.17	8,857.24	8,812.33	44.90	197.254	
8,600.00	6,987.38	2,015.62	1,928.74	42.93	17.94	-2.63	2,273.65	-8,854.25	8,774.94	8,729.90	45.03	194.865	
8,700.00	6,987.31	2,031.12	1,941.44	43.98	18.01	0.24	2,273.91	-8,863.13	8,692.86	8,647.72	45.14	192.555	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 497-MWD OWSG Rev5												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,800.00	6,987.23	2,031.12	1,941.44	45.03	18.01	3.07	2,273.91	-8,863.13	8,611.10	8,565.95	45.15	190.704	
8,872.16	6,987.18	2,466.37	2,301.36	45.79	20.76	5.54	2,279.66	-9,107.59	8,552.26	8,504.63	47.62	179.580	
8,900.00	6,987.16	2,478.69	2,311.73	46.08	20.85	5.55	2,280.17	-9,114.21	8,528.84	8,481.15	47.69	178.836	
9,000.00	6,987.09	2,555.27	2,376.21	47.16	21.39	5.66	2,282.65	-9,155.45	8,444.77	8,396.63	48.13	175.454	
9,100.00	6,987.01	2,555.27	2,376.21	48.27	21.39	5.66	2,282.65	-9,155.45	8,360.82	8,312.69	48.13	173.722	
9,200.00	6,986.94	2,646.62	2,452.82	49.40	22.07	5.78	2,284.59	-9,205.18	8,277.18	8,228.50	48.68	170.019	
9,300.00	6,986.86	2,677.99	2,479.18	50.56	22.31	5.82	2,285.20	-9,222.16	8,193.26	8,144.38	48.88	167.609	
9,400.00	6,986.79	2,677.99	2,479.18	51.75	22.31	5.82	2,285.20	-9,222.16	8,109.58	8,060.68	48.90	165.823	
9,500.00	6,986.71	2,691.69	2,490.63	52.95	22.42	5.84	2,285.60	-9,229.67	8,026.21	7,977.19	49.02	163.739	
9,600.00	6,986.64	2,709.35	2,505.30	54.18	22.56	5.87	2,286.31	-9,239.49	7,943.20	7,894.03	49.16	161.564	
9,700.00	6,986.56	3,346.41	3,047.17	55.42	27.74	7.28	2,329.26	-9,570.54	7,857.25	7,804.31	52.94	148.416	
9,800.00	6,986.49	3,443.96	3,131.69	56.69	28.55	7.66	2,343.79	-9,616.89	7,770.09	7,716.57	53.52	145.181	
9,900.00	6,986.41	3,458.77	3,144.54	57.97	28.67	7.71	2,345.47	-9,624.05	7,683.17	7,629.52	53.65	143.215	
10,000.00	6,986.34	3,458.77	3,144.54	59.26	28.67	7.71	2,345.47	-9,624.05	7,596.49	7,542.79	53.70	141.456	
10,100.00	6,986.27	3,458.77	3,144.54	60.57	28.67	7.71	2,345.47	-9,624.05	7,510.14	7,456.37	53.77	139.681	
10,200.00	6,986.19	3,472.86	3,156.72	61.90	28.80	7.75	2,346.72	-9,631.04	7,424.03	7,370.11	53.92	137.685	
10,300.00	6,986.12	3,489.30	3,170.81	63.23	28.94	7.80	2,348.12	-9,639.39	7,338.31	7,284.21	54.10	135.651	
10,400.00	6,986.04	3,489.30	3,170.81	64.58	28.94	7.80	2,348.12	-9,639.39	7,252.81	7,198.61	54.19	133.837	
10,500.00	6,985.97	3,510.69	3,189.06	65.94	29.13	7.86	2,349.88	-9,650.40	7,167.64	7,113.22	54.42	131.718	
10,600.00	6,985.89	3,613.97	3,277.42	67.32	30.02	8.14	2,355.94	-9,703.51	7,082.31	7,027.21	55.10	128.532	
10,700.00	6,985.82	3,645.58	3,304.47	68.70	30.30	8.22	2,356.96	-9,719.83	6,996.98	6,941.58	55.40	126.300	
10,800.00	6,985.74	3,645.58	3,304.47	70.09	30.30	8.22	2,356.96	-9,719.83	6,911.88	6,856.35	55.53	124.463	
10,900.00	6,985.67	3,662.44	3,318.81	71.49	30.45	8.26	2,357.49	-9,728.68	6,827.11	6,771.34	55.77	122.408	
11,000.00	6,985.59	3,675.71	3,330.06	72.90	30.57	8.29	2,357.87	-9,735.71	6,742.65	6,686.64	56.00	120.394	
11,100.00	6,985.52	3,690.53	3,342.57	74.31	30.70	8.32	2,358.22	-9,743.64	6,658.51	6,602.25	56.26	118.356	
11,200.00	6,985.45	3,706.80	3,356.25	75.74	30.85	8.36	2,358.51	-9,752.44	6,574.69	6,518.16	56.53	116.301	
11,300.00	6,985.37	3,750.28	3,392.75	77.17	31.26	8.44	2,358.81	-9,776.06	6,491.01	6,434.05	56.96	113.957	
11,400.00	6,985.30	3,769.67	3,408.96	78.61	31.44	8.48	2,358.85	-9,786.71	6,407.61	6,350.34	57.27	111.876	
11,500.00	6,985.22	3,782.70	3,419.81	80.05	31.57	8.51	2,358.84	-9,793.92	6,324.55	6,266.98	57.57	109.858	
11,600.00	6,985.15	4,013.00	3,613.18	81.50	33.78	8.93	2,355.24	-9,918.91	6,240.17	6,181.19	58.98	105.800	
11,700.00	6,985.07	4,013.00	3,613.18	82.96	33.78	8.93	2,355.24	-9,918.91	6,156.00	6,096.78	59.22	103.951	
11,800.00	6,985.00	4,049.69	3,644.06	84.42	34.14	9.00	2,354.93	-9,938.73	6,072.08	6,012.43	59.66	101.780	
11,900.00	6,984.92	4,076.27	3,666.35	85.89	34.40	9.06	2,354.62	-9,953.21	5,988.44	5,928.38	60.06	99.711	
12,000.00	6,984.85	4,197.36	3,767.93	87.36	35.59	9.31	2,352.84	-10,019.09	5,904.86	5,843.95	60.91	96.939	
12,100.00	6,984.77	4,243.57	3,806.90	88.83	36.04	9.42	2,352.79	-10,043.90	5,820.78	5,759.37	61.41	94.780	
12,200.00	6,984.70	4,267.00	3,826.67	90.31	36.27	9.48	2,353.00	-10,056.49	5,736.83	5,675.01	61.82	92.796	
12,300.00	6,984.63	4,267.00	3,826.67	91.80	36.27	9.48	2,353.00	-10,056.49	5,653.35	5,591.21	62.15	90.969	
12,400.00	6,984.55	4,267.00	3,826.67	93.29	36.27	9.48	2,353.00	-10,056.49	5,570.42	5,507.92	62.49	89.139	
12,500.00	6,984.48	4,323.37	3,873.86	94.78	36.90	9.64	2,354.21	-10,087.29	5,487.09	5,423.95	63.13	86.914	
12,600.00	6,984.40	4,340.23	3,887.84	96.28	37.09	9.70	2,354.78	-10,096.70	5,404.64	5,341.05	63.59	84.987	
12,700.00	6,984.33	4,395.00	3,932.79	97.78	37.70	9.88	2,357.24	-10,127.90	5,323.05	5,258.81	64.24	82.859	
12,800.00	6,984.25	4,395.00	3,932.79	99.28	37.70	9.88	2,357.24	-10,127.90	5,241.16	5,176.50	64.66	81.053	
12,900.00	6,984.18	4,395.00	3,932.79	100.78	37.70	9.88	2,357.24	-10,127.90	5,159.91	5,094.80	65.11	79.250	
13,000.00	6,984.10	4,444.87	3,973.38	102.29	38.24	10.07	2,360.02	-10,156.72	5,079.07	5,013.34	65.73	77.272	
13,100.00	6,984.03	4,482.88	4,004.30	103.80	38.66	10.22	2,362.90	-10,178.64	4,998.36	4,932.03	66.32	75.366	
13,200.00	6,983.95	4,565.85	4,071.69	105.32	39.56	10.64	2,372.20	-10,226.15	4,917.80	4,850.77	67.03	73.368	
13,300.00	6,983.88	4,604.00	4,102.74	106.84	39.97	10.84	2,376.92	-10,247.79	4,837.06	4,769.41	67.64	71.510	
13,400.00	6,983.81	4,604.00	4,102.74	108.36	39.97	10.84	2,376.92	-10,247.79	4,756.89	4,688.69	68.20	69.752	
13,500.00	6,983.73	4,604.00	4,102.74	109.88	39.97	10.84	2,376.92	-10,247.79	4,677.49	4,608.70	68.78	68.002	
13,600.00	6,983.66	4,604.00	4,102.74	111.40	39.97	10.84	2,376.92	-10,247.79	4,598.89	4,529.49	69.40	66.264	
13,700.00	6,983.58	4,604.00	4,102.74	112.93	39.97	10.84	2,376.92	-10,247.79	4,521.14	4,451.09	70.05	64.539	
13,800.00	6,983.51	4,604.00	4,102.74	114.46	39.97	10.84	2,376.92	-10,247.79	4,444.28	4,373.54	70.74	62.829	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		497-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,900.00	6,983.43	4,604.00	4,102.74	115.99	39.97	10.84	2,376.92	-10,247.79	4,368.35	4,296.90	71.45	61.136		
14,000.00	6,983.36	4,604.00	4,102.74	117.52	39.97	10.84	2,376.92	-10,247.79	4,293.41	4,221.21	72.20	59.462		
14,100.00	6,983.28	4,604.00	4,102.74	119.06	39.97	10.84	2,376.92	-10,247.79	4,219.51	4,146.52	72.99	57.809		
14,200.00	6,983.21	4,604.00	4,102.74	120.59	39.97	10.84	2,376.92	-10,247.79	4,146.71	4,072.90	73.81	56.180		
14,300.00	6,983.13	4,604.00	4,102.74	122.13	39.97	10.84	2,376.92	-10,247.79	4,075.05	4,000.39	74.67	54.577		
14,400.00	6,983.06	4,604.00	4,102.74	123.67	39.97	10.84	2,376.92	-10,247.79	4,004.62	3,929.06	75.56	53.001		
14,500.00	6,982.99	4,604.00	4,102.74	125.21	39.97	10.84	2,376.92	-10,247.79	3,935.46	3,858.98	76.48	51.456		
14,600.00	6,982.91	4,604.00	4,102.74	126.75	39.97	10.84	2,376.92	-10,247.79	3,867.66	3,790.21	77.44	49.943		
14,700.00	6,982.84	4,604.00	4,102.74	128.30	39.97	10.84	2,376.92	-10,247.79	3,801.27	3,722.84	78.43	48.465		
14,800.00	6,982.76	4,604.00	4,102.74	129.85	39.97	10.84	2,376.92	-10,247.79	3,736.38	3,656.92	79.46	47.024		
14,900.00	6,982.69	4,604.00	4,102.74	131.39	39.97	10.84	2,376.92	-10,247.79	3,673.07	3,592.56	80.51	45.621		
15,000.00	6,982.61	4,604.00	4,102.74	132.94	39.97	10.84	2,376.92	-10,247.79	3,611.42	3,529.82	81.60	44.260		
15,100.00	6,982.54	4,604.00	4,102.74	134.49	39.97	10.84	2,376.92	-10,247.79	3,551.51	3,468.81	82.71	42.941		
15,200.00	6,982.46	4,604.00	4,102.74	136.04	39.97	10.84	2,376.92	-10,247.79	3,493.44	3,409.60	83.84	41.667		
15,300.00	6,982.39	4,604.00	4,102.74	137.60	39.97	10.84	2,376.92	-10,247.79	3,437.30	3,352.30	85.00	40.440		
15,400.00	6,982.31	4,604.00	4,102.74	139.15	39.97	10.84	2,376.92	-10,247.79	3,383.18	3,297.01	86.17	39.262		
15,500.00	6,982.24	4,604.00	4,102.74	140.70	39.97	10.84	2,376.92	-10,247.79	3,331.19	3,243.83	87.36	38.133		
15,600.00	6,982.17	4,604.00	4,102.74	142.26	39.97	10.84	2,376.92	-10,247.79	3,281.42	3,192.87	88.55	37.056		
15,700.00	6,982.09	4,604.00	4,102.74	143.82	39.97	10.84	2,376.92	-10,247.79	3,233.98	3,144.22	89.76	36.031		
15,800.00	6,982.02	4,604.00	4,102.74	145.38	39.97	10.84	2,376.92	-10,247.79	3,188.97	3,098.01	90.96	35.061		
15,900.00	6,981.94	4,604.00	4,102.74	146.94	39.97	10.84	2,376.92	-10,247.79	3,146.49	3,054.34	92.15	34.145		
16,000.00	6,981.87	4,604.00	4,102.74	148.50	39.97	10.84	2,376.92	-10,247.79	3,106.65	3,013.32	93.33	33.286		
16,100.00	6,981.79	4,604.00	4,102.74	150.06	39.97	10.84	2,376.92	-10,247.79	3,069.56	2,975.07	94.49	32.484		
16,200.00	6,981.72	4,604.00	4,102.74	151.62	39.97	10.84	2,376.92	-10,247.79	3,035.31	2,939.68	95.63	31.740		
16,300.00	6,981.64	4,604.00	4,102.74	153.18	39.97	10.84	2,376.92	-10,247.79	3,004.00	2,907.26	96.74	31.053		
16,400.00	6,981.57	4,604.00	4,102.74	154.74	39.97	10.84	2,376.92	-10,247.79	2,975.72	2,877.91	97.81	30.425		
16,500.00	6,981.49	4,604.00	4,102.74	156.31	39.97	10.84	2,376.92	-10,247.79	2,950.56	2,851.73	98.83	29.855		
16,600.00	6,981.42	4,604.00	4,102.74	157.87	39.97	10.84	2,376.92	-10,247.79	2,928.60	2,828.79	99.80	29.344		
16,700.00	6,981.35	4,604.00	4,102.74	159.44	39.97	10.84	2,376.92	-10,247.79	2,909.91	2,809.19	100.72	28.891		
16,800.00	6,981.27	4,604.00	4,102.74	161.01	39.97	10.84	2,376.92	-10,247.79	2,894.56	2,792.98	101.58	28.495		
16,900.00	6,981.20	4,604.00	4,102.74	162.58	39.97	10.84	2,376.92	-10,247.79	2,882.60	2,780.22	102.37	28.157		
17,000.00	6,981.12	4,604.00	4,102.74	164.14	39.97	10.84	2,376.92	-10,247.79	2,874.07	2,770.96	103.10	27.876		
17,100.00	6,981.05	4,604.00	4,102.74	165.71	39.97	10.84	2,376.92	-10,247.79	2,869.00	2,765.24	103.76	27.650		
17,195.52	6,980.98	4,604.00	4,102.74	167.21	39.97	10.84	2,376.92	-10,247.79	2,867.41	2,763.08	104.33	27.484	CC	
17,200.00	6,980.97	4,604.00	4,102.74	167.28	39.97	10.84	2,376.92	-10,247.79	2,867.41	2,763.06	104.36	27.477	ES	
17,300.00	6,980.90	4,604.00	4,102.74	168.85	39.97	10.84	2,376.92	-10,247.79	2,869.31	2,764.43	104.88	27.358		
17,400.00	6,980.82	4,604.00	4,102.74	170.42	39.97	10.84	2,376.92	-10,247.79	2,874.69	2,769.35	105.34	27.289		
17,500.00	6,980.75	4,604.00	4,102.74	172.00	39.97	10.84	2,376.92	-10,247.79	2,883.53	2,777.79	105.74	27.270	SF	
17,600.00	6,980.67	4,604.00	4,102.74	173.57	39.97	10.84	2,376.92	-10,247.79	2,895.80	2,789.72	106.08	27.298		
17,700.00	6,980.60	4,604.00	4,102.74	175.14	39.97	10.84	2,376.92	-10,247.79	2,911.45	2,805.08	106.37	27.372		
17,800.00	6,980.53	4,604.00	4,102.74	176.71	39.97	10.84	2,376.92	-10,247.79	2,930.43	2,823.83	106.61	27.488		
17,900.00	6,980.45	4,604.00	4,102.74	178.29	39.97	10.84	2,376.92	-10,247.79	2,952.68	2,845.88	106.80	27.646		
18,000.00	6,980.38	4,604.00	4,102.74	179.86	39.97	10.84	2,376.92	-10,247.79	2,978.12	2,871.16	106.96	27.843		
18,100.00	6,980.30	4,604.00	4,102.74	181.44	39.97	10.84	2,376.92	-10,247.79	3,006.68	2,899.60	107.08	28.078		
18,200.00	6,980.23	4,604.00	4,102.74	183.01	39.97	10.84	2,376.92	-10,247.79	3,038.26	2,931.08	107.18	28.348		
18,300.00	6,980.15	4,604.00	4,102.74	184.59	39.97	10.84	2,376.92	-10,247.79	3,072.77	2,965.53	107.24	28.653		
18,400.00	6,980.08	4,604.00	4,102.74	186.16	39.97	10.84	2,376.92	-10,247.79	3,110.11	3,002.83	107.28	28.990		
18,500.00	6,980.00	4,604.00	4,102.74	187.74	39.97	10.84	2,376.92	-10,247.79	3,150.19	3,042.89	107.30	29.359		
18,600.00	6,979.93	4,604.00	4,102.74	189.32	39.97	10.84	2,376.92	-10,247.79	3,192.90	3,085.61	107.29	29.759		
18,700.00	6,979.85	4,604.00	4,102.74	190.90	39.97	10.84	2,376.92	-10,247.79	3,238.13	3,130.87	107.26	30.189		
18,800.00	6,979.78	4,604.00	4,102.74	192.48	39.97	10.84	2,376.92	-10,247.79	3,285.79	3,178.58	107.21	30.648		
18,900.00	6,979.71	4,604.00	4,102.74	194.05	39.97	10.84	2,376.92	-10,247.79	3,335.76	3,228.62	107.14	31.135		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		497-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,000.00	6,979.63	4,604.00	4,102.74	195.63	39.97	10.84	2,376.92	-10,247.79	3,387.95	3,280.90	107.05	31.649		
19,100.00	6,979.56	4,604.00	4,102.74	197.21	39.97	10.84	2,376.92	-10,247.79	3,442.25	3,335.32	106.93	32.191		
19,200.00	6,979.48	4,604.00	4,102.74	198.79	39.97	10.84	2,376.92	-10,247.79	3,498.57	3,391.77	106.80	32.758		
19,300.00	6,979.41	4,604.00	4,102.74	200.37	39.97	10.84	2,376.92	-10,247.79	3,556.81	3,450.16	106.65	33.350		
19,400.00	6,979.33	4,604.00	4,102.74	201.95	39.97	10.84	2,376.92	-10,247.79	3,616.87	3,510.39	106.48	33.966		
19,500.00	6,979.26	4,604.00	4,102.74	203.54	39.97	10.84	2,376.92	-10,247.79	3,678.68	3,572.38	106.30	34.606		
19,600.00	6,979.18	4,604.00	4,102.74	205.12	39.97	10.84	2,376.92	-10,247.79	3,742.13	3,636.03	106.10	35.268		
19,700.00	6,979.11	4,604.00	4,102.74	206.70	39.97	10.84	2,376.92	-10,247.79	3,807.16	3,701.27	105.89	35.953		
19,800.00	6,979.03	4,604.00	4,102.74	208.28	39.97	10.84	2,376.92	-10,247.79	3,873.67	3,768.00	105.67	36.658		
19,900.00	6,978.96	4,604.00	4,102.74	209.86	39.97	10.84	2,376.92	-10,247.79	3,941.61	3,836.17	105.44	37.383		
20,000.00	6,978.89	4,604.00	4,102.74	211.45	39.97	10.84	2,376.92	-10,247.79	4,010.88	3,905.68	105.20	38.127		
20,100.00	6,978.81	4,604.00	4,102.74	213.03	39.97	10.84	2,376.92	-10,247.79	4,081.43	3,976.48	104.95	38.890		
20,200.00	6,978.74	4,604.00	4,102.74	214.61	39.97	10.84	2,376.92	-10,247.79	4,153.18	4,048.49	104.69	39.671		
20,300.00	6,978.66	4,604.00	4,102.74	216.20	39.97	10.84	2,376.92	-10,247.79	4,226.09	4,121.66	104.43	40.468		
20,400.00	6,978.59	4,604.00	4,102.74	217.78	39.97	10.84	2,376.92	-10,247.79	4,300.09	4,195.92	104.17	41.281		
20,500.00	6,978.51	4,604.00	4,102.74	219.37	39.97	10.84	2,376.92	-10,247.79	4,375.11	4,271.22	103.90	42.110		
20,600.00	6,978.44	4,604.00	4,102.74	220.95	39.97	10.84	2,376.92	-10,247.79	4,451.13	4,347.50	103.63	42.953		
20,700.00	6,978.36	4,604.00	4,102.74	222.53	39.97	10.84	2,376.92	-10,247.79	4,528.07	4,424.71	103.36	43.811		
20,800.00	6,978.29	4,604.00	4,102.74	224.12	39.97	10.84	2,376.92	-10,247.79	4,605.90	4,502.82	103.08	44.681		
20,900.00	6,978.21	4,604.00	4,102.74	225.71	39.97	10.84	2,376.92	-10,247.79	4,684.57	4,581.76	102.81	45.564		
21,000.00	6,978.14	4,604.00	4,102.74	227.29	39.97	10.84	2,376.92	-10,247.79	4,764.04	4,661.50	102.54	46.460		
21,100.00	6,978.07	4,604.00	4,102.74	228.88	39.97	10.84	2,376.92	-10,247.79	4,844.28	4,742.00	102.27	47.367		
21,200.00	6,977.99	4,604.00	4,102.74	230.46	39.97	10.84	2,376.92	-10,247.79	4,925.23	4,823.23	102.01	48.284		
21,300.00	6,977.92	4,604.00	4,102.74	232.05	39.97	10.84	2,376.92	-10,247.79	5,006.88	4,905.13	101.74	49.212		
21,400.00	6,977.84	4,604.00	4,102.74	233.64	39.97	10.84	2,376.92	-10,247.79	5,089.17	4,987.70	101.48	50.150		
21,500.00	6,977.77	4,604.00	4,102.74	235.22	39.97	10.84	2,376.92	-10,247.79	5,172.10	5,070.88	101.22	51.097		
21,600.00	6,977.69	4,604.00	4,102.74	236.81	39.97	10.84	2,376.92	-10,247.79	5,255.61	5,154.65	100.97	52.053		
21,700.00	6,977.62	4,604.00	4,102.74	238.40	39.97	10.84	2,376.92	-10,247.79	5,339.70	5,238.98	100.72	53.018		
21,800.00	6,977.54	4,604.00	4,102.74	239.99	39.97	10.84	2,376.92	-10,247.79	5,424.32	5,323.85	100.47	53.990		
21,900.00	6,977.47	4,604.00	4,102.74	241.57	39.97	10.84	2,376.92	-10,247.79	5,509.46	5,409.24	100.23	54.970		
22,000.00	6,977.39	4,604.00	4,102.74	243.16	39.97	10.84	2,376.92	-10,247.79	5,595.09	5,495.11	99.99	55.958		
22,100.00	6,977.32	4,604.00	4,102.74	244.75	39.97	10.84	2,376.92	-10,247.79	5,681.19	5,581.44	99.75	56.952		
22,200.00	6,977.25	4,604.00	4,102.74	246.34	39.97	10.84	2,376.92	-10,247.79	5,767.74	5,668.22	99.53	57.952		
22,300.00	6,977.17	4,604.00	4,102.74	247.93	39.97	10.84	2,376.92	-10,247.79	5,854.72	5,755.42	99.30	58.959		
22,400.00	6,977.10	4,604.00	4,102.74	249.52	39.97	10.84	2,376.92	-10,247.79	5,942.11	5,843.03	99.08	59.971		
22,500.00	6,977.02	4,604.00	4,102.74	251.11	39.97	10.84	2,376.92	-10,247.79	6,029.89	5,931.02	98.87	60.989		
22,529.62	6,977.00	4,604.00	4,102.74	251.58	39.97	10.84	2,376.92	-10,247.79	6,055.96	5,957.15	98.81	61.291		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 535-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-74.91	2,247.89	-8,335.01	8,633.05				
100.00	100.00	36.00	36.00	0.25	0.83	-74.91	2,247.89	-8,335.01	8,632.81	8,631.72	1.08	7,957.239	
200.00	200.00	136.00	136.00	0.61	3.15	-74.91	2,247.89	-8,335.01	8,632.81	8,629.05	3.76	2,296.327	
300.00	300.00	236.00	236.00	0.97	5.47	-74.91	2,247.89	-8,335.01	8,632.81	8,626.37	6.43	1,341.770	
400.00	400.00	336.00	336.00	1.33	7.78	-74.91	2,247.89	-8,335.01	8,632.81	8,623.70	9.11	947.786	
500.00	500.00	436.00	436.00	1.68	10.10	-74.91	2,247.89	-8,335.01	8,632.81	8,621.03	11.78	732.656	
550.00	550.00	486.00	486.00	1.86	11.26	-74.91	2,247.89	-8,335.01	8,632.81	8,619.69	13.12	657.981	
600.00	600.00	536.04	536.00	2.04	12.42	-72.53	2,247.89	-8,335.01	8,632.68	8,618.22	14.46	597.080	
700.00	699.93	635.97	635.93	2.40	14.73	-72.57	2,247.89	-8,335.01	8,631.63	8,614.50	17.13	503.877	
800.00	799.68	735.73	735.68	2.77	17.04	-72.65	2,247.89	-8,335.01	8,629.54	8,609.74	19.80	435.848	
900.00	899.13	835.17	835.13	3.13	19.34	-72.78	2,247.89	-8,335.01	8,626.42	8,603.95	22.46	383.995	
1,000.00	998.15	934.19	934.15	3.49	21.64	-72.95	2,247.89	-8,335.01	8,622.28	8,597.15	25.13	343.147	
1,100.00	1,096.63	1,033.42	1,033.35	3.87	23.93	-73.14	2,250.52	-8,335.01	8,617.82	8,590.01	27.80	309.954	
1,130.50	1,126.54	1,064.88	1,064.81	3.99	24.66	-73.21	2,250.50	-8,335.01	8,616.05	8,587.40	28.65	300.733	
1,200.00	1,194.61	1,136.48	1,136.40	4.26	26.32	-73.20	2,250.37	-8,335.01	8,611.91	8,581.33	30.58	281.622	
1,300.00	1,292.57	1,239.42	1,239.33	4.66	28.71	-73.44	2,249.98	-8,335.01	8,605.94	8,572.58	33.36	257.968	
1,400.00	1,390.52	1,342.26	1,342.16	5.07	31.09	-73.57	2,249.34	-8,335.01	8,599.96	8,563.82	36.14	237.930	
1,500.00	1,488.48	1,445.01	1,444.90	5.48	33.47	-73.71	2,248.47	-8,335.01	8,593.97	8,555.04	38.93	220.745	
1,600.00	1,586.43	1,522.70	1,522.43	5.90	35.31	-73.82	2,247.89	-8,335.01	8,588.07	8,546.88	41.18	208.530	
1,700.00	1,684.38	1,620.66	1,620.38	6.31	37.78	-73.94	2,247.89	-8,335.01	8,582.37	8,538.31	44.06	194.767	
1,800.00	1,782.34	1,718.61	1,718.34	6.73	40.24	-74.07	2,247.89	-8,335.01	8,576.72	8,529.77	46.95	182.685	
1,900.00	1,880.29	1,822.82	1,822.52	7.15	42.87	-74.20	2,249.15	-8,335.01	8,571.41	8,521.42	49.99	171.460	
2,000.00	1,978.25	1,930.16	1,929.85	7.58	45.57	-74.34	2,248.57	-8,335.01	8,565.72	8,512.61	53.11	161.271	
2,100.00	2,076.20	2,012.65	2,012.20	8.00	47.63	-74.45	2,247.89	-8,335.01	8,560.03	8,504.43	55.59	153.975	
2,200.00	2,174.15	2,110.60	2,110.15	8.43	49.90	-74.58	2,247.89	-8,335.01	8,554.55	8,496.27	58.28	146.774	
2,300.00	2,272.11	2,208.55	2,208.11	8.85	52.17	-74.71	2,247.89	-8,335.01	8,549.12	8,488.14	60.98	140.207	
2,400.00	2,370.06	2,313.96	2,313.48	9.28	54.61	-74.83	2,249.67	-8,335.01	8,544.13	8,480.29	63.84	133.837	
2,500.00	2,468.02	2,424.96	2,424.46	9.71	57.18	-74.98	2,248.86	-8,335.01	8,538.62	8,471.79	66.83	127.758	
2,600.00	2,565.97	2,502.54	2,501.97	10.14	58.96	-75.09	2,247.89	-8,335.01	8,533.08	8,464.03	69.05	123.583	
2,700.00	2,663.92	2,600.49	2,599.92	10.57	60.85	-75.22	2,247.89	-8,335.01	8,527.82	8,456.46	71.36	119.507	
2,800.00	2,761.88	2,698.45	2,697.88	11.00	62.73	-75.35	2,247.89	-8,335.01	8,522.61	8,448.94	73.67	115.687	
2,900.00	2,859.83	2,796.40	2,795.83	11.43	64.62	-75.47	2,247.89	-8,335.01	8,517.44	8,441.46	75.98	112.099	
3,000.00	2,957.79	2,894.36	2,893.79	11.86	66.50	-75.60	2,247.89	-8,335.01	8,512.32	8,434.02	78.29	108.723	
3,100.00	3,055.74	2,992.31	2,991.74	12.29	68.38	-75.73	2,247.89	-8,335.01	8,507.24	8,426.63	80.61	105.541	
3,200.00	3,153.69	3,091.07	3,090.48	12.72	70.28	-75.85	2,249.69	-8,335.01	8,502.58	8,419.64	82.93	102.521	
3,300.00	3,251.65	3,191.09	3,190.51	13.15	72.21	-75.98	2,249.59	-8,335.01	8,497.56	8,412.27	85.29	99.634	
3,400.00	3,349.60	3,291.08	3,290.49	13.59	74.13	-76.12	2,249.36	-8,335.01	8,492.57	8,404.93	87.64	96.902	
3,500.00	3,447.56	3,391.01	3,390.42	14.02	76.05	-76.25	2,249.02	-8,335.01	8,487.60	8,397.60	89.99	94.314	
3,600.00	3,545.51	3,490.90	3,490.30	14.45	77.97	-76.38	2,248.56	-8,335.01	8,482.65	8,390.30	92.34	91.858	
3,700.00	3,643.46	3,590.74	3,590.14	14.88	79.89	-76.52	2,247.99	-8,335.01	8,477.72	8,383.03	94.70	89.526	
3,800.00	3,741.42	3,678.08	3,677.42	15.32	81.79	-76.64	2,247.89	-8,335.01	8,472.93	8,375.91	97.02	87.331	
3,900.00	3,839.37	3,776.04	3,775.37	15.75	83.96	-76.77	2,247.89	-8,335.01	8,468.21	8,368.59	99.63	85.001	
4,000.00	3,937.33	3,874.67	3,874.00	16.18	86.15	-76.89	2,248.71	-8,335.01	8,463.69	8,361.45	102.25	82.778	
4,100.00	4,035.28	3,976.84	3,976.16	16.62	88.42	-77.03	2,248.53	-8,335.01	8,459.03	8,354.09	104.94	80.605	
4,200.00	4,133.23	4,078.90	4,078.22	17.05	90.68	-77.17	2,248.09	-8,335.01	8,454.36	8,346.72	107.64	78.542	
4,300.00	4,231.19	4,167.95	4,167.19	17.48	93.04	-77.29	2,247.89	-8,335.01	8,449.78	8,339.35	110.43	76.514	
4,400.00	4,329.14	4,265.91	4,265.14	17.92	95.88	-77.42	2,247.89	-8,335.01	8,445.29	8,331.59	113.70	74.275	
4,500.00	4,427.10	4,364.94	4,364.15	18.35	98.74	-77.54	2,249.46	-8,335.01	8,441.12	8,324.12	117.00	72.146	
4,600.00	4,525.05	4,471.56	4,470.76	18.78	101.83	-77.69	2,249.08	-8,335.01	8,436.65	8,316.13	120.52	70.002	
4,700.00	4,623.00	4,577.94	4,577.12	19.22	104.91	-77.83	2,248.08	-8,335.01	8,432.13	8,308.10	124.03	67.984	
4,800.00	4,720.96	4,658.02	4,656.96	19.65	107.61	-77.94	2,247.89	-8,335.01	8,427.77	8,300.61	127.17	66.274	
4,900.00	4,818.91	4,755.98	4,754.91	20.09	111.02	-78.07	2,247.89	-8,335.01	8,423.51	8,292.50	131.01	64.297	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		535-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.00	4,916.87	4,853.93	4,852.87	20.52	114.43	-78.20	2,247.89	-8,335.01	8,419.29	8,284.43	134.85	62.433		
5,100.00	5,014.82	4,951.89	4,950.82	20.96	117.84	-78.34	2,247.89	-8,335.01	8,415.11	8,276.42	138.70	60.673		
5,200.00	5,112.77	5,049.84	5,048.77	21.39	121.25	-78.47	2,247.89	-8,335.01	8,410.99	8,268.45	142.54	59.008		
5,300.00	5,210.73	5,147.79	5,146.73	21.82	124.66	-78.60	2,247.89	-8,335.01	8,406.91	8,260.52	146.38	57.430		
5,400.00	5,308.68	5,245.75	5,244.68	22.26	128.07	-78.73	2,247.89	-8,335.01	8,402.87	8,252.64	150.23	55.934		
5,493.23	5,400.00	5,337.07	5,336.00	22.66	131.25	-78.85	2,247.89	-8,335.01	8,399.15	8,245.34	153.81	54.606		
5,500.00	5,406.64	5,343.70	5,342.64	22.69	131.48	-78.86	2,247.89	-8,335.01	8,398.88	8,244.81	154.07	54.512		
5,600.00	5,504.69	5,441.75	5,440.69	23.12	134.89	-78.97	2,247.89	-8,335.01	8,395.04	8,237.12	157.92	53.161		
5,700.00	5,602.91	5,539.97	5,538.91	23.55	138.31	-79.08	2,247.89	-8,335.01	8,391.40	8,229.63	161.76	51.875		
5,800.00	5,701.29	5,638.35	5,637.29	23.97	141.74	-79.18	2,247.89	-8,335.01	8,387.96	8,222.36	165.61	50.649		
5,900.00	5,799.82	5,736.89	5,735.82	24.39	145.17	-79.28	2,247.89	-8,335.01	8,384.73	8,215.27	169.45	49.481		
6,000.00	5,898.50	5,835.57	5,834.50	24.79	148.60	-79.37	2,247.89	-8,335.01	8,381.69	8,208.39	173.30	48.366		
6,100.00	5,997.31	5,934.38	5,933.31	25.20	152.04	-79.46	2,247.89	-8,335.01	8,378.83	8,201.69	177.14	47.300		
6,200.00	6,096.26	6,033.33	6,032.26	25.60	155.49	-79.54	2,247.89	-8,335.01	8,376.17	8,195.18	180.98	46.281		
6,300.00	6,195.33	6,060.00	6,057.39	25.99	156.41	-79.55	2,247.89	-8,335.01	8,374.01	8,191.71	182.30	45.934		
6,400.00	6,294.51	6,060.00	6,057.39	26.37	156.41	-79.55	2,247.89	-8,335.01	8,373.17	8,190.50	182.67	45.838		
6,412.47	6,306.89	6,060.00	6,057.39	26.42	156.41	-79.55	2,247.89	-8,335.01	8,373.15	8,190.45	182.71	45.828		
6,498.19	6,392.00	6,060.00	6,057.39	26.75	156.41	-79.55	2,247.89	-8,335.01	8,373.65	8,190.66	182.99	45.759		
6,500.00	6,393.80	6,060.00	6,057.39	26.76	156.41	-78.35	2,247.89	-8,335.01	8,373.67	8,190.67	183.00	45.758		
6,550.00	6,443.29	6,060.00	6,057.39	26.95	156.41	-55.63	2,247.89	-8,335.01	8,372.44	8,189.28	183.16	45.711		
6,600.00	6,492.24	6,060.00	6,057.39	27.16	156.41	-44.99	2,247.89	-8,335.01	8,367.82	8,184.50	183.32	45.645		
6,650.00	6,540.33	6,060.00	6,057.39	27.38	156.41	-39.39	2,247.89	-8,335.01	8,359.86	8,176.37	183.49	45.560		
6,700.00	6,587.28	6,060.00	6,057.39	27.60	156.41	-36.19	2,247.89	-8,335.01	8,348.57	8,164.92	183.66	45.458		
6,750.00	6,632.80	6,060.00	6,057.39	27.84	156.41	-34.30	2,247.89	-8,335.01	8,334.03	8,150.21	183.82	45.338		
6,800.00	6,676.60	6,060.00	6,057.39	28.09	156.41	-33.25	2,247.89	-8,335.01	8,316.30	8,132.32	183.99	45.200		
6,850.00	6,718.42	6,060.00	6,057.39	28.34	156.41	-32.80	2,247.89	-8,335.01	8,295.48	8,111.33	184.15	45.047		
6,900.00	6,758.00	6,060.00	6,057.39	28.60	156.41	-32.83	2,247.89	-8,335.01	8,271.67	8,087.35	184.32	44.878		
6,950.00	6,795.09	6,060.00	6,057.39	28.87	156.41	-33.28	2,247.89	-8,335.01	8,244.98	8,060.50	184.48	44.694		
7,000.00	6,829.46	6,060.00	6,057.39	29.14	156.41	-34.13	2,247.89	-8,335.01	8,215.56	8,030.93	184.64	44.496		
7,050.00	6,860.91	6,060.00	6,057.39	29.43	156.41	-35.39	2,247.89	-8,335.01	8,183.57	7,998.77	184.79	44.285		
7,100.00	6,889.24	6,060.00	6,057.39	29.73	156.41	-37.12	2,247.89	-8,335.01	8,149.16	7,964.21	184.95	44.061		
7,150.00	6,914.27	6,060.00	6,057.39	30.05	156.41	-39.37	2,247.89	-8,335.01	8,112.53	7,927.42	185.11	43.826		
7,200.00	6,935.85	6,060.00	6,057.39	30.37	156.41	-42.24	2,247.89	-8,335.01	8,073.86	7,888.60	185.26	43.581		
7,250.00	6,953.84	6,060.00	6,057.39	30.71	156.41	-45.88	2,247.89	-8,335.01	8,033.37	7,847.96	185.42	43.326		
7,300.00	6,968.15	6,060.00	6,057.39	31.06	156.41	-50.46	2,247.89	-8,335.01	7,991.29	7,805.72	185.57	43.063		
7,350.00	6,978.67	6,060.00	6,057.39	31.42	156.41	-56.19	2,247.89	-8,335.01	7,947.85	7,762.12	185.73	42.792		
7,400.00	6,985.34	6,060.00	6,057.39	31.79	156.41	-63.28	2,247.89	-8,335.01	7,903.29	7,717.40	185.89	42.516		
7,450.00	6,988.13	6,060.00	6,057.39	32.17	156.41	-71.86	2,247.89	-8,335.01	7,857.88	7,671.83	186.05	42.235		
7,461.13	6,988.22	6,060.00	6,057.39	32.26	156.41	-73.98	2,247.89	-8,335.01	7,847.68	7,661.60	186.09	42.172		
7,500.00	6,988.19	6,060.00	6,057.39	32.56	156.41	-73.47	2,247.89	-8,335.01	7,811.94	7,625.73	186.21	41.952		
7,600.00	6,988.12	6,060.00	6,057.39	33.37	156.41	-72.00	2,247.89	-8,335.01	7,719.22	7,532.69	186.52	41.385		
7,700.00	6,988.05	6,060.00	6,057.39	34.21	156.41	-70.26	2,247.89	-8,335.01	7,625.47	7,438.65	186.82	40.817		
7,800.00	6,987.98	6,060.00	6,057.39	35.09	156.41	-68.17	2,247.89	-8,335.01	7,530.76	7,343.67	187.10	40.250		
7,900.00	6,987.91	6,060.00	6,057.39	35.99	156.41	-65.62	2,247.89	-8,335.01	7,435.19	7,247.83	187.36	39.685		
8,000.00	6,987.83	6,060.00	6,057.39	36.93	156.41	-62.47	2,247.89	-8,335.01	7,338.83	7,151.24	187.59	39.121		
8,100.00	6,987.76	6,060.00	6,057.39	37.88	156.41	-58.50	2,247.89	-8,335.01	7,241.77	7,053.98	187.80	38.561		
8,200.00	6,987.68	6,060.00	6,057.39	38.86	156.41	-53.42	2,247.89	-8,335.01	7,144.11	6,956.13	187.98	38.005		
8,300.00	6,987.61	6,060.00	6,057.39	39.86	156.41	-46.80	2,247.89	-8,335.01	7,045.94	6,857.82	188.12	37.454		
8,400.00	6,987.53	6,060.00	6,057.39	40.87	156.41	-38.15	2,247.89	-8,335.01	6,947.36	6,759.12	188.24	36.908		
8,500.00	6,987.46	6,060.00	6,057.39	41.90	156.41	-26.97	2,247.89	-8,335.01	6,848.47	6,660.16	188.31	36.368		
8,600.00	6,987.38	6,060.00	6,057.39	42.93	156.41	-13.27	2,247.89	-8,335.01	6,749.40	6,561.05	188.35	35.835		
8,700.00	6,987.31	6,060.00	6,057.39	43.98	156.41	1.92	2,247.89	-8,335.01	6,650.24	6,461.89	188.34	35.309		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 535-A027Ua_INC-ONLY				Rule Assigned:								Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
8,800.00	6,987.23	6,060.00	6,057.39	45.03	156.41	16.63	2,247.89	-8,335.01	6,551.12	6,362.82	188.30	34.791	
8,872.16	6,987.18	6,060.00	6,057.39	45.79	156.41	25.98	2,247.89	-8,335.01	6,479.70	6,291.46	188.24	34.423	
8,900.00	6,987.16	6,060.00	6,057.39	46.08	156.41	25.98	2,247.89	-8,335.01	6,452.16	6,263.95	188.21	34.282	
9,000.00	6,987.09	6,060.00	6,057.39	47.16	156.41	25.98	2,247.89	-8,335.01	6,353.29	6,165.18	188.11	33.774	
9,100.00	6,987.01	6,060.00	6,057.39	48.27	156.41	25.98	2,247.89	-8,335.01	6,254.45	6,066.44	188.01	33.267	
9,200.00	6,986.94	6,060.00	6,057.39	49.40	156.41	25.98	2,247.89	-8,335.01	6,155.65	5,967.75	187.90	32.760	
9,300.00	6,986.86	6,060.00	6,057.39	50.56	156.41	25.98	2,247.89	-8,335.01	6,056.89	5,869.09	187.79	32.253	
9,400.00	6,986.79	6,060.00	6,057.39	51.75	156.41	25.98	2,247.89	-8,335.01	5,958.17	5,770.49	187.68	31.746	
9,500.00	6,986.71	6,060.00	6,057.39	52.95	156.41	25.98	2,247.89	-8,335.01	5,859.49	5,671.92	187.56	31.240	
9,600.00	6,986.64	6,060.00	6,057.39	54.18	156.41	25.98	2,247.89	-8,335.01	5,760.86	5,573.41	187.45	30.733	
9,700.00	6,986.56	6,060.00	6,057.39	55.42	156.41	25.98	2,247.89	-8,335.01	5,662.27	5,474.95	187.33	30.227	
9,800.00	6,986.49	6,060.00	6,057.39	56.69	156.41	25.98	2,247.89	-8,335.01	5,563.74	5,376.54	187.20	29.721	
9,900.00	6,986.41	6,060.00	6,057.39	57.97	156.41	25.98	2,247.89	-8,335.01	5,465.26	5,278.19	187.07	29.215	
10,000.00	6,986.34	6,060.00	6,057.39	59.26	156.41	25.98	2,247.89	-8,335.01	5,366.84	5,179.90	186.94	28.709	
10,100.00	6,986.27	6,060.00	6,057.39	60.57	156.41	25.98	2,247.89	-8,335.01	5,268.47	5,081.67	186.80	28.203	
10,200.00	6,986.19	6,060.00	6,057.39	61.90	156.41	25.98	2,247.89	-8,335.01	5,170.17	4,983.51	186.66	27.698	
10,300.00	6,986.12	6,060.00	6,057.39	63.23	156.41	25.98	2,247.89	-8,335.01	5,071.93	4,885.42	186.52	27.193	
10,400.00	6,986.04	6,060.00	6,057.39	64.58	156.41	25.98	2,247.89	-8,335.01	4,973.77	4,787.40	186.37	26.688	
10,500.00	6,985.97	6,060.00	6,057.39	65.94	156.41	25.98	2,247.89	-8,335.01	4,875.68	4,689.47	186.21	26.183	
10,600.00	6,985.89	6,060.00	6,057.39	67.32	156.41	25.98	2,247.89	-8,335.01	4,777.67	4,591.62	186.05	25.679	
10,700.00	6,985.82	6,060.00	6,057.39	68.70	156.41	25.98	2,247.89	-8,335.01	4,679.74	4,493.85	185.89	25.175	
10,800.00	6,985.74	6,060.00	6,057.39	70.09	156.41	25.98	2,247.89	-8,335.01	4,581.90	4,396.19	185.72	24.671	
10,900.00	6,985.67	6,060.00	6,057.39	71.49	156.41	25.98	2,247.89	-8,335.01	4,484.16	4,298.62	185.54	24.168	
11,000.00	6,985.59	6,060.00	6,057.39	72.90	156.41	25.98	2,247.89	-8,335.01	4,386.52	4,201.16	185.36	23.665	
11,100.00	6,985.52	6,060.00	6,057.39	74.31	156.41	25.98	2,247.89	-8,335.01	4,288.99	4,103.82	185.17	23.162	
11,200.00	6,985.45	6,060.00	6,057.39	75.74	156.41	25.98	2,247.89	-8,335.01	4,191.58	4,006.60	184.98	22.660	
11,300.00	6,985.37	6,060.00	6,057.39	77.17	156.41	25.98	2,247.89	-8,335.01	4,094.29	3,909.51	184.77	22.158	
11,400.00	6,985.30	6,060.00	6,057.39	78.61	156.41	25.98	2,247.89	-8,335.01	3,997.13	3,812.56	184.57	21.657	
11,500.00	6,985.22	6,060.00	6,057.39	80.05	156.41	25.98	2,247.89	-8,335.01	3,900.12	3,715.77	184.35	21.156	
11,600.00	6,985.15	6,060.00	6,057.39	81.50	156.41	25.98	2,247.89	-8,335.01	3,803.26	3,619.13	184.13	20.656	
11,700.00	6,985.07	6,060.00	6,057.39	82.96	156.41	25.98	2,247.89	-8,335.01	3,706.57	3,522.67	183.90	20.156	
11,800.00	6,985.00	6,060.00	6,057.39	84.42	156.41	25.98	2,247.89	-8,335.01	3,610.05	3,426.40	183.66	19.657	
11,900.00	6,984.92	6,060.00	6,057.39	85.89	156.41	25.98	2,247.89	-8,335.01	3,513.74	3,330.33	183.41	19.158	
12,000.00	6,984.85	6,060.00	6,057.39	87.36	156.41	25.98	2,247.89	-8,335.01	3,417.63	3,234.48	183.16	18.660	
12,100.00	6,984.77	6,060.00	6,057.39	88.83	156.41	25.98	2,247.89	-8,335.01	3,321.76	3,138.87	182.89	18.162	
12,200.00	6,984.70	6,060.00	6,057.39	90.31	156.41	25.98	2,247.89	-8,335.01	3,226.14	3,043.51	182.62	17.666	
12,300.00	6,984.63	6,060.00	6,057.39	91.80	156.41	25.98	2,247.89	-8,335.01	3,130.79	2,948.44	182.34	17.170	
12,400.00	6,984.55	6,060.00	6,057.39	93.29	156.41	25.98	2,247.89	-8,335.01	3,035.74	2,853.68	182.06	16.675	
12,500.00	6,984.48	6,060.00	6,057.39	94.78	156.41	25.98	2,247.89	-8,335.01	2,941.01	2,759.25	181.76	16.180	
12,600.00	6,984.40	6,060.00	6,057.39	96.28	156.41	25.98	2,247.89	-8,335.01	2,846.65	2,665.19	181.46	15.687	
12,700.00	6,984.33	6,060.00	6,057.39	97.78	156.41	25.98	2,247.89	-8,335.01	2,752.69	2,571.53	181.15	15.195	
12,800.00	6,984.25	6,060.00	6,057.39	99.28	156.41	25.98	2,247.89	-8,335.01	2,659.16	2,478.33	180.84	14.705	
12,900.00	6,984.18	6,060.00	6,057.39	100.78	156.41	25.98	2,247.89	-8,335.01	2,566.13	2,385.61	180.52	14.216	
13,000.00	6,984.10	6,060.00	6,057.39	102.29	156.41	25.98	2,247.89	-8,335.01	2,473.64	2,293.45	180.19	13.728	
13,100.00	6,984.03	6,060.00	6,057.39	103.80	156.41	25.98	2,247.89	-8,335.01	2,381.75	2,201.90	179.85	13.243	
13,200.00	6,983.95	6,060.00	6,057.39	105.32	156.41	25.98	2,247.89	-8,335.01	2,290.55	2,111.03	179.52	12.760	
13,300.00	6,983.88	6,060.00	6,057.39	106.84	156.41	25.98	2,247.89	-8,335.01	2,200.11	2,020.94	179.17	12.279	
13,400.00	6,983.81	6,060.00	6,057.39	108.36	156.41	25.98	2,247.89	-8,335.01	2,110.53	1,931.71	178.82	11.803	
13,500.00	6,983.73	6,060.00	6,057.39	109.88	156.41	25.98	2,247.89	-8,335.01	2,021.93	1,843.48	178.46	11.330	
13,600.00	6,983.66	6,060.00	6,057.39	111.40	156.41	25.98	2,247.89	-8,335.01	1,934.44	1,756.36	178.08	10.863	
13,700.00	6,983.58	6,060.00	6,057.39	112.93	156.41	25.98	2,247.89	-8,335.01	1,848.23	1,670.54	177.68	10.402	
13,800.00	6,983.51	6,060.00	6,057.39	114.46	156.41	25.98	2,247.89	-8,335.01	1,763.46	1,586.21	177.26	9.949	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 535-A027Ua_INC-ONLY				Rule Assigned:								Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
13,900.00	6,983.43	6,060.00	6,057.39	115.99	156.41	25.98	2,247.89	-8,335.01	1,680.38	1,503.59	176.79	9.505	
14,000.00	6,983.36	6,060.00	6,057.39	117.52	156.41	25.98	2,247.89	-8,335.01	1,599.23	1,422.97	176.25	9.073	
14,100.00	6,983.28	6,060.00	6,057.39	119.06	156.41	25.98	2,247.89	-8,335.01	1,520.33	1,344.70	175.63	8.656	
14,200.00	6,983.21	6,060.00	6,057.39	120.59	156.41	25.98	2,247.89	-8,335.01	1,444.04	1,269.16	174.88	8.257	
14,300.00	6,983.13	6,060.00	6,057.39	122.13	156.41	25.98	2,247.89	-8,335.01	1,370.81	1,196.85	173.97	7.880	
14,400.00	6,983.06	6,060.00	6,057.39	123.67	156.41	25.98	2,247.89	-8,335.01	1,301.15	1,128.32	172.83	7.529	
14,500.00	6,982.99	6,060.00	6,057.39	125.21	156.41	25.98	2,247.89	-8,335.01	1,235.66	1,064.25	171.42	7.209	
14,600.00	6,982.91	6,060.00	6,057.39	126.75	156.41	25.98	2,247.89	-8,335.01	1,175.04	1,005.36	169.68	6.925	
14,700.00	6,982.84	6,060.00	6,057.39	128.30	156.41	25.98	2,247.89	-8,335.01	1,120.08	952.49	167.59	6.683	
14,800.00	6,982.76	6,060.00	6,057.39	129.85	156.41	25.98	2,247.89	-8,335.01	1,071.66	906.46	165.20	6.487	
14,900.00	6,982.69	6,060.00	6,057.39	131.39	156.41	25.98	2,247.89	-8,335.01	1,030.69	868.04	162.65	6.337	
15,000.00	6,982.61	6,060.00	6,057.39	132.94	156.41	25.98	2,247.89	-8,335.01	998.09	837.81	160.28	6.227	
15,100.00	6,982.54	6,060.00	6,057.39	134.49	156.41	25.98	2,247.89	-8,335.01	974.71	816.07	158.64	6.144	
15,200.00	6,982.46	6,060.00	6,057.39	136.04	156.41	25.98	2,247.89	-8,335.01	961.21	802.79	158.41	6.068	
15,280.67	6,982.40	6,060.00	6,057.39	137.30	156.41	25.98	2,247.89	-8,335.01	957.81	798.14	159.67	5.999 CC	
15,300.00	6,982.39	6,060.00	6,057.39	137.60	156.41	25.98	2,247.89	-8,335.01	958.01	797.83	160.18	5.981 ES	
15,400.00	6,982.31	6,060.00	6,057.39	139.15	156.41	25.98	2,247.89	-8,335.01	965.22	801.17	164.05	5.884	
15,500.00	6,982.24	6,060.00	6,057.39	140.70	156.41	25.98	2,247.89	-8,335.01	982.60	813.09	169.52	5.797	
15,600.00	6,982.17	6,060.00	6,057.39	142.26	156.41	25.98	2,247.89	-8,335.01	1,009.64	833.86	175.78	5.744	
15,700.00	6,982.09	6,060.00	6,057.39	143.82	156.41	25.98	2,247.89	-8,335.01	1,045.58	863.50	182.08	5.742 SF	
15,800.00	6,982.02	6,060.00	6,057.39	145.38	156.41	25.98	2,247.89	-8,335.01	1,089.54	901.64	187.91	5.798	
15,900.00	6,981.94	6,060.00	6,057.39	146.94	156.41	25.98	2,247.89	-8,335.01	1,140.60	947.59	193.01	5.910	
16,000.00	6,981.87	6,060.00	6,057.39	148.50	156.41	25.98	2,247.89	-8,335.01	1,197.85	1,000.55	197.29	6.071	
16,100.00	6,981.79	6,060.00	6,057.39	150.06	156.41	25.98	2,247.89	-8,335.01	1,260.44	1,059.64	200.80	6.277	
16,200.00	6,981.72	6,060.00	6,057.39	151.62	156.41	25.98	2,247.89	-8,335.01	1,327.62	1,124.02	203.60	6.521	
16,300.00	6,981.64	6,060.00	6,057.39	153.18	156.41	25.98	2,247.89	-8,335.01	1,398.73	1,192.92	205.80	6.796	
16,400.00	6,981.57	6,060.00	6,057.39	154.74	156.41	25.98	2,247.89	-8,335.01	1,473.19	1,265.68	207.52	7.099	
16,500.00	6,981.49	6,060.00	6,057.39	156.31	156.41	25.98	2,247.89	-8,335.01	1,550.54	1,341.71	208.82	7.425	
16,600.00	6,981.42	6,060.00	6,057.39	157.87	156.41	25.98	2,247.89	-8,335.01	1,630.35	1,420.54	209.81	7.771	
16,700.00	6,981.35	6,060.00	6,057.39	159.44	156.41	25.98	2,247.89	-8,335.01	1,712.28	1,501.74	210.54	8.133	
16,800.00	6,981.27	6,060.00	6,057.39	161.01	156.41	25.98	2,247.89	-8,335.01	1,796.04	1,584.98	211.07	8.509	
16,900.00	6,981.20	6,060.00	6,057.39	162.58	156.41	25.98	2,247.89	-8,335.01	1,881.39	1,669.96	211.43	8.898	
17,000.00	6,981.12	6,060.00	6,057.39	164.14	156.41	25.98	2,247.89	-8,335.01	1,968.12	1,756.45	211.67	9.298	
17,100.00	6,981.05	6,060.00	6,057.39	165.71	156.41	25.98	2,247.89	-8,335.01	2,056.05	1,844.24	211.82	9.707	
17,200.00	6,980.97	6,060.00	6,057.39	167.28	156.41	25.98	2,247.89	-8,335.01	2,145.05	1,933.16	211.88	10.124	
17,300.00	6,980.90	6,060.00	6,057.39	168.85	156.41	25.98	2,247.89	-8,335.01	2,234.97	2,023.08	211.89	10.548	
17,400.00	6,980.82	6,060.00	6,057.39	170.42	156.41	25.98	2,247.89	-8,335.01	2,325.72	2,113.86	211.86	10.978	
17,500.00	6,980.75	6,060.00	6,057.39	172.00	156.41	25.98	2,247.89	-8,335.01	2,417.19	2,205.40	211.79	11.413	
17,600.00	6,980.67	6,060.00	6,057.39	173.57	156.41	25.98	2,247.89	-8,335.01	2,509.32	2,297.63	211.69	11.854	
17,700.00	6,980.60	6,060.00	6,057.39	175.14	156.41	25.98	2,247.89	-8,335.01	2,602.03	2,390.45	211.58	12.298	
17,800.00	6,980.53	6,060.00	6,057.39	176.71	156.41	25.98	2,247.89	-8,335.01	2,695.26	2,483.81	211.45	12.747	
17,900.00	6,980.45	6,060.00	6,057.39	178.29	156.41	25.98	2,247.89	-8,335.01	2,788.96	2,577.65	211.31	13.198	
18,000.00	6,980.38	6,060.00	6,057.39	179.86	156.41	25.98	2,247.89	-8,335.01	2,883.08	2,671.91	211.17	13.653	
18,100.00	6,980.30	6,060.00	6,057.39	181.44	156.41	25.98	2,247.89	-8,335.01	2,977.58	2,766.57	211.02	14.111	
18,200.00	6,980.23	6,060.00	6,057.39	183.01	156.41	25.98	2,247.89	-8,335.01	3,072.44	2,861.57	210.87	14.570	
18,300.00	6,980.15	6,060.00	6,057.39	184.59	156.41	25.98	2,247.89	-8,335.01	3,167.61	2,956.89	210.72	15.032	
18,400.00	6,980.08	6,060.00	6,057.39	186.16	156.41	25.98	2,247.89	-8,335.01	3,263.07	3,052.49	210.57	15.496	
18,500.00	6,980.00	6,060.00	6,057.39	187.74	156.41	25.98	2,247.89	-8,335.01	3,358.79	3,148.36	210.43	15.962	
18,600.00	6,979.93	6,060.00	6,057.39	189.32	156.41	25.98	2,247.89	-8,335.01	3,454.76	3,244.47	210.29	16.429	
18,700.00	6,979.85	6,060.00	6,057.39	190.90	156.41	25.98	2,247.89	-8,335.01	3,550.94	3,340.79	210.15	16.897	
18,800.00	6,979.78	6,060.00	6,057.39	192.48	156.41	25.98	2,247.89	-8,335.01	3,647.34	3,437.32	210.02	17.367	
18,900.00	6,979.71	6,060.00	6,057.39	194.05	156.41	25.98	2,247.89	-8,335.01	3,743.92	3,534.03	209.89	17.838	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164A - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 535-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,000.00	6,979.63	6,060.00	6,057.39	195.63	156.41	25.98	2,247.89	-8,335.01	3,840.68	3,630.91	209.76	18.310	
19,100.00	6,979.56	6,060.00	6,057.39	197.21	156.41	25.98	2,247.89	-8,335.01	3,937.60	3,727.95	209.64	18.782	
19,200.00	6,979.48	6,060.00	6,057.39	198.79	156.41	25.98	2,247.89	-8,335.01	4,034.67	3,825.14	209.53	19.256	
19,300.00	6,979.41	6,060.00	6,057.39	200.37	156.41	25.98	2,247.89	-8,335.01	4,131.88	3,922.46	209.42	19.730	
19,400.00	6,979.33	6,060.00	6,057.39	201.95	156.41	25.98	2,247.89	-8,335.01	4,229.21	4,019.90	209.31	20.205	
19,500.00	6,979.26	6,060.00	6,057.39	203.54	156.41	25.98	2,247.89	-8,335.01	4,326.68	4,117.46	209.21	20.681	
19,600.00	6,979.18	6,060.00	6,057.39	205.12	156.41	25.98	2,247.89	-8,335.01	4,424.25	4,215.13	209.12	21.157	
19,700.00	6,979.11	6,060.00	6,057.39	206.70	156.41	25.98	2,247.89	-8,335.01	4,521.93	4,312.90	209.03	21.633	
19,800.00	6,979.03	6,060.00	6,057.39	208.28	156.41	25.98	2,247.89	-8,335.01	4,619.71	4,410.77	208.94	22.110	
19,900.00	6,978.96	6,060.00	6,057.39	209.86	156.41	25.98	2,247.89	-8,335.01	4,717.58	4,508.72	208.86	22.587	
20,000.00	6,978.89	6,060.00	6,057.39	211.45	156.41	25.98	2,247.89	-8,335.01	4,815.54	4,606.75	208.79	23.064	
20,100.00	6,978.81	6,060.00	6,057.39	213.03	156.41	25.98	2,247.89	-8,335.01	4,913.58	4,704.87	208.72	23.542	
20,200.00	6,978.74	6,060.00	6,057.39	214.61	156.41	25.98	2,247.89	-8,335.01	5,011.70	4,803.06	208.65	24.020	
20,300.00	6,978.66	6,060.00	6,057.39	216.20	156.41	25.98	2,247.89	-8,335.01	5,109.90	4,901.31	208.59	24.498	
20,400.00	6,978.59	6,060.00	6,057.39	217.78	156.41	25.98	2,247.89	-8,335.01	5,208.16	4,999.63	208.53	24.976	
20,500.00	6,978.51	6,060.00	6,057.39	219.37	156.41	25.98	2,247.89	-8,335.01	5,306.48	5,098.01	208.47	25.454	
20,600.00	6,978.44	6,060.00	6,057.39	220.95	156.41	25.98	2,247.89	-8,335.01	5,404.87	5,196.45	208.42	25.932	
20,700.00	6,978.36	6,060.00	6,057.39	222.53	156.41	25.98	2,247.89	-8,335.01	5,503.32	5,294.94	208.37	26.411	
20,800.00	6,978.29	6,060.00	6,057.39	224.12	156.41	25.98	2,247.89	-8,335.01	5,601.82	5,393.49	208.33	26.889	
20,900.00	6,978.21	6,060.00	6,057.39	225.71	156.41	25.98	2,247.89	-8,335.01	5,700.37	5,492.08	208.29	27.367	
21,000.00	6,978.14	6,060.00	6,057.39	227.29	156.41	25.98	2,247.89	-8,335.01	5,798.97	5,590.72	208.25	27.846	
21,100.00	6,978.07	6,060.00	6,057.39	228.88	156.41	25.98	2,247.89	-8,335.01	5,897.62	5,689.40	208.22	28.324	
21,200.00	6,977.99	6,060.00	6,057.39	230.46	156.41	25.98	2,247.89	-8,335.01	5,996.32	5,788.13	208.19	28.802	
21,300.00	6,977.92	6,060.00	6,057.39	232.05	156.41	25.98	2,247.89	-8,335.01	6,095.06	5,886.89	208.16	29.280	
21,400.00	6,977.84	6,060.00	6,057.39	233.64	156.41	25.98	2,247.89	-8,335.01	6,193.83	5,985.69	208.14	29.758	
21,500.00	6,977.77	6,060.00	6,057.39	235.22	156.41	25.98	2,247.89	-8,335.01	6,292.65	6,084.53	208.12	30.236	
21,600.00	6,977.69	6,060.00	6,057.39	236.81	156.41	25.98	2,247.89	-8,335.01	6,391.50	6,183.40	208.10	30.714	
21,700.00	6,977.62	6,060.00	6,057.39	238.40	156.41	25.98	2,247.89	-8,335.01	6,490.39	6,282.31	208.08	31.191	
21,800.00	6,977.54	6,060.00	6,057.39	239.99	156.41	25.98	2,247.89	-8,335.01	6,589.31	6,381.24	208.07	31.669	
21,900.00	6,977.47	6,060.00	6,057.39	241.57	156.41	25.98	2,247.89	-8,335.01	6,688.27	6,480.20	208.06	32.146	
22,000.00	6,977.39	6,060.00	6,057.39	243.16	156.41	25.98	2,247.89	-8,335.01	6,787.25	6,579.20	208.05	32.623	
22,100.00	6,977.32	6,060.00	6,057.39	244.75	156.41	25.98	2,247.89	-8,335.01	6,886.26	6,678.22	208.05	33.099	
22,200.00	6,977.25	6,060.00	6,057.39	246.34	156.41	25.98	2,247.89	-8,335.01	6,985.31	6,777.26	208.04	33.576	
22,300.00	6,977.17	6,060.00	6,057.39	247.93	156.41	25.98	2,247.89	-8,335.01	7,084.37	6,876.33	208.04	34.052	
22,400.00	6,977.10	6,060.00	6,057.39	249.52	156.41	25.98	2,247.89	-8,335.01	7,183.47	6,975.42	208.05	34.528	
22,500.00	6,977.02	6,060.00	6,057.39	251.11	156.41	25.98	2,247.89	-8,335.01	7,282.59	7,074.54	208.05	35.004	
22,529.62	6,977.00	6,060.00	6,057.39	251.58	156.41	25.98	2,247.89	-8,335.01	7,311.95	7,103.89	208.05	35.145	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 563-MWD OWSG Rev5													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-74.95	2,249.76	-8,369.09	8,666.41					
100.00	100.00	38.00	38.00	0.25	0.68	-74.95	2,249.74	-8,369.10	8,666.21	8,665.28	0.92	9,372.465		
200.00	200.00	133.01	133.01	0.61	2.36	-74.96	2,249.51	-8,369.21	8,666.26	8,663.29	2.97	2,920.984		
300.00	300.00	228.02	228.02	0.97	4.05	-74.96	2,249.03	-8,369.45	8,666.37	8,661.36	5.01	1,730.121		
400.00	400.00	323.03	323.02	1.33	5.74	-74.96	2,248.31	-8,369.81	8,666.54	8,659.48	7.05	1,229.077		
500.00	500.00	418.03	418.01	1.68	7.43	-74.97	2,247.33	-8,370.29	8,666.76	8,657.67	9.09	953.092		
550.00	550.00	465.52	465.51	1.86	8.27	-74.98	2,246.75	-8,370.58	8,666.90	8,656.78	10.11	856.897		
600.00	600.00	513.01	512.99	2.04	9.11	-72.60	2,246.10	-8,370.90	8,666.91	8,655.78	11.13	778.355		
700.00	699.93	563.00	562.97	2.40	10.00	-72.62	2,245.35	-8,371.27	8,666.33	8,653.96	12.38	700.123		
800.00	799.68	611.66	611.62	2.77	10.18	-72.67	2,244.40	-8,371.98	8,665.30	8,652.42	12.88	672.762		
900.00	899.13	654.00	653.92	3.13	10.34	-72.73	2,243.26	-8,373.15	8,664.06	8,650.70	13.36	648.396		
1,000.00	998.15	654.00	653.92	3.49	10.34	-72.76	2,243.26	-8,373.15	8,662.63	8,648.90	13.73	631.034		
1,100.00	1,096.63	654.00	653.92	3.87	10.34	-72.78	2,243.26	-8,373.15	8,661.32	8,647.22	14.10	614.220		
1,130.50	1,126.54	692.88	692.73	3.99	10.50	-72.85	2,241.82	-8,374.89	8,660.50	8,646.19	14.31	605.188		
1,200.00	1,194.61	706.12	705.94	4.26	10.55	-72.87	2,241.21	-8,375.68	8,659.58	8,644.97	14.61	592.796		
1,300.00	1,292.57	744.00	743.66	4.66	10.73	-72.94	2,239.15	-8,378.49	8,659.16	8,644.08	15.08	574.246		
1,322.84	1,314.94	744.00	743.66	4.76	10.73	-72.94	2,239.15	-8,378.49	8,659.13	8,643.96	15.17	570.817		
1,400.00	1,390.52	744.00	743.66	5.07	10.73	-72.94	2,239.15	-8,378.49	8,659.47	8,644.00	15.48	559.577		
1,500.00	1,488.48	787.63	787.03	5.48	10.90	-73.02	2,236.39	-8,382.37	8,660.70	8,644.73	15.97	542.363		
1,600.00	1,586.43	835.00	834.06	5.90	11.08	-73.11	2,233.14	-8,386.95	8,662.60	8,646.13	16.47	525.959		
1,700.00	1,684.38	869.42	868.19	6.31	11.17	-73.17	2,230.48	-8,390.58	8,665.19	8,648.26	16.93	511.815		
1,800.00	1,782.34	928.00	926.11	6.73	11.33	-73.29	2,225.04	-8,397.45	8,668.59	8,651.16	17.43	497.291		
1,900.00	1,880.29	928.00	926.11	7.15	11.33	-73.29	2,225.04	-8,397.45	8,672.64	8,654.80	17.84	486.211		
2,000.00	1,978.25	975.11	972.54	7.58	11.50	-73.39	2,219.97	-8,403.63	8,677.47	8,659.13	18.34	473.027		
2,100.00	2,076.20	1,023.00	1,019.59	8.00	11.68	-73.50	2,214.33	-8,410.52	8,683.17	8,664.32	18.85	460.550		
2,200.00	2,174.15	1,023.00	1,019.59	8.43	11.68	-73.50	2,214.33	-8,410.52	8,689.64	8,670.38	19.26	451.197		
2,300.00	2,272.11	1,023.00	1,019.59	8.85	11.68	-73.50	2,214.33	-8,410.52	8,697.25	8,677.59	19.66	442.329		
2,400.00	2,370.06	1,079.24	1,074.64	9.28	11.87	-73.63	2,207.28	-8,419.60	8,705.23	8,685.03	20.21	430.804		
2,500.00	2,468.02	1,118.00	1,112.44	9.71	12.01	-73.72	2,202.28	-8,426.56	8,714.47	8,693.76	20.71	420.838		
2,600.00	2,565.97	1,118.00	1,112.44	10.14	12.01	-73.72	2,202.28	-8,426.56	8,724.48	8,703.38	21.11	413.340		
2,700.00	2,663.92	1,159.26	1,152.54	10.57	12.14	-73.82	2,196.72	-8,434.50	8,735.36	8,713.74	21.62	404.088		
2,800.00	2,761.88	1,210.00	1,201.68	11.00	12.31	-73.94	2,189.42	-8,444.83	8,747.07	8,724.92	22.15	394.834		
2,900.00	2,859.83	1,210.00	1,201.68	11.43	12.31	-73.94	2,189.42	-8,444.83	8,759.50	8,736.95	22.55	388.471		
3,000.00	2,957.79	1,253.25	1,243.37	11.86	12.48	-74.05	2,182.68	-8,454.17	8,772.72	8,749.64	23.08	380.143		
3,100.00	3,055.74	1,305.00	1,292.95	12.29	12.68	-74.19	2,173.83	-8,466.06	8,786.88	8,763.24	23.63	371.794		
3,200.00	3,153.69	1,305.00	1,292.95	12.72	12.68	-74.19	2,173.83	-8,466.06	8,801.68	8,777.65	24.02	366.387		
3,300.00	3,251.65	1,305.00	1,292.95	13.15	12.68	-74.19	2,173.83	-8,466.06	8,817.59	8,793.18	24.41	361.250		
3,400.00	3,349.60	1,351.32	1,337.03	13.59	12.88	-74.32	2,165.33	-8,477.47	8,834.07	8,809.10	24.97	353.818		
3,500.00	3,447.56	1,395.00	1,378.32	14.02	13.07	-74.44	2,156.98	-8,489.01	8,851.74	8,826.22	25.52	346.887		
3,600.00	3,545.51	1,395.00	1,378.32	14.45	13.07	-74.44	2,156.98	-8,489.01	8,870.03	8,844.14	25.90	342.518		
3,700.00	3,643.46	1,395.00	1,378.32	14.88	13.07	-74.44	2,156.98	-8,489.01	8,889.42	8,863.15	26.27	338.368		
3,800.00	3,741.42	1,438.83	1,419.41	15.32	13.30	-74.57	2,147.97	-8,501.31	8,909.47	8,882.62	26.85	331.780		
3,900.00	3,839.37	1,487.00	1,464.08	15.75	13.55	-74.71	2,137.02	-8,515.62	8,930.60	8,903.14	27.46	325.241		
4,000.00	3,937.33	1,487.00	1,464.08	16.18	13.55	-74.71	2,137.02	-8,515.62	8,952.31	8,924.48	27.83	321.720		
4,100.00	4,035.28	1,487.00	1,464.08	16.62	13.55	-74.71	2,137.02	-8,515.62	8,975.08	8,946.88	28.19	318.376		
4,200.00	4,133.23	1,524.32	1,498.36	17.05	13.75	-74.83	2,127.94	-8,527.28	8,998.56	8,969.81	28.75	312.957		
4,300.00	4,231.19	1,578.00	1,547.14	17.48	14.04	-75.00	2,114.24	-8,544.97	9,023.27	8,993.86	29.41	306.832		
4,400.00	4,329.14	1,578.00	1,547.14	17.92	14.04	-75.00	2,114.24	-8,544.97	9,048.32	9,018.56	29.76	304.001		
4,500.00	4,427.10	1,578.00	1,547.14	18.35	14.04	-75.00	2,114.24	-8,544.97	9,074.41	9,044.29	30.12	301.315		
4,600.00	4,525.05	1,578.00	1,547.14	18.78	14.04	-75.00	2,114.24	-8,544.97	9,101.52	9,071.06	30.46	298.768		
4,700.00	4,623.00	1,578.00	1,547.14	19.22	14.04	-75.00	2,114.24	-8,544.97	9,129.65	9,098.84	30.81	296.355		
4,800.00	4,720.96	1,623.97	1,588.39	19.65	14.28	-75.16	2,101.94	-8,561.11	9,158.10	9,126.67	31.43	291.383		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 563-MWD OWSG Rev5												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
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
4,900.00	4,818.91	1,670.00	1,629.11	20.09	14.53	-75.31	2,089.14	-8,578.34	9,188.08	9,156.03	32.06	286.632	
5,000.00	4,916.87	1,670.00	1,629.11	20.52	14.53	-75.31	2,089.14	-8,578.34	9,218.38	9,185.99	32.39	284.603	
5,100.00	5,014.82	1,670.00	1,629.11	20.96	14.53	-75.31	2,089.14	-8,578.34	9,249.66	9,216.94	32.72	282.684	
5,200.00	5,112.77	1,670.00	1,629.11	21.39	14.53	-75.31	2,089.14	-8,578.34	9,281.91	9,248.86	33.05	280.872	
5,300.00	5,210.73	1,670.00	1,629.11	21.82	14.53	-75.31	2,089.14	-8,578.34	9,315.12	9,281.76	33.37	279.162	
5,400.00	5,308.68	1,710.00	1,664.08	22.26	14.71	-75.45	2,077.84	-8,594.12	9,348.83	9,314.88	33.95	275.370	
5,493.23	5,400.00	1,723.86	1,676.13	22.66	14.78	-75.50	2,073.94	-8,599.75	9,381.16	9,346.82	34.34	273.217	
5,500.00	5,406.64	1,724.86	1,677.00	22.69	14.78	-75.51	2,073.66	-8,600.16	9,383.53	9,349.17	34.36	273.064	
5,600.00	5,504.69	1,763.00	1,709.97	23.12	14.96	-75.83	2,062.97	-8,616.08	9,419.31	9,384.39	34.93	269.675	
5,700.00	5,602.91	1,763.00	1,709.97	23.55	14.96	-76.02	2,062.97	-8,616.08	9,455.80	9,420.57	35.23	268.415	
5,800.00	5,701.29	1,763.00	1,709.97	23.97	14.96	-76.21	2,062.97	-8,616.08	9,493.40	9,457.88	35.52	267.281	
5,900.00	5,799.82	1,763.00	1,709.97	24.39	14.96	-76.42	2,062.97	-8,616.08	9,532.09	9,496.29	35.80	266.269	
6,000.00	5,898.50	1,812.73	1,752.53	24.79	15.15	-76.79	2,048.85	-8,637.57	9,571.35	9,534.95	36.39	262.991	
6,100.00	5,997.31	1,859.00	1,791.69	25.20	15.32	-77.15	2,035.29	-8,658.16	9,611.81	9,574.85	36.96	260.054	
6,200.00	6,096.26	1,859.00	1,791.69	25.60	15.32	-77.37	2,035.29	-8,658.16	9,652.88	9,615.67	37.22	259.372	
6,300.00	6,195.33	1,859.00	1,791.69	25.99	15.32	-77.60	2,035.29	-8,658.16	9,694.99	9,657.52	37.46	258.790	
6,400.00	6,294.51	1,859.00	1,791.69	26.37	15.32	-77.83	2,035.29	-8,658.16	9,738.10	9,700.40	37.70	258.305	
6,498.19	6,392.00	1,859.00	1,791.69	26.75	15.32	-78.07	2,035.29	-8,658.16	9,781.41	9,743.48	37.92	257.919	
6,500.00	6,393.80	1,859.00	1,791.69	26.76	15.32	-76.84	2,035.29	-8,658.16	9,782.22	9,744.29	37.93	257.913	
6,550.00	6,443.29	1,899.10	1,825.09	26.95	15.53	-53.56	2,022.99	-8,676.62	9,802.29	9,763.91	38.38	255.372	
6,600.00	6,492.24	1,905.35	1,830.24	27.16	15.57	-42.28	2,021.00	-8,679.56	9,819.48	9,780.92	38.56	254.652	
6,650.00	6,540.33	1,911.61	1,835.37	27.38	15.60	-36.06	2,019.00	-8,682.52	9,833.32	9,794.57	38.75	253.792	
6,700.00	6,587.28	1,952.00	1,868.09	27.60	15.81	-32.34	2,005.60	-8,702.06	9,844.12	9,804.89	39.23	250.914	
6,750.00	6,632.80	1,952.00	1,868.09	27.84	15.81	-29.77	2,005.60	-8,702.06	9,850.94	9,811.56	39.38	250.153	
6,800.00	6,676.60	1,952.00	1,868.09	28.09	15.81	-28.00	2,005.60	-8,702.06	9,854.28	9,814.74	39.53	249.277	
6,850.00	6,718.42	1,952.00	1,868.09	28.34	15.81	-26.76	2,005.60	-8,702.06	9,854.11	9,814.43	39.69	248.293	
6,900.00	6,758.00	1,952.00	1,868.09	28.60	15.81	-25.91	2,005.60	-8,702.06	9,850.45	9,810.61	39.85	247.208	
6,950.00	6,795.09	1,952.00	1,868.09	28.87	15.81	-25.37	2,005.60	-8,702.06	9,843.31	9,803.30	40.01	246.030	
7,000.00	6,829.46	1,952.00	1,868.09	29.14	15.81	-25.08	2,005.60	-8,702.06	9,832.73	9,792.56	40.17	244.765	
7,050.00	6,860.91	1,952.00	1,868.09	29.43	15.81	-25.02	2,005.60	-8,702.06	9,818.76	9,778.42	40.34	243.422	
7,100.00	6,889.24	1,952.00	1,868.09	29.73	15.81	-25.17	2,005.60	-8,702.06	9,801.47	9,760.97	40.50	242.006	
7,150.00	6,914.27	1,952.00	1,868.09	30.05	15.81	-25.52	2,005.60	-8,702.06	9,780.95	9,740.28	40.67	240.525	
7,200.00	6,935.85	1,952.00	1,868.09	30.37	15.81	-26.09	2,005.60	-8,702.06	9,757.31	9,716.48	40.83	238.986	
7,250.00	6,953.84	1,952.00	1,868.09	30.71	15.81	-26.90	2,005.60	-8,702.06	9,730.67	9,689.69	40.99	237.395	
7,300.00	6,968.15	1,952.00	1,868.09	31.06	15.81	-27.97	2,005.60	-8,702.06	9,701.18	9,660.03	41.15	235.762	
7,350.00	6,978.67	1,990.65	1,898.81	31.42	16.02	-29.60	1,992.27	-8,721.36	9,668.58	9,626.90	41.69	231.932	
7,400.00	6,985.34	1,994.24	1,901.64	31.79	16.04	-31.39	1,991.02	-8,723.17	9,633.78	9,591.90	41.88	230.050	
7,450.00	6,988.13	1,997.31	1,904.05	32.17	16.06	-33.65	1,989.95	-8,724.73	9,596.64	9,554.59	42.06	228.178	
7,461.13	6,988.22	1,997.92	1,904.54	32.26	16.06	-34.23	1,989.73	-8,725.04	9,588.08	9,545.98	42.10	227.749	
7,500.00	6,988.19	2,000.04	1,906.20	32.56	16.07	-33.45	1,988.99	-8,726.12	9,557.93	9,515.70	42.23	226.328	
7,600.00	6,988.12	2,005.77	1,910.70	33.37	16.10	-31.39	1,986.98	-8,729.04	9,479.80	9,437.23	42.56	222.717	
7,700.00	6,988.05	2,046.00	1,942.00	34.21	16.33	-29.52	1,972.65	-8,749.87	9,401.25	9,358.01	43.24	217.413	
7,800.00	6,987.98	2,046.00	1,942.00	35.09	16.33	-27.20	1,972.65	-8,749.87	9,321.60	9,278.10	43.50	214.296	
7,900.00	6,987.91	2,046.00	1,942.00	35.99	16.33	-24.79	1,972.65	-8,749.87	9,241.38	9,197.64	43.74	211.272	
8,000.00	6,987.83	2,046.00	1,942.00	36.93	16.33	-22.28	1,972.65	-8,749.87	9,160.68	9,116.71	43.97	208.348	
8,100.00	6,987.76	2,046.00	1,942.00	37.88	16.33	-19.69	1,972.65	-8,749.87	9,079.57	9,035.40	44.18	205.528	
8,200.00	6,987.68	2,046.00	1,942.00	38.86	16.33	-17.03	1,972.65	-8,749.87	8,998.16	8,953.79	44.37	202.816	
8,300.00	6,987.61	2,046.00	1,942.00	39.86	16.33	-14.31	1,972.65	-8,749.87	8,916.52	8,871.99	44.53	200.215	
8,400.00	6,987.53	2,046.00	1,942.00	40.87	16.33	-11.55	1,972.65	-8,749.87	8,834.76	8,790.08	44.68	197.727	
8,500.00	6,987.46	2,091.27	1,976.69	41.90	16.50	-9.03	1,956.07	-8,773.77	8,752.59	8,707.38	45.21	193.599	
8,600.00	6,987.38	2,106.04	1,987.90	42.93	16.56	-6.29	1,950.53	-8,781.63	8,670.57	8,625.13	45.45	190.790	
8,700.00	6,987.31	5,941.73	5,331.90	43.98	52.19	-37.09	1,134.42	-10,169.29	8,587.15	8,506.81	80.34	106.887	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY											Offset Site Error: 0.00 usft		
Survey Program: Reference		563-MWD OWSG Rev5 Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance			Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,800.00	6,987.23	5,971.15	5,360.77	45.03	52.38	-30.25	1,135.45	-10,174.83	8,489.65	8,408.91	80.74	105.153	
8,872.16	6,987.18	5,992.06	5,381.30	45.79	52.52	-24.48	1,136.20	-10,178.74	8,419.05	8,338.06	81.00	103.943	
8,900.00	6,987.16	6,000.06	5,389.15	46.08	52.57	-24.58	1,136.49	-10,180.24	8,391.78	8,310.68	81.09	103.483	
9,000.00	6,987.09	6,028.58	5,417.16	47.16	52.76	-24.95	1,137.55	-10,185.54	8,293.80	8,212.37	81.44	101.840	
9,100.00	6,987.01	6,056.76	5,444.83	48.27	52.95	-25.33	1,138.61	-10,190.75	8,195.82	8,114.03	81.79	100.211	
9,200.00	6,986.94	6,054.69	5,442.78	49.40	52.91	-25.30	1,138.54	-10,190.46	8,097.95	8,016.06	81.88	98.896	
9,300.00	6,986.86	6,074.98	5,462.69	50.56	53.04	-25.58	1,139.32	-10,194.25	8,000.01	7,917.84	82.17	97.358	
9,400.00	6,986.79	6,095.23	5,482.58	51.75	53.17	-25.86	1,140.12	-10,198.03	7,902.07	7,819.61	82.46	95.826	
9,500.00	6,986.71	6,115.45	5,502.43	52.95	53.29	-26.15	1,140.93	-10,201.80	7,804.14	7,721.38	82.76	94.301	
9,600.00	6,986.64	6,135.64	5,522.25	54.18	53.42	-26.44	1,141.75	-10,205.56	7,706.22	7,623.16	83.06	92.783	
9,700.00	6,986.56	6,155.80	5,542.03	55.42	53.55	-26.74	1,142.58	-10,209.31	7,608.30	7,524.94	83.36	91.271	
9,800.00	6,986.49	6,175.92	5,561.79	56.69	53.67	-27.05	1,143.42	-10,213.06	7,510.38	7,426.71	83.67	89.766	
9,900.00	6,986.41	6,196.01	5,581.51	57.97	53.80	-27.36	1,144.28	-10,216.79	7,412.47	7,328.49	83.98	88.268	
10,000.00	6,986.34	6,216.07	5,601.20	59.26	53.93	-27.68	1,145.14	-10,220.51	7,314.56	7,230.27	84.29	86.777	
10,100.00	6,986.27	6,236.09	5,620.85	60.57	54.05	-28.01	1,146.02	-10,224.23	7,216.66	7,132.05	84.61	85.293	
10,200.00	6,986.19	6,256.08	5,640.48	61.90	54.18	-28.34	1,146.91	-10,227.93	7,118.77	7,033.84	84.93	83.815	
10,300.00	6,986.12	6,276.04	5,660.07	63.23	54.31	-28.68	1,147.82	-10,231.63	7,020.89	6,935.62	85.26	82.345	
10,400.00	6,986.04	6,295.97	5,679.63	64.58	54.43	-29.03	1,148.73	-10,235.32	6,923.01	6,837.41	85.60	80.881	
10,500.00	6,985.97	6,315.86	5,699.16	65.94	54.56	-29.38	1,149.65	-10,239.00	6,825.14	6,739.20	85.93	79.424	
10,600.00	6,985.89	6,335.73	5,718.66	67.32	54.68	-29.74	1,150.59	-10,242.67	6,727.27	6,641.00	86.28	77.974	
10,700.00	6,985.82	6,355.56	5,738.13	68.70	54.81	-30.11	1,151.54	-10,246.33	6,629.42	6,542.79	86.62	76.531	
10,800.00	6,985.74	6,375.35	5,757.56	70.09	54.93	-30.49	1,152.50	-10,249.98	6,531.57	6,444.60	86.98	75.095	
10,900.00	6,985.67	6,395.12	5,776.96	71.49	55.06	-30.88	1,153.46	-10,253.62	6,433.74	6,346.40	87.34	73.666	
11,000.00	6,985.59	6,414.85	5,796.33	72.90	55.18	-31.28	1,154.45	-10,257.25	6,335.91	6,248.21	87.70	72.244	
11,100.00	6,985.52	6,434.55	5,815.67	74.31	55.31	-31.68	1,155.44	-10,260.88	6,238.10	6,150.03	88.07	70.829	
11,200.00	6,985.45	6,454.22	5,834.98	75.74	55.43	-32.10	1,156.44	-10,264.49	6,140.30	6,051.85	88.45	69.421	
11,300.00	6,985.37	6,473.86	5,854.26	77.17	55.55	-32.53	1,157.45	-10,268.10	6,042.51	5,953.67	88.84	68.019	
11,400.00	6,985.30	6,497.67	5,877.63	78.61	55.69	-33.06	1,158.68	-10,272.46	5,944.72	5,855.48	89.24	66.613	
11,500.00	6,985.22	6,521.72	5,901.25	80.05	55.83	-33.61	1,159.90	-10,276.84	5,846.94	5,757.28	89.66	65.214	
11,600.00	6,985.15	6,545.49	5,924.60	81.50	55.97	-34.18	1,161.09	-10,281.14	5,749.16	5,659.08	90.08	63.824	
11,700.00	6,985.07	6,568.98	5,947.68	82.96	56.11	-34.76	1,162.24	-10,285.37	5,651.38	5,560.87	90.51	62.442	
11,800.00	6,985.00	6,592.20	5,970.49	84.42	56.25	-35.36	1,163.36	-10,289.52	5,553.60	5,462.67	90.94	61.069	
11,900.00	6,984.92	6,615.14	5,993.04	85.89	56.38	-35.97	1,164.44	-10,293.60	5,455.83	5,364.45	91.38	59.704	
12,000.00	6,984.85	6,637.82	6,015.34	87.36	56.51	-36.59	1,165.49	-10,297.61	5,358.07	5,266.24	91.83	58.347	
12,100.00	6,984.77	6,660.24	6,037.39	88.83	56.64	-37.23	1,166.52	-10,301.56	5,260.32	5,168.03	92.29	56.998	
12,200.00	6,984.70	6,682.40	6,059.19	90.31	56.77	-37.88	1,167.51	-10,305.43	5,162.57	5,069.82	92.76	55.657	
12,300.00	6,984.63	6,704.31	6,080.74	91.80	56.90	-38.55	1,168.47	-10,309.24	5,064.84	4,971.61	93.23	54.324	
12,400.00	6,984.55	6,725.97	6,102.06	93.29	57.03	-39.23	1,169.41	-10,312.98	4,967.12	4,873.40	93.72	52.999	
12,500.00	6,984.48	6,747.39	6,123.14	94.78	57.15	-39.92	1,170.31	-10,316.66	4,869.42	4,775.20	94.22	51.681	
12,600.00	6,984.40	6,768.57	6,143.98	96.28	57.28	-40.64	1,171.19	-10,320.28	4,771.74	4,677.01	94.73	50.370	
12,700.00	6,984.33	6,789.51	6,164.60	97.78	57.40	-41.36	1,172.04	-10,323.84	4,674.08	4,578.82	95.26	49.067	
12,800.00	6,984.25	6,810.22	6,185.00	99.28	57.52	-42.11	1,172.87	-10,327.34	4,576.45	4,480.65	95.80	47.772	
12,900.00	6,984.18	6,830.70	6,205.17	100.78	57.64	-42.87	1,173.68	-10,330.79	4,478.84	4,382.48	96.35	46.483	
13,000.00	6,984.10	6,850.96	6,225.13	102.29	57.76	-43.64	1,174.46	-10,334.17	4,381.26	4,284.33	96.93	45.202	
13,100.00	6,984.03	6,871.00	6,244.87	103.80	57.87	-44.43	1,175.21	-10,337.51	4,283.71	4,186.20	97.52	43.929	
13,200.00	6,983.95	6,890.82	6,264.41	105.32	57.99	-45.24	1,175.94	-10,340.78	4,186.21	4,088.08	98.13	42.662	
13,300.00	6,983.88	6,910.42	6,283.73	106.84	58.11	-46.07	1,176.65	-10,344.01	4,088.74	3,989.98	98.76	41.402	
13,400.00	6,983.81	6,929.82	6,302.85	108.36	58.22	-46.91	1,177.34	-10,347.18	3,991.32	3,891.91	99.41	40.150	
13,500.00	6,983.73	6,949.00	6,321.77	109.88	58.33	-47.77	1,178.01	-10,350.31	3,893.95	3,793.86	100.09	38.905	
13,600.00	6,983.66	6,968.39	6,340.89	111.40	58.44	-48.67	1,178.67	-10,353.44	3,796.63	3,695.84	100.80	37.667	
13,700.00	6,983.58	6,990.80	6,363.00	112.93	58.57	-49.74	1,179.43	-10,357.04	3,699.37	3,597.83	101.54	36.433	
13,800.00	6,983.51	7,012.73	6,384.64	114.46	58.69	-50.82	1,180.16	-10,360.52	3,602.16	3,499.84	102.31	35.207	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY												Offset Site Error:	0.00 usft				
Survey Program: 563-MWD OWSG Rev5				Reference				Offset				Rule Assigned:				Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning				
13,900.00	6,983.43	7,034.20	6,405.82	115.99	58.81	-51.92	1,180.88	-10,363.89	3,505.00	3,401.88	103.12	33.989					
14,000.00	6,983.36	7,055.21	6,426.57	117.52	58.92	-53.03	1,181.58	-10,367.16	3,407.92	3,303.95	103.97	32.779					
14,100.00	6,983.28	7,075.79	6,446.89	119.06	59.04	-54.15	1,182.26	-10,370.32	3,310.91	3,206.06	104.85	31.577					
14,200.00	6,983.21	7,095.94	6,466.80	120.59	59.15	-55.28	1,182.92	-10,373.39	3,213.99	3,108.21	105.78	30.384					
14,300.00	6,983.13	7,115.68	6,486.31	122.13	59.26	-56.42	1,183.57	-10,376.37	3,117.16	3,010.41	106.75	29.199					
14,400.00	6,983.06	7,135.03	6,505.42	123.67	59.36	-57.58	1,184.20	-10,379.25	3,020.45	2,912.67	107.79	28.023					
14,500.00	6,982.99	7,153.98	6,524.16	125.21	59.47	-58.74	1,184.81	-10,382.05	2,923.86	2,814.99	108.88	26.855					
14,600.00	6,982.91	7,172.56	6,542.53	126.75	59.57	-59.91	1,185.42	-10,384.77	2,827.41	2,717.38	110.03	25.696					
14,700.00	6,982.84	7,190.78	6,560.55	128.30	59.67	-61.08	1,186.00	-10,387.40	2,731.12	2,619.86	111.26	24.547					
14,800.00	6,982.76	7,208.64	6,578.22	129.85	59.77	-62.27	1,186.58	-10,389.96	2,635.01	2,522.44	112.57	23.407					
14,900.00	6,982.69	7,226.16	6,595.55	131.39	59.86	-63.45	1,187.14	-10,392.45	2,539.10	2,425.12	113.97	22.278					
15,000.00	6,982.61	7,243.35	6,612.55	132.94	59.96	-64.64	1,187.68	-10,394.87	2,443.41	2,327.93	115.48	21.159					
15,100.00	6,982.54	7,260.21	6,629.24	134.49	60.05	-65.84	1,188.22	-10,397.22	2,347.99	2,230.89	117.10	20.051					
15,200.00	6,982.46	7,276.75	6,645.62	136.04	60.14	-67.04	1,188.74	-10,399.50	2,252.86	2,134.01	118.85	18.956					
15,300.00	6,982.39	7,292.99	6,661.69	137.60	60.23	-68.23	1,189.25	-10,401.72	2,158.06	2,037.32	120.74	17.873					
15,400.00	6,982.31	7,308.93	6,677.48	139.15	60.32	-69.43	1,189.75	-10,403.88	2,063.65	1,940.85	122.80	16.805					
15,500.00	6,982.24	7,324.58	6,692.98	140.70	60.41	-70.63	1,190.24	-10,405.98	1,969.69	1,844.64	125.05	15.751					
15,600.00	6,982.17	7,339.94	6,708.20	142.26	60.49	-71.82	1,190.72	-10,408.02	1,876.24	1,748.73	127.51	14.715					
15,700.00	6,982.09	7,355.03	6,723.15	143.82	60.58	-73.01	1,191.19	-10,410.01	1,783.39	1,653.18	130.21	13.696					
15,800.00	6,982.02	7,369.86	6,737.84	145.38	60.66	-74.20	1,191.64	-10,411.95	1,691.24	1,558.04	133.19	12.698					
15,900.00	6,981.94	7,384.42	6,752.27	146.94	60.74	-75.38	1,192.09	-10,413.83	1,599.91	1,463.41	136.50	11.721					
16,000.00	6,981.87	7,398.73	6,766.46	148.50	60.82	-76.56	1,192.53	-10,415.67	1,509.56	1,369.39	140.17	10.770					
16,100.00	6,981.79	7,412.79	6,780.40	150.06	60.90	-77.72	1,192.96	-10,417.46	1,420.37	1,276.11	144.26	9.846					
16,200.00	6,981.72	7,426.61	6,794.10	151.62	60.97	-78.88	1,193.38	-10,419.20	1,332.59	1,183.75	148.84	8.953					
16,300.00	6,981.64	7,440.19	6,807.57	153.18	61.05	-80.03	1,193.80	-10,420.90	1,246.51	1,092.54	153.97	8.096					
16,400.00	6,981.57	7,453.55	6,820.82	154.74	61.12	-81.17	1,194.20	-10,422.56	1,162.52	1,002.79	159.73	7.278					
16,500.00	6,981.49	7,466.68	6,833.85	156.31	61.19	-82.30	1,194.60	-10,424.17	1,081.11	914.91	166.20	6.505					
16,600.00	6,981.42	7,479.60	6,846.66	157.87	61.27	-83.42	1,194.99	-10,425.75	1,002.91	829.48	173.43	5.783					
16,700.00	6,981.35	7,492.21	6,859.18	159.44	61.31	-84.52	1,195.37	-10,427.29	928.73	747.32	181.41	5.119					
16,800.00	6,981.27	7,504.77	6,871.64	161.01	61.37	-85.62	1,195.76	-10,428.80	859.62	669.48	190.14	4.521					
16,900.00	6,981.20	7,517.19	6,883.96	162.58	61.43	-86.71	1,196.14	-10,430.30	796.91	597.52	199.38	3.997					
17,000.00	6,981.12	7,529.48	6,896.15	164.14	61.49	-87.80	1,196.52	-10,431.76	742.21	533.49	208.72	3.556					
17,100.00	6,981.05	7,541.64	6,908.22	165.71	61.55	-88.87	1,196.90	-10,433.21	697.42	480.01	217.41	3.208					
17,200.00	6,980.97	7,553.66	6,920.15	167.28	61.60	-89.94	1,197.28	-10,434.63	664.56	440.15	224.40	2.961					
17,300.00	6,980.90	7,565.56	6,931.96	168.85	61.66	-90.99	1,197.65	-10,436.03	645.44	416.92	228.52	2.824					
17,376.96	6,980.84	7,574.63	6,940.96	170.06	61.70	-91.80	1,197.94	-10,437.09	640.90	411.76	229.14	2.797	CC, ES, SF				
17,400.00	6,980.82	7,577.33	6,943.65	170.42	61.71	-92.04	1,198.02	-10,437.41	641.31	412.45	228.86	2.802					
17,500.00	6,980.75	7,588.98	6,955.21	172.00	61.77	-93.07	1,198.40	-10,438.76	652.45	427.24	225.21	2.897					
17,600.00	6,980.67	7,600.50	6,966.65	173.57	61.82	-94.10	1,198.76	-10,440.10	678.11	459.94	218.17	3.108					
17,700.00	6,980.60	7,611.91	6,977.97	175.14	61.88	-95.11	1,199.13	-10,441.41	716.74	507.87	208.86	3.432					
17,800.00	6,980.53	7,623.19	6,989.18	176.71	61.93	-96.10	1,199.50	-10,442.70	766.38	567.88	198.49	3.861					
17,900.00	6,980.45	7,634.36	7,000.27	178.29	61.98	-97.09	1,199.86	-10,443.98	825.05	637.04	188.00	4.388					
18,000.00	6,980.38	7,645.42	7,011.25	179.86	62.03	-98.06	1,200.22	-10,445.23	890.96	712.96	178.00	5.005					
18,100.00	6,980.30	7,656.36	7,022.11	181.44	62.08	-99.02	1,200.58	-10,446.47	962.64	793.84	168.80	5.703					
18,200.00	6,980.23	7,667.19	7,032.87	183.01	62.14	-99.97	1,200.94	-10,447.68	1,038.89	878.37	160.52	6.472					
18,300.00	6,980.15	7,677.91	7,043.52	184.59	62.19	-100.90	1,201.30	-10,448.88	1,118.79	965.61	153.18	7.304					
18,400.00	6,980.08	7,688.53	7,054.06	186.16	62.24	-101.81	1,201.65	-10,450.06	1,201.59	1,054.90	146.70	8.191					
18,500.00	6,980.00	7,699.03	7,064.50	187.74	62.29	-102.72	1,202.00	-10,451.22	1,286.76	1,145.75	141.00	9.126					
18,600.00	6,979.93	7,709.43	7,074.83	189.32	62.33	-103.61	1,202.35	-10,452.37	1,373.84	1,237.83	136.01	10.101					
18,700.00	6,979.85	7,719.73	7,085.06	190.90	62.38	-104.48	1,202.70	-10,453.49	1,462.49	1,330.87	131.63	11.111					
18,800.00	6,979.78	7,729.93	7,095.19	192.48	62.43	-105.34	1,203.05	-10,454.60	1,552.46	1,424.68	127.78	12.150					
18,900.00	6,979.71	7,740.03	7,105.22	194.05	62.48	-106.19	1,203.39	-10,455.70	1,643.51	1,519.12	124.39	13.212					

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164B - OH - OH-SVY											Offset Site Error: 0.00 usft
Survey Program: 563-MWD OWSG Rev5											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	
19,000.00	6,979.63	7,750.03	7,115.16	195.63	62.53	-107.02	1,203.74	-10,456.78	1,735.49	1,614.08	14.294
19,100.00	6,979.56	7,759.93	7,125.00	197.21	62.57	-107.84	1,204.08	-10,457.84	1,828.26	1,709.47	15.391
19,200.00	6,979.48	7,769.73	7,134.74	198.79	62.62	-108.64	1,204.42	-10,458.89	1,921.69	1,805.23	16.501
19,300.00	6,979.41	7,779.45	7,144.39	200.37	62.66	-109.43	1,204.75	-10,459.92	2,015.71	1,901.30	17.619
19,400.00	6,979.33	7,789.06	7,153.95	201.95	62.71	-110.20	1,205.09	-10,460.94	2,110.22	1,997.64	18.743
19,500.00	6,979.26	7,798.59	7,163.42	203.54	62.75	-110.96	1,205.42	-10,461.94	2,205.18	2,094.20	19.872
19,600.00	6,979.18	7,808.03	7,172.79	205.12	62.80	-111.71	1,205.75	-10,462.93	2,300.51	2,190.98	21.002
19,700.00	6,979.11	7,817.37	7,182.08	206.70	62.84	-112.44	1,206.08	-10,463.90	2,396.19	2,287.93	22.133
19,800.00	6,979.03	7,826.63	7,191.29	208.28	62.89	-113.16	1,206.41	-10,464.87	2,492.17	2,385.04	23.263
19,900.00	6,978.96	7,835.80	7,200.40	209.86	62.93	-113.87	1,206.74	-10,465.81	2,588.42	2,482.29	24.390
20,000.00	6,978.89	7,844.89	7,209.43	211.45	62.97	-114.56	1,207.06	-10,466.75	2,684.90	2,579.67	25.515
20,100.00	6,978.81	7,853.89	7,218.38	213.03	63.02	-115.24	1,207.38	-10,467.67	2,781.60	2,677.17	26.635
20,200.00	6,978.74	7,862.81	7,227.25	214.61	63.06	-115.90	1,207.71	-10,468.58	2,878.50	2,774.78	27.752
20,300.00	6,978.66	7,871.65	7,236.04	216.20	63.10	-116.56	1,208.02	-10,469.47	2,975.57	2,872.48	28.862
20,400.00	6,978.59	7,880.40	7,244.74	217.78	63.14	-117.20	1,208.34	-10,470.36	3,072.80	2,970.26	29.968
20,500.00	6,978.51	7,889.08	7,253.37	219.37	63.18	-117.83	1,208.66	-10,471.23	3,170.17	3,068.13	31.068
20,600.00	6,978.44	7,897.67	7,261.92	220.95	63.22	-118.44	1,208.97	-10,472.09	3,267.68	3,166.08	32.162
20,700.00	6,978.36	7,938.00	7,302.02	222.53	63.41	-121.25	1,210.46	-10,476.07	3,365.48	3,263.71	33.069
20,800.00	6,978.29	7,938.00	7,302.02	224.12	63.41	-121.25	1,210.46	-10,476.07	3,463.14	3,361.86	34.194
20,900.00	6,978.21	7,938.00	7,302.02	225.71	63.41	-121.25	1,210.46	-10,476.07	3,560.92	3,460.09	35.316
21,000.00	6,978.14	7,938.00	7,302.02	227.29	63.41	-121.25	1,210.46	-10,476.07	3,658.83	3,558.40	36.433
21,100.00	6,978.07	7,938.00	7,302.02	228.88	63.41	-121.25	1,210.46	-10,476.07	3,756.85	3,656.79	37.547
21,200.00	6,977.99	7,938.00	7,302.02	230.46	63.41	-121.25	1,210.46	-10,476.07	3,854.96	3,755.24	38.655
21,300.00	6,977.92	7,938.00	7,302.02	232.05	63.41	-121.25	1,210.46	-10,476.07	3,953.18	3,853.75	39.760
21,400.00	6,977.84	7,938.00	7,302.02	233.64	63.41	-121.25	1,210.46	-10,476.07	4,051.48	3,952.32	40.859
21,500.00	6,977.77	7,938.00	7,302.02	235.22	63.41	-121.25	1,210.46	-10,476.07	4,149.86	4,050.94	41.954
21,600.00	6,977.69	7,938.00	7,302.02	236.81	63.41	-121.25	1,210.46	-10,476.07	4,248.31	4,149.62	43.045
21,700.00	6,977.62	7,938.00	7,302.02	238.40	63.41	-121.25	1,210.46	-10,476.07	4,346.84	4,248.34	44.130
21,800.00	6,977.54	7,938.00	7,302.02	239.99	63.41	-121.25	1,210.46	-10,476.07	4,445.43	4,347.11	45.211
21,900.00	6,977.47	7,938.00	7,302.02	241.57	63.41	-121.25	1,210.46	-10,476.07	4,544.09	4,445.92	46.288
22,000.00	6,977.39	7,938.00	7,302.02	243.16	63.41	-121.25	1,210.46	-10,476.07	4,642.80	4,544.77	47.360
22,100.00	6,977.32	7,938.00	7,302.02	244.75	63.41	-121.25	1,210.46	-10,476.07	4,741.56	4,643.65	48.427
22,200.00	6,977.25	8,020.49	7,384.07	246.34	63.99	-126.54	1,213.56	-10,483.90	4,839.46	4,740.24	49.776
22,300.00	6,977.17	8,027.40	7,390.95	247.93	64.04	-126.95	1,213.83	-10,484.54	4,938.17	4,838.94	49.764
22,400.00	6,977.10	8,034.25	7,397.76	249.52	64.09	-127.36	1,214.09	-10,485.16	5,036.93	4,937.68	50.747
22,500.00	6,977.02	8,041.02	7,404.51	251.11	64.13	-127.76	1,214.35	-10,485.78	5,135.72	5,036.44	51.725
22,529.62	6,977.00	8,043.02	7,406.49	251.58	64.15	-127.88	1,214.43	-10,485.96	5,164.99	5,065.69	52.014

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 386-APC_ISCWSA REV 2 MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-71.93	2,610.44	-7,998.65	8,413.86				
100.00	100.00	1,690.00	1,571.11	0.25	9.49	-75.16	2,118.39	-7,997.53	8,406.46	8,396.83	9.62	873.765	
200.00	200.00	1,722.00	1,597.57	0.61	9.78	-75.28	2,100.39	-7,997.56	8,389.23	8,379.08	10.15	826.471	
300.00	300.00	1,803.74	1,665.53	0.97	10.51	-75.59	2,054.99	-7,997.60	8,372.67	8,361.49	11.18	748.919	
400.00	400.00	1,866.09	1,717.30	1.33	11.13	-75.82	2,020.23	-7,997.53	8,356.28	8,344.16	12.13	689.169	
500.00	500.00	1,893.12	1,739.87	1.68	11.37	-75.92	2,005.37	-7,997.62	8,340.76	8,328.04	12.72	655.837	
550.00	550.00	1,913.00	1,756.57	1.86	11.54	-76.00	1,994.58	-7,997.73	8,333.31	8,320.25	13.06	638.035	
600.00	600.00	1,934.00	1,774.24	2.04	11.73	-73.83	1,983.23	-7,997.88	8,325.93	8,312.50	13.43	619.984	
700.00	699.93	1,994.27	1,824.77	2.40	12.32	-74.36	1,950.39	-7,998.50	8,310.86	8,296.49	14.37	578.398	
800.00	799.68	2,041.00	1,863.89	2.77	12.77	-74.85	1,924.84	-7,999.27	8,295.64	8,280.46	15.18	546.456	
900.00	899.13	2,183.79	1,983.07	3.13	14.15	-75.78	1,846.21	-8,000.89	8,279.29	8,262.38	16.91	489.712	
1,000.00	998.15	2,198.00	1,994.84	3.49	14.29	-76.17	1,838.26	-8,001.13	8,262.99	8,245.56	17.43	474.011	
1,100.00	1,096.63	2,345.86	2,117.32	3.87	15.71	-77.21	1,755.48	-8,003.38	8,246.20	8,226.98	19.22	428.967	
1,130.50	1,126.54	2,372.94	2,140.01	3.99	15.97	-77.45	1,740.69	-8,003.58	8,240.98	8,221.39	19.60	420.546	
1,200.00	1,194.61	2,484.00	2,233.63	4.26	16.99	-77.98	1,680.95	-8,003.48	8,228.83	8,207.95	20.88	394.033	
1,300.00	1,292.57	2,599.54	2,331.00	4.66	18.10	-78.54	1,618.76	-8,003.16	8,211.94	8,189.57	22.38	366.967	
1,400.00	1,390.52	2,643.00	2,367.74	5.07	18.50	-78.75	1,595.55	-8,002.78	8,195.16	8,171.95	23.20	353.233	
1,500.00	1,488.48	2,916.00	2,596.67	5.48	21.16	-80.10	1,446.91	-7,999.47	8,179.26	8,153.04	26.22	311.942	
1,600.00	1,586.43	2,931.00	2,609.07	5.90	21.31	-80.17	1,438.48	-7,999.17	8,162.26	8,135.45	26.81	304.432	
1,700.00	1,684.38	2,963.00	2,635.65	6.31	21.61	-80.33	1,420.66	-7,998.72	8,146.30	8,118.75	27.55	295.699	
1,800.00	1,782.34	3,090.00	2,744.56	6.73	22.71	-80.93	1,355.51	-7,994.92	8,130.43	8,101.37	29.06	279.794	
1,900.00	1,880.29	3,122.00	2,772.57	7.15	22.97	-81.08	1,340.08	-7,993.79	8,115.35	8,085.58	29.77	272.622	
2,000.00	1,978.25	3,153.00	2,799.98	7.58	23.21	-81.22	1,325.63	-7,992.88	8,101.27	8,070.81	30.46	265.967	
2,100.00	2,076.20	3,168.61	2,813.87	8.00	23.33	-81.29	1,318.52	-7,992.49	8,088.14	8,057.11	31.03	260.631	
2,200.00	2,174.15	3,216.00	2,856.26	8.43	23.70	-81.49	1,297.37	-7,991.43	8,075.93	8,044.09	31.84	253.644	
2,300.00	2,272.11	3,247.00	2,884.26	8.85	23.92	-81.63	1,284.06	-7,990.86	8,064.59	8,032.07	32.52	248.006	
2,400.00	2,370.06	3,247.00	2,884.26	9.28	23.92	-81.63	1,284.06	-7,990.86	8,054.24	8,021.27	32.97	244.271	
2,500.00	2,468.02	3,279.00	2,913.47	9.71	24.15	-81.76	1,271.02	-7,990.66	8,045.02	8,011.37	33.65	239.109	
2,600.00	2,565.97	3,279.00	2,913.47	10.14	24.15	-81.76	1,271.02	-7,990.66	8,036.81	8,002.71	34.10	235.707	
2,700.00	2,663.92	3,468.00	3,090.72	10.57	25.30	-82.47	1,205.70	-7,988.47	8,028.52	7,992.84	35.68	225.023	
2,800.00	2,761.88	3,482.36	3,104.42	11.00	25.38	-82.51	1,201.42	-7,988.19	8,020.68	7,984.48	36.20	221.537	
2,900.00	2,859.83	3,500.00	3,121.31	11.43	25.47	-82.57	1,196.33	-7,988.08	8,014.00	7,977.25	36.75	218.096	
3,000.00	2,957.79	3,512.80	3,133.61	11.86	25.53	-82.62	1,192.77	-7,988.10	8,008.37	7,971.11	37.25	214.967	
3,100.00	3,055.74	3,657.00	3,273.43	12.29	26.19	-83.06	1,157.54	-7,988.02	8,003.54	7,965.19	38.35	208.711	
3,200.00	3,153.69	3,688.00	3,303.67	12.72	26.31	-83.15	1,150.74	-7,987.93	7,998.57	7,959.65	38.92	205.525	
3,300.00	3,251.65	3,719.00	3,334.05	13.15	26.43	-83.24	1,144.59	-7,988.02	7,994.51	7,955.03	39.48	202.517	
3,400.00	3,349.60	3,875.00	3,487.89	13.59	26.93	-83.64	1,118.79	-7,987.71	7,990.67	7,950.25	40.42	197.706	
3,500.00	3,447.56	3,907.00	3,519.62	14.02	27.02	-83.72	1,114.65	-7,987.55	7,986.84	7,945.90	40.94	195.072	
3,600.00	3,545.51	3,925.48	3,537.98	14.45	27.06	-83.76	1,112.57	-7,987.60	7,983.97	7,942.55	41.42	192.735	
3,700.00	3,643.46	3,938.00	3,550.44	14.88	27.09	-83.78	1,111.31	-7,987.70	7,982.11	7,940.22	41.89	190.555	
3,800.00	3,741.42	3,969.00	3,581.32	15.32	27.15	-83.85	1,108.66	-7,988.20	7,981.18	7,938.80	42.38	188.316	
3,900.00	3,839.37	4,049.37	3,661.55	15.75	27.26	-83.99	1,104.44	-7,990.01	7,980.95	7,938.02	42.93	185.898	
4,000.00	3,937.33	4,147.74	3,759.81	16.18	27.38	-84.16	1,100.53	-7,992.20	7,980.86	7,937.37	43.50	183.486	
4,100.00	4,035.28	4,246.71	3,858.69	16.62	27.51	-84.33	1,096.64	-7,994.38	7,980.83	7,936.76	44.06	181.125	
4,126.51	4,061.25	4,272.96	3,884.91	16.73	27.54	-84.38	1,095.61	-7,994.96	7,980.83	7,936.61	44.21	180.509	
4,200.00	4,133.23	4,345.72	3,957.60	17.05	27.64	-84.50	1,092.79	-7,996.54	7,980.84	7,936.21	44.63	178.826	
4,300.00	4,231.19	4,444.74	4,056.53	17.48	27.77	-84.67	1,088.99	-7,998.67	7,980.90	7,935.70	45.20	176.587	
4,400.00	4,329.14	4,543.80	4,155.49	17.92	27.89	-84.84	1,085.24	-8,000.78	7,981.01	7,935.24	45.76	174.404	
4,500.00	4,427.10	4,642.87	4,254.47	18.35	28.02	-85.01	1,081.53	-8,002.86	7,981.16	7,934.83	46.33	172.277	
4,600.00	4,525.05	4,741.97	4,353.48	18.78	28.15	-85.18	1,077.87	-8,004.91	7,981.36	7,934.47	46.89	170.203	
4,700.00	4,623.00	4,841.09	4,452.51	19.22	28.28	-85.35	1,074.26	-8,006.94	7,981.61	7,934.15	47.46	168.180	
4,800.00	4,720.96	4,940.23	4,551.57	19.65	28.41	-85.52	1,070.69	-8,008.95	7,981.91	7,933.88	48.02	166.207	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		386-APC_ISCWSA REV 2 MWD						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
4,900.00	4,818.91	5,039.40	4,650.66	20.09	28.53	-85.69	1,067.16	-8,010.92	7,982.25	7,933.66	48.59	164.280	
5,000.00	4,916.87	5,138.59	4,749.77	20.52	28.66	-85.85	1,063.69	-8,012.87	7,982.63	7,933.48	49.15	162.399	
5,100.00	5,014.82	5,237.81	4,848.90	20.96	28.79	-86.02	1,060.25	-8,014.80	7,983.06	7,933.34	49.72	160.563	
5,200.00	5,112.77	5,337.04	4,948.07	21.39	28.92	-86.19	1,056.87	-8,016.70	7,983.54	7,933.25	50.28	158.769	
5,300.00	5,210.73	5,436.31	5,047.25	21.82	29.05	-86.35	1,053.53	-8,018.57	7,984.06	7,933.21	50.85	157.015	
5,400.00	5,308.68	5,535.59	5,146.47	22.26	29.17	-86.52	1,050.24	-8,020.42	7,984.62	7,933.21	51.41	155.302	
5,493.23	5,400.00	5,628.17	5,238.98	22.66	29.29	-86.68	1,047.21	-8,022.12	7,985.18	7,933.24	51.94	153.739	
5,500.00	5,406.64	5,634.90	5,245.70	22.69	29.30	-86.69	1,046.99	-8,022.24	7,985.23	7,933.25	51.98	153.627	
5,600.00	5,504.69	5,734.34	5,345.08	23.12	29.43	-86.85	1,043.78	-8,024.04	7,985.90	7,933.36	52.54	151.998	
5,700.00	5,602.91	5,834.01	5,444.68	23.55	29.56	-87.01	1,040.62	-8,025.82	7,986.66	7,933.57	53.10	150.421	
5,800.00	5,701.29	5,933.89	5,544.50	23.97	29.69	-87.17	1,037.50	-8,027.57	7,987.50	7,933.85	53.65	148.893	
5,900.00	5,799.82	6,033.97	5,644.51	24.39	29.82	-87.32	1,034.41	-8,029.30	7,988.41	7,934.22	54.19	147.413	
6,000.00	5,898.50	6,134.24	5,744.73	24.79	29.95	-87.46	1,031.37	-8,031.00	7,989.38	7,934.65	54.73	145.978	
6,100.00	5,997.31	6,234.70	5,845.13	25.20	30.08	-87.60	1,028.38	-8,032.69	7,990.41	7,935.14	55.26	144.587	
6,200.00	6,096.26	6,335.34	5,945.71	25.60	30.21	-87.73	1,025.42	-8,034.34	7,991.48	7,935.69	55.79	143.239	
6,300.00	6,195.33	6,436.15	6,046.46	25.99	30.34	-87.85	1,022.51	-8,035.98	7,992.60	7,936.29	56.31	141.930	
6,400.00	6,294.51	6,537.11	6,147.37	26.37	30.47	-87.97	1,019.64	-8,037.59	7,993.76	7,936.93	56.83	140.660	
6,498.19	6,392.00	6,636.38	6,246.59	26.75	30.60	-88.08	1,016.87	-8,039.14	7,994.93	7,937.60	57.33	139.449	
6,500.00	6,393.80	6,638.22	6,248.43	26.76	30.60	-86.88	1,016.82	-8,039.17	7,994.95	7,937.61	57.34	139.427	
6,550.00	6,443.29	6,688.63	6,298.82	26.95	30.66	-64.23	1,015.43	-8,039.95	7,993.71	7,936.11	57.60	138.776	
6,600.00	6,492.24	6,738.49	6,348.65	27.16	30.73	-53.72	1,014.07	-8,040.71	7,989.04	7,931.17	57.87	138.046	
6,650.00	6,540.33	6,787.49	6,397.63	27.38	30.79	-48.32	1,012.74	-8,041.46	7,980.98	7,922.83	58.15	137.245	
6,700.00	6,587.28	6,835.33	6,445.44	27.60	30.85	-45.36	1,011.45	-8,042.18	7,969.59	7,911.15	58.44	136.379	
6,750.00	6,632.80	6,881.71	6,491.81	27.84	30.91	-43.79	1,010.22	-8,042.87	7,954.95	7,896.22	58.73	135.455	
6,800.00	6,676.60	6,926.35	6,536.43	28.09	30.97	-43.13	1,009.04	-8,043.53	7,937.15	7,878.13	59.02	134.480	
6,850.00	6,718.42	6,968.98	6,579.03	28.34	31.03	-43.14	1,007.92	-8,044.16	7,916.32	7,857.00	59.32	133.459	
6,900.00	6,758.00	7,009.32	6,619.35	28.60	31.08	-43.70	1,006.87	-8,044.75	7,892.59	7,832.98	59.61	132.400	
6,950.00	6,795.09	7,047.13	6,657.15	28.87	31.13	-44.76	1,005.90	-8,045.30	7,866.13	7,806.22	59.91	131.307	
7,000.00	6,829.46	7,082.18	6,692.18	29.14	31.17	-46.32	1,005.00	-8,045.80	7,837.10	7,776.90	60.20	130.186	
7,050.00	6,860.91	7,114.24	6,724.23	29.43	31.22	-48.37	1,004.18	-8,046.26	7,805.70	7,745.21	60.49	129.043	
7,100.00	6,889.24	7,143.13	6,753.10	29.73	31.25	-50.95	1,003.45	-8,046.67	7,772.12	7,711.35	60.78	127.882	
7,150.00	6,914.27	7,168.66	6,778.62	30.05	31.29	-54.12	1,002.80	-8,047.03	7,736.59	7,675.53	61.06	126.709	
7,200.00	6,935.85	7,190.67	6,800.63	30.37	31.31	-57.90	1,002.25	-8,047.34	7,699.33	7,638.00	61.34	125.528	
7,250.00	6,953.84	7,209.04	6,818.99	30.71	31.34	-62.37	1,001.79	-8,047.60	7,660.58	7,598.98	61.61	124.345	
7,300.00	6,968.15	7,223.64	6,833.58	31.06	31.36	-67.53	1,001.43	-8,047.80	7,620.58	7,558.71	61.87	123.163	
7,350.00	6,978.67	7,234.38	6,844.32	31.42	31.37	-73.39	1,001.16	-8,047.95	7,579.59	7,517.45	62.13	121.987	
7,400.00	6,985.34	7,241.20	6,851.14	31.79	31.38	-79.87	1,000.99	-8,048.05	7,537.85	7,475.46	62.39	120.822	
7,450.00	6,988.13	7,244.07	6,854.00	32.17	31.38	-86.81	1,000.92	-8,048.09	7,495.62	7,432.99	62.63	119.672	
7,461.13	6,988.22	7,244.16	6,854.10	32.26	31.38	-88.40	1,000.92	-8,048.09	7,486.18	7,423.49	62.69	119.418	
7,500.00	6,988.19	7,244.16	6,854.09	32.56	31.38	-88.36	1,000.92	-8,048.09	7,453.09	7,390.21	62.88	118.535	
7,600.00	6,988.12	7,244.21	6,854.15	33.37	31.38	-88.27	1,000.92	-8,048.09	7,366.95	7,303.59	63.36	116.273	
7,700.00	6,988.05	7,244.37	6,854.31	34.21	31.38	-88.16	1,000.91	-8,048.09	7,279.42	7,215.58	63.84	114.028	
7,800.00	6,987.98	7,244.63	6,854.57	35.09	31.38	-88.04	1,000.91	-8,048.10	7,190.55	7,126.24	64.31	111.809	
7,900.00	6,987.91	7,244.99	6,854.93	35.99	31.38	-87.90	1,000.90	-8,048.10	7,100.40	7,035.62	64.77	109.618	
8,000.00	6,987.83	7,245.45	6,855.38	36.93	31.39	-87.74	1,000.89	-8,048.11	7,009.03	6,943.81	65.22	107.462	
8,100.00	6,987.76	7,246.01	6,855.94	37.88	31.39	-87.55	1,000.87	-8,048.12	6,916.52	6,850.86	65.66	105.343	
8,200.00	6,987.68	7,246.66	6,856.59	38.86	31.39	-87.33	1,000.86	-8,048.13	6,822.92	6,756.85	66.07	103.265	
8,300.00	6,987.61	7,247.41	6,857.35	39.86	31.39	-87.07	1,000.84	-8,048.14	6,728.31	6,661.84	66.46	101.231	
8,400.00	6,987.53	7,248.26	6,858.19	40.87	31.39	-86.75	1,000.82	-8,048.15	6,632.76	6,565.93	66.83	99.243	
8,500.00	6,987.46	7,249.20	6,859.14	41.90	31.39	-86.34	1,000.79	-8,048.16	6,536.36	6,469.19	67.17	97.304	
8,600.00	6,987.38	7,250.24	6,860.17	42.93	31.39	-85.82	1,000.77	-8,048.18	6,439.18	6,371.69	67.49	95.416	
8,700.00	6,987.31	7,251.37	6,861.30	43.98	31.39	-85.11	1,000.74	-8,048.19	6,341.31	6,273.54	67.76	93.580	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		386-APC_ISCWSA REV 2 MWD						Rule Assigned:					Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.23	7,252.59	6,862.52	45.03	31.39	-84.11	1,000.71	-8,048.21	6,242.83	6,174.83	68.01	91.798		
8,872.16	6,987.18	7,253.53	6,863.46	45.79	31.40	-83.09	1,000.69	-8,048.22	6,171.45	6,103.30	68.16	90.546		
8,900.00	6,987.16	7,253.90	6,863.83	46.08	31.40	-83.11	1,000.68	-8,048.23	6,143.87	6,075.65	68.21	90.069		
9,000.00	6,987.09	7,255.22	6,865.15	47.16	31.40	-83.20	1,000.65	-8,048.24	6,044.80	5,976.39	68.41	88.357		
9,100.00	6,987.01	7,256.55	6,866.48	48.27	31.40	-83.29	1,000.61	-8,048.26	5,945.77	5,877.15	68.62	86.646		
9,200.00	6,986.94	7,257.88	6,867.81	49.40	31.40	-83.39	1,000.58	-8,048.28	5,846.77	5,777.93	68.84	84.936		
9,300.00	6,986.86	7,259.21	6,869.13	50.56	31.40	-83.48	1,000.55	-8,048.30	5,747.81	5,678.74	69.06	83.227		
9,400.00	6,986.79	7,260.53	6,870.46	51.75	31.40	-83.57	1,000.51	-8,048.32	5,648.88	5,579.58	69.30	81.519		
9,500.00	6,986.71	7,261.86	6,871.78	52.95	31.41	-83.66	1,000.48	-8,048.34	5,549.99	5,480.45	69.54	79.812		
9,600.00	6,986.64	7,263.18	6,873.11	54.18	31.41	-83.75	1,000.45	-8,048.36	5,451.13	5,381.34	69.79	78.107		
9,700.00	6,986.56	7,264.50	6,874.43	55.42	31.41	-83.84	1,000.42	-8,048.37	5,352.33	5,282.27	70.05	76.404		
9,800.00	6,986.49	7,265.83	6,875.75	56.69	31.41	-83.93	1,000.38	-8,048.39	5,253.56	5,183.24	70.33	74.703		
9,900.00	6,986.41	7,267.15	6,877.07	57.97	31.41	-84.02	1,000.35	-8,048.41	5,154.85	5,084.23	70.61	73.003		
10,000.00	6,986.34	7,268.47	6,878.39	59.26	31.42	-84.11	1,000.32	-8,048.43	5,056.18	4,985.27	70.91	71.306		
10,100.00	6,986.27	7,269.79	6,879.71	60.57	31.42	-84.20	1,000.29	-8,048.45	4,957.57	4,886.35	71.22	69.612		
10,200.00	6,986.19	7,271.11	6,881.03	61.90	31.42	-84.29	1,000.25	-8,048.47	4,859.01	4,787.47	71.54	67.920		
10,300.00	6,986.12	7,272.43	6,882.35	63.23	31.42	-84.39	1,000.22	-8,048.48	4,760.51	4,688.63	71.88	66.230		
10,400.00	6,986.04	7,273.75	6,883.67	64.58	31.42	-84.48	1,000.19	-8,048.50	4,662.08	4,589.85	72.23	64.544		
10,500.00	6,985.97	7,275.06	6,884.99	65.94	31.42	-84.57	1,000.16	-8,048.52	4,563.71	4,491.11	72.60	62.861		
10,600.00	6,985.89	7,276.38	6,886.30	67.32	31.43	-84.66	1,000.12	-8,048.54	4,465.42	4,392.43	72.99	61.182		
10,700.00	6,985.82	7,277.70	6,887.62	68.70	31.43	-84.75	1,000.09	-8,048.56	4,367.20	4,293.81	73.39	59.506		
10,800.00	6,985.74	7,279.01	6,888.93	70.09	31.43	-84.84	1,000.06	-8,048.57	4,269.07	4,195.25	73.82	57.834		
10,900.00	6,985.67	7,280.33	6,890.25	71.49	31.43	-84.93	1,000.03	-8,048.59	4,171.02	4,096.76	74.26	56.167		
11,000.00	6,985.59	7,281.64	6,891.56	72.90	31.43	-85.02	999.99	-8,048.61	4,073.07	3,998.34	74.73	54.505		
11,100.00	6,985.52	7,282.95	6,892.87	74.31	31.43	-85.11	999.96	-8,048.63	3,975.22	3,900.00	75.22	52.847		
11,200.00	6,985.45	7,284.27	6,894.19	75.74	31.44	-85.20	999.93	-8,048.65	3,877.48	3,801.74	75.74	51.195		
11,300.00	6,985.37	7,285.58	6,895.50	77.17	31.44	-85.29	999.90	-8,048.66	3,779.86	3,703.57	76.28	49.549		
11,400.00	6,985.30	7,286.89	6,896.81	78.61	31.44	-85.38	999.86	-8,048.68	3,682.36	3,605.50	76.86	47.909		
11,500.00	6,985.22	7,288.20	6,898.12	80.05	31.44	-85.47	999.83	-8,048.70	3,585.01	3,507.54	77.47	46.277		
11,600.00	6,985.15	7,289.51	6,899.43	81.50	31.44	-85.56	999.80	-8,048.72	3,487.80	3,409.68	78.11	44.651		
11,700.00	6,985.07	7,290.82	6,900.74	82.96	31.44	-85.65	999.77	-8,048.74	3,390.75	3,311.96	78.79	43.033		
11,800.00	6,985.00	7,292.13	6,902.04	84.42	31.45	-85.74	999.74	-8,048.76	3,293.88	3,214.36	79.52	41.424		
11,900.00	6,984.92	7,293.44	6,903.35	85.89	31.45	-85.83	999.70	-8,048.77	3,197.20	3,116.92	80.28	39.824		
12,000.00	6,984.85	7,294.74	6,904.66	87.36	31.45	-85.92	999.67	-8,048.79	3,100.73	3,019.63	81.10	38.235		
12,100.00	6,984.77	7,296.05	6,905.96	88.83	31.45	-86.01	999.64	-8,048.81	3,004.49	2,922.53	81.96	36.656		
12,200.00	6,984.70	7,297.35	6,907.27	90.31	31.45	-86.10	999.61	-8,048.83	2,908.51	2,825.62	82.89	35.089		
12,300.00	6,984.63	7,298.66	6,908.57	91.80	31.45	-86.19	999.58	-8,048.85	2,812.80	2,728.92	83.88	33.534		
12,400.00	6,984.55	7,299.96	6,909.88	93.29	31.46	-86.28	999.54	-8,048.86	2,717.40	2,632.47	84.93	31.994		
12,500.00	6,984.48	7,301.27	6,911.18	94.78	31.46	-86.37	999.51	-8,048.88	2,622.35	2,536.28	86.07	30.469		
12,600.00	6,984.40	7,302.57	6,912.48	96.28	31.46	-86.46	999.48	-8,048.90	2,527.68	2,440.39	87.28	28.960		
12,700.00	6,984.33	7,303.87	6,913.78	97.78	31.46	-86.55	999.45	-8,048.92	2,433.43	2,344.84	88.59	27.469		
12,800.00	6,984.25	7,305.17	6,915.08	99.28	31.46	-86.64	999.42	-8,048.93	2,339.66	2,249.66	89.99	25.998		
12,900.00	6,984.18	7,306.47	6,916.38	100.78	31.46	-86.73	999.38	-8,048.95	2,246.42	2,154.91	91.51	24.549		
13,000.00	6,984.10	7,307.77	6,917.68	102.29	31.47	-86.82	999.35	-8,048.97	2,153.79	2,060.65	93.15	23.123		
13,100.00	6,984.03	7,309.07	6,918.98	103.80	31.47	-86.91	999.32	-8,048.99	2,061.85	1,966.93	94.92	21.722		
13,200.00	6,983.95	7,310.37	6,920.28	105.32	31.47	-87.00	999.29	-8,049.01	1,970.69	1,873.86	96.84	20.351		
13,300.00	6,983.88	7,311.67	6,921.58	106.84	31.47	-87.09	999.26	-8,049.02	1,880.44	1,781.52	98.92	19.010		
13,400.00	6,983.81	7,312.97	6,922.87	108.36	31.47	-87.18	999.22	-8,049.04	1,791.21	1,690.03	101.18	17.703		
13,500.00	6,983.73	7,314.26	6,924.17	109.88	31.47	-87.27	999.19	-8,049.06	1,703.18	1,599.55	103.64	16.434		
13,600.00	6,983.66	7,315.56	6,925.47	111.40	31.48	-87.36	999.16	-8,049.08	1,616.55	1,510.25	106.30	15.207		
13,700.00	6,983.58	7,316.86	6,926.76	112.93	31.48	-87.45	999.13	-8,049.10	1,531.54	1,422.34	109.20	14.025		
13,800.00	6,983.51	7,318.15	6,928.05	114.46	31.48	-87.54	999.10	-8,049.11	1,448.45	1,336.12	112.33	12.894		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 386-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
13,900.00	6,983.43	7,319.44	6,929.35	115.99	31.48	-87.63	999.07	-8,049.13	1,367.62	1,251.90	115.72	11.819	
14,000.00	6,983.36	7,320.74	6,930.64	117.52	31.48	-87.72	999.03	-8,049.15	1,289.48	1,170.14	119.35	10.804	
14,100.00	6,983.28	7,322.03	6,931.93	119.06	31.48	-87.81	999.00	-8,049.17	1,214.55	1,091.35	123.20	9.858	
14,200.00	6,983.21	7,323.32	6,933.22	120.59	31.49	-87.90	998.97	-8,049.18	1,143.47	1,016.22	127.25	8.986	
14,300.00	6,983.13	7,324.61	6,934.51	122.13	31.49	-87.99	998.94	-8,049.20	1,076.98	945.58	131.40	8.196	
14,400.00	6,983.06	7,325.90	6,935.80	123.67	31.49	-88.08	998.91	-8,049.22	1,016.00	880.45	135.54	7.496	
14,500.00	6,982.99	7,327.19	6,937.09	125.21	31.49	-88.16	998.88	-8,049.24	961.57	822.07	139.50	6.893	
14,600.00	6,982.91	7,328.48	6,938.38	126.75	31.49	-88.25	998.85	-8,049.25	914.86	771.84	143.03	6.396	
14,700.00	6,982.84	7,329.77	6,939.67	128.30	31.49	-88.34	998.81	-8,049.27	877.12	731.24	145.88	6.013	
14,800.00	6,982.76	7,331.06	6,940.96	129.85	31.50	-88.43	998.78	-8,049.29	849.52	701.74	147.79	5.748	
14,900.00	6,982.69	7,332.34	6,942.24	131.39	31.50	-88.52	998.75	-8,049.31	833.09	684.52	148.57	5.608	
14,988.27	6,982.62	7,333.48	6,943.38	132.76	31.50	-88.60	998.72	-8,049.32	828.40	680.16	148.24	5.588	CC, ES, SF
15,000.00	6,982.61	7,333.63	6,943.53	132.94	31.50	-88.61	998.72	-8,049.33	828.48	680.36	148.12	5.593	
15,100.00	6,982.54	7,334.92	6,944.81	134.49	31.50	-88.70	998.69	-8,049.34	835.90	689.44	146.46	5.707	
15,200.00	6,982.46	7,336.20	6,946.10	136.04	31.50	-88.79	998.66	-8,049.36	855.03	711.36	143.67	5.951	
15,300.00	6,982.39	7,337.48	6,947.38	137.60	31.50	-88.88	998.63	-8,049.38	885.10	745.18	139.92	6.326	
15,400.00	6,982.31	7,338.77	6,948.67	139.15	31.51	-88.97	998.59	-8,049.40	925.06	789.59	135.47	6.828	
15,500.00	6,982.24	7,340.05	6,949.95	140.70	31.51	-89.05	998.56	-8,049.41	973.69	843.08	130.61	7.455	
15,600.00	6,982.17	7,341.33	6,951.23	142.26	31.51	-89.14	998.53	-8,049.43	1,029.76	904.18	125.58	8.200	
15,700.00	6,982.09	7,342.61	6,952.51	143.82	31.51	-89.23	998.50	-8,049.45	1,092.12	971.52	120.60	9.056	
15,800.00	6,982.02	7,343.90	6,953.79	145.38	31.51	-89.32	998.47	-8,049.47	1,159.76	1,043.96	115.80	10.015	
15,900.00	6,981.94	7,345.18	6,955.07	146.94	31.51	-89.41	998.44	-8,049.48	1,231.81	1,120.53	111.28	11.069	
16,000.00	6,981.87	7,346.45	6,956.35	148.50	31.52	-89.50	998.41	-8,049.50	1,307.54	1,200.46	107.09	12.210	
16,100.00	6,981.79	7,347.73	6,957.63	150.06	31.52	-89.59	998.38	-8,049.52	1,386.36	1,283.13	103.23	13.430	
16,200.00	6,981.72	7,349.01	6,958.90	151.62	31.52	-89.67	998.35	-8,049.54	1,467.75	1,368.04	99.71	14.720	
16,300.00	6,981.64	7,350.29	6,960.18	153.18	31.52	-89.76	998.31	-8,049.55	1,551.32	1,454.81	96.51	16.074	
16,400.00	6,981.57	7,351.57	6,961.46	154.74	31.52	-89.85	998.28	-8,049.57	1,636.73	1,543.12	93.61	17.485	
16,500.00	6,981.49	7,352.84	6,962.73	156.31	31.52	-89.94	998.25	-8,049.59	1,723.72	1,632.73	90.99	18.945	
16,600.00	6,981.42	7,354.12	6,964.01	157.87	31.53	-90.03	998.22	-8,049.60	1,812.04	1,723.42	88.62	20.448	
16,700.00	6,981.35	7,355.39	6,965.28	159.44	31.53	-90.11	998.19	-8,049.62	1,901.52	1,815.04	86.48	21.989	
16,800.00	6,981.27	7,356.67	6,966.56	161.01	31.53	-90.20	998.16	-8,049.64	1,992.00	1,907.46	84.55	23.561	
16,900.00	6,981.20	7,357.94	6,967.83	162.58	31.53	-90.29	998.13	-8,049.66	2,083.35	2,000.55	82.80	25.161	
17,000.00	6,981.12	7,359.21	6,969.10	164.14	31.53	-90.38	998.10	-8,049.67	2,175.46	2,094.24	81.22	26.784	
17,100.00	6,981.05	7,360.48	6,970.37	165.71	31.53	-90.47	998.07	-8,049.69	2,268.24	2,188.44	79.80	28.425	
17,200.00	6,980.97	7,361.76	6,971.64	167.28	31.54	-90.55	998.04	-8,049.71	2,361.61	2,283.10	78.51	30.081	
17,300.00	6,980.90	7,363.03	6,972.91	168.85	31.54	-90.64	998.01	-8,049.73	2,455.50	2,378.15	77.34	31.748	
17,400.00	6,980.82	7,364.30	6,974.18	170.42	31.54	-90.73	997.98	-8,049.74	2,549.85	2,473.56	76.29	33.424	
17,500.00	6,980.75	7,365.56	6,975.45	172.00	31.54	-90.82	997.94	-8,049.76	2,644.62	2,569.28	75.33	35.106	
17,600.00	6,980.67	7,366.83	6,976.72	173.57	31.54	-90.91	997.91	-8,049.78	2,739.75	2,665.29	74.47	36.792	
17,700.00	6,980.60	7,368.10	6,977.99	175.14	31.54	-90.99	997.88	-8,049.79	2,835.23	2,761.54	73.68	38.479	
17,800.00	6,980.53	7,369.37	6,979.25	176.71	31.55	-91.08	997.85	-8,049.81	2,931.00	2,858.03	72.97	40.165	
17,900.00	6,980.45	7,370.64	6,980.52	178.29	31.55	-91.17	997.82	-8,049.83	3,027.05	2,954.72	72.33	41.850	
18,000.00	6,980.38	7,371.90	6,981.79	179.86	31.55	-91.26	997.79	-8,049.85	3,123.34	3,051.60	71.75	43.532	
18,100.00	6,980.30	7,373.17	6,983.05	181.44	31.55	-91.34	997.76	-8,049.86	3,219.86	3,148.64	71.22	45.210	
18,200.00	6,980.23	7,374.43	6,984.31	183.01	31.55	-91.43	997.73	-8,049.88	3,316.59	3,245.85	70.74	46.882	
18,300.00	6,980.15	7,375.70	6,985.58	184.59	31.55	-91.52	997.70	-8,049.90	3,413.50	3,343.19	70.31	48.549	
18,400.00	6,980.08	7,376.96	6,986.84	186.16	31.56	-91.60	997.67	-8,049.91	3,510.59	3,440.67	69.92	50.208	
18,500.00	6,980.00	7,378.22	6,988.10	187.74	31.56	-91.69	997.64	-8,049.93	3,607.83	3,538.27	69.57	51.861	
18,600.00	6,979.93	7,379.48	6,989.36	189.32	31.56	-91.78	997.61	-8,049.95	3,705.23	3,635.98	69.25	53.505	
18,700.00	6,979.85	7,380.74	6,990.63	190.90	31.56	-91.87	997.58	-8,049.97	3,802.75	3,733.79	68.96	55.141	
18,800.00	6,979.78	7,382.00	6,991.89	192.48	31.56	-91.95	997.55	-8,049.98	3,900.40	3,831.70	68.71	56.769	
18,900.00	6,979.71	7,383.26	6,993.14	194.05	31.56	-92.04	997.52	-8,050.00	3,998.17	3,929.70	68.48	58.389	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #164C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		386-APC_ISCWSA REV 2 MWD						Rule Assigned:		Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Warning						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,000.00	6,979.63	7,384.52	6,994.40	195.63	31.57	-92.13	997.49	-8,050.02	4,096.05	4,027.78	68.27	59.999		
19,100.00	6,979.56	7,385.78	6,995.66	197.21	31.57	-92.21	997.46	-8,050.03	4,194.02	4,125.94	68.08	61.600		
19,200.00	6,979.48	7,387.04	6,996.92	198.79	31.57	-92.30	997.43	-8,050.05	4,292.09	4,224.17	67.92	63.193		
19,300.00	6,979.41	7,388.30	6,998.18	200.37	31.57	-92.39	997.40	-8,050.07	4,390.24	4,322.47	67.78	64.776		
19,400.00	6,979.33	7,389.55	6,999.43	201.95	31.57	-92.47	997.36	-8,050.09	4,488.48	4,420.83	67.65	66.350		
19,500.00	6,979.26	7,390.81	7,000.69	203.54	31.57	-92.56	997.33	-8,050.10	4,586.79	4,519.25	67.54	67.915		
19,600.00	6,979.18	7,392.07	7,001.94	205.12	31.58	-92.64	997.30	-8,050.12	4,685.17	4,617.73	67.44	69.472		
19,700.00	6,979.11	7,393.32	7,003.20	206.70	31.58	-92.73	997.27	-8,050.14	4,783.62	4,716.26	67.36	71.019		
19,800.00	6,979.03	7,394.57	7,004.45	208.28	31.58	-92.82	997.24	-8,050.15	4,882.13	4,814.84	67.29	72.557		
19,900.00	6,978.96	7,395.83	7,005.70	209.86	31.58	-92.90	997.21	-8,050.17	4,980.70	4,913.47	67.23	74.086		
20,000.00	6,978.89	7,397.08	7,006.96	211.45	31.58	-92.99	997.18	-8,050.19	5,079.33	5,012.15	67.18	75.607		
20,100.00	6,978.81	7,398.33	7,008.21	213.03	31.58	-93.08	997.15	-8,050.20	5,178.01	5,110.86	67.14	77.119		
20,200.00	6,978.74	7,399.58	7,009.46	214.61	31.59	-93.16	997.12	-8,050.22	5,276.74	5,209.62	67.12	78.622		
20,300.00	6,978.66	7,400.83	7,010.71	216.20	31.59	-93.25	997.09	-8,050.24	5,375.51	5,308.42	67.10	80.117		
20,400.00	6,978.59	7,402.08	7,011.96	217.78	31.59	-93.33	997.06	-8,050.25	5,474.33	5,407.25	67.08	81.604		
20,500.00	6,978.51	7,403.33	7,013.21	219.37	31.59	-93.42	997.03	-8,050.27	5,573.19	5,506.11	67.08	83.082		
20,600.00	6,978.44	7,404.58	7,014.45	220.95	31.59	-93.51	997.00	-8,050.29	5,672.09	5,605.01	67.08	84.552		
20,700.00	6,978.36	7,405.83	7,015.70	222.53	31.59	-93.59	996.97	-8,050.31	5,771.03	5,703.94	67.09	86.015		
20,800.00	6,978.29	7,407.08	7,016.95	224.12	31.59	-93.68	996.94	-8,050.32	5,870.00	5,802.89	67.11	87.469		
20,900.00	6,978.21	7,408.33	7,018.20	225.71	31.60	-93.76	996.91	-8,050.34	5,969.01	5,901.88	67.13	88.916		
21,000.00	6,978.14	7,409.57	7,019.44	227.29	31.60	-93.85	996.88	-8,050.36	6,068.05	6,000.89	67.16	90.355		
21,100.00	6,978.07	7,410.82	7,020.69	228.88	31.60	-93.93	996.85	-8,050.37	6,167.12	6,099.93	67.19	91.786		
21,200.00	6,977.99	7,412.06	7,021.93	230.46	31.60	-94.02	996.82	-8,050.39	6,266.22	6,199.00	67.23	93.210		
21,300.00	6,977.92	7,413.31	7,023.17	232.05	31.60	-94.10	996.79	-8,050.41	6,365.35	6,298.08	67.27	94.627		
21,400.00	6,977.84	7,414.55	7,024.42	233.64	31.60	-94.19	996.76	-8,050.42	6,464.51	6,397.19	67.31	96.036		
21,500.00	6,977.77	7,415.79	7,025.66	235.22	31.61	-94.27	996.73	-8,050.44	6,563.69	6,496.32	67.36	97.438		
21,600.00	6,977.69	7,417.03	7,026.90	236.81	31.61	-94.36	996.70	-8,050.46	6,662.89	6,595.48	67.42	98.834		
21,700.00	6,977.62	7,418.28	7,028.14	238.40	31.61	-94.44	996.67	-8,050.47	6,762.12	6,694.65	67.47	100.222		
21,800.00	6,977.54	7,419.52	7,029.38	239.99	31.61	-94.53	996.64	-8,050.49	6,861.37	6,793.84	67.53	101.603		
21,900.00	6,977.47	7,420.76	7,030.62	241.57	31.61	-94.61	996.62	-8,050.51	6,960.64	6,893.05	67.59	102.978		
22,000.00	6,977.39	7,422.00	7,031.86	243.16	31.61	-94.70	996.59	-8,050.52	7,059.93	6,992.27	67.66	104.346		
22,100.00	6,977.32	7,423.24	7,033.10	244.75	31.62	-94.78	996.56	-8,050.54	7,159.24	7,091.52	67.73	105.707		
22,200.00	6,977.25	7,424.47	7,034.34	246.34	31.62	-94.87	996.53	-8,050.56	7,258.57	7,190.77	67.80	107.062		
22,300.00	6,977.17	7,425.71	7,035.58	247.93	31.62	-94.95	996.50	-8,050.57	7,357.92	7,290.05	67.87	108.410		
22,400.00	6,977.10	7,426.95	7,036.81	249.52	31.62	-95.04	996.47	-8,050.59	7,457.28	7,389.34	67.95	109.753		
22,500.00	6,977.02	7,428.19	7,038.05	251.11	31.62	-95.12	996.44	-8,050.61	7,556.67	7,488.64	68.02	111.088		
22,529.62	6,977.00	7,428.55	7,038.41	251.58	31.62	-95.15	996.43	-8,050.61	7,586.10	7,518.05	68.05	111.483		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 95-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-103.19	-1,126.38	-4,807.64	4,939.10				
100.00	100.00	0.00	0.00	0.25	0.00	-103.19	-1,126.38	-4,807.64	4,937.84	4,937.59	0.25	N/A	
137.88	137.88	25.88	25.88	0.39	0.48	-103.19	-1,126.38	-4,807.64	4,937.83	4,936.96	0.87	5,706.883	
200.00	200.00	88.00	88.00	0.61	1.63	-103.19	-1,126.38	-4,807.64	4,937.83	4,935.59	2.24	2,208.200	
286.68	286.68	174.43	174.43	0.92	3.22	-103.18	-1,126.22	-4,807.64	4,937.79	4,933.64	4.14	1,191.394	
300.00	300.00	186.93	186.93	0.97	3.46	-103.18	-1,126.23	-4,807.64	4,937.79	4,933.37	4.42	1,116.295	
400.00	400.00	288.01	288.00	1.33	5.32	-103.19	-1,126.38	-4,807.64	4,937.83	4,931.18	6.65	742.500	
480.54	480.54	368.53	368.52	1.62	6.81	-103.18	-1,126.12	-4,807.64	4,937.76	4,929.34	8.43	585.914	
500.00	500.00	387.23	387.22	1.68	7.16	-103.18	-1,126.12	-4,807.64	4,937.77	4,928.92	8.84	558.384	
550.00	550.00	435.30	435.29	1.86	8.05	-103.18	-1,126.20	-4,807.64	4,937.78	4,927.87	9.91	498.228	
600.00	600.00	483.36	483.35	2.04	8.94	-100.80	-1,126.35	-4,807.64	4,937.90	4,926.92	10.98	449.791	
700.00	699.93	587.95	587.93	2.40	10.87	-100.83	-1,126.38	-4,807.64	4,938.56	4,925.29	13.27	372.180	
800.00	799.68	687.70	687.68	2.77	12.71	-100.88	-1,126.38	-4,807.64	4,939.88	4,924.41	15.47	319.278	
900.00	899.13	785.68	785.66	3.13	14.52	-100.96	-1,125.93	-4,807.64	4,941.77	4,924.12	17.65	280.054	
1,000.00	998.15	882.54	882.52	3.49	16.31	-101.06	-1,126.14	-4,807.64	4,944.50	4,924.70	19.81	249.650	
1,100.00	1,096.63	984.66	984.63	3.87	18.24	-101.20	-1,126.38	-4,807.64	4,947.96	4,925.85	22.11	223.749	
1,130.50	1,126.54	1,014.57	1,014.54	3.99	18.83	-101.24	-1,126.38	-4,807.64	4,949.14	4,926.33	22.82	216.904	
1,200.00	1,194.61	1,082.65	1,082.61	4.26	20.16	-101.39	-1,126.38	-4,807.64	4,951.94	4,927.52	24.42	202.767	
1,300.00	1,292.57	1,180.60	1,180.57	4.66	22.08	-101.62	-1,126.38	-4,807.64	4,956.04	4,929.30	26.74	185.362	
1,400.00	1,390.52	1,276.62	1,276.58	5.07	23.95	-101.83	-1,125.92	-4,807.64	4,960.10	4,931.08	29.02	170.920	
1,500.00	1,488.48	1,372.37	1,372.33	5.48	25.83	-102.05	-1,126.15	-4,807.64	4,964.41	4,933.11	31.30	158.596	
1,600.00	1,586.43	1,474.51	1,474.43	5.90	27.83	-102.29	-1,126.38	-4,807.64	4,968.79	4,935.08	33.72	147.373	
1,700.00	1,684.38	1,572.46	1,572.38	6.31	29.75	-102.51	-1,126.38	-4,807.64	4,973.20	4,937.15	36.05	137.937	
1,800.00	1,782.34	1,670.41	1,670.34	6.73	31.67	-102.73	-1,126.38	-4,807.64	4,977.68	4,939.29	38.39	129.645	
1,900.00	1,880.29	1,765.39	1,765.30	7.15	33.54	-102.93	-1,125.30	-4,807.64	4,981.95	4,941.28	40.68	122.472	
2,000.00	1,978.25	1,859.13	1,859.03	7.58	35.38	-103.15	-1,125.65	-4,807.64	4,986.69	4,943.75	42.94	116.134	
2,100.00	2,076.20	1,964.32	1,964.20	8.00	37.45	-103.39	-1,126.38	-4,807.64	4,991.60	4,946.17	45.43	109.883	
2,200.00	2,174.15	2,062.28	2,062.15	8.43	39.37	-103.61	-1,126.38	-4,807.64	4,996.39	4,948.62	47.77	104.582	
2,300.00	2,272.11	2,160.23	2,160.11	8.85	41.30	-103.83	-1,126.38	-4,807.64	5,001.26	4,951.14	50.12	99.778	
2,400.00	2,370.06	2,256.10	2,255.97	9.28	43.18	-104.04	-1,125.96	-4,807.64	5,006.08	4,953.65	52.43	95.477	
2,500.00	2,468.02	2,351.27	2,351.14	9.71	45.05	-104.26	-1,126.18	-4,807.64	5,011.17	4,956.44	54.73	91.565	
2,600.00	2,565.97	2,454.13	2,453.97	10.14	47.04	-104.49	-1,126.38	-4,807.64	5,016.32	4,959.18	57.14	87.784	
2,700.00	2,663.92	2,552.09	2,551.92	10.57	48.91	-104.71	-1,126.38	-4,807.64	5,021.49	4,962.06	59.43	84.489	
2,800.00	2,761.88	2,647.31	2,647.13	11.00	50.72	-104.91	-1,125.54	-4,807.64	5,026.48	4,964.81	61.67	81.504	
2,900.00	2,859.83	2,739.15	2,738.97	11.43	52.47	-105.12	-1,125.88	-4,807.64	5,031.92	4,968.07	63.85	78.814	
3,000.00	2,957.79	2,845.98	2,845.79	11.86	54.46	-105.36	-1,126.38	-4,807.64	5,037.46	4,971.20	66.26	76.026	
3,100.00	3,055.74	2,943.93	2,943.74	12.29	56.20	-105.58	-1,126.38	-4,807.64	5,042.93	4,974.50	68.43	73.693	
3,200.00	3,153.69	3,041.88	3,041.69	12.72	57.95	-105.79	-1,126.38	-4,807.64	5,048.47	4,977.87	70.60	71.505	
3,300.00	3,251.65	3,138.63	3,138.44	13.15	59.67	-106.00	-1,126.14	-4,807.64	5,054.02	4,981.27	72.75	69.468	
3,400.00	3,349.60	3,235.17	3,234.98	13.59	61.39	-106.22	-1,126.26	-4,807.64	5,059.75	4,984.85	74.90	67.554	
3,500.00	3,447.56	3,335.76	3,335.56	14.02	63.27	-106.44	-1,126.38	-4,807.64	5,065.55	4,988.35	77.20	65.612	
3,600.00	3,545.51	3,433.71	3,433.51	14.45	65.26	-106.65	-1,126.38	-4,807.64	5,071.39	4,991.78	79.62	63.696	
3,700.00	3,643.46	3,531.67	3,531.46	14.88	67.25	-106.86	-1,126.38	-4,807.64	5,077.31	4,995.28	82.03	61.894	
3,800.00	3,741.42	3,629.62	3,629.42	15.32	69.24	-107.08	-1,126.38	-4,807.64	5,083.29	4,998.85	84.45	60.195	
3,900.00	3,839.37	3,727.57	3,727.37	15.75	71.23	-107.29	-1,126.38	-4,807.64	5,089.35	5,002.49	86.86	58.592	
4,000.00	3,937.33	3,825.53	3,825.33	16.18	73.21	-107.50	-1,126.38	-4,807.64	5,095.48	5,006.21	89.27	57.076	
4,100.00	4,035.28	3,923.48	3,923.28	16.62	75.20	-107.71	-1,126.38	-4,807.64	5,101.69	5,010.00	91.69	55.642	
4,200.00	4,133.23	4,021.21	4,021.01	17.05	77.19	-107.91	-1,124.86	-4,807.64	5,107.42	5,013.32	94.10	54.278	
4,300.00	4,231.19	4,118.07	4,117.86	17.48	79.15	-108.12	-1,124.90	-4,807.64	5,113.78	5,017.29	96.49	52.999	
4,400.00	4,329.14	4,214.90	4,214.69	17.92	81.12	-108.33	-1,125.00	-4,807.64	5,120.23	5,021.35	98.88	51.783	
4,500.00	4,427.10	4,311.71	4,311.50	18.35	83.08	-108.53	-1,125.15	-4,807.64	5,126.77	5,025.50	101.27	50.625	
4,600.00	4,525.05	4,408.50	4,408.28	18.78	85.05	-108.74	-1,125.37	-4,807.64	5,133.40	5,029.75	103.66	49.522	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		95-A027Ua_INC-ONLY						Rule Assigned:		Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,700.00	4,623.00	4,505.26	4,505.05	19.22	87.01	-108.95	-1,125.64	-4,807.64	5,140.13	5,034.09	106.05	48.470		
4,800.00	4,720.96	4,602.00	4,601.78	19.65	88.97	-109.16	-1,125.98	-4,807.64	5,146.96	5,038.52	108.43	47.466		
4,900.00	4,818.91	4,707.29	4,706.91	20.09	91.12	-109.39	-1,126.38	-4,807.64	5,153.87	5,042.87	111.00	46.429		
5,000.00	4,916.87	4,805.24	4,804.87	20.52	93.25	-109.59	-1,126.38	-4,807.64	5,160.71	5,047.15	113.56	45.443		
5,100.00	5,014.82	4,903.19	4,902.82	20.96	95.39	-109.80	-1,126.38	-4,807.64	5,167.62	5,051.50	116.12	44.502		
5,200.00	5,112.77	5,001.15	5,000.77	21.39	97.52	-110.01	-1,126.38	-4,807.64	5,174.60	5,055.92	118.68	43.601		
5,300.00	5,210.73	5,099.10	5,098.73	21.82	99.66	-110.21	-1,126.38	-4,807.64	5,181.64	5,060.40	121.24	42.740		
5,400.00	5,308.68	5,197.06	5,196.68	22.26	101.79	-110.42	-1,126.38	-4,807.64	5,188.76	5,064.96	123.80	41.914		
5,493.23	5,400.00	5,288.37	5,288.00	22.66	103.78	-110.61	-1,126.38	-4,807.64	5,195.45	5,069.27	126.18	41.175		
5,500.00	5,406.64	5,295.01	5,294.64	22.69	103.93	-110.62	-1,126.38	-4,807.64	5,195.94	5,069.59	126.35	41.123		
5,600.00	5,504.69	5,393.06	5,392.69	23.12	106.06	-110.86	-1,126.38	-4,807.64	5,203.01	5,074.11	128.91	40.362		
5,700.00	5,602.91	5,491.28	5,490.91	23.55	108.20	-111.08	-1,126.38	-4,807.64	5,209.84	5,078.38	131.46	39.629		
5,800.00	5,701.29	5,589.66	5,589.29	23.97	110.35	-111.29	-1,126.38	-4,807.64	5,216.41	5,082.39	134.02	38.923		
5,900.00	5,799.82	5,688.20	5,687.82	24.39	112.49	-111.49	-1,126.38	-4,807.64	5,222.72	5,086.15	136.57	38.242		
6,000.00	5,898.50	5,786.87	5,786.50	24.79	114.64	-111.68	-1,126.38	-4,807.64	5,228.75	5,089.63	139.12	37.585		
6,100.00	5,997.31	5,885.69	5,885.31	25.20	116.80	-111.86	-1,126.38	-4,807.64	5,234.50	5,092.83	141.67	36.949		
6,200.00	6,096.26	5,984.63	5,984.26	25.60	118.95	-112.03	-1,126.38	-4,807.64	5,239.96	5,095.75	144.21	36.335		
6,300.00	6,195.33	6,028.00	6,027.37	25.99	119.90	-112.12	-1,126.38	-4,807.64	5,245.43	5,099.90	145.52	36.045		
6,400.00	6,294.51	6,028.00	6,027.37	26.37	119.90	-112.15	-1,126.38	-4,807.64	5,252.29	5,106.46	145.83	36.017		
6,498.19	6,392.00	6,028.00	6,027.37	26.75	119.90	-112.19	-1,126.38	-4,807.64	5,260.54	5,114.47	146.07	36.014		
6,500.00	6,393.80	6,028.00	6,027.37	26.76	119.90	-110.98	-1,126.38	-4,807.64	5,260.71	5,114.63	146.08	36.014		
6,550.00	6,443.29	6,028.00	6,027.37	26.95	119.90	-87.96	-1,126.38	-4,807.64	5,264.28	5,118.09	146.19	36.010		
6,600.00	6,492.24	6,028.00	6,027.37	27.16	119.90	-77.05	-1,126.38	-4,807.64	5,265.95	5,119.64	146.30	35.993		
6,650.00	6,540.33	6,028.00	6,027.37	27.38	119.90	-71.22	-1,126.38	-4,807.64	5,265.70	5,119.28	146.42	35.962		
6,700.00	6,587.28	6,028.00	6,027.37	27.60	119.90	-67.80	-1,126.38	-4,807.64	5,263.54	5,117.00	146.55	35.917		
6,750.00	6,632.80	6,028.00	6,027.37	27.84	119.90	-65.71	-1,126.38	-4,807.64	5,259.48	5,112.81	146.67	35.858		
6,800.00	6,676.60	6,028.00	6,027.37	28.09	119.90	-64.45	-1,126.38	-4,807.64	5,253.54	5,106.74	146.81	35.785		
6,850.00	6,718.42	6,028.00	6,027.37	28.34	119.90	-63.78	-1,126.38	-4,807.64	5,245.75	5,098.81	146.95	35.699		
6,900.00	6,758.00	6,028.00	6,027.37	28.60	119.90	-63.55	-1,126.38	-4,807.64	5,236.15	5,089.06	147.09	35.598		
6,950.00	6,795.09	6,028.00	6,027.37	28.87	119.90	-63.68	-1,126.38	-4,807.64	5,224.79	5,077.54	147.25	35.483		
7,000.00	6,829.46	6,028.00	6,027.37	29.14	119.90	-64.11	-1,126.38	-4,807.64	5,211.72	5,064.31	147.42	35.354		
7,050.00	6,860.91	6,028.00	6,027.37	29.43	119.90	-64.81	-1,126.38	-4,807.64	5,197.02	5,049.43	147.60	35.211		
7,100.00	6,889.24	6,028.00	6,027.37	29.73	119.90	-65.76	-1,126.38	-4,807.64	5,180.77	5,032.98	147.79	35.055		
7,150.00	6,914.27	6,028.00	6,027.37	30.05	119.90	-66.94	-1,126.38	-4,807.64	5,163.04	5,015.04	148.00	34.884		
7,200.00	6,935.85	6,028.00	6,027.37	30.37	119.90	-68.33	-1,126.38	-4,807.64	5,143.94	4,995.70	148.24	34.701		
7,250.00	6,953.84	6,028.00	6,027.37	30.71	119.90	-69.94	-1,126.38	-4,807.64	5,123.56	4,975.07	148.49	34.505		
7,300.00	6,968.15	6,028.00	6,027.37	31.06	119.90	-71.75	-1,126.38	-4,807.64	5,102.02	4,953.26	148.76	34.297		
7,350.00	6,978.67	6,028.00	6,027.37	31.42	119.90	-73.75	-1,126.38	-4,807.64	5,079.44	4,930.38	149.06	34.077		
7,400.00	6,985.34	6,028.00	6,027.37	31.79	119.90	-75.92	-1,126.38	-4,807.64	5,055.94	4,906.57	149.37	33.847		
7,450.00	6,988.13	6,028.00	6,027.37	32.17	119.90	-78.27	-1,126.38	-4,807.64	5,031.66	4,881.94	149.71	33.608		
7,461.13	6,988.22	6,028.00	6,027.37	32.26	119.90	-78.81	-1,126.38	-4,807.64	5,026.16	4,876.37	149.79	33.554		
7,500.00	6,988.19	6,028.00	6,027.37	32.56	119.90	-78.73	-1,126.38	-4,807.64	5,006.79	4,856.72	150.07	33.363		
7,600.00	6,988.12	6,028.00	6,027.37	33.37	119.90	-78.49	-1,126.38	-4,807.64	4,955.95	4,805.14	150.81	32.863		
7,700.00	6,988.05	6,028.00	6,027.37	34.21	119.90	-78.25	-1,126.38	-4,807.64	4,903.66	4,752.09	151.57	32.352		
7,800.00	6,987.98	6,028.00	6,027.37	35.09	119.90	-77.99	-1,126.38	-4,807.64	4,849.94	4,697.58	152.36	31.833		
7,900.00	6,987.91	6,028.00	6,027.37	35.99	119.90	-77.71	-1,126.38	-4,807.64	4,794.80	4,641.64	153.16	31.305		
8,000.00	6,987.83	6,028.00	6,027.37	36.93	119.90	-77.42	-1,126.38	-4,807.64	4,738.28	4,584.29	153.99	30.771		
8,100.00	6,987.76	6,028.00	6,027.37	37.88	119.90	-77.11	-1,126.38	-4,807.64	4,680.37	4,525.55	154.82	30.230		
8,200.00	6,987.68	6,028.00	6,027.37	38.86	119.90	-76.78	-1,126.38	-4,807.64	4,621.11	4,465.44	155.67	29.685		
8,300.00	6,987.61	6,028.00	6,027.37	39.86	119.90	-76.42	-1,126.38	-4,807.64	4,560.52	4,403.99	156.53	29.135		
8,400.00	6,987.53	6,028.00	6,027.37	40.87	119.90	-76.05	-1,126.38	-4,807.64	4,498.62	4,341.22	157.39	28.582		
8,500.00	6,987.46	6,028.00	6,027.37	41.90	119.90	-75.65	-1,126.38	-4,807.64	4,435.42	4,277.16	158.26	28.026		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC										Offset Site Error:		0.00 usft	
Survey Program:		95-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)		
8,600.00	6,987.38	6,028.00	6,027.37	42.93	119.90	-75.23	-1,126.38	-4,807.64	4,370.96	4,211.83	159.13	27.468			
8,700.00	6,987.31	6,028.00	6,027.37	43.98	119.90	-74.78	-1,126.38	-4,807.64	4,305.26	4,145.26	160.00	26.909			
8,800.00	6,987.23	6,028.00	6,027.37	45.03	119.90	-74.30	-1,126.38	-4,807.64	4,238.33	4,077.48	160.86	26.348			
8,872.16	6,987.18	6,028.00	6,027.37	45.79	119.90	-73.94	-1,126.38	-4,807.64	4,189.30	4,027.82	161.48	25.944			
8,900.00	6,987.16	6,028.00	6,027.37	46.08	119.90	-73.94	-1,126.38	-4,807.64	4,170.31	4,008.60	161.71	25.788			
9,000.00	6,987.09	6,028.00	6,027.37	47.16	119.90	-73.94	-1,126.38	-4,807.64	4,102.94	3,940.35	162.59	25.235			
9,100.00	6,987.01	6,028.00	6,027.37	48.27	119.90	-73.94	-1,126.38	-4,807.64	4,036.92	3,873.42	163.50	24.691			
9,200.00	6,986.94	6,028.00	6,027.37	49.40	119.90	-73.94	-1,126.38	-4,807.64	3,972.32	3,807.89	164.44	24.157			
9,300.00	6,986.86	6,028.00	6,027.37	50.56	119.90	-73.94	-1,126.38	-4,807.64	3,909.22	3,743.81	165.41	23.634			
9,400.00	6,986.79	6,028.00	6,027.37	51.75	119.90	-73.94	-1,126.38	-4,807.64	3,847.68	3,681.27	166.40	23.123			
9,500.00	6,986.71	6,028.00	6,027.37	52.95	119.90	-73.94	-1,126.38	-4,807.64	3,787.77	3,620.34	167.43	22.623			
9,600.00	6,986.64	6,028.00	6,027.37	54.18	119.90	-73.94	-1,126.38	-4,807.64	3,729.59	3,561.11	168.48	22.136			
9,700.00	6,986.56	6,028.00	6,027.37	55.42	119.90	-73.94	-1,126.38	-4,807.64	3,673.21	3,503.65	169.56	21.663			
9,800.00	6,986.49	6,028.00	6,027.37	56.69	119.90	-73.94	-1,126.38	-4,807.64	3,618.72	3,448.05	170.67	21.203			
9,900.00	6,986.41	6,028.00	6,027.37	57.97	119.90	-73.94	-1,126.38	-4,807.64	3,566.19	3,394.40	171.80	20.758			
10,000.00	6,986.34	6,028.00	6,027.37	59.26	119.90	-73.94	-1,126.38	-4,807.64	3,515.73	3,342.79	172.94	20.329			
10,100.00	6,986.27	6,028.00	6,027.37	60.57	119.90	-73.94	-1,126.38	-4,807.64	3,467.42	3,293.31	174.10	19.916			
10,200.00	6,986.19	6,028.00	6,027.37	61.90	119.90	-73.94	-1,126.38	-4,807.64	3,421.35	3,246.07	175.28	19.519			
10,300.00	6,986.12	6,028.00	6,027.37	63.23	119.90	-73.94	-1,126.38	-4,807.64	3,377.61	3,201.14	176.47	19.140			
10,400.00	6,986.04	6,028.00	6,027.37	64.58	119.90	-73.94	-1,126.38	-4,807.64	3,336.29	3,158.63	177.66	18.779			
10,500.00	6,985.97	6,028.00	6,027.37	65.94	119.90	-73.94	-1,126.38	-4,807.64	3,297.50	3,118.64	178.86	18.437			
10,600.00	6,985.89	6,028.00	6,027.37	67.32	119.90	-73.94	-1,126.38	-4,807.64	3,261.30	3,081.26	180.05	18.113			
10,700.00	6,985.82	6,028.00	6,027.37	68.70	119.90	-73.94	-1,126.38	-4,807.64	3,227.81	3,046.57	181.24	17.810			
10,800.00	6,985.74	6,028.00	6,027.37	70.09	119.90	-73.94	-1,126.38	-4,807.64	3,197.09	3,014.67	182.41	17.527			
10,900.00	6,985.67	6,028.00	6,027.37	71.49	119.90	-73.94	-1,126.38	-4,807.64	3,169.22	2,985.65	183.57	17.264			
11,000.00	6,985.59	6,028.00	6,027.37	72.90	119.90	-73.94	-1,126.38	-4,807.64	3,144.30	2,959.59	184.71	17.023			
11,100.00	6,985.52	6,028.00	6,027.37	74.31	119.90	-73.94	-1,126.38	-4,807.64	3,122.38	2,936.56	185.82	16.804			
11,200.00	6,985.45	6,028.00	6,027.37	75.74	119.90	-73.94	-1,126.38	-4,807.64	3,103.52	2,916.63	186.89	16.606			
11,300.00	6,985.37	6,028.00	6,027.37	77.17	119.90	-73.94	-1,126.38	-4,807.64	3,087.80	2,899.86	187.93	16.430			
11,400.00	6,985.30	6,028.00	6,027.37	78.61	119.90	-73.94	-1,126.38	-4,807.64	3,075.24	2,886.31	188.93	16.277			
11,500.00	6,985.22	6,028.00	6,027.37	80.05	119.90	-73.94	-1,126.38	-4,807.64	3,065.90	2,876.02	189.88	16.147			
11,600.00	6,985.15	6,028.00	6,027.37	81.50	119.90	-73.94	-1,126.38	-4,807.64	3,059.80	2,869.02	190.78	16.039			
11,700.00	6,985.07	6,028.00	6,027.37	82.96	119.90	-73.94	-1,126.38	-4,807.64	3,056.96	2,865.34	191.62	15.953			
11,736.88	6,985.05	6,028.00	6,027.37	83.50	119.90	-73.94	-1,126.38	-4,807.64	3,056.73	2,864.82	191.92	15.927 CC, ES			
11,800.00	6,985.00	6,028.00	6,027.37	84.42	119.90	-73.94	-1,126.38	-4,807.64	3,057.39	2,864.98	192.40	15.890			
11,900.00	6,984.92	6,028.00	6,027.37	85.89	119.90	-73.94	-1,126.38	-4,807.64	3,061.08	2,867.96	193.13	15.850			
12,000.00	6,984.85	6,028.00	6,027.37	87.36	119.90	-73.94	-1,126.38	-4,807.64	3,068.04	2,874.25	193.79	15.832 SF			
12,100.00	6,984.77	6,028.00	6,027.37	88.83	119.90	-73.94	-1,126.38	-4,807.64	3,078.23	2,883.85	194.38	15.836			
12,200.00	6,984.70	6,028.00	6,027.37	90.31	119.90	-73.94	-1,126.38	-4,807.64	3,091.62	2,896.71	194.91	15.862			
12,300.00	6,984.63	6,028.00	6,027.37	91.80	119.90	-73.94	-1,126.38	-4,807.64	3,108.17	2,912.80	195.37	15.909			
12,400.00	6,984.55	6,028.00	6,027.37	93.29	119.90	-73.94	-1,126.38	-4,807.64	3,127.84	2,932.07	195.77	15.977			
12,500.00	6,984.48	6,028.00	6,027.37	94.78	119.90	-73.94	-1,126.38	-4,807.64	3,150.55	2,954.45	196.10	16.066			
12,600.00	6,984.40	6,028.00	6,027.37	96.28	119.90	-73.94	-1,126.38	-4,807.64	3,176.26	2,979.88	196.37	16.175			
12,700.00	6,984.33	6,028.00	6,027.37	97.78	119.90	-73.94	-1,126.38	-4,807.64	3,204.88	3,008.30	196.58	16.303			
12,800.00	6,984.25	6,028.00	6,027.37	99.28	119.90	-73.94	-1,126.38	-4,807.64	3,236.33	3,039.60	196.73	16.451			
12,900.00	6,984.18	6,028.00	6,027.37	100.78	119.90	-73.94	-1,126.38	-4,807.64	3,270.55	3,073.72	196.82	16.617			
13,000.00	6,984.10	6,028.00	6,027.37	102.29	119.90	-73.94	-1,126.38	-4,807.64	3,307.43	3,110.57	196.86	16.801			
13,100.00	6,984.03	6,028.00	6,027.37	103.80	119.90	-73.94	-1,126.38	-4,807.64	3,346.90	3,150.04	196.85	17.002			
13,200.00	6,983.95	6,028.00	6,027.37	105.32	119.90	-73.94	-1,126.38	-4,807.64	3,388.86	3,192.06	196.80	17.220			
13,300.00	6,983.88	6,028.00	6,027.37	106.84	119.90	-73.94	-1,126.38	-4,807.64	3,433.22	3,236.52	196.70	17.454			
13,400.00	6,983.81	6,028.00	6,027.37	108.36	119.90	-73.94	-1,126.38	-4,807.64	3,479.89	3,283.32	196.56	17.704			
13,500.00	6,983.73	6,028.00	6,027.37	109.88	119.90	-73.94	-1,126.38	-4,807.64	3,528.77	3,332.38	196.39	17.968			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		95-A027Ua_INC-ONLY						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
13,600.00	6,983.66	6,028.00	6,027.37	111.40	119.90	-73.94	-1,126.38	-4,807.64	3,579.78	3,383.60	196.18	18.247		
13,700.00	6,983.58	6,028.00	6,027.37	112.93	119.90	-73.94	-1,126.38	-4,807.64	3,632.83	3,436.89	195.95	18.540		
13,800.00	6,983.51	6,028.00	6,027.37	114.46	119.90	-73.94	-1,126.38	-4,807.64	3,687.83	3,492.15	195.69	18.846		
13,900.00	6,983.43	6,028.00	6,027.37	115.99	119.90	-73.94	-1,126.38	-4,807.64	3,744.69	3,549.29	195.40	19.164		
14,000.00	6,983.36	6,028.00	6,027.37	117.52	119.90	-73.94	-1,126.38	-4,807.64	3,803.33	3,608.24	195.10	19.495		
14,100.00	6,983.28	6,028.00	6,027.37	119.06	119.90	-73.94	-1,126.38	-4,807.64	3,863.67	3,668.90	194.77	19.837		
14,200.00	6,983.21	6,028.00	6,027.37	120.59	119.90	-73.94	-1,126.38	-4,807.64	3,925.63	3,731.20	194.44	20.190		
14,300.00	6,983.13	6,028.00	6,027.37	122.13	119.90	-73.94	-1,126.38	-4,807.64	3,989.14	3,795.05	194.09	20.553		
14,400.00	6,983.06	6,028.00	6,027.37	123.67	119.90	-73.94	-1,126.38	-4,807.64	4,054.12	3,860.39	193.73	20.927		
14,500.00	6,982.99	6,028.00	6,027.37	125.21	119.90	-73.94	-1,126.38	-4,807.64	4,120.50	3,927.14	193.36	21.310		
14,600.00	6,982.91	6,028.00	6,027.37	126.75	119.90	-73.94	-1,126.38	-4,807.64	4,188.21	3,995.23	192.98	21.702		
14,700.00	6,982.84	6,028.00	6,027.37	128.30	119.90	-73.94	-1,126.38	-4,807.64	4,257.20	4,064.59	192.60	22.103		
14,800.00	6,982.76	6,028.00	6,027.37	129.85	119.90	-73.94	-1,126.38	-4,807.64	4,327.40	4,135.18	192.22	22.513		
14,900.00	6,982.69	6,028.00	6,027.37	131.39	119.90	-73.94	-1,126.38	-4,807.64	4,398.75	4,206.91	191.83	22.930		
15,000.00	6,982.61	6,028.00	6,027.37	132.94	119.90	-73.94	-1,126.38	-4,807.64	4,471.20	4,279.75	191.45	23.355		
15,100.00	6,982.54	6,028.00	6,027.37	134.49	119.90	-73.94	-1,126.38	-4,807.64	4,544.69	4,353.63	191.06	23.787		
15,200.00	6,982.46	6,028.00	6,027.37	136.04	119.90	-73.94	-1,126.38	-4,807.64	4,619.18	4,428.51	190.68	24.225		
15,300.00	6,982.39	6,028.00	6,027.37	137.60	119.90	-73.94	-1,126.38	-4,807.64	4,694.62	4,504.33	190.29	24.671		
15,400.00	6,982.31	6,028.00	6,027.37	139.15	119.90	-73.94	-1,126.38	-4,807.64	4,770.96	4,581.05	189.91	25.122		
15,500.00	6,982.24	6,028.00	6,027.37	140.70	119.90	-73.94	-1,126.38	-4,807.64	4,848.17	4,658.63	189.53	25.579		
15,600.00	6,982.17	6,028.00	6,027.37	142.26	119.90	-73.94	-1,126.38	-4,807.64	4,926.19	4,737.03	189.16	26.042		
15,700.00	6,982.09	6,028.00	6,027.37	143.82	119.90	-73.94	-1,126.38	-4,807.64	5,005.00	4,816.20	188.79	26.511		
15,800.00	6,982.02	6,028.00	6,027.37	145.38	119.90	-73.94	-1,126.38	-4,807.64	5,084.55	4,896.12	188.43	26.984		
15,900.00	6,981.94	6,028.00	6,027.37	146.94	119.90	-73.94	-1,126.38	-4,807.64	5,164.81	4,976.74	188.07	27.462		
16,000.00	6,981.87	6,028.00	6,027.37	148.50	119.90	-73.94	-1,126.38	-4,807.64	5,245.75	5,058.03	187.72	27.945		
16,100.00	6,981.79	6,028.00	6,027.37	150.06	119.90	-73.94	-1,126.38	-4,807.64	5,327.33	5,139.96	187.37	28.432		
16,200.00	6,981.72	6,028.00	6,027.37	151.62	119.90	-73.94	-1,126.38	-4,807.64	5,409.54	5,222.51	187.03	28.923		
16,300.00	6,981.64	6,028.00	6,027.37	153.18	119.90	-73.94	-1,126.38	-4,807.64	5,492.33	5,305.64	186.70	29.419		
16,400.00	6,981.57	6,028.00	6,027.37	154.74	119.90	-73.94	-1,126.38	-4,807.64	5,575.69	5,389.32	186.37	29.918		
16,500.00	6,981.49	6,028.00	6,027.37	156.31	119.90	-73.94	-1,126.38	-4,807.64	5,659.59	5,473.54	186.05	30.420		
16,600.00	6,981.42	6,028.00	6,027.37	157.87	119.90	-73.94	-1,126.38	-4,807.64	5,744.01	5,558.27	185.73	30.926		
16,700.00	6,981.35	6,028.00	6,027.37	159.44	119.90	-73.94	-1,126.38	-4,807.64	5,828.91	5,643.49	185.42	31.436		
16,800.00	6,981.27	6,028.00	6,027.37	161.01	119.90	-73.94	-1,126.38	-4,807.64	5,914.29	5,729.17	185.12	31.948		
16,900.00	6,981.20	6,028.00	6,027.37	162.58	119.90	-73.94	-1,126.38	-4,807.64	6,000.12	5,815.30	184.83	32.463		
17,000.00	6,981.12	6,028.00	6,027.37	164.14	119.90	-73.94	-1,126.38	-4,807.64	6,086.39	5,901.85	184.54	32.981		
17,100.00	6,981.05	6,028.00	6,027.37	165.71	119.90	-73.94	-1,126.38	-4,807.64	6,173.06	5,988.81	184.26	33.502		
17,200.00	6,980.97	6,028.00	6,027.37	167.28	119.90	-73.94	-1,126.38	-4,807.64	6,260.14	6,076.16	183.98	34.026		
17,300.00	6,980.90	6,028.00	6,027.37	168.85	119.90	-73.94	-1,126.38	-4,807.64	6,347.60	6,163.88	183.71	34.551		
17,400.00	6,980.82	6,028.00	6,027.37	170.42	119.90	-73.94	-1,126.38	-4,807.64	6,435.42	6,251.96	183.45	35.079		
17,500.00	6,980.75	6,028.00	6,027.37	172.00	119.90	-73.94	-1,126.38	-4,807.64	6,523.59	6,340.39	183.20	35.610		
17,600.00	6,980.67	6,028.00	6,027.37	173.57	119.90	-73.94	-1,126.38	-4,807.64	6,612.10	6,429.15	182.95	36.142		
17,700.00	6,980.60	6,028.00	6,027.37	175.14	119.90	-73.94	-1,126.38	-4,807.64	6,700.93	6,518.22	182.71	36.676		
17,800.00	6,980.53	6,028.00	6,027.37	176.71	119.90	-73.94	-1,126.38	-4,807.64	6,790.07	6,607.60	182.47	37.212		
17,900.00	6,980.45	6,028.00	6,027.37	178.29	119.90	-73.94	-1,126.38	-4,807.64	6,879.51	6,697.28	182.24	37.750		
18,000.00	6,980.38	6,028.00	6,027.37	179.86	119.90	-73.94	-1,126.38	-4,807.64	6,969.24	6,787.23	182.02	38.289		
18,100.00	6,980.30	6,028.00	6,027.37	181.44	119.90	-73.94	-1,126.38	-4,807.64	7,059.25	6,877.45	181.80	38.830		
18,200.00	6,980.23	6,028.00	6,027.37	183.01	119.90	-73.94	-1,126.38	-4,807.64	7,149.52	6,967.93	181.58	39.373		
18,300.00	6,980.15	6,028.00	6,027.37	184.59	119.90	-73.94	-1,126.38	-4,807.64	7,240.04	7,058.67	181.38	39.917		
18,400.00	6,980.08	6,028.00	6,027.37	186.16	119.90	-73.94	-1,126.38	-4,807.64	7,330.82	7,149.64	181.18	40.462		
18,500.00	6,980.00	6,028.00	6,027.37	187.74	119.90	-73.94	-1,126.38	-4,807.64	7,421.82	7,240.84	180.98	41.009		
18,600.00	6,979.93	6,028.00	6,027.37	189.32	119.90	-73.94	-1,126.38	-4,807.64	7,513.06	7,332.27	180.79	41.557		
18,700.00	6,979.85	6,028.00	6,027.37	190.90	119.90	-73.94	-1,126.38	-4,807.64	7,604.52	7,423.92	180.60	42.106		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171 - OH - OH-INC													Offset Site Error:	0.00 usft				
Survey Program:		95-A027Ua_INC-ONLY					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Distance	Warning	Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor						
18,800.00	6,979.78	6,028.00	6,027.37	192.48	119.90	-73.94	-1,126.38	-4,807.64	7,696.19	7,515.77	180.42	42.656						
18,900.00	6,979.71	6,028.00	6,027.37	194.05	119.90	-73.94	-1,126.38	-4,807.64	7,788.07	7,607.82	180.25	43.207						
19,000.00	6,979.63	6,028.00	6,027.37	195.63	119.90	-73.94	-1,126.38	-4,807.64	7,880.14	7,700.06	180.08	43.759						
19,100.00	6,979.56	6,028.00	6,027.37	197.21	119.90	-73.94	-1,126.38	-4,807.64	7,972.40	7,792.49	179.92	44.312						
19,200.00	6,979.48	6,028.00	6,027.37	198.79	119.90	-73.94	-1,126.38	-4,807.64	8,064.85	7,885.10	179.76	44.866						
19,300.00	6,979.41	6,028.00	6,027.37	200.37	119.90	-73.94	-1,126.38	-4,807.64	8,157.48	7,977.88	179.60	45.420						
19,400.00	6,979.33	6,028.00	6,027.37	201.95	119.90	-73.94	-1,126.38	-4,807.64	8,250.28	8,070.83	179.45	45.975						
19,500.00	6,979.26	6,028.00	6,027.37	203.54	119.90	-73.94	-1,126.38	-4,807.64	8,343.24	8,163.94	179.30	46.531						
19,600.00	6,979.18	6,028.00	6,027.37	205.12	119.90	-73.94	-1,126.38	-4,807.64	8,436.37	8,257.21	179.16	47.088						
19,700.00	6,979.11	6,028.00	6,027.37	206.70	119.90	-73.94	-1,126.38	-4,807.64	8,529.65	8,350.63	179.02	47.645						
19,800.00	6,979.03	6,028.00	6,027.37	208.28	119.90	-73.94	-1,126.38	-4,807.64	8,623.09	8,444.19	178.89	48.203						
19,900.00	6,978.96	6,028.00	6,027.37	209.86	119.90	-73.94	-1,126.38	-4,807.64	8,716.66	8,537.90	178.76	48.761						
20,000.00	6,978.89	6,028.00	6,027.37	211.45	119.90	-73.94	-1,126.38	-4,807.64	8,810.38	8,631.75	178.64	49.320						
20,100.00	6,978.81	6,028.00	6,027.37	213.03	119.90	-73.94	-1,126.38	-4,807.64	8,904.24	8,725.72	178.52	49.879						
20,200.00	6,978.74	6,028.00	6,027.37	214.61	119.90	-73.94	-1,126.38	-4,807.64	8,998.23	8,819.83	178.40	50.438						
20,300.00	6,978.66	6,028.00	6,027.37	216.20	119.90	-73.94	-1,126.38	-4,807.64	9,092.34	8,914.06	178.29	50.998						
20,400.00	6,978.59	6,028.00	6,027.37	217.78	119.90	-73.94	-1,126.38	-4,807.64	9,186.59	9,008.41	178.18	51.559						
20,500.00	6,978.51	6,028.00	6,027.37	219.37	119.90	-73.94	-1,126.38	-4,807.64	9,280.95	9,102.87	178.07	52.119						
20,600.00	6,978.44	6,028.00	6,027.37	220.95	119.90	-73.94	-1,126.38	-4,807.64	9,375.43	9,197.46	177.97	52.680						
20,700.00	6,978.36	6,028.00	6,027.37	222.53	119.90	-73.94	-1,126.38	-4,807.64	9,470.02	9,292.15	177.87	53.241						
20,800.00	6,978.29	6,028.00	6,027.37	224.12	119.90	-73.94	-1,126.38	-4,807.64	9,564.72	9,386.94	177.78	53.802						
20,900.00	6,978.21	6,028.00	6,027.37	225.71	119.90	-73.94	-1,126.38	-4,807.64	9,659.53	9,481.84	177.68	54.363						
21,000.00	6,978.14	6,028.00	6,027.37	227.29	119.90	-73.94	-1,126.38	-4,807.64	9,754.44	9,576.84	177.60	54.925						
21,100.00	6,978.07	6,028.00	6,027.37	228.88	119.90	-73.94	-1,126.38	-4,807.64	9,849.45	9,671.94	177.51	55.487						
21,200.00	6,977.99	6,028.00	6,027.37	230.46	119.90	-73.94	-1,126.38	-4,807.64	9,944.56	9,767.14	177.43	56.048						
21,300.00	6,977.92	6,028.00	6,027.37	232.05	119.90	-73.94	-1,126.38	-4,807.64	10,039.77	9,862.42	177.35	56.610						
21,400.00	6,977.84	6,028.00	6,027.37	233.64	119.90	-73.94	-1,126.38	-4,807.64	10,135.07	9,957.79	177.27	57.172						
21,500.00	6,977.77	6,028.00	6,027.37	235.22	119.90	-73.94	-1,126.38	-4,807.64	10,230.46	10,053.25	177.20	57.734						
21,600.00	6,977.69	6,028.00	6,027.37	236.81	119.90	-73.94	-1,126.38	-4,807.64	10,325.93	10,148.80	177.13	58.295						
21,700.00	6,977.62	6,028.00	6,027.37	238.40	119.90	-73.94	-1,126.38	-4,807.64	10,421.49	10,244.43	177.06	58.857						
21,800.00	6,977.54	6,028.00	6,027.37	239.99	119.90	-73.94	-1,126.38	-4,807.64	10,517.13	10,340.13	177.00	59.419						
21,900.00	6,977.47	6,028.00	6,027.37	241.57	119.90	-73.94	-1,126.38	-4,807.64	10,612.86	10,435.92	176.94	59.980						
22,000.00	6,977.39	6,028.00	6,027.37	243.16	119.90	-73.94	-1,126.38	-4,807.64	10,708.66	10,531.78	176.88	60.542						
22,100.00	6,977.32	6,028.00	6,027.37	244.75	119.90	-73.94	-1,126.38	-4,807.64	10,804.53	10,627.71	176.82	61.103						
22,200.00	6,977.25	6,028.00	6,027.37	246.34	119.90	-73.94	-1,126.38	-4,807.64	10,900.49	10,723.72	176.77	61.665						
22,300.00	6,977.17	6,028.00	6,027.37	247.93	119.90	-73.94	-1,126.38	-4,807.64	10,996.51	10,819.79	176.72	62.226						
22,400.00	6,977.10	6,028.00	6,027.37	249.52	119.90	-73.94	-1,126.38	-4,807.64	11,092.60	10,915.93	176.67	62.787						
22,500.00	6,977.02	6,028.00	6,027.37	251.11	119.90	-73.94	-1,126.38	-4,807.64	11,188.77	11,012.14	176.62	63.348						
22,529.62	6,977.00	6,028.00	6,027.37	251.58	119.90	-73.94	-1,126.38	-4,807.64	11,217.26	11,040.64	176.61	63.514						

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY													Offset Site Error: 0.00 usft					
Survey Program: Reference		561-MWD OWSG Rev5					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning					
0.00	0.00	0.00	0.00	0.00	0.00	-103.03	-1,130.56	-4,883.47	5,013.86									
100.00	100.00	0.00	0.00	0.25	0.00	-103.03	-1,130.56	-4,883.47	5,012.64	5,012.39	0.25	N/A						
111.00	111.00	0.00	0.00	0.29	0.00	-103.03	-1,130.56	-4,883.47	5,012.63	5,012.34	0.29	N/A						
200.00	200.00	0.00	0.00	0.61	0.00	-103.03	-1,130.56	-4,883.47	5,013.42	5,012.81	0.61	8,206.861						
300.00	300.00	0.00	0.00	0.97	0.00	-103.03	-1,130.56	-4,883.47	5,016.19	5,015.22	0.97	5,164.239						
400.00	400.00	0.00	0.00	1.33	0.00	-103.03	-1,130.56	-4,883.47	5,020.95	5,019.62	1.33	3,771.811						
500.00	500.00	0.00	0.00	1.68	0.00	-103.03	-1,130.56	-4,883.47	5,027.70	5,026.01	1.69	2,975.154						
550.00	550.00	0.00	0.00	1.86	0.00	-103.03	-1,130.56	-4,883.47	5,031.81	5,029.95	1.87	2,692.683						
578.57	578.57	175.82	175.71	1.97	10.92	-100.61	-1,130.79	-4,888.66	5,026.24	5,013.42	12.82	392.000						
600.00	600.00	183.85	183.74	2.04	11.42	-100.58	-1,130.81	-4,889.14	5,027.57	5,014.17	13.40	375.224						
700.00	699.93	221.30	221.10	2.40	13.74	-100.45	-1,130.93	-4,891.69	5,034.90	5,018.81	16.09	312.957						
800.00	799.68	258.61	258.28	2.77	16.06	-100.29	-1,131.06	-4,894.69	5,044.09	5,025.32	18.77	268.711						
900.00	899.13	295.72	295.23	3.13	18.36	-100.11	-1,131.22	-4,898.13	5,055.13	5,033.69	21.45	235.721						
1,000.00	998.15	332.58	331.89	3.49	20.65	-99.90	-1,131.39	-4,902.01	5,068.01	5,043.90	24.11	210.224						
1,100.00	1,096.63	369.14	368.19	3.87	22.92	-99.67	-1,131.59	-4,906.31	5,082.71	5,055.95	26.76	189.966						
1,130.50	1,126.54	380.22	379.18	3.99	23.61	-99.59	-1,131.65	-4,907.70	5,087.55	5,059.99	27.56	184.595						
1,200.00	1,194.61	561.00	557.68	4.26	34.83	-99.94	-1,132.94	-4,936.13	5,105.43	5,066.44	38.98	130.970						
1,300.00	1,292.57	561.00	557.68	4.66	34.83	-99.94	-1,132.94	-4,936.13	5,120.41	5,081.01	39.40	129.967						
1,400.00	1,390.52	561.00	557.68	5.07	34.83	-99.94	-1,132.94	-4,936.13	5,137.30	5,097.50	39.80	129.069						
1,500.00	1,488.48	561.00	557.68	5.48	34.83	-99.94	-1,132.94	-4,936.13	5,156.08	5,115.88	40.20	128.276						
1,600.00	1,586.43	561.00	557.68	5.90	34.83	-99.94	-1,132.94	-4,936.13	5,176.71	5,136.14	40.57	127.586						
1,700.00	1,684.38	645.06	640.24	6.31	34.91	-100.10	-1,133.79	-4,951.93	5,198.94	5,157.90	41.03	126.697						
1,800.00	1,782.34	682.00	676.53	6.73	34.92	-100.17	-1,133.95	-4,958.82	5,221.22	5,179.80	41.42	126.058						
1,900.00	1,880.29	712.00	705.89	7.15	34.94	-100.21	-1,133.56	-4,964.96	5,244.76	5,202.97	41.80	125.482						
2,000.00	1,978.25	712.00	705.89	7.58	34.94	-100.21	-1,133.56	-4,964.96	5,269.89	5,227.75	42.14	125.056						
2,100.00	2,076.20	773.00	765.06	8.00	34.99	-100.29	-1,131.55	-4,979.63	5,296.26	5,253.69	42.57	124.423						
2,200.00	2,174.15	779.73	771.55	8.43	35.00	-100.29	-1,131.27	-4,981.39	5,323.79	5,280.90	42.90	124.105						
2,300.00	2,272.11	834.00	823.86	8.85	35.02	-100.36	-1,129.53	-4,995.73	5,352.48	5,309.20	43.28	123.669						
2,400.00	2,370.06	864.00	852.63	9.28	35.03	-100.39	-1,128.33	-5,004.16	5,382.27	5,338.64	43.63	123.370						
2,500.00	2,468.02	883.26	871.00	9.71	35.05	-100.40	-1,127.33	-5,009.84	5,413.21	5,369.26	43.95	123.168						
2,600.00	2,565.97	923.00	908.77	10.14	35.07	-100.43	-1,124.92	-5,021.99	5,445.23	5,400.93	44.30	122.917						
2,700.00	2,663.92	955.00	939.07	10.57	35.08	-100.45	-1,122.97	-5,032.09	5,478.25	5,433.62	44.63	122.745						
2,800.00	2,761.88	981.24	963.81	11.00	35.10	-100.47	-1,121.42	-5,040.69	5,512.42	5,467.47	44.95	122.636						
2,900.00	2,859.83	1,017.00	997.34	11.43	35.13	-100.49	-1,119.28	-5,052.92	5,547.76	5,502.47	45.28	122.513						
3,000.00	2,957.79	1,017.00	997.34	11.86	35.13	-100.49	-1,119.28	-5,052.92	5,584.26	5,538.74	45.52	122.676						
3,100.00	3,055.74	1,066.74	1,043.67	12.29	35.19	-100.51	-1,116.28	-5,070.76	5,621.63	5,575.73	45.90	122.473						
3,200.00	3,153.69	1,109.00	1,082.76	12.72	35.24	-100.53	-1,113.76	-5,086.63	5,660.17	5,613.92	46.25	122.369						
3,300.00	3,251.65	1,156.65	1,126.64	13.15	35.28	-100.55	-1,110.75	-5,104.94	5,699.51	5,652.90	46.61	122.269						
3,400.00	3,349.60	1,203.00	1,169.26	13.59	35.33	-100.57	-1,107.46	-5,122.88	5,739.24	5,692.27	46.97	122.196						
3,500.00	3,447.56	1,239.57	1,202.70	14.02	35.38	-100.57	-1,104.59	-5,137.41	5,779.81	5,732.51	47.30	122.202						
3,600.00	3,545.51	1,297.00	1,254.58	14.45	35.45	-100.57	-1,099.57	-5,161.51	5,821.78	5,774.08	47.70	122.047						
3,700.00	3,643.46	1,297.00	1,254.58	14.88	35.45	-100.57	-1,099.57	-5,161.51	5,864.14	5,816.25	47.88	122.466						
3,800.00	3,741.42	1,360.15	1,311.54	15.32	35.56	-100.59	-1,095.44	-5,188.44	5,907.55	5,859.21	48.34	122.199						
3,900.00	3,839.37	1,452.63	1,395.73	15.75	35.68	-100.66	-1,094.02	-5,226.70	5,951.01	5,902.12	48.89	121.720						
4,000.00	3,937.33	1,523.84	1,460.59	16.18	35.76	-100.72	-1,093.34	-5,256.08	5,994.54	5,945.21	49.33	121.519						
4,100.00	4,035.28	1,575.00	1,507.08	16.62	35.82	-100.76	-1,092.76	-5,277.42	6,038.50	5,988.81	49.69	121.527						
4,200.00	4,133.23	1,632.24	1,558.90	17.05	35.88	-100.80	-1,091.76	-5,301.70	6,082.97	6,032.89	50.08	121.467						
4,300.00	4,231.19	1,684.56	1,606.02	17.48	35.95	-100.83	-1,090.34	-5,324.39	6,128.05	6,077.59	50.45	121.465						
4,400.00	4,329.14	1,748.95	1,663.77	17.92	36.03	-100.86	-1,087.95	-5,352.77	6,173.55	6,122.67	50.88	121.340						
4,500.00	4,427.10	1,814.27	1,722.09	18.35	36.12	-100.88	-1,084.71	-5,382.00	6,219.40	6,168.09	51.31	121.205						
4,600.00	4,525.05	1,856.00	1,759.21	18.78	36.17	-100.88	-1,082.16	-5,400.91	6,265.65	6,214.01	51.65	121.321						
4,700.00	4,623.00	1,909.34	1,806.30	19.22	36.26	-100.88	-1,078.08	-5,425.61	6,312.45	6,260.40	52.05	121.276						

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		561-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,800.00	4,720.96	1,949.00	1,840.98	19.65	36.32	-100.87	-1,074.30	-5,444.49	6,359.97	6,307.58	52.39	121.403		
4,900.00	4,818.91	2,030.16	1,911.62	20.09	36.45	-100.84	-1,065.98	-5,483.58	6,407.88	6,354.93	52.94	121.036		
5,000.00	4,916.87	2,361.54	2,202.61	20.52	37.02	-100.72	-1,030.09	-5,637.89	6,454.12	6,399.34	54.78	117.817		
5,100.00	5,014.82	2,506.00	2,331.56	20.96	37.30	-100.71	-1,016.76	-5,701.60	6,498.39	6,442.71	55.69	116.698		
5,200.00	5,112.77	2,541.07	2,363.05	21.39	37.39	-100.71	-1,014.26	-5,716.82	6,542.54	6,486.49	56.05	116.718		
5,300.00	5,210.73	3,337.00	3,088.56	21.82	39.41	-100.81	-949.53	-6,032.65	6,587.70	6,527.31	60.39	109.089		
5,400.00	5,308.68	3,337.00	3,088.56	22.26	39.41	-100.81	-949.53	-6,032.65	6,623.14	6,562.50	60.64	109.221		
5,493.23	5,400.00	3,337.00	3,088.56	22.66	39.41	-100.81	-949.53	-6,032.65	6,657.37	6,596.50	60.86	109.383		
5,500.00	5,406.64	3,337.00	3,088.56	22.69	39.41	-100.82	-949.53	-6,032.65	6,659.90	6,599.02	60.88	109.396		
5,600.00	5,504.69	3,337.00	3,088.56	23.12	39.41	-101.02	-949.53	-6,032.65	6,697.86	6,636.75	61.10	109.616		
5,700.00	5,602.91	3,337.00	3,088.56	23.55	39.41	-101.23	-949.53	-6,032.65	6,736.93	6,675.62	61.31	109.882		
5,800.00	5,701.29	3,337.00	3,088.56	23.97	39.41	-101.44	-949.53	-6,032.65	6,777.11	6,715.61	61.50	110.193		
5,900.00	5,799.82	3,337.00	3,088.56	24.39	39.41	-101.67	-949.53	-6,032.65	6,818.35	6,756.67	61.68	110.547		
6,000.00	5,898.50	3,337.00	3,088.56	24.79	39.41	-101.89	-949.53	-6,032.65	6,860.65	6,798.81	61.84	110.943		
6,100.00	5,997.31	3,337.00	3,088.56	25.20	39.41	-102.13	-949.53	-6,032.65	6,903.97	6,841.99	61.99	111.379		
6,200.00	6,096.26	3,337.00	3,088.56	25.60	39.41	-102.37	-949.53	-6,032.65	6,948.30	6,886.18	62.12	111.855		
6,300.00	6,195.33	3,337.00	3,088.56	25.99	39.41	-102.62	-949.53	-6,032.65	6,993.61	6,931.38	62.24	112.369		
6,400.00	6,294.51	3,337.00	3,088.56	26.37	39.41	-102.87	-949.53	-6,032.65	7,039.89	6,977.54	62.34	112.920		
6,498.19	6,392.00	3,337.00	3,088.56	26.75	39.41	-103.13	-949.53	-6,032.65	7,086.23	7,023.80	62.44	113.497		
6,500.00	6,393.80	3,337.00	3,088.56	26.76	39.41	-101.87	-949.53	-6,032.65	7,087.10	7,024.66	62.44	113.508		
6,550.00	6,443.29	3,337.00	3,088.56	26.95	39.41	-77.55	-949.53	-6,032.65	7,109.71	7,047.23	62.48	113.786		
6,600.00	6,492.24	3,337.00	3,088.56	27.16	39.41	-65.44	-949.53	-6,032.65	7,129.99	7,067.46	62.53	114.016		
6,650.00	6,540.33	3,337.00	3,088.56	27.38	39.41	-58.48	-949.53	-6,032.65	7,147.83	7,085.23	62.59	114.193		
6,700.00	6,587.28	3,337.00	3,088.56	27.60	39.41	-53.98	-949.53	-6,032.65	7,163.13	7,100.47	62.66	114.316		
6,750.00	6,632.80	3,337.00	3,088.56	27.84	39.41	-50.86	-949.53	-6,032.65	7,175.82	7,113.09	62.73	114.386		
6,800.00	6,676.60	3,337.00	3,088.56	28.09	39.41	-48.61	-949.53	-6,032.65	7,185.83	7,123.02	62.81	114.402		
6,850.00	6,718.42	3,337.00	3,088.56	28.34	39.41	-46.97	-949.53	-6,032.65	7,193.12	7,130.22	62.90	114.363		
6,900.00	6,758.00	3,337.00	3,088.56	28.60	39.41	-45.77	-949.53	-6,032.65	7,197.64	7,134.66	62.99	114.270		
6,950.00	6,795.09	3,337.00	3,088.56	28.87	39.41	-44.95	-949.53	-6,032.65	7,199.38	7,136.30	63.09	114.122		
7,000.00	6,829.46	3,337.00	3,088.56	29.14	39.41	-44.42	-949.53	-6,032.65	7,198.33	7,135.14	63.19	113.918		
7,050.00	6,860.91	3,337.00	3,088.56	29.43	39.41	-44.17	-949.53	-6,032.65	7,194.48	7,131.18	63.30	113.657		
7,100.00	6,889.24	3,337.00	3,088.56	29.73	39.41	-44.16	-949.53	-6,032.65	7,187.86	7,124.45	63.42	113.341		
7,150.00	6,914.27	3,337.00	3,088.56	30.05	39.41	-44.39	-949.53	-6,032.65	7,178.51	7,114.97	63.54	112.968		
7,200.00	6,935.85	3,337.00	3,088.56	30.37	39.41	-44.85	-949.53	-6,032.65	7,166.47	7,102.79	63.68	112.539		
7,250.00	6,953.84	3,337.00	3,088.56	30.71	39.41	-45.53	-949.53	-6,032.65	7,151.80	7,087.97	63.82	112.055		
7,300.00	6,968.15	3,337.00	3,088.56	31.06	39.41	-46.46	-949.53	-6,032.65	7,134.57	7,070.59	63.98	111.517		
7,350.00	6,978.67	3,337.00	3,088.56	31.42	39.41	-47.63	-949.53	-6,032.65	7,114.88	7,050.74	64.14	110.927		
7,400.00	6,985.34	3,337.00	3,088.56	31.79	39.41	-49.07	-949.53	-6,032.65	7,092.82	7,028.51	64.31	110.288		
7,450.00	6,988.13	3,337.00	3,088.56	32.17	39.41	-50.79	-949.53	-6,032.65	7,068.52	7,004.02	64.49	109.602		
7,461.13	6,988.22	3,337.00	3,088.56	32.26	39.41	-51.22	-949.53	-6,032.65	7,062.81	6,998.28	64.54	109.440		
7,500.00	6,988.19	3,337.00	3,088.56	32.56	39.41	-50.92	-949.53	-6,032.65	7,042.61	6,977.93	64.68	108.885		
7,600.00	6,988.12	3,337.00	3,088.56	33.37	39.41	-50.13	-949.53	-6,032.65	6,989.76	6,924.70	65.06	107.440		
7,700.00	6,988.05	3,337.00	3,088.56	34.21	39.41	-49.30	-949.53	-6,032.65	6,935.66	6,870.22	65.45	105.977		
7,800.00	6,987.98	3,337.00	3,088.56	35.09	39.41	-48.43	-949.53	-6,032.65	6,880.36	6,814.52	65.84	104.502		
7,900.00	6,987.91	3,337.00	3,088.56	35.99	39.41	-47.52	-949.53	-6,032.65	6,823.89	6,757.66	66.24	103.023		
8,000.00	6,987.83	3,337.00	3,088.56	36.93	39.41	-46.56	-949.53	-6,032.65	6,766.30	6,699.67	66.63	101.544		
8,100.00	6,987.76	3,337.00	3,088.56	37.88	39.41	-45.55	-949.53	-6,032.65	6,707.62	6,640.59	67.03	100.070		
8,200.00	6,987.68	3,337.00	3,088.56	38.86	39.41	-44.50	-949.53	-6,032.65	6,647.91	6,580.49	67.42	98.605		
8,300.00	6,987.61	3,337.00	3,088.56	39.86	39.41	-43.40	-949.53	-6,032.65	6,587.19	6,519.39	67.80	97.154		
8,400.00	6,987.53	3,337.00	3,088.56	40.87	39.41	-42.26	-949.53	-6,032.65	6,525.53	6,457.36	68.17	95.719		
8,500.00	6,987.46	3,337.00	3,088.56	41.90	39.41	-41.06	-949.53	-6,032.65	6,462.98	6,394.44	68.53	94.305		
8,600.00	6,987.38	3,337.00	3,088.56	42.93	39.41	-39.81	-949.53	-6,032.65	6,399.57	6,330.69	68.88	92.913		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		561-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:	0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,700.00	6,987.31	3,337.00	3,088.56	43.98	39.41	-38.52	-949.53	-6,032.65	6,335.37	6,266.17	69.20	91.547		
8,800.00	6,987.23	3,337.00	3,088.56	45.03	39.41	-37.17	-949.53	-6,032.65	6,270.43	6,200.92	69.51	90.207		
8,872.16	6,987.18	3,337.00	3,088.56	45.79	39.41	-36.17	-949.53	-6,032.65	6,223.15	6,153.43	69.72	89.259		
8,900.00	6,987.16	3,337.00	3,088.56	46.08	39.41	-36.17	-949.53	-6,032.65	6,204.87	6,135.07	69.80	88.897		
9,000.00	6,987.09	3,337.00	3,088.56	47.16	39.41	-36.17	-949.53	-6,032.65	6,139.82	6,069.74	70.09	87.603		
9,100.00	6,987.01	3,337.00	3,088.56	48.27	39.41	-36.17	-949.53	-6,032.65	6,075.73	6,005.34	70.39	86.320		
9,200.00	6,986.94	3,337.00	3,088.56	49.40	39.41	-36.17	-949.53	-6,032.65	6,012.61	5,941.91	70.70	85.048		
9,300.00	6,986.86	3,337.00	3,088.56	50.56	39.41	-36.17	-949.53	-6,032.65	5,950.50	5,879.49	71.02	83.790		
9,400.00	6,986.79	3,337.00	3,088.56	51.75	39.41	-36.17	-949.53	-6,032.65	5,889.44	5,818.09	71.35	82.546		
9,500.00	6,986.71	3,337.00	3,088.56	52.95	39.41	-36.17	-949.53	-6,032.65	5,829.45	5,757.76	71.69	81.318		
9,600.00	6,986.64	3,337.00	3,088.56	54.18	39.41	-36.17	-949.53	-6,032.65	5,770.57	5,698.54	72.04	80.107		
9,700.00	6,986.56	3,337.00	3,088.56	55.42	39.41	-36.17	-949.53	-6,032.65	5,712.84	5,640.45	72.39	78.914		
9,800.00	6,986.49	3,337.00	3,088.56	56.69	39.41	-36.17	-949.53	-6,032.65	5,656.28	5,583.53	72.76	77.740		
9,900.00	6,986.41	3,337.00	3,088.56	57.97	39.41	-36.17	-949.53	-6,032.65	5,600.94	5,527.81	73.13	76.587		
10,000.00	6,986.34	3,337.00	3,088.56	59.26	39.41	-36.17	-949.53	-6,032.65	5,546.85	5,473.34	73.51	75.456		
10,100.00	6,986.27	3,337.00	3,088.56	60.57	39.41	-36.17	-949.53	-6,032.65	5,494.05	5,420.15	73.90	74.347		
10,200.00	6,986.19	3,337.00	3,088.56	61.90	39.41	-36.17	-949.53	-6,032.65	5,442.57	5,368.29	74.29	73.263		
10,300.00	6,986.12	3,337.00	3,088.56	63.23	39.41	-36.17	-949.53	-6,032.65	5,392.46	5,317.78	74.68	72.204		
10,400.00	6,986.04	3,337.00	3,088.56	64.58	39.41	-36.17	-949.53	-6,032.65	5,343.75	5,268.67	75.08	71.172		
10,500.00	6,985.97	3,337.00	3,088.56	65.94	39.41	-36.17	-949.53	-6,032.65	5,296.48	5,220.99	75.48	70.166		
10,600.00	6,985.89	3,337.00	3,088.56	67.32	39.41	-36.17	-949.53	-6,032.65	5,250.68	5,174.79	75.89	69.189		
10,700.00	6,985.82	3,337.00	3,088.56	68.70	39.41	-36.17	-949.53	-6,032.65	5,206.41	5,130.11	76.29	68.242		
10,800.00	6,985.74	3,337.00	3,088.56	70.09	39.41	-36.17	-949.53	-6,032.65	5,163.69	5,086.99	76.70	67.324		
10,900.00	6,985.67	3,337.00	3,088.56	71.49	39.41	-36.17	-949.53	-6,032.65	5,122.57	5,045.47	77.10	66.437		
11,000.00	6,985.59	3,337.00	3,088.56	72.90	39.41	-36.17	-949.53	-6,032.65	5,083.08	5,005.58	77.51	65.583		
11,100.00	6,985.52	3,337.00	3,088.56	74.31	39.41	-36.17	-949.53	-6,032.65	5,045.27	4,967.36	77.91	64.760		
11,200.00	6,985.45	3,337.00	3,088.56	75.74	39.41	-36.17	-949.53	-6,032.65	5,009.17	4,930.86	78.30	63.971		
11,300.00	6,985.37	3,337.00	3,088.56	77.17	39.41	-36.17	-949.53	-6,032.65	4,974.81	4,896.12	78.70	63.215		
11,400.00	6,985.30	3,337.00	3,088.56	78.61	39.41	-36.17	-949.53	-6,032.65	4,942.25	4,863.16	79.08	62.494		
11,500.00	6,985.22	3,337.00	3,088.56	80.05	39.41	-36.17	-949.53	-6,032.65	4,911.50	4,832.03	79.47	61.807		
11,600.00	6,985.15	3,337.00	3,088.56	81.50	39.41	-36.17	-949.53	-6,032.65	4,882.60	4,802.76	79.84	61.155		
11,700.00	6,985.07	3,337.00	3,088.56	82.96	39.41	-36.17	-949.53	-6,032.65	4,855.60	4,775.39	80.21	60.538		
11,800.00	6,985.00	3,337.00	3,088.56	84.42	39.41	-36.17	-949.53	-6,032.65	4,830.51	4,749.95	80.57	59.956		
11,900.00	6,984.92	3,337.00	3,088.56	85.89	39.41	-36.17	-949.53	-6,032.65	4,807.38	4,726.46	80.92	59.410		
12,000.00	6,984.85	3,337.00	3,088.56	87.36	39.41	-36.17	-949.53	-6,032.65	4,786.22	4,704.96	81.26	58.898		
12,100.00	6,984.77	3,337.00	3,088.56	88.83	39.41	-36.17	-949.53	-6,032.65	4,767.06	4,685.47	81.60	58.422		
12,200.00	6,984.70	3,337.00	3,088.56	90.31	39.41	-36.17	-949.53	-6,032.65	4,749.94	4,668.02	81.92	57.981		
12,300.00	6,984.63	3,337.00	3,088.56	91.80	39.41	-36.17	-949.53	-6,032.65	4,734.86	4,652.62	82.24	57.574		
12,400.00	6,984.55	3,337.00	3,088.56	93.29	39.41	-36.17	-949.53	-6,032.65	4,721.86	4,639.31	82.55	57.201		
12,500.00	6,984.48	3,337.00	3,088.56	94.78	39.41	-36.17	-949.53	-6,032.65	4,710.94	4,628.09	82.85	56.860		
12,600.00	6,984.40	3,337.00	3,088.56	96.28	39.41	-36.17	-949.53	-6,032.65	4,702.12	4,618.98	83.15	56.552		
12,700.00	6,984.33	3,337.00	3,088.56	97.78	39.41	-36.17	-949.53	-6,032.65	4,695.42	4,611.99	83.44	56.276		
12,800.00	6,984.25	3,337.00	3,088.56	99.28	39.41	-36.17	-949.53	-6,032.65	4,690.84	4,607.12	83.72	56.030		
12,900.00	6,984.18	3,337.00	3,088.56	100.78	39.41	-36.17	-949.53	-6,032.65	4,688.39	4,604.39	84.00	55.813		
12,964.92	6,984.13	3,337.00	3,088.56	101.76	39.41	-36.17	-949.53	-6,032.65	4,687.94	4,603.76	84.18	55.686	CC, ES	
13,000.00	6,984.10	3,337.00	3,088.56	102.29	39.41	-36.17	-949.53	-6,032.65	4,688.07	4,603.79	84.28	55.623		
13,100.00	6,984.03	3,337.00	3,088.56	103.80	39.41	-36.17	-949.53	-6,032.65	4,689.89	4,605.32	84.56	55.460		
13,200.00	6,983.95	3,337.00	3,088.56	105.32	39.41	-36.17	-949.53	-6,032.65	4,693.83	4,608.99	84.85	55.322		
13,300.00	6,983.88	3,337.00	3,088.56	106.84	39.41	-36.17	-949.53	-6,032.65	4,699.90	4,614.77	85.13	55.208		
13,400.00	6,983.81	3,337.00	3,088.56	108.36	39.41	-36.17	-949.53	-6,032.65	4,708.09	4,622.67	85.42	55.115		
13,500.00	6,983.73	3,337.00	3,088.56	109.88	39.41	-36.17	-949.53	-6,032.65	4,718.38	4,632.66	85.72	55.043		
13,600.00	6,983.66	3,337.00	3,088.56	111.40	39.41	-36.17	-949.53	-6,032.65	4,730.76	4,644.73	86.03	54.989		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY											Offset Site Error: 0.00 usft
Survey Program: 561-MWD OWSG Rev5											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	
13,700.00	6,983.58	3,337.00	3,088.56	112.93	39.41	-36.17	-949.53	-6,032.65	4,745.22	4,658.87	
13,800.00	6,983.51	3,337.00	3,088.56	114.46	39.41	-36.17	-949.53	-6,032.65	4,761.74	4,675.06	
13,900.00	6,983.43	3,337.00	3,088.56	115.99	39.41	-36.17	-949.53	-6,032.65	4,780.29	4,693.27	SF
14,000.00	6,983.36	3,337.00	3,088.56	117.52	39.41	-36.17	-949.53	-6,032.65	4,800.85	4,713.47	
14,100.00	6,983.28	3,337.00	3,088.56	119.06	39.41	-36.17	-949.53	-6,032.65	4,823.40	4,735.65	
14,200.00	6,983.21	3,337.00	3,088.56	120.59	39.41	-36.17	-949.53	-6,032.65	4,847.91	4,759.78	
14,300.00	6,983.13	3,337.00	3,088.56	122.13	39.41	-36.17	-949.53	-6,032.65	4,874.34	4,785.82	
14,400.00	6,983.06	3,337.00	3,088.56	123.67	39.41	-36.17	-949.53	-6,032.65	4,902.68	4,813.75	
14,500.00	6,982.99	3,337.00	3,088.56	125.21	39.41	-36.17	-949.53	-6,032.65	4,932.88	4,843.54	
14,600.00	6,982.91	3,337.00	3,088.56	126.75	39.41	-36.17	-949.53	-6,032.65	4,964.90	4,875.15	
14,700.00	6,982.84	3,337.00	3,088.56	128.30	39.41	-36.17	-949.53	-6,032.65	4,998.73	4,908.55	
14,800.00	6,982.76	3,337.00	3,088.56	129.85	39.41	-36.17	-949.53	-6,032.65	5,034.31	4,943.70	
14,900.00	6,982.69	3,337.00	3,088.56	131.39	39.41	-36.17	-949.53	-6,032.65	5,071.62	4,980.58	
15,000.00	6,982.61	3,337.00	3,088.56	132.94	39.41	-36.17	-949.53	-6,032.65	5,110.61	5,019.15	
15,100.00	6,982.54	3,337.00	3,088.56	134.49	39.41	-36.17	-949.53	-6,032.65	5,151.25	5,059.36	
15,200.00	6,982.46	3,337.00	3,088.56	136.04	39.41	-36.17	-949.53	-6,032.65	5,193.49	5,101.18	
15,300.00	6,982.39	3,337.00	3,088.56	137.60	39.41	-36.17	-949.53	-6,032.65	5,237.31	5,144.58	
15,400.00	6,982.31	3,337.00	3,088.56	139.15	39.41	-36.17	-949.53	-6,032.65	5,282.65	5,189.52	
15,500.00	6,982.24	3,337.00	3,088.56	140.70	39.41	-36.17	-949.53	-6,032.65	5,329.49	5,235.96	
15,600.00	6,982.17	3,337.00	3,088.56	142.26	39.41	-36.17	-949.53	-6,032.65	5,377.77	5,283.86	
15,700.00	6,982.09	3,337.00	3,088.56	143.82	39.41	-36.17	-949.53	-6,032.65	5,427.47	5,333.18	
15,800.00	6,982.02	3,337.00	3,088.56	145.38	39.41	-36.17	-949.53	-6,032.65	5,478.55	5,383.89	
15,900.00	6,981.94	3,337.00	3,088.56	146.94	39.41	-36.17	-949.53	-6,032.65	5,530.96	5,435.94	
16,000.00	6,981.87	3,337.00	3,088.56	148.50	39.41	-36.17	-949.53	-6,032.65	5,584.67	5,489.31	
16,100.00	6,981.79	3,337.00	3,088.56	150.06	39.41	-36.17	-949.53	-6,032.65	5,639.64	5,543.96	
16,200.00	6,981.72	3,337.00	3,088.56	151.62	39.41	-36.17	-949.53	-6,032.65	5,695.83	5,599.84	
16,300.00	6,981.64	3,337.00	3,088.56	153.18	39.41	-36.17	-949.53	-6,032.65	5,753.22	5,656.92	
16,400.00	6,981.57	3,337.00	3,088.56	154.74	39.41	-36.17	-949.53	-6,032.65	5,811.76	5,715.17	
16,500.00	6,981.49	3,337.00	3,088.56	156.31	39.41	-36.17	-949.53	-6,032.65	5,871.42	5,774.55	
16,600.00	6,981.42	3,337.00	3,088.56	157.87	39.41	-36.17	-949.53	-6,032.65	5,932.16	5,835.04	
16,700.00	6,981.35	3,337.00	3,088.56	159.44	39.41	-36.17	-949.53	-6,032.65	5,993.96	5,896.58	
16,800.00	6,981.27	3,337.00	3,088.56	161.01	39.41	-36.17	-949.53	-6,032.65	6,056.78	5,959.16	
16,900.00	6,981.20	3,337.00	3,088.56	162.58	39.41	-36.17	-949.53	-6,032.65	6,120.59	6,022.75	
17,000.00	6,981.12	3,337.00	3,088.56	164.14	39.41	-36.17	-949.53	-6,032.65	6,185.36	6,087.30	
17,100.00	6,981.05	3,337.00	3,088.56	165.71	39.41	-36.17	-949.53	-6,032.65	6,251.05	6,152.79	
17,200.00	6,980.97	3,337.00	3,088.56	167.28	39.41	-36.17	-949.53	-6,032.65	6,317.65	6,219.19	
17,300.00	6,980.90	3,337.00	3,088.56	168.85	39.41	-36.17	-949.53	-6,032.65	6,385.11	6,286.48	
17,400.00	6,980.82	3,337.00	3,088.56	170.42	39.41	-36.17	-949.53	-6,032.65	6,453.43	6,354.62	
17,500.00	6,980.75	3,337.00	3,088.56	172.00	39.41	-36.17	-949.53	-6,032.65	6,522.55	6,423.58	
17,600.00	6,980.67	3,337.00	3,088.56	173.57	39.41	-36.17	-949.53	-6,032.65	6,592.48	6,493.35	
17,700.00	6,980.60	3,337.00	3,088.56	175.14	39.41	-36.17	-949.53	-6,032.65	6,663.16	6,563.90	
17,800.00	6,980.53	3,337.00	3,088.56	176.71	39.41	-36.17	-949.53	-6,032.65	6,734.59	6,635.19	
17,900.00	6,980.45	3,337.00	3,088.56	178.29	39.41	-36.17	-949.53	-6,032.65	6,806.74	6,707.22	
18,000.00	6,980.38	3,337.00	3,088.56	179.86	39.41	-36.17	-949.53	-6,032.65	6,879.59	6,779.94	
18,100.00	6,980.30	3,337.00	3,088.56	181.44	39.41	-36.17	-949.53	-6,032.65	6,953.11	6,853.35	
18,200.00	6,980.23	3,337.00	3,088.56	183.01	39.41	-36.17	-949.53	-6,032.65	7,027.29	6,927.43	
18,300.00	6,980.15	3,337.00	3,088.56	184.59	39.41	-36.17	-949.53	-6,032.65	7,102.10	7,002.14	
18,400.00	6,980.08	3,337.00	3,088.56	186.16	39.41	-36.17	-949.53	-6,032.65	7,177.52	7,077.47	
18,500.00	6,980.00	3,337.00	3,088.56	187.74	39.41	-36.17	-949.53	-6,032.65	7,253.54	7,153.40	
18,600.00	6,979.93	3,337.00	3,088.56	189.32	39.41	-36.17	-949.53	-6,032.65	7,330.14	7,229.91	
18,700.00	6,979.85	3,337.00	3,088.56	190.90	39.41	-36.17	-949.53	-6,032.65	7,407.29	7,306.99	
18,800.00	6,979.78	3,337.00	3,088.56	192.48	39.41	-36.17	-949.53	-6,032.65	7,484.98	7,384.61	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171A - OH - OH-SVY													Offset Site Error:	0.00 usft	
Survey Program:		561-MWD OWSG Rev5										Rule Assigned:		Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
18,900.00	6,979.71	3,337.00	3,088.56	194.05	39.41	-36.17	-949.53	-6,032.65	7,563.20	7,462.76	100.43	75.307			
19,000.00	6,979.63	3,337.00	3,088.56	195.63	39.41	-36.17	-949.53	-6,032.65	7,641.92	7,541.43	100.49	76.045			
19,100.00	6,979.56	3,337.00	3,088.56	197.21	39.41	-36.17	-949.53	-6,032.65	7,721.14	7,620.59	100.55	76.790			
19,200.00	6,979.48	3,337.00	3,088.56	198.79	39.41	-36.17	-949.53	-6,032.65	7,800.83	7,700.23	100.60	77.542			
19,300.00	6,979.41	3,337.00	3,088.56	200.37	39.41	-36.17	-949.53	-6,032.65	7,880.99	7,780.34	100.65	78.301			
19,400.00	6,979.33	3,337.00	3,088.56	201.95	39.41	-36.17	-949.53	-6,032.65	7,961.60	7,860.90	100.70	79.066			
19,500.00	6,979.26	3,337.00	3,088.56	203.54	39.41	-36.17	-949.53	-6,032.65	8,042.64	7,941.90	100.74	79.837			
19,600.00	6,979.18	3,337.00	3,088.56	205.12	39.41	-36.17	-949.53	-6,032.65	8,124.10	8,023.32	100.78	80.615			
19,700.00	6,979.11	3,337.00	3,088.56	206.70	39.41	-36.17	-949.53	-6,032.65	8,205.98	8,105.16	100.81	81.398			
19,800.00	6,979.03	3,337.00	3,088.56	208.28	39.41	-36.17	-949.53	-6,032.65	8,288.25	8,187.40	100.85	82.186			
19,900.00	6,978.96	3,337.00	3,088.56	209.86	39.41	-36.17	-949.53	-6,032.65	8,370.91	8,270.03	100.88	82.980			
20,000.00	6,978.89	3,337.00	3,088.56	211.45	39.41	-36.17	-949.53	-6,032.65	8,453.94	8,353.03	100.91	83.779			
20,100.00	6,978.81	3,337.00	3,088.56	213.03	39.41	-36.17	-949.53	-6,032.65	8,537.34	8,436.40	100.93	84.583			
20,200.00	6,978.74	3,337.00	3,088.56	214.61	39.41	-36.17	-949.53	-6,032.65	8,621.09	8,520.13	100.96	85.392			
20,300.00	6,978.66	3,337.00	3,088.56	216.20	39.41	-36.17	-949.53	-6,032.65	8,705.18	8,604.20	100.98	86.205			
20,400.00	6,978.59	3,337.00	3,088.56	217.78	39.41	-36.17	-949.53	-6,032.65	8,789.60	8,688.60	101.00	87.022			
20,500.00	6,978.51	3,337.00	3,088.56	219.37	39.41	-36.17	-949.53	-6,032.65	8,874.35	8,773.33	101.02	87.844			
20,600.00	6,978.44	3,337.00	3,088.56	220.95	39.41	-36.17	-949.53	-6,032.65	8,959.42	8,858.38	101.04	88.670			
20,700.00	6,978.36	3,337.00	3,088.56	222.53	39.41	-36.17	-949.53	-6,032.65	9,044.79	8,943.73	101.06	89.499			
20,800.00	6,978.29	3,337.00	3,088.56	224.12	39.41	-36.17	-949.53	-6,032.65	9,130.46	9,029.38	101.08	90.332			
20,900.00	6,978.21	3,337.00	3,088.56	225.71	39.41	-36.17	-949.53	-6,032.65	9,216.41	9,115.32	101.09	91.169			
21,000.00	6,978.14	3,337.00	3,088.56	227.29	39.41	-36.17	-949.53	-6,032.65	9,302.65	9,201.54	101.11	92.009			
21,100.00	6,978.07	3,337.00	3,088.56	228.88	39.41	-36.17	-949.53	-6,032.65	9,389.16	9,288.04	101.12	92.852			
21,200.00	6,977.99	3,337.00	3,088.56	230.46	39.41	-36.17	-949.53	-6,032.65	9,475.93	9,374.80	101.13	93.699			
21,300.00	6,977.92	3,337.00	3,088.56	232.05	39.41	-36.17	-949.53	-6,032.65	9,562.96	9,461.82	101.14	94.548			
21,400.00	6,977.84	3,337.00	3,088.56	233.64	39.41	-36.17	-949.53	-6,032.65	9,650.25	9,549.09	101.16	95.400			
21,500.00	6,977.77	3,337.00	3,088.56	235.22	39.41	-36.17	-949.53	-6,032.65	9,737.78	9,636.61	101.17	96.255			
21,600.00	6,977.69	3,337.00	3,088.56	236.81	39.41	-36.17	-949.53	-6,032.65	9,825.54	9,724.37	101.18	97.112			
21,700.00	6,977.62	3,337.00	3,088.56	238.40	39.41	-36.17	-949.53	-6,032.65	9,913.54	9,812.36	101.19	97.972			
21,800.00	6,977.54	3,337.00	3,088.56	239.99	39.41	-36.17	-949.53	-6,032.65	10,001.77	9,900.57	101.20	98.834			
21,900.00	6,977.47	3,337.00	3,088.56	241.57	39.41	-36.17	-949.53	-6,032.65	10,090.21	9,989.00	101.21	99.698			
22,000.00	6,977.39	3,337.00	3,088.56	243.16	39.41	-36.17	-949.53	-6,032.65	10,178.87	10,077.65	101.22	100.565			
22,100.00	6,977.32	3,337.00	3,088.56	244.75	39.41	-36.17	-949.53	-6,032.65	10,267.74	10,166.51	101.23	101.433			
22,200.00	6,977.25	3,337.00	3,088.56	246.34	39.41	-36.17	-949.53	-6,032.65	10,356.81	10,255.57	101.24	102.304			
22,300.00	6,977.17	3,337.00	3,088.56	247.93	39.41	-36.17	-949.53	-6,032.65	10,446.07	10,344.83	101.25	103.176			
22,400.00	6,977.10	3,337.00	3,088.56	249.52	39.41	-36.17	-949.53	-6,032.65	10,535.53	10,434.28	101.25	104.050			
22,500.00	6,977.02	3,337.00	3,088.56	251.11	39.41	-36.17	-949.53	-6,032.65	10,625.18	10,523.92	101.26	104.925			
22,529.62	6,977.00	3,337.00	3,088.56	251.58	39.41	-36.17	-949.53	-6,032.65	10,651.77	10,550.50	101.27	105.185			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 324-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	37.09	37.09	0.00	0.41	-72.65	1,422.03	-4,550.74	4,767.74				
100.00	100.00	132.21	132.21	0.25	1.47	-72.65	1,422.06	-4,550.82	4,767.83	4,766.12	1.72	2,774.761	
200.00	200.00	227.32	227.32	0.61	2.52	-72.65	1,422.11	-4,550.99	4,768.03	4,764.90	3.13	1,522.235	
300.00	300.00	324.00	324.00	0.97	3.60	-72.65	1,422.19	-4,551.27	4,768.32	4,763.76	4.56	1,044.873	
400.00	400.00	413.26	413.26	1.33	3.76	-72.64	1,422.48	-4,551.56	4,768.73	4,763.65	5.08	938.296	
500.00	500.00	497.07	497.06	1.68	3.86	-72.65	1,422.50	-4,552.19	4,769.45	4,763.90	5.55	859.879	
550.00	550.00	525.70	525.69	1.86	3.90	-72.65	1,422.20	-4,552.60	4,769.99	4,764.22	5.77	827.153	
600.00	600.00	565.00	564.97	2.04	3.98	-70.27	1,421.30	-4,553.58	4,770.67	4,764.66	6.01	793.436	
700.00	699.93	601.43	601.33	2.40	4.40	-70.29	1,419.70	-4,555.03	4,771.81	4,765.24	6.57	725.860	
800.00	799.68	655.00	654.64	2.77	5.23	-70.37	1,415.53	-4,558.26	4,772.89	4,765.79	7.10	672.034	
900.00	899.13	715.80	714.85	3.13	6.16	-70.53	1,408.63	-4,563.13	4,773.73	4,766.00	7.73	617.566	
1,000.00	998.15	781.12	779.19	3.49	6.84	-70.75	1,399.29	-4,569.33	4,774.15	4,765.84	8.31	574.501	
1,100.00	1,096.63	845.59	842.43	3.87	7.22	-71.01	1,388.80	-4,576.25	4,774.25	4,765.39	8.86	538.870	
1,130.50	1,126.54	867.93	864.30	3.99	7.28	-71.11	1,385.04	-4,578.76	4,774.20	4,765.17	9.03	528.609	
1,161.08	1,156.49	890.29	886.19	4.11	7.34	-71.21	1,381.28	-4,581.31	4,774.17	4,764.97	9.21	518.600	
1,200.00	1,194.61	926.00	921.17	4.26	7.44	-71.38	1,375.32	-4,585.42	4,774.23	4,764.78	9.44	505.500	
1,300.00	1,292.57	974.85	968.92	4.66	7.59	-71.60	1,366.88	-4,591.36	4,774.97	4,764.99	9.98	478.417	
1,400.00	1,390.52	1,020.00	1,012.88	5.07	7.73	-71.82	1,358.52	-4,597.31	4,776.78	4,766.27	10.51	454.375	
1,500.00	1,488.48	1,083.64	1,074.62	5.48	7.99	-72.13	1,346.03	-4,606.39	4,779.62	4,768.49	11.13	429.387	
1,600.00	1,586.43	1,140.08	1,129.15	5.90	8.23	-72.41	1,334.37	-4,615.05	4,783.51	4,771.77	11.74	407.487	
1,700.00	1,684.38	1,207.00	1,193.48	6.31	8.50	-72.76	1,319.56	-4,626.04	4,788.41	4,776.01	12.40	386.247	
1,800.00	1,782.34	1,279.49	1,262.81	6.73	8.77	-73.16	1,302.42	-4,638.48	4,794.09	4,781.00	13.10	366.098	
1,900.00	1,880.29	1,342.84	1,323.12	7.15	9.02	-73.51	1,286.60	-4,649.67	4,800.45	4,786.68	13.77	348.537	
2,000.00	1,978.25	1,393.00	1,370.61	7.58	9.21	-73.79	1,273.41	-4,658.97	4,807.84	4,793.44	14.40	333.805	
2,100.00	2,076.20	1,470.34	1,443.44	8.00	9.52	-74.25	1,252.09	-4,673.88	4,816.12	4,800.94	15.18	317.288	
2,200.00	2,174.15	1,528.43	1,497.87	8.43	9.75	-74.59	1,235.38	-4,685.45	4,825.29	4,809.41	15.88	303.904	
2,300.00	2,272.11	1,584.21	1,549.87	8.85	9.96	-74.93	1,218.83	-4,697.00	4,835.53	4,818.96	16.57	291.829	
2,400.00	2,370.06	1,657.87	1,618.24	9.28	10.23	-75.39	1,196.34	-4,712.64	4,846.66	4,829.30	17.37	279.086	
2,500.00	2,468.02	1,704.64	1,661.46	9.71	10.42	-75.68	1,181.65	-4,722.82	4,858.74	4,840.70	18.04	269.332	
2,600.00	2,565.97	1,764.00	1,715.84	10.14	10.67	-76.06	1,162.16	-4,736.48	4,872.20	4,853.41	18.79	259.275	
2,700.00	2,663.92	1,791.02	1,740.44	10.57	10.79	-76.24	1,153.05	-4,742.94	4,886.81	4,867.45	19.36	252.385	
2,800.00	2,761.88	1,858.00	1,801.24	11.00	11.09	-76.68	1,130.25	-4,759.38	4,902.71	4,882.53	20.18	242.933	
2,900.00	2,859.83	1,858.00	1,801.24	11.43	11.09	-76.68	1,130.25	-4,759.38	4,919.85	4,899.28	20.57	239.161	
3,000.00	2,957.79	1,926.44	1,863.10	11.86	11.35	-77.13	1,106.80	-4,776.94	4,938.01	4,916.59	21.42	230.550	
3,100.00	3,055.74	1,983.00	1,914.02	12.29	11.58	-77.50	1,087.45	-4,792.14	4,957.63	4,935.45	22.18	223.532	
3,200.00	3,153.69	2,280.29	2,184.25	12.72	12.85	-79.38	988.74	-4,866.86	4,977.50	4,952.94	24.56	202.707	
3,300.00	3,251.65	2,337.87	2,236.96	13.15	13.09	-79.74	969.69	-4,880.00	4,994.94	4,969.62	25.32	197.267	
3,400.00	3,349.60	2,423.82	2,315.71	13.59	13.45	-80.27	941.54	-4,899.89	5,013.21	4,986.95	26.26	190.874	
3,500.00	3,447.56	2,665.33	2,539.17	14.02	14.55	-81.71	866.17	-4,951.81	5,030.65	5,002.44	28.22	178.279	
3,600.00	3,545.51	2,729.00	2,598.03	14.45	14.85	-82.09	845.51	-4,964.60	5,047.34	5,018.32	29.02	173.908	
3,700.00	3,643.46	2,770.56	2,636.35	14.88	15.05	-82.34	831.91	-4,973.19	5,065.09	5,035.41	29.68	170.666	
3,800.00	3,741.42	2,854.93	2,714.04	15.32	15.48	-82.85	804.48	-4,991.34	5,084.04	5,053.43	30.62	166.060	
3,900.00	3,839.37	2,980.33	2,830.15	15.75	16.14	-83.58	764.86	-5,017.28	5,102.71	5,070.89	31.82	160.384	
4,000.00	3,937.33	3,087.72	2,930.11	16.18	16.72	-84.19	732.13	-5,038.93	5,121.39	5,088.52	32.87	155.790	
4,100.00	4,035.28	3,171.35	3,008.18	16.62	17.18	-84.65	707.14	-5,055.51	5,140.23	5,106.46	33.77	152.199	
4,200.00	4,133.23	3,291.19	3,119.56	17.05	17.89	-85.33	669.89	-5,079.32	5,159.70	5,124.77	34.93	147.708	
4,300.00	4,231.19	3,347.17	3,171.48	17.48	18.25	-85.65	652.07	-5,090.28	5,179.37	5,143.68	35.69	145.109	
4,400.00	4,329.14	3,420.63	3,239.99	17.92	18.71	-86.06	630.12	-5,105.14	5,199.90	5,163.34	36.56	142.244	
4,500.00	4,427.10	3,736.97	3,538.02	18.35	20.49	-87.72	540.66	-5,161.61	5,217.87	5,179.00	38.87	134.226	
4,600.00	4,525.05	3,793.31	3,591.66	18.78	20.78	-88.00	526.14	-5,170.90	5,235.64	5,196.07	39.58	132.296	
4,700.00	4,623.00	4,275.84	4,061.25	19.22	23.23	-89.95	440.95	-5,235.96	5,248.91	5,206.23	42.68	122.992	
4,800.00	4,720.96	4,359.00	4,143.48	19.65	24.00	-90.21	432.71	-5,245.18	5,260.93	5,217.29	43.64	120.548	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		324-MWD OWSG Rev5						Rule Assigned:		Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,900.00	4,818.91	4,359.00	4,143.48	20.09	24.00	-90.21	432.71	-5,245.18	5,273.91	5,229.84	44.07	119.672		
5,000.00	4,916.87	4,399.37	4,183.38	20.52	24.17	-90.33	429.46	-5,250.34	5,288.09	5,243.45	44.65	118.443		
5,100.00	5,014.82	4,451.00	4,234.30	20.96	24.38	-90.47	426.83	-5,258.49	5,304.17	5,258.90	45.26	117.182		
5,200.00	5,112.77	4,451.00	4,234.30	21.39	24.38	-90.47	426.83	-5,258.49	5,321.02	5,275.36	45.66	116.530		
5,300.00	5,210.73	4,451.00	4,234.30	21.82	24.38	-90.47	426.83	-5,258.49	5,339.70	5,293.65	46.04	115.967		
5,400.00	5,308.68	4,545.68	4,327.35	22.26	25.18	-90.70	423.60	-5,275.66	5,358.69	5,311.56	47.14	113.682		
5,493.23	5,400.00	4,596.03	4,376.74	22.66	25.75	-90.82	421.91	-5,285.31	5,377.40	5,329.53	47.87	112.335		
5,500.00	5,406.64	4,599.68	4,380.32	22.69	25.79	-90.84	421.79	-5,286.02	5,378.79	5,330.87	47.92	112.240		
5,600.00	5,504.69	4,653.60	4,433.12	23.12	26.48	-91.07	420.02	-5,296.78	5,399.70	5,351.00	48.70	110.873		
5,700.00	5,602.91	4,707.46	4,485.79	23.55	27.21	-91.30	418.27	-5,307.94	5,421.41	5,371.94	49.47	109.581		
5,800.00	5,701.29	4,821.00	4,596.51	23.97	28.78	-91.64	414.69	-5,332.81	5,444.49	5,393.78	50.72	107.350		
5,900.00	5,799.82	4,821.00	4,596.51	24.39	28.78	-91.76	414.69	-5,332.81	5,467.19	5,416.14	51.05	107.105		
6,000.00	5,898.50	5,399.85	5,164.90	24.79	30.65	-92.68	421.48	-5,440.62	5,486.35	5,432.02	54.33	100.978		
6,100.00	5,997.31	5,637.49	5,400.29	25.20	31.35	-93.02	428.88	-5,472.28	5,500.29	5,444.48	55.81	98.549		
6,200.00	6,096.26	5,743.94	5,505.98	25.60	31.66	-93.20	431.48	-5,484.68	5,512.49	5,455.82	56.67	97.271		
6,300.00	6,195.33	5,824.56	5,586.01	25.99	31.89	-93.35	433.20	-5,494.26	5,524.95	5,467.54	57.41	96.238		
6,400.00	6,294.51	5,905.15	5,665.98	26.37	32.13	-93.50	434.71	-5,504.09	5,537.71	5,479.57	58.14	95.246		
6,498.19	6,392.00	6,062.11	5,821.76	26.75	32.69	-93.70	437.73	-5,523.06	5,550.25	5,490.98	59.26	93.651		
6,500.00	6,393.80	6,067.35	5,826.97	26.76	32.71	-92.49	437.86	-5,523.65	5,550.46	5,491.16	59.30	93.603		
6,550.00	6,443.29	6,212.18	5,970.93	26.95	33.29	-69.68	442.43	-5,538.87	5,554.17	5,493.97	60.21	92.254		
6,600.00	6,492.24	6,357.11	6,115.13	27.16	33.90	-59.11	448.77	-5,551.80	5,553.80	5,492.69	61.11	90.881		
6,650.00	6,540.33	6,270.53	6,029.06	27.38	33.53	-53.27	445.80	-5,543.01	5,549.54	5,488.60	60.94	91.061		
6,700.00	6,587.28	6,388.00	6,145.89	27.60	33.90	-50.29	450.24	-5,554.27	5,542.95	5,481.33	61.62	89.953		
6,750.00	6,632.80	6,388.00	6,145.89	27.84	33.90	-48.42	450.24	-5,554.27	5,533.39	5,471.51	61.88	89.423		
6,800.00	6,676.60	6,388.00	6,145.89	28.09	33.90	-47.40	450.24	-5,554.27	5,521.16	5,459.02	62.14	88.849		
6,850.00	6,718.42	6,388.00	6,145.89	28.34	33.90	-47.00	450.24	-5,554.27	5,506.30	5,443.89	62.41	88.232		
6,900.00	6,758.00	6,388.00	6,145.89	28.60	33.90	-47.08	450.24	-5,554.27	5,488.88	5,426.21	62.68	87.575		
6,950.00	6,795.09	6,388.00	6,145.89	28.87	33.90	-47.57	450.24	-5,554.27	5,469.00	5,406.05	62.95	86.879		
7,000.00	6,829.46	6,388.00	6,145.89	29.14	33.90	-48.43	450.24	-5,554.27	5,446.75	5,383.52	63.23	86.148		
7,050.00	6,860.91	6,388.00	6,145.89	29.43	33.90	-49.65	450.24	-5,554.27	5,422.23	5,358.73	63.50	85.384		
7,100.00	6,889.24	6,388.00	6,145.89	29.73	33.90	-51.24	450.24	-5,554.27	5,395.57	5,331.79	63.79	84.588		
7,150.00	6,914.27	6,388.00	6,145.89	30.05	33.90	-53.19	450.24	-5,554.27	5,366.91	5,302.83	64.07	83.764		
7,200.00	6,935.85	6,388.00	6,145.89	30.37	33.90	-55.54	450.24	-5,554.27	5,336.38	5,272.02	64.36	82.915		
7,250.00	6,953.84	6,388.00	6,145.89	30.71	33.90	-58.30	450.24	-5,554.27	5,304.14	5,239.49	64.65	82.042		
7,300.00	6,968.15	6,388.00	6,145.89	31.06	33.90	-61.49	450.24	-5,554.27	5,270.37	5,205.43	64.95	81.150		
7,350.00	6,978.67	6,388.00	6,145.89	31.42	33.90	-65.14	450.24	-5,554.27	5,235.25	5,170.00	65.24	80.242		
7,400.00	6,985.34	6,388.00	6,145.89	31.79	33.90	-69.26	450.24	-5,554.27	5,198.96	5,133.41	65.54	79.321		
7,450.00	6,988.13	6,388.00	6,145.89	32.17	33.90	-73.82	450.24	-5,554.27	5,161.71	5,095.86	65.85	78.392		
7,461.13	6,988.22	6,388.00	6,145.89	32.26	33.90	-74.89	450.24	-5,554.27	5,153.30	5,087.39	65.91	78.183		
7,500.00	6,988.19	6,388.00	6,145.89	32.56	33.90	-74.65	450.24	-5,554.27	5,123.80	5,057.65	66.15	77.458		
7,600.00	6,988.12	6,388.00	6,145.89	33.37	33.90	-74.00	450.24	-5,554.27	5,046.94	4,980.18	66.76	75.593		
7,700.00	6,988.05	6,388.00	6,145.89	34.21	33.90	-73.30	450.24	-5,554.27	4,968.76	4,901.37	67.39	73.730		
7,800.00	6,987.98	6,388.00	6,145.89	35.09	33.90	-72.53	450.24	-5,554.27	4,889.28	4,821.25	68.02	71.875		
7,900.00	6,987.91	6,388.00	6,145.89	35.99	33.90	-71.69	450.24	-5,554.27	4,808.54	4,739.88	68.66	70.031		
8,000.00	6,987.83	6,388.00	6,145.89	36.93	33.90	-70.78	450.24	-5,554.27	4,726.58	4,657.27	69.30	68.202		
8,100.00	6,987.76	6,388.00	6,145.89	37.88	33.90	-69.77	450.24	-5,554.27	4,643.43	4,573.48	69.94	66.390		
8,200.00	6,987.68	6,388.00	6,145.89	38.86	33.90	-68.66	450.24	-5,554.27	4,559.13	4,488.55	70.58	64.598		
8,300.00	6,987.61	6,388.00	6,145.89	39.86	33.90	-67.43	450.24	-5,554.27	4,473.73	4,402.52	71.20	62.829		
8,400.00	6,987.53	6,388.00	6,145.89	40.87	33.90	-66.07	450.24	-5,554.27	4,387.26	4,315.44	71.82	61.084		
8,500.00	6,987.46	6,388.00	6,145.89	41.90	33.90	-64.57	450.24	-5,554.27	4,299.78	4,227.35	72.43	59.365		
8,600.00	6,987.38	6,388.00	6,145.89	42.93	33.90	-62.89	450.24	-5,554.27	4,211.32	4,138.30	73.02	57.673		
8,700.00	6,987.31	6,388.00	6,145.89	43.98	33.90	-61.02	450.24	-5,554.27	4,121.94	4,048.34	73.59	56.009		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft		
Survey Program: 324-MWD OWSG Rev5		Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
8,800.00	6,987.23	6,388.00	6,145.89	45.03	33.90	-58.92	450.24	-5,554.27	4,031.68	3,957.53	74.15	54.375			
8,872.16	6,987.18	6,388.00	6,145.89	45.79	33.90	-57.25	450.24	-5,554.27	3,966.04	3,891.51	74.53	53.214			
8,900.00	6,987.16	6,388.00	6,145.89	46.08	33.90	-57.25	450.24	-5,554.27	3,940.65	3,865.98	74.68	52.770			
9,000.00	6,987.09	6,388.00	6,145.89	47.16	33.90	-57.25	450.24	-5,554.27	3,849.74	3,774.52	75.22	51.181			
9,100.00	6,987.01	6,388.00	6,145.89	48.27	33.90	-57.25	450.24	-5,554.27	3,759.29	3,683.50	75.79	49.603			
9,200.00	6,986.94	6,388.00	6,145.89	49.40	33.90	-57.25	450.24	-5,554.27	3,669.33	3,592.95	76.39	48.036			
9,300.00	6,986.86	6,388.00	6,145.89	50.56	33.90	-57.25	450.24	-5,554.27	3,579.91	3,502.89	77.02	46.481			
9,400.00	6,986.79	6,388.00	6,145.89	51.75	33.90	-57.25	450.24	-5,554.27	3,491.06	3,413.38	77.68	44.940			
9,500.00	6,986.71	6,388.00	6,145.89	52.95	33.90	-57.25	450.24	-5,554.27	3,402.83	3,324.45	78.38	43.413			
9,600.00	6,986.64	6,388.00	6,145.89	54.18	33.90	-57.25	450.24	-5,554.27	3,315.27	3,236.15	79.12	41.902			
9,700.00	6,986.56	6,388.00	6,145.89	55.42	33.90	-57.25	450.24	-5,554.27	3,228.44	3,148.54	79.89	40.409			
9,800.00	6,986.49	6,388.00	6,145.89	56.69	33.90	-57.25	450.24	-5,554.27	3,142.38	3,061.67	80.71	38.934			
9,900.00	6,986.41	6,388.00	6,145.89	57.97	33.90	-57.25	450.24	-5,554.27	3,057.17	2,975.60	81.57	37.479			
10,000.00	6,986.34	6,388.00	6,145.89	59.26	33.90	-57.25	450.24	-5,554.27	2,972.89	2,890.42	82.47	36.046			
10,100.00	6,986.27	6,388.00	6,145.89	60.57	33.90	-57.25	450.24	-5,554.27	2,889.61	2,806.18	83.42	34.637			
10,200.00	6,986.19	6,388.00	6,145.89	61.90	33.90	-57.25	450.24	-5,554.27	2,807.42	2,722.99	84.42	33.254			
10,300.00	6,986.12	6,388.00	6,145.89	63.23	33.90	-57.25	450.24	-5,554.27	2,726.42	2,640.94	85.47	31.899			
10,400.00	6,986.04	6,388.00	6,145.89	64.58	33.90	-57.25	450.24	-5,554.27	2,646.72	2,560.15	86.57	30.573			
10,500.00	6,985.97	6,388.00	6,145.89	65.94	33.90	-57.25	450.24	-5,554.27	2,568.43	2,480.72	87.72	29.280			
10,600.00	6,985.89	6,388.00	6,145.89	67.32	33.90	-57.25	450.24	-5,554.27	2,491.71	2,402.79	88.92	28.022			
10,700.00	6,985.82	6,388.00	6,145.89	68.70	33.90	-57.25	450.24	-5,554.27	2,416.69	2,326.51	90.17	26.801			
10,800.00	6,985.74	6,388.00	6,145.89	70.09	33.90	-57.25	450.24	-5,554.27	2,343.53	2,252.06	91.47	25.620			
10,900.00	6,985.67	6,388.00	6,145.89	71.49	33.90	-57.25	450.24	-5,554.27	2,272.42	2,179.60	92.82	24.482			
11,000.00	6,985.59	6,388.00	6,145.89	72.90	33.90	-57.25	450.24	-5,554.27	2,203.55	2,109.35	94.21	23.391			
11,100.00	6,985.52	6,388.00	6,145.89	74.31	33.90	-57.25	450.24	-5,554.27	2,137.15	2,041.52	95.63	22.349			
11,200.00	6,985.45	6,388.00	6,145.89	75.74	33.90	-57.25	450.24	-5,554.27	2,073.44	1,976.37	97.07	21.360			
11,300.00	6,985.37	6,388.00	6,145.89	77.17	33.90	-57.25	450.24	-5,554.27	2,012.69	1,914.16	98.53	20.428			
11,400.00	6,985.30	6,388.00	6,145.89	78.61	33.90	-57.25	450.24	-5,554.27	1,955.17	1,855.18	99.98	19.555			
11,500.00	6,985.22	6,388.00	6,145.89	80.05	33.90	-57.25	450.24	-5,554.27	1,901.17	1,799.74	101.42	18.745			
11,600.00	6,985.15	6,388.00	6,145.89	81.50	33.90	-57.25	450.24	-5,554.27	1,851.00	1,748.18	102.82	18.002			
11,700.00	6,985.07	6,388.00	6,145.89	82.96	33.90	-57.25	450.24	-5,554.27	1,804.98	1,700.83	104.15	17.330			
11,800.00	6,985.00	6,388.00	6,145.89	84.42	33.90	-57.25	450.24	-5,554.27	1,763.44	1,658.04	105.39	16.732			
11,900.00	6,984.92	6,388.00	6,145.89	85.89	33.90	-57.25	450.24	-5,554.27	1,726.69	1,620.18	106.52	16.211			
12,000.00	6,984.85	6,388.00	6,145.89	87.36	33.90	-57.25	450.24	-5,554.27	1,695.06	1,587.57	107.49	15.769			
12,100.00	6,984.77	6,388.00	6,145.89	88.83	33.90	-57.25	450.24	-5,554.27	1,668.83	1,560.54	108.29	15.411			
12,200.00	6,984.70	6,388.00	6,145.89	90.31	33.90	-57.25	450.24	-5,554.27	1,648.25	1,539.37	108.88	15.138			
12,300.00	6,984.63	6,388.00	6,145.89	91.80	33.90	-57.25	450.24	-5,554.27	1,633.55	1,524.30	109.26	14.951			
12,400.00	6,984.55	6,388.00	6,145.89	93.29	33.90	-57.25	450.24	-5,554.27	1,624.88	1,515.49	109.39	14.853			
12,491.21	6,984.48	6,388.00	6,145.89	94.65	33.90	-57.25	450.24	-5,554.27	1,622.32	1,513.01	109.31	14.841	CC, ES, SF		
12,500.00	6,984.48	6,388.00	6,145.89	94.78	33.90	-57.25	450.24	-5,554.27	1,622.35	1,513.06	109.29	14.844			
12,600.00	6,984.40	6,388.00	6,145.89	96.28	33.90	-57.25	450.24	-5,554.27	1,625.97	1,517.02	108.95	14.924			
12,700.00	6,984.33	6,388.00	6,145.89	97.78	33.90	-57.25	450.24	-5,554.27	1,635.70	1,527.32	108.38	15.092			
12,800.00	6,984.25	6,388.00	6,145.89	99.28	33.90	-57.25	450.24	-5,554.27	1,651.45	1,543.85	107.60	15.348			
12,900.00	6,984.18	6,388.00	6,145.89	100.78	33.90	-57.25	450.24	-5,554.27	1,673.03	1,566.40	106.64	15.689			
13,000.00	6,984.10	6,388.00	6,145.89	102.29	33.90	-57.25	450.24	-5,554.27	1,700.23	1,594.72	105.51	16.114			
13,100.00	6,984.03	6,388.00	6,145.89	103.80	33.90	-57.25	450.24	-5,554.27	1,732.79	1,628.52	104.27	16.619			
13,200.00	6,983.95	6,388.00	6,145.89	105.32	33.90	-57.25	450.24	-5,554.27	1,770.40	1,667.48	102.92	17.201			
13,300.00	6,983.88	6,388.00	6,145.89	106.84	33.90	-57.25	450.24	-5,554.27	1,812.75	1,711.24	101.51	17.858			
13,400.00	6,983.81	6,388.00	6,145.89	108.36	33.90	-57.25	450.24	-5,554.27	1,859.52	1,759.46	100.06	18.584			
13,500.00	6,983.73	6,388.00	6,145.89	109.88	33.90	-57.25	450.24	-5,554.27	1,910.39	1,811.80	98.59	19.378			
13,600.00	6,983.66	6,388.00	6,145.89	111.40	33.90	-57.25	450.24	-5,554.27	1,965.03	1,867.91	97.12	20.234			
13,700.00	6,983.58	6,388.00	6,145.89	112.93	33.90	-57.25	450.24	-5,554.27	2,023.14	1,927.48	95.66	21.148			

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error: 0.00 usft	
Survey Program: 324-MWD OWSG Rev5		Rule Assigned:						Offset Well Error: 0.00 usft						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,800.00	6,983.51	6,388.00	6,145.89	114.46	33.90	-57.25	450.24	-5,554.27	2,084.43	1,990.19	94.24	22.118		
13,900.00	6,983.43	6,388.00	6,145.89	115.99	33.90	-57.25	450.24	-5,554.27	2,148.63	2,055.77	92.86	23.139		
14,000.00	6,983.36	6,388.00	6,145.89	117.52	33.90	-57.25	450.24	-5,554.27	2,215.48	2,123.96	91.52	24.207		
14,100.00	6,983.28	6,388.00	6,145.89	119.06	33.90	-57.25	450.24	-5,554.27	2,284.76	2,194.52	90.24	25.319		
14,200.00	6,983.21	6,388.00	6,145.89	120.59	33.90	-57.25	450.24	-5,554.27	2,356.24	2,267.23	89.01	26.471		
14,300.00	6,983.13	6,388.00	6,145.89	122.13	33.90	-57.25	450.24	-5,554.27	2,429.74	2,341.90	87.84	27.661		
14,400.00	6,983.06	6,388.00	6,145.89	123.67	33.90	-57.25	450.24	-5,554.27	2,505.08	2,418.35	86.73	28.884		
14,500.00	6,982.99	6,388.00	6,145.89	125.21	33.90	-57.25	450.24	-5,554.27	2,582.08	2,496.41	85.67	30.139		
14,600.00	6,982.91	6,388.00	6,145.89	126.75	33.90	-57.25	450.24	-5,554.27	2,660.62	2,575.95	84.67	31.422		
14,700.00	6,982.84	6,388.00	6,145.89	128.30	33.90	-57.25	450.24	-5,554.27	2,740.56	2,656.83	83.73	32.730		
14,800.00	6,982.76	6,388.00	6,145.89	129.85	33.90	-57.25	450.24	-5,554.27	2,821.78	2,738.94	82.84	34.062		
14,900.00	6,982.69	6,388.00	6,145.89	131.39	33.90	-57.25	450.24	-5,554.27	2,904.17	2,822.16	82.00	35.415		
15,000.00	6,982.61	6,388.00	6,145.89	132.94	33.90	-57.25	450.24	-5,554.27	2,987.63	2,906.42	81.21	36.787		
15,100.00	6,982.54	6,388.00	6,145.89	134.49	33.90	-57.25	450.24	-5,554.27	3,072.08	2,991.61	80.47	38.176		
15,200.00	6,982.46	6,388.00	6,145.89	136.04	33.90	-57.25	450.24	-5,554.27	3,157.45	3,077.67	79.77	39.580		
15,300.00	6,982.39	6,388.00	6,145.89	137.60	33.90	-57.25	450.24	-5,554.27	3,243.64	3,164.53	79.12	40.998		
15,400.00	6,982.31	6,388.00	6,145.89	139.15	33.90	-57.25	450.24	-5,554.27	3,330.61	3,252.11	78.50	42.428		
15,500.00	6,982.24	6,388.00	6,145.89	140.70	33.90	-57.25	450.24	-5,554.27	3,418.29	3,340.37	77.92	43.868		
15,600.00	6,982.17	6,388.00	6,145.89	142.26	33.90	-57.25	450.24	-5,554.27	3,506.64	3,429.26	77.38	45.318		
15,700.00	6,982.09	6,388.00	6,145.89	143.82	33.90	-57.25	450.24	-5,554.27	3,595.59	3,518.72	76.87	46.775		
15,800.00	6,982.02	6,388.00	6,145.89	145.38	33.90	-57.25	450.24	-5,554.27	3,685.11	3,608.72	76.39	48.240		
15,900.00	6,981.94	6,388.00	6,145.89	146.94	33.90	-57.25	450.24	-5,554.27	3,775.15	3,699.21	75.94	49.710		
16,000.00	6,981.87	6,388.00	6,145.89	148.50	33.90	-57.25	450.24	-5,554.27	3,865.69	3,790.16	75.52	51.186		
16,100.00	6,981.79	6,388.00	6,145.89	150.06	33.90	-57.25	450.24	-5,554.27	3,956.68	3,881.55	75.13	52.665		
16,200.00	6,981.72	6,388.00	6,145.89	151.62	33.90	-57.25	450.24	-5,554.27	4,048.09	3,973.33	74.76	54.148		
16,300.00	6,981.64	6,388.00	6,145.89	153.18	33.90	-57.25	450.24	-5,554.27	4,139.90	4,065.49	74.41	55.633		
16,400.00	6,981.57	6,388.00	6,145.89	154.74	33.90	-57.25	450.24	-5,554.27	4,232.09	4,158.00	74.09	57.121		
16,500.00	6,981.49	6,388.00	6,145.89	156.31	33.90	-57.25	450.24	-5,554.27	4,324.62	4,250.83	73.79	58.609		
16,600.00	6,981.42	6,388.00	6,145.89	157.87	33.90	-57.25	450.24	-5,554.27	4,417.47	4,343.97	73.50	60.098		
16,700.00	6,981.35	6,388.00	6,145.89	159.44	33.90	-57.25	450.24	-5,554.27	4,510.63	4,437.40	73.24	61.588		
16,800.00	6,981.27	6,388.00	6,145.89	161.01	33.90	-57.25	450.24	-5,554.27	4,604.08	4,531.09	72.99	63.077		
16,900.00	6,981.20	6,388.00	6,145.89	162.58	33.90	-57.25	450.24	-5,554.27	4,697.80	4,625.04	72.76	64.565		
17,000.00	6,981.12	6,388.00	6,145.89	164.14	33.90	-57.25	450.24	-5,554.27	4,791.77	4,719.23	72.54	66.053		
17,100.00	6,981.05	6,388.00	6,145.89	165.71	33.90	-57.25	450.24	-5,554.27	4,885.99	4,813.64	72.34	67.539		
17,200.00	6,980.97	6,388.00	6,145.89	167.28	33.90	-57.25	450.24	-5,554.27	4,980.42	4,908.27	72.16	69.023		
17,300.00	6,980.90	6,388.00	6,145.89	168.85	33.90	-57.25	450.24	-5,554.27	5,075.07	5,003.09	71.98	70.505		
17,400.00	6,980.82	6,388.00	6,145.89	170.42	33.90	-57.25	450.24	-5,554.27	5,169.93	5,098.11	71.82	71.985		
17,500.00	6,980.75	6,388.00	6,145.89	172.00	33.90	-57.25	450.24	-5,554.27	5,264.97	5,193.30	71.67	73.462		
17,600.00	6,980.67	6,388.00	6,145.89	173.57	33.90	-57.25	450.24	-5,554.27	5,360.19	5,288.66	71.53	74.937		
17,700.00	6,980.60	6,388.00	6,145.89	175.14	33.90	-57.25	450.24	-5,554.27	5,455.58	5,384.18	71.40	76.408		
17,800.00	6,980.53	6,388.00	6,145.89	176.71	33.90	-57.25	450.24	-5,554.27	5,551.14	5,479.86	71.28	77.876		
17,900.00	6,980.45	6,388.00	6,145.89	178.29	33.90	-57.25	450.24	-5,554.27	5,646.85	5,575.68	71.17	79.341		
18,000.00	6,980.38	6,388.00	6,145.89	179.86	33.90	-57.25	450.24	-5,554.27	5,742.71	5,671.64	71.07	80.803		
18,100.00	6,980.30	6,388.00	6,145.89	181.44	33.90	-57.25	450.24	-5,554.27	5,838.70	5,767.72	70.98	82.260		
18,200.00	6,980.23	6,388.00	6,145.89	183.01	33.90	-57.25	450.24	-5,554.27	5,934.83	5,863.93	70.89	83.714		
18,300.00	6,980.15	6,388.00	6,145.89	184.59	33.90	-57.25	450.24	-5,554.27	6,031.08	5,960.26	70.82	85.164		
18,400.00	6,980.08	6,388.00	6,145.89	186.16	33.90	-57.25	450.24	-5,554.27	6,127.45	6,056.71	70.75	86.609		
18,500.00	6,980.00	6,388.00	6,145.89	187.74	33.90	-57.25	450.24	-5,554.27	6,223.94	6,153.26	70.69	88.051		
18,600.00	6,979.93	6,388.00	6,145.89	189.32	33.90	-57.25	450.24	-5,554.27	6,320.54	6,249.91	70.63	89.488		
18,700.00	6,979.85	6,388.00	6,145.89	190.90	33.90	-57.25	450.24	-5,554.27	6,417.24	6,346.66	70.58	90.921		
18,800.00	6,979.78	6,388.00	6,145.89	192.48	33.90	-57.25	450.24	-5,554.27	6,514.04	6,443.50	70.54	92.350		
18,900.00	6,979.71	6,388.00	6,145.89	194.05	33.90	-57.25	450.24	-5,554.27	6,610.94	6,540.44	70.50	93.774		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		324-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,000.00	6,979.63	6,388.00	6,145.89	195.63	33.90	-57.25	450.24	-5,554.27	6,707.92	6,637.46	70.47	95.194		
19,100.00	6,979.56	6,388.00	6,145.89	197.21	33.90	-57.25	450.24	-5,554.27	6,805.00	6,734.56	70.44	96.609		
19,200.00	6,979.48	6,388.00	6,145.89	198.79	33.90	-57.25	450.24	-5,554.27	6,902.16	6,831.74	70.42	98.020		
19,300.00	6,979.41	6,388.00	6,145.89	200.37	33.90	-57.25	450.24	-5,554.27	6,999.39	6,929.00	70.40	99.425		
19,400.00	6,979.33	6,388.00	6,145.89	201.95	33.90	-57.25	450.24	-5,554.27	7,096.71	7,026.32	70.39	100.827		
19,500.00	6,979.26	6,388.00	6,145.89	203.54	33.90	-57.25	450.24	-5,554.27	7,194.10	7,123.72	70.38	102.223		
19,600.00	6,979.18	6,388.00	6,145.89	205.12	33.90	-57.25	450.24	-5,554.27	7,291.56	7,221.18	70.37	103.615		
19,700.00	6,979.11	6,388.00	6,145.89	206.70	33.90	-57.25	450.24	-5,554.27	7,389.08	7,318.71	70.37	105.002		
19,800.00	6,979.03	6,388.00	6,145.89	208.28	33.90	-57.25	450.24	-5,554.27	7,486.68	7,416.30	70.37	106.384		
19,900.00	6,978.96	6,388.00	6,145.89	209.86	33.90	-57.25	450.24	-5,554.27	7,584.33	7,513.95	70.38	107.761		
20,000.00	6,978.89	6,388.00	6,145.89	211.45	33.90	-57.25	450.24	-5,554.27	7,682.05	7,611.65	70.39	109.133		
20,100.00	6,978.81	6,388.00	6,145.89	213.03	33.90	-57.25	450.24	-5,554.27	7,779.82	7,709.41	70.41	110.501		
20,200.00	6,978.74	6,388.00	6,145.89	214.61	33.90	-57.25	450.24	-5,554.27	7,877.65	7,807.23	70.42	111.863		
20,300.00	6,978.66	6,388.00	6,145.89	216.20	33.90	-57.25	450.24	-5,554.27	7,975.53	7,905.09	70.44	113.221		
20,400.00	6,978.59	6,388.00	6,145.89	217.78	33.90	-57.25	450.24	-5,554.27	8,073.47	8,003.00	70.47	114.574		
20,500.00	6,978.51	6,388.00	6,145.89	219.37	33.90	-57.25	450.24	-5,554.27	8,171.45	8,100.96	70.49	115.922		
20,600.00	6,978.44	6,388.00	6,145.89	220.95	33.90	-57.25	450.24	-5,554.27	8,269.48	8,198.96	70.52	117.265		
20,700.00	6,978.36	6,388.00	6,145.89	222.53	33.90	-57.25	450.24	-5,554.27	8,367.56	8,297.01	70.55	118.603		
20,800.00	6,978.29	6,388.00	6,145.89	224.12	33.90	-57.25	450.24	-5,554.27	8,465.69	8,395.10	70.59	119.936		
20,900.00	6,978.21	6,388.00	6,145.89	225.71	33.90	-57.25	450.24	-5,554.27	8,563.86	8,493.24	70.62	121.264		
21,000.00	6,978.14	6,388.00	6,145.89	227.29	33.90	-57.25	450.24	-5,554.27	8,662.07	8,591.41	70.66	122.588		
21,100.00	6,978.07	6,388.00	6,145.89	228.88	33.90	-57.25	450.24	-5,554.27	8,760.32	8,689.62	70.70	123.906		
21,200.00	6,977.99	6,388.00	6,145.89	230.46	33.90	-57.25	450.24	-5,554.27	8,858.61	8,787.86	70.74	125.220		
21,300.00	6,977.92	6,388.00	6,145.89	232.05	33.90	-57.25	450.24	-5,554.27	8,956.93	8,886.14	70.79	126.528		
21,400.00	6,977.84	6,388.00	6,145.89	233.64	33.90	-57.25	450.24	-5,554.27	9,055.30	8,984.46	70.84	127.832		
21,500.00	6,977.77	6,388.00	6,145.89	235.22	33.90	-57.25	450.24	-5,554.27	9,153.70	9,082.81	70.89	129.131		
21,600.00	6,977.69	6,388.00	6,145.89	236.81	33.90	-57.25	450.24	-5,554.27	9,252.13	9,181.19	70.94	130.425		
21,700.00	6,977.62	6,388.00	6,145.89	238.40	33.90	-57.25	450.24	-5,554.27	9,350.60	9,279.61	70.99	131.714		
21,800.00	6,977.54	6,388.00	6,145.89	239.99	33.90	-57.25	450.24	-5,554.27	9,449.10	9,378.05	71.05	132.998		
21,900.00	6,977.47	6,388.00	6,145.89	241.57	33.90	-57.25	450.24	-5,554.27	9,547.63	9,476.53	71.10	134.277		
22,000.00	6,977.39	6,388.00	6,145.89	243.16	33.90	-57.25	450.24	-5,554.27	9,646.19	9,575.03	71.16	135.552		
22,100.00	6,977.32	6,388.00	6,145.89	244.75	33.90	-57.25	450.24	-5,554.27	9,744.78	9,673.56	71.22	136.821		
22,200.00	6,977.25	6,388.00	6,145.89	246.34	33.90	-57.25	450.24	-5,554.27	9,843.40	9,772.11	71.28	138.086		
22,300.00	6,977.17	6,388.00	6,145.89	247.93	33.90	-57.25	450.24	-5,554.27	9,942.04	9,870.70	71.35	139.346		
22,400.00	6,977.10	6,388.00	6,145.89	249.52	33.90	-57.25	450.24	-5,554.27	10,040.72	9,969.30	71.41	140.601		
22,500.00	6,977.02	6,388.00	6,145.89	251.11	33.90	-57.25	450.24	-5,554.27	10,139.42	10,067.94	71.48	141.852		
22,529.62	6,977.00	6,388.00	6,145.89	251.58	33.90	-57.25	450.24	-5,554.27	10,168.65	10,097.15	71.50	142.221		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 288-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	39.00	39.00	0.00	0.79	-72.80	1,417.89	-4,579.73	4,794.19				
100.00	100.00	139.00	139.00	0.25	2.82	-72.80	1,417.89	-4,579.73	4,794.19	4,791.13	3.07	1,563.668	
200.00	200.00	239.00	239.00	0.61	4.84	-72.80	1,417.89	-4,579.73	4,794.19	4,788.74	5.45	879.742	
210.00	210.00	249.00	249.00	0.65	5.04	-72.80	1,417.89	-4,579.73	4,794.19	4,788.51	5.69	842.876	
300.00	300.00	311.41	311.41	0.97	5.85	-72.80	1,417.93	-4,579.78	4,794.34	4,787.53	6.81	703.514	
400.00	400.00	386.12	386.12	1.33	5.97	-72.80	1,418.08	-4,580.46	4,795.24	4,787.95	7.29	657.980	
500.00	500.00	459.90	459.88	1.68	6.10	-72.81	1,417.59	-4,581.61	4,796.56	4,788.80	7.76	618.010	
550.00	550.00	487.76	487.73	1.86	6.12	-72.81	1,417.28	-4,582.25	4,797.50	4,789.53	7.97	602.077	
600.00	600.00	516.27	516.23	2.04	6.15	-70.42	1,416.89	-4,583.07	4,798.52	4,790.35	8.17	587.006	
700.00	699.93	562.00	561.92	2.40	6.18	-70.42	1,415.88	-4,584.77	4,800.37	4,791.80	8.57	559.822	
800.00	799.68	622.00	621.80	2.77	6.28	-70.47	1,413.88	-4,588.02	4,802.21	4,793.20	9.01	533.135	
900.00	899.13	644.53	644.25	3.13	6.34	-70.47	1,412.95	-4,589.63	4,804.12	4,794.71	9.40	510.839	
1,000.00	998.15	682.00	681.54	3.49	6.45	-70.52	1,411.18	-4,592.86	4,806.30	4,796.47	9.83	488.939	
1,100.00	1,096.63	714.51	713.82	3.87	6.56	-70.57	1,409.36	-4,596.18	4,808.69	4,798.42	10.27	468.324	
1,130.50	1,126.54	742.00	741.07	3.99	6.65	-70.65	1,407.58	-4,599.34	4,809.52	4,799.08	10.44	460.677	
1,200.00	1,194.61	742.00	741.07	4.26	6.65	-70.65	1,407.58	-4,599.34	4,811.56	4,800.85	10.70	449.624	
1,300.00	1,292.57	776.59	775.27	4.66	6.77	-70.77	1,405.08	-4,603.86	4,815.81	4,804.64	11.17	431.044	
1,400.00	1,390.52	803.00	801.31	5.07	6.87	-70.87	1,403.03	-4,607.79	4,821.61	4,809.98	11.63	414.747	
1,500.00	1,488.48	833.41	831.20	5.48	6.99	-70.98	1,400.52	-4,612.77	4,828.91	4,816.81	12.10	399.060	
1,600.00	1,586.43	863.00	860.20	5.90	7.11	-71.09	1,397.91	-4,618.08	4,837.70	4,825.13	12.57	384.714	
1,700.00	1,684.38	888.28	884.88	6.31	7.21	-71.19	1,395.56	-4,623.00	4,848.00	4,834.96	13.04	371.639	
1,800.00	1,782.34	924.00	919.61	6.73	7.36	-71.34	1,392.06	-4,630.61	4,859.89	4,846.34	13.55	358.613	
1,900.00	1,880.29	944.83	939.77	7.15	7.44	-71.42	1,389.90	-4,635.35	4,873.20	4,859.19	14.01	347.884	
2,000.00	1,978.25	986.00	979.46	7.58	7.61	-71.60	1,385.23	-4,645.24	4,887.92	4,873.38	14.54	336.153	
2,100.00	2,076.20	1,008.79	1,001.32	8.00	7.71	-71.70	1,382.43	-4,651.04	4,904.00	4,889.00	15.01	326.773	
2,200.00	2,174.15	1,049.00	1,039.66	8.43	7.88	-71.88	1,377.10	-4,661.94	4,921.62	4,906.08	15.55	316.585	
2,300.00	2,272.11	1,049.00	1,039.66	8.85	7.88	-71.88	1,377.10	-4,661.94	4,940.66	4,924.75	15.91	310.539	
2,400.00	2,370.06	1,087.14	1,075.73	9.28	8.06	-72.06	1,371.68	-4,673.09	4,961.11	4,944.66	16.45	301.584	
2,500.00	2,468.02	1,110.00	1,097.21	9.71	8.16	-72.16	1,368.31	-4,680.14	4,983.10	4,966.18	16.92	294.592	
2,600.00	2,565.97	1,110.00	1,097.21	10.14	8.16	-72.16	1,368.31	-4,680.14	5,006.80	4,989.54	17.26	290.038	
2,700.00	2,663.92	1,173.00	1,155.72	10.57	8.48	-72.47	1,358.52	-4,701.33	5,031.81	5,013.84	17.96	280.090	
2,800.00	2,761.88	1,173.00	1,155.72	11.00	8.48	-72.47	1,358.52	-4,701.33	5,058.14	5,039.83	18.30	276.363	
2,900.00	2,859.83	1,173.00	1,155.72	11.43	8.48	-72.47	1,358.52	-4,701.33	5,086.30	5,067.66	18.63	272.992	
3,000.00	2,957.79	1,208.44	1,188.13	11.86	8.68	-72.65	1,352.72	-4,714.45	5,115.68	5,096.48	19.19	266.513	
3,100.00	3,055.74	1,235.00	1,212.15	12.29	8.82	-72.78	1,348.27	-4,724.85	5,146.70	5,127.00	19.70	261.308	
3,200.00	3,153.69	1,235.00	1,212.15	12.72	8.82	-72.78	1,348.27	-4,724.85	5,179.14	5,159.13	20.01	258.879	
3,300.00	3,251.65	1,265.11	1,239.10	13.15	8.99	-72.94	1,343.00	-4,737.20	5,212.92	5,192.39	20.53	253.903	
3,400.00	3,349.60	1,297.00	1,267.29	13.59	9.17	-73.11	1,337.08	-4,750.89	5,248.19	5,227.12	21.07	249.106	
3,500.00	3,447.56	1,297.00	1,267.29	14.02	9.17	-73.11	1,337.08	-4,750.89	5,284.71	5,263.35	21.36	247.426	
3,600.00	3,545.51	1,297.00	1,267.29	14.45	9.17	-73.11	1,337.08	-4,750.89	5,322.85	5,301.21	21.64	245.964	
3,700.00	3,643.46	1,359.00	1,321.01	14.88	9.50	-73.45	1,325.00	-4,779.38	5,362.15	5,339.74	22.41	239.272	
3,800.00	3,741.42	1,359.00	1,321.01	15.32	9.50	-73.45	1,325.00	-4,779.38	5,402.52	5,379.84	22.68	238.191	
3,900.00	3,839.37	1,359.00	1,321.01	15.75	9.50	-73.45	1,325.00	-4,779.38	5,444.42	5,421.48	22.94	237.289	
4,000.00	3,937.33	1,389.05	1,346.52	16.18	9.65	-73.61	1,318.88	-4,794.04	5,487.49	5,464.05	23.44	234.076	
4,100.00	4,035.28	1,421.00	1,373.27	16.62	9.81	-73.79	1,312.02	-4,810.10	5,531.86	5,507.90	23.95	230.928	
4,200.00	4,133.23	1,421.00	1,373.27	17.05	9.81	-73.79	1,312.02	-4,810.10	5,577.29	5,553.09	24.20	230.476	
4,300.00	4,231.19	1,421.00	1,373.27	17.48	9.81	-73.79	1,312.02	-4,810.10	5,624.14	5,599.70	24.44	230.164	
4,400.00	4,329.14	1,453.80	1,400.26	17.92	9.97	-73.98	1,304.64	-4,827.21	5,671.84	5,646.89	24.95	227.285	
4,500.00	4,427.10	1,482.00	1,423.04	18.35	10.11	-74.15	1,298.08	-4,842.48	5,720.98	5,695.55	25.43	224.961	
4,600.00	4,525.05	1,482.00	1,423.04	18.78	10.11	-74.15	1,298.08	-4,842.48	5,771.06	5,745.41	25.65	224.989	
4,700.00	4,623.00	1,482.00	1,423.04	19.22	10.11	-74.15	1,298.08	-4,842.48	5,822.42	5,796.56	25.86	225.125	
4,800.00	4,720.96	1,507.31	1,443.14	19.65	10.25	-74.30	1,292.03	-4,856.61	5,874.74	5,848.42	26.32	223.226	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
4,900.00	4,818.91	1,543.00	1,470.91	20.09	10.43	-74.51	1,283.20	-4,877.23	5,928.44	5,901.56	26.87	220.618		
5,000.00	4,916.87	1,543.00	1,470.91	20.52	10.43	-74.51	1,283.20	-4,877.23	5,982.73	5,955.66	27.07	221.010		
5,100.00	5,014.82	1,543.00	1,470.91	20.96	10.43	-74.51	1,283.20	-4,877.23	6,038.18	6,010.92	27.26	221.487		
5,200.00	5,112.77	1,543.00	1,470.91	21.39	10.43	-74.51	1,283.20	-4,877.23	6,094.78	6,067.33	27.45	222.043		
5,300.00	5,210.73	1,575.06	1,495.30	21.82	10.58	-74.70	1,274.90	-4,896.32	6,152.08	6,124.14	27.94	220.153		
5,400.00	5,308.68	1,604.00	1,516.87	22.26	10.72	-74.88	1,267.05	-4,913.92	6,210.50	6,182.09	28.41	218.620		
5,493.23	5,400.00	1,604.00	1,516.87	22.66	10.72	-74.88	1,267.05	-4,913.92	6,265.61	6,237.04	28.57	219.302		
5,500.00	5,406.64	1,604.00	1,516.87	22.69	10.72	-74.91	1,267.05	-4,913.92	6,269.66	6,241.07	28.58	219.354		
5,600.00	5,504.69	1,632.54	1,537.86	23.12	10.82	-75.45	1,258.98	-4,931.50	6,329.79	6,300.80	29.00	218.288		
5,700.00	5,602.91	1,667.00	1,562.95	23.55	10.95	-76.03	1,248.82	-4,952.83	6,390.80	6,361.34	29.46	216.965		
5,800.00	5,701.29	1,689.62	1,579.27	23.97	11.01	-76.55	1,241.94	-4,966.89	6,452.64	6,422.84	29.79	216.594		
5,900.00	5,799.82	1,729.00	1,607.44	24.39	11.15	-77.18	1,229.66	-4,991.53	6,515.34	6,485.08	30.25	215.365		
6,000.00	5,898.50	1,749.31	1,621.85	24.79	11.23	-77.71	1,223.20	-5,004.30	6,578.77	6,548.22	30.55	215.329		
6,100.00	5,997.31	1,791.00	1,651.31	25.20	11.70	-78.36	1,209.81	-5,030.58	6,642.91	6,611.90	31.02	214.161		
6,200.00	6,096.26	1,817.63	1,670.03	25.60	12.02	-78.93	1,201.19	-5,047.44	6,707.73	6,676.37	31.36	213.894		
6,300.00	6,195.33	2,217.40	1,956.43	25.99	17.08	-81.53	1,070.84	-5,293.88	6,771.69	6,736.72	34.96	193.679		
6,400.00	6,294.51	2,259.00	1,986.92	26.37	17.60	-82.13	1,057.48	-5,318.83	6,834.16	6,798.70	35.46	192.735		
6,498.19	6,392.00	2,301.31	2,017.82	26.75	18.15	-82.74	1,043.85	-5,344.32	6,896.03	6,860.08	35.95	191.825		
6,500.00	6,393.80	2,302.05	2,018.36	26.76	18.16	-81.49	1,043.62	-5,344.77	6,897.18	6,861.22	35.96	191.811		
6,550.00	6,443.29	2,322.87	2,033.53	26.95	18.43	-57.51	1,036.94	-5,357.37	6,927.36	6,891.16	36.20	191.366		
6,600.00	6,492.24	2,354.00	2,056.17	27.16	18.84	-45.79	1,027.01	-5,376.28	6,954.71	6,918.18	36.54	190.349		
6,650.00	6,540.33	2,354.00	2,056.17	27.38	18.84	-39.05	1,027.01	-5,376.28	6,979.08	6,942.48	36.60	190.682		
6,700.00	6,587.28	2,393.16	2,084.61	27.60	19.36	-34.93	1,014.61	-5,400.18	7,000.29	6,963.27	37.03	189.065		
6,750.00	6,632.80	2,418.80	2,103.20	27.84	19.69	-32.10	1,006.56	-5,415.89	7,018.29	6,980.96	37.33	187.993		
6,800.00	6,676.60	2,446.00	2,122.91	28.09	20.05	-30.09	998.08	-5,432.61	7,032.97	6,995.31	37.66	186.759		
6,850.00	6,718.42	2,446.00	2,122.91	28.34	20.05	-28.51	998.08	-5,432.61	7,044.32	7,006.58	37.74	186.657		
6,900.00	6,758.00	6,923.67	6,041.52	28.60	72.42	-45.40	494.31	-7,121.70	7,042.21	6,954.46	87.75	80.250		
6,950.00	6,795.09	6,964.80	6,082.29	28.87	73.32	-46.10	496.93	-7,126.39	7,020.89	6,931.93	88.96	78.920		
7,000.00	6,829.46	6,990.00	6,107.28	29.14	73.87	-47.17	498.53	-7,129.26	6,996.89	6,907.10	89.79	77.927		
7,050.00	6,860.91	6,990.00	6,107.28	29.43	73.87	-48.53	498.53	-7,129.26	6,970.50	6,880.49	90.01	77.443		
7,100.00	6,889.24	6,990.00	6,107.28	29.73	73.87	-50.28	498.53	-7,129.26	6,941.90	6,851.68	90.22	76.940		
7,150.00	6,914.27	6,990.00	6,107.28	30.05	73.87	-52.44	498.53	-7,129.26	6,911.25	6,820.81	90.44	76.421		
7,200.00	6,935.85	6,990.00	6,107.28	30.37	73.87	-55.05	498.53	-7,129.26	6,878.70	6,788.06	90.64	75.888		
7,250.00	6,953.84	6,990.00	6,107.28	30.71	73.87	-58.14	498.53	-7,129.26	6,844.44	6,753.59	90.85	75.342		
7,300.00	6,968.15	6,990.00	6,107.28	31.06	73.87	-61.73	498.53	-7,129.26	6,808.64	6,717.60	91.04	74.784		
7,350.00	6,978.67	6,990.00	6,107.28	31.42	73.87	-65.87	498.53	-7,129.26	6,771.51	6,680.27	91.24	74.218		
7,400.00	6,985.34	6,990.00	6,107.28	31.79	73.87	-70.55	498.53	-7,129.26	6,733.26	6,641.83	91.43	73.645		
7,450.00	6,988.13	6,990.00	6,107.28	32.17	73.87	-75.76	498.53	-7,129.26	6,694.10	6,602.49	91.61	73.068		
7,461.13	6,988.22	6,990.00	6,107.28	32.26	73.87	-76.98	498.53	-7,129.26	6,685.28	6,593.63	91.66	72.939		
7,500.00	6,988.19	6,990.00	6,107.28	32.56	73.87	-76.75	498.53	-7,129.26	6,654.32	6,562.52	91.80	72.488		
7,600.00	6,988.12	6,990.00	6,107.28	33.37	73.87	-76.11	498.53	-7,129.26	6,573.63	6,481.46	92.17	71.318		
7,700.00	6,988.05	6,990.00	6,107.28	34.21	73.87	-75.40	498.53	-7,129.26	6,491.49	6,398.93	92.56	70.133		
7,800.00	6,987.98	6,990.00	6,107.28	35.09	73.87	-74.62	498.53	-7,129.26	6,407.93	6,314.98	92.95	68.938		
7,900.00	6,987.91	6,990.00	6,107.28	35.99	73.87	-73.75	498.53	-7,129.26	6,323.02	6,229.67	93.35	67.737		
8,000.00	6,987.83	6,990.00	6,107.28	36.93	73.87	-72.77	498.53	-7,129.26	6,236.80	6,143.05	93.74	66.531		
8,100.00	6,987.76	6,990.00	6,107.28	37.88	73.87	-71.67	498.53	-7,129.26	6,149.32	6,055.18	94.14	65.322		
8,200.00	6,987.68	6,990.00	6,107.28	38.86	73.87	-70.42	498.53	-7,129.26	6,060.63	5,966.10	94.53	64.115		
8,300.00	6,987.61	6,990.00	6,107.28	39.86	73.87	-69.00	498.53	-7,129.26	5,970.80	5,875.89	94.91	62.910		
8,400.00	6,987.53	6,990.00	6,107.28	40.87	73.87	-67.38	498.53	-7,129.26	5,879.88	5,784.60	95.28	61.710		
8,500.00	6,987.46	6,990.00	6,107.28	41.90	73.87	-65.52	498.53	-7,129.26	5,787.93	5,692.29	95.64	60.516		
8,600.00	6,987.38	6,990.00	6,107.28	42.93	73.87	-63.35	498.53	-7,129.26	5,695.03	5,599.04	95.99	59.331		
8,700.00	6,987.31	6,990.00	6,107.28	43.98	73.87	-60.82	498.53	-7,129.26	5,601.23	5,504.92	96.32	58.155		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5					Rule Assigned:					Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,800.00	6,987.23	6,990.00	6,107.28	45.03	73.87	-57.84	498.53	-7,129.26	5,506.61	5,409.99	96.62	56.991	
8,872.16	6,987.18	6,990.00	6,107.28	45.79	73.87	-55.35	498.53	-7,129.26	5,437.87	5,341.04	96.83	56.159	
8,900.00	6,987.16	6,990.00	6,107.28	46.08	73.87	-55.35	498.53	-7,129.26	5,411.28	5,314.38	96.91	55.840	
9,000.00	6,987.09	6,990.00	6,107.28	47.16	73.87	-55.35	498.53	-7,129.26	5,315.89	5,218.70	97.19	54.693	
9,100.00	6,987.01	6,990.00	6,107.28	48.27	73.87	-55.35	498.53	-7,129.26	5,220.67	5,123.18	97.49	53.548	
9,200.00	6,986.94	6,990.00	6,107.28	49.40	73.87	-55.35	498.53	-7,129.26	5,125.63	5,027.83	97.81	52.405	
9,300.00	6,986.86	6,990.00	6,107.28	50.56	73.87	-55.35	498.53	-7,129.26	5,030.79	4,932.65	98.14	51.263	
9,400.00	6,986.79	6,990.00	6,107.28	51.75	73.87	-55.35	498.53	-7,129.26	4,936.15	4,837.67	98.48	50.123	
9,500.00	6,986.71	6,990.00	6,107.28	52.95	73.87	-55.35	498.53	-7,129.26	4,841.72	4,742.88	98.84	48.985	
9,600.00	6,986.64	6,990.00	6,107.28	54.18	73.87	-55.35	498.53	-7,129.26	4,747.52	4,648.31	99.22	47.850	
9,700.00	6,986.56	6,990.00	6,107.28	55.42	73.87	-55.35	498.53	-7,129.26	4,653.57	4,553.96	99.61	46.717	
9,800.00	6,986.49	6,990.00	6,107.28	56.69	73.87	-55.35	498.53	-7,129.26	4,559.87	4,459.84	100.03	45.587	
9,900.00	6,986.41	6,990.00	6,107.28	57.97	73.87	-55.35	498.53	-7,129.26	4,466.44	4,365.98	100.46	44.460	
10,000.00	6,986.34	6,990.00	6,107.28	59.26	73.87	-55.35	498.53	-7,129.26	4,373.31	4,272.39	100.91	43.337	
10,100.00	6,986.27	6,990.00	6,107.28	60.57	73.87	-55.35	498.53	-7,129.26	4,280.48	4,179.09	101.39	42.217	
10,200.00	6,986.19	6,990.00	6,107.28	61.90	73.87	-55.35	498.53	-7,129.26	4,187.99	4,086.10	101.89	41.102	
10,300.00	6,986.12	6,990.00	6,107.28	63.23	73.87	-55.35	498.53	-7,129.26	4,095.85	3,993.43	102.42	39.991	
10,400.00	6,986.04	6,990.00	6,107.28	64.58	73.87	-55.35	498.53	-7,129.26	4,004.08	3,901.11	102.97	38.885	
10,500.00	6,985.97	6,990.00	6,107.28	65.94	73.87	-55.35	498.53	-7,129.26	3,912.72	3,809.17	103.55	37.785	
10,600.00	6,985.89	6,990.00	6,107.28	67.32	73.87	-55.35	498.53	-7,129.26	3,821.79	3,717.63	104.16	36.690	
10,700.00	6,985.82	6,990.00	6,107.28	68.70	73.87	-55.35	498.53	-7,129.26	3,731.33	3,626.52	104.81	35.602	
10,800.00	6,985.74	6,990.00	6,107.28	70.09	73.87	-55.35	498.53	-7,129.26	3,641.36	3,535.88	105.48	34.521	
10,900.00	6,985.67	6,990.00	6,107.28	71.49	73.87	-55.35	498.53	-7,129.26	3,551.93	3,445.74	106.20	33.447	
11,000.00	6,985.59	6,990.00	6,107.28	72.90	73.87	-55.35	498.53	-7,129.26	3,463.08	3,356.14	106.95	32.382	
11,100.00	6,985.52	6,990.00	6,107.28	74.31	73.87	-55.35	498.53	-7,129.26	3,374.86	3,267.12	107.74	31.325	
11,200.00	6,985.45	6,990.00	6,107.28	75.74	73.87	-55.35	498.53	-7,129.26	3,287.30	3,178.73	108.57	30.278	
11,300.00	6,985.37	6,990.00	6,107.28	77.17	73.87	-55.35	498.53	-7,129.26	3,200.48	3,091.03	109.45	29.242	
11,400.00	6,985.30	6,990.00	6,107.28	78.61	73.87	-55.35	498.53	-7,129.26	3,114.45	3,004.07	110.38	28.216	
11,500.00	6,985.22	6,990.00	6,107.28	80.05	73.87	-55.35	498.53	-7,129.26	3,029.27	2,917.92	111.36	27.204	
11,600.00	6,985.15	6,990.00	6,107.28	81.50	73.87	-55.35	498.53	-7,129.26	2,945.03	2,832.64	112.39	26.204	
11,700.00	6,985.07	6,990.00	6,107.28	82.96	73.87	-55.35	498.53	-7,129.26	2,861.80	2,748.33	113.48	25.219	
11,800.00	6,985.00	6,990.00	6,107.28	84.42	73.87	-55.35	498.53	-7,129.26	2,779.68	2,665.06	114.62	24.250	
11,900.00	6,984.92	6,990.00	6,107.28	85.89	73.87	-55.35	498.53	-7,129.26	2,698.77	2,582.93	115.84	23.298	
12,000.00	6,984.85	6,990.00	6,107.28	87.36	73.87	-55.35	498.53	-7,129.26	2,619.17	2,502.06	117.11	22.364	
12,100.00	6,984.77	6,990.00	6,107.28	88.83	73.87	-55.35	498.53	-7,129.26	2,541.02	2,422.56	118.46	21.451	
12,200.00	6,984.70	6,990.00	6,107.28	90.31	73.87	-55.35	498.53	-7,129.26	2,464.44	2,344.57	119.88	20.558	
12,300.00	6,984.63	6,990.00	6,107.28	91.80	73.87	-55.35	498.53	-7,129.26	2,389.60	2,268.23	121.37	19.689	
12,400.00	6,984.55	6,990.00	6,107.28	93.29	73.87	-55.35	498.53	-7,129.26	2,316.66	2,193.73	122.93	18.845	
12,500.00	6,984.48	6,990.00	6,107.28	94.78	73.87	-55.35	498.53	-7,129.26	2,245.80	2,121.23	124.57	18.028	
12,600.00	6,984.40	6,990.00	6,107.28	96.28	73.87	-55.35	498.53	-7,129.26	2,177.23	2,050.94	126.28	17.241	
12,700.00	6,984.33	6,990.00	6,107.28	97.78	73.87	-55.35	498.53	-7,129.26	2,111.17	1,983.10	128.07	16.484	
12,800.00	6,984.25	6,990.00	6,107.28	99.28	73.87	-55.35	498.53	-7,129.26	2,047.86	1,917.94	129.93	15.762	
12,900.00	6,984.18	6,990.00	6,107.28	100.78	73.87	-55.35	498.53	-7,129.26	1,987.57	1,855.73	131.85	15.075	
13,000.00	6,984.10	6,990.00	6,107.28	102.29	73.87	-55.35	498.53	-7,129.26	1,930.59	1,796.77	133.82	14.427	
13,100.00	6,984.03	6,990.00	6,107.28	103.80	73.87	-55.35	498.53	-7,129.26	1,877.20	1,741.37	135.83	13.820	
13,200.00	6,983.95	6,990.00	6,107.28	105.32	73.87	-55.35	498.53	-7,129.26	1,827.73	1,689.85	137.87	13.257	
13,300.00	6,983.88	6,990.00	6,107.28	106.84	73.87	-55.35	498.53	-7,129.26	1,782.50	1,642.58	139.92	12.740	
13,400.00	6,983.81	6,990.00	6,107.28	108.36	73.87	-55.35	498.53	-7,129.26	1,741.84	1,599.90	141.94	12.272	
13,500.00	6,983.73	6,990.00	6,107.28	109.88	73.87	-55.35	498.53	-7,129.26	1,706.08	1,562.17	143.91	11.855	
13,600.00	6,983.66	6,990.00	6,107.28	111.40	73.87	-55.35	498.53	-7,129.26	1,675.54	1,529.74	145.80	11.492	
13,700.00	6,983.58	6,990.00	6,107.28	112.93	73.87	-55.35	498.53	-7,129.26	1,650.50	1,502.94	147.56	11.185	
13,800.00	6,983.51	6,990.00	6,107.28	114.46	73.87	-55.35	498.53	-7,129.26	1,631.21	1,482.06	149.15	10.937	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
13,900.00	6,983.43	6,990.00	6,107.28	115.99	73.87	-55.35	498.53	-7,129.26	1,617.89	1,467.35	150.54	10.747	
14,000.00	6,983.36	6,990.00	6,107.28	117.52	73.87	-55.35	498.53	-7,129.26	1,610.68	1,458.99	151.69	10.619	
14,066.44	6,983.31	6,990.00	6,107.28	118.54	73.87	-55.35	498.53	-7,129.26	1,609.30	1,457.01	152.30	10.567 CC, ES	
14,100.00	6,983.28	6,990.00	6,107.28	119.06	73.87	-55.35	498.53	-7,129.26	1,609.65	1,457.10	152.56	10.551	
14,200.00	6,983.21	6,990.00	6,107.28	120.59	73.87	-55.35	498.53	-7,129.26	1,614.84	1,461.70	153.14	10.545 SF	
14,300.00	6,983.13	6,990.00	6,107.28	122.13	73.87	-55.35	498.53	-7,129.26	1,626.16	1,472.75	153.41	10.600	
14,400.00	6,983.06	6,990.00	6,107.28	123.67	73.87	-55.35	498.53	-7,129.26	1,643.51	1,490.13	153.38	10.716	
14,500.00	6,982.99	6,990.00	6,107.28	125.21	73.87	-55.35	498.53	-7,129.26	1,666.68	1,513.63	153.05	10.890	
14,600.00	6,982.91	6,990.00	6,107.28	126.75	73.87	-55.35	498.53	-7,129.26	1,695.45	1,543.00	152.45	11.121	
14,700.00	6,982.84	6,990.00	6,107.28	128.30	73.87	-55.35	498.53	-7,129.26	1,729.52	1,577.92	151.60	11.408	
14,800.00	6,982.76	6,990.00	6,107.28	129.85	73.87	-55.35	498.53	-7,129.26	1,768.61	1,618.06	150.54	11.748	
14,900.00	6,982.69	6,990.00	6,107.28	131.39	73.87	-55.35	498.53	-7,129.26	1,812.37	1,663.06	149.31	12.139	
15,000.00	6,982.61	6,990.00	6,107.28	132.94	73.87	-55.35	498.53	-7,129.26	1,860.48	1,712.55	147.93	12.577	
15,100.00	6,982.54	6,990.00	6,107.28	134.49	73.87	-55.35	498.53	-7,129.26	1,912.62	1,766.18	146.44	13.061	
15,200.00	6,982.46	6,990.00	6,107.28	136.04	73.87	-55.35	498.53	-7,129.26	1,968.45	1,823.58	144.88	13.587	
15,300.00	6,982.39	6,990.00	6,107.28	137.60	73.87	-55.35	498.53	-7,129.26	2,027.69	1,884.42	143.26	14.153	
15,400.00	6,982.31	6,990.00	6,107.28	139.15	73.87	-55.35	498.53	-7,129.26	2,090.03	1,948.40	141.63	14.757	
15,500.00	6,982.24	6,990.00	6,107.28	140.70	73.87	-55.35	498.53	-7,129.26	2,155.21	2,015.23	139.99	15.396	
15,600.00	6,982.17	6,990.00	6,107.28	142.26	73.87	-55.35	498.53	-7,129.26	2,222.98	2,084.63	138.36	16.067	
15,700.00	6,982.09	6,990.00	6,107.28	143.82	73.87	-55.35	498.53	-7,129.26	2,293.11	2,156.36	136.75	16.769	
15,800.00	6,982.02	6,990.00	6,107.28	145.38	73.87	-55.35	498.53	-7,129.26	2,365.39	2,230.21	135.18	17.498	
15,900.00	6,981.94	6,990.00	6,107.28	146.94	73.87	-55.35	498.53	-7,129.26	2,439.63	2,305.98	133.65	18.253	
16,000.00	6,981.87	6,990.00	6,107.28	148.50	73.87	-55.35	498.53	-7,129.26	2,515.65	2,383.48	132.18	19.033	
16,100.00	6,981.79	6,990.00	6,107.28	150.06	73.87	-55.35	498.53	-7,129.26	2,593.30	2,462.55	130.75	19.834	
16,200.00	6,981.72	6,990.00	6,107.28	151.62	73.87	-55.35	498.53	-7,129.26	2,672.44	2,543.06	129.38	20.656	
16,300.00	6,981.64	6,990.00	6,107.28	153.18	73.87	-55.35	498.53	-7,129.26	2,752.93	2,624.87	128.07	21.496	
16,400.00	6,981.57	6,990.00	6,107.28	154.74	73.87	-55.35	498.53	-7,129.26	2,834.67	2,707.86	126.81	22.354	
16,500.00	6,981.49	6,990.00	6,107.28	156.31	73.87	-55.35	498.53	-7,129.26	2,917.54	2,791.94	125.61	23.228	
16,600.00	6,981.42	6,990.00	6,107.28	157.87	73.87	-55.35	498.53	-7,129.26	3,001.46	2,877.00	124.46	24.116	
16,700.00	6,981.35	6,990.00	6,107.28	159.44	73.87	-55.35	498.53	-7,129.26	3,086.34	2,962.97	123.37	25.017	
16,800.00	6,981.27	6,990.00	6,107.28	161.01	73.87	-55.35	498.53	-7,129.26	3,172.10	3,049.76	122.33	25.930	
16,900.00	6,981.20	6,990.00	6,107.28	162.58	73.87	-55.35	498.53	-7,129.26	3,258.67	3,137.32	121.35	26.854	
17,000.00	6,981.12	6,990.00	6,107.28	164.14	73.87	-55.35	498.53	-7,129.26	3,345.98	3,225.58	120.41	27.789	
17,100.00	6,981.05	6,990.00	6,107.28	165.71	73.87	-55.35	498.53	-7,129.26	3,434.00	3,314.48	119.52	28.732	
17,200.00	6,980.97	6,990.00	6,107.28	167.28	73.87	-55.35	498.53	-7,129.26	3,522.65	3,403.98	118.67	29.684	
17,300.00	6,980.90	6,990.00	6,107.28	168.85	73.87	-55.35	498.53	-7,129.26	3,611.89	3,494.02	117.87	30.643	
17,400.00	6,980.82	6,990.00	6,107.28	170.42	73.87	-55.35	498.53	-7,129.26	3,701.68	3,584.58	117.11	31.609	
17,500.00	6,980.75	6,990.00	6,107.28	172.00	73.87	-55.35	498.53	-7,129.26	3,791.99	3,675.60	116.39	32.581	
17,600.00	6,980.67	6,990.00	6,107.28	173.57	73.87	-55.35	498.53	-7,129.26	3,882.77	3,767.07	115.70	33.559	
17,700.00	6,980.60	6,990.00	6,107.28	175.14	73.87	-55.35	498.53	-7,129.26	3,973.99	3,858.94	115.05	34.541	
17,800.00	6,980.53	6,990.00	6,107.28	176.71	73.87	-55.35	498.53	-7,129.26	4,065.62	3,951.19	114.44	35.527	
17,900.00	6,980.45	6,990.00	6,107.28	178.29	73.87	-55.35	498.53	-7,129.26	4,157.65	4,043.79	113.85	36.518	
18,000.00	6,980.38	6,990.00	6,107.28	179.86	73.87	-55.35	498.53	-7,129.26	4,250.03	4,136.73	113.30	37.511	
18,100.00	6,980.30	6,990.00	6,107.28	181.44	73.87	-55.35	498.53	-7,129.26	4,342.75	4,229.97	112.78	38.508	
18,200.00	6,980.23	6,990.00	6,107.28	183.01	73.87	-55.35	498.53	-7,129.26	4,435.78	4,323.50	112.28	39.507	
18,300.00	6,980.15	6,990.00	6,107.28	184.59	73.87	-55.35	498.53	-7,129.26	4,529.11	4,417.30	111.81	40.508	
18,400.00	6,980.08	6,990.00	6,107.28	186.16	73.87	-55.35	498.53	-7,129.26	4,622.72	4,511.36	111.36	41.511	
18,500.00	6,980.00	6,990.00	6,107.28	187.74	73.87	-55.35	498.53	-7,129.26	4,716.60	4,605.66	110.94	42.515	
18,600.00	6,979.93	6,990.00	6,107.28	189.32	73.87	-55.35	498.53	-7,129.26	4,810.72	4,700.18	110.54	43.521	
18,700.00	6,979.85	6,990.00	6,107.28	190.90	73.87	-55.35	498.53	-7,129.26	4,905.07	4,794.91	110.16	44.527	
18,800.00	6,979.78	6,990.00	6,107.28	192.48	73.87	-55.35	498.53	-7,129.26	4,999.64	4,889.84	109.80	45.534	
18,900.00	6,979.71	6,990.00	6,107.28	194.05	73.87	-55.35	498.53	-7,129.26	5,094.42	4,984.96	109.46	46.541	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #171C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		288-MWD OWSG Rev5						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
19,000.00	6,979.63	6,990.00	6,107.28	195.63	73.87	-55.35	498.53	-7,129.26	5,189.40	5,080.26	109.14	47.549		
19,100.00	6,979.56	6,990.00	6,107.28	197.21	73.87	-55.35	498.53	-7,129.26	5,284.56	5,175.72	108.83	48.556		
19,200.00	6,979.48	6,990.00	6,107.28	198.79	73.87	-55.35	498.53	-7,129.26	5,379.89	5,271.35	108.55	49.563		
19,300.00	6,979.41	6,990.00	6,107.28	200.37	73.87	-55.35	498.53	-7,129.26	5,475.40	5,367.12	108.27	50.570		
19,400.00	6,979.33	6,990.00	6,107.28	201.95	73.87	-55.35	498.53	-7,129.26	5,571.06	5,463.04	108.02	51.577		
19,500.00	6,979.26	6,990.00	6,107.28	203.54	73.87	-55.35	498.53	-7,129.26	5,666.87	5,559.10	107.77	52.582		
19,600.00	6,979.18	6,990.00	6,107.28	205.12	73.87	-55.35	498.53	-7,129.26	5,762.82	5,655.28	107.54	53.587		
19,700.00	6,979.11	6,990.00	6,107.28	206.70	73.87	-55.35	498.53	-7,129.26	5,858.91	5,751.59	107.32	54.591		
19,800.00	6,979.03	6,990.00	6,107.28	208.28	73.87	-55.35	498.53	-7,129.26	5,955.13	5,848.01	107.12	55.594		
19,900.00	6,978.96	6,990.00	6,107.28	209.86	73.87	-55.35	498.53	-7,129.26	6,051.47	5,944.54	106.93	56.595		
20,000.00	6,978.89	6,990.00	6,107.28	211.45	73.87	-55.35	498.53	-7,129.26	6,147.92	6,041.18	106.74	57.596		
20,100.00	6,978.81	6,990.00	6,107.28	213.03	73.87	-55.35	498.53	-7,129.26	6,244.49	6,137.92	106.57	58.595		
20,200.00	6,978.74	6,990.00	6,107.28	214.61	73.87	-55.35	498.53	-7,129.26	6,341.17	6,234.76	106.41	59.592		
20,300.00	6,978.66	6,990.00	6,107.28	216.20	73.87	-55.35	498.53	-7,129.26	6,437.94	6,331.68	106.26	60.588		
20,400.00	6,978.59	6,990.00	6,107.28	217.78	73.87	-55.35	498.53	-7,129.26	6,534.81	6,428.70	106.12	61.582		
20,500.00	6,978.51	6,990.00	6,107.28	219.37	73.87	-55.35	498.53	-7,129.26	6,631.78	6,525.80	105.98	62.575		
20,600.00	6,978.44	6,990.00	6,107.28	220.95	73.87	-55.35	498.53	-7,129.26	6,728.84	6,622.98	105.86	63.566		
20,700.00	6,978.36	6,990.00	6,107.28	222.53	73.87	-55.35	498.53	-7,129.26	6,825.98	6,720.24	105.74	64.555		
20,800.00	6,978.29	6,990.00	6,107.28	224.12	73.87	-55.35	498.53	-7,129.26	6,923.20	6,817.57	105.63	65.542		
20,900.00	6,978.21	6,990.00	6,107.28	225.71	73.87	-55.35	498.53	-7,129.26	7,020.50	6,914.97	105.53	66.527		
21,000.00	6,978.14	6,990.00	6,107.28	227.29	73.87	-55.35	498.53	-7,129.26	7,117.87	7,012.44	105.43	67.510		
21,100.00	6,978.07	6,990.00	6,107.28	228.88	73.87	-55.35	498.53	-7,129.26	7,215.32	7,109.97	105.35	68.492		
21,200.00	6,977.99	6,990.00	6,107.28	230.46	73.87	-55.35	498.53	-7,129.26	7,312.83	7,207.57	105.26	69.471		
21,300.00	6,977.92	6,990.00	6,107.28	232.05	73.87	-55.35	498.53	-7,129.26	7,410.41	7,305.22	105.19	70.448		
21,400.00	6,977.84	6,990.00	6,107.28	233.64	73.87	-55.35	498.53	-7,129.26	7,508.06	7,402.94	105.12	71.423		
21,500.00	6,977.77	6,990.00	6,107.28	235.22	73.87	-55.35	498.53	-7,129.26	7,605.76	7,500.71	105.06	72.396		
21,600.00	6,977.69	6,990.00	6,107.28	236.81	73.87	-55.35	498.53	-7,129.26	7,703.53	7,598.53	105.00	73.367		
21,700.00	6,977.62	6,990.00	6,107.28	238.40	73.87	-55.35	498.53	-7,129.26	7,801.35	7,696.40	104.95	74.336		
21,800.00	6,977.54	6,990.00	6,107.28	239.99	73.87	-55.35	498.53	-7,129.26	7,899.23	7,794.32	104.90	75.302		
21,900.00	6,977.47	6,990.00	6,107.28	241.57	73.87	-55.35	498.53	-7,129.26	7,997.15	7,892.30	104.86	76.266		
22,000.00	6,977.39	6,990.00	6,107.28	243.16	73.87	-55.35	498.53	-7,129.26	8,095.13	7,990.31	104.82	77.228		
22,100.00	6,977.32	6,990.00	6,107.28	244.75	73.87	-55.35	498.53	-7,129.26	8,193.16	8,088.37	104.79	78.187		
22,200.00	6,977.25	6,990.00	6,107.28	246.34	73.87	-55.35	498.53	-7,129.26	8,291.24	8,186.48	104.76	79.145		
22,300.00	6,977.17	6,990.00	6,107.28	247.93	73.87	-55.35	498.53	-7,129.26	8,389.36	8,284.62	104.74	80.100		
22,400.00	6,977.10	6,990.00	6,107.28	249.52	73.87	-55.35	498.53	-7,129.26	8,487.52	8,382.81	104.72	81.052		
22,500.00	6,977.02	6,990.00	6,107.28	251.11	73.87	-55.35	498.53	-7,129.26	8,585.73	8,481.03	104.70	82.003		
22,529.62	6,977.00	6,990.00	6,107.28	251.58	73.87	-55.35	498.53	-7,129.26	8,614.82	8,510.12	104.70	82.284		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 406-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-97.03	-1,089.32	-8,828.91	8,896.76				
100.00	100.00	0.00	0.00	0.25	0.00	-97.03	-1,089.32	-8,828.91	8,895.90	8,895.65	0.25	N/A	
145.66	145.66	18.66	18.66	0.41	0.33	-97.03	-1,089.32	-8,828.91	8,895.86	8,895.11	0.75	N/A	
200.00	200.00	73.00	73.00	0.61	1.29	-97.03	-1,089.32	-8,828.91	8,895.86	8,893.95	1.90	4,674.884	
300.00	300.00	173.00	173.00	0.97	3.07	-97.03	-1,089.32	-8,828.91	8,895.86	8,891.82	4.03	2,205.754	
400.00	400.00	273.00	273.00	1.33	4.84	-97.03	-1,089.32	-8,828.91	8,895.86	8,889.69	6.16	1,443.396	
500.00	500.00	373.00	373.00	1.68	6.61	-97.03	-1,089.32	-8,828.91	8,895.86	8,887.56	8.29	1,072.661	
550.00	550.00	423.00	423.00	1.86	7.50	-97.03	-1,089.32	-8,828.91	8,895.86	8,886.49	9.36	950.064	
600.00	600.00	473.00	473.00	2.04	8.40	-94.65	-1,089.32	-8,828.91	8,895.89	8,885.45	10.44	851.834	
700.00	699.93	572.93	572.93	2.40	10.20	-94.67	-1,089.32	-8,828.91	8,896.18	8,883.57	12.60	705.979	
800.00	799.68	672.68	672.68	2.77	12.00	-94.70	-1,089.32	-8,828.91	8,896.75	8,881.99	14.76	602.888	
900.00	899.13	771.47	771.47	3.13	13.78	-94.75	-1,089.03	-8,828.91	8,897.58	8,880.68	16.90	526.516	
1,000.00	998.15	869.64	869.64	3.49	15.55	-94.81	-1,089.12	-8,828.91	8,898.76	8,879.72	19.04	467.442	
1,100.00	1,096.63	967.25	967.24	3.87	17.30	-94.89	-1,089.29	-8,828.91	8,900.27	8,879.10	21.18	420.307	
1,130.50	1,126.54	999.55	999.54	3.99	17.91	-94.92	-1,089.32	-8,828.91	8,900.80	8,878.90	21.90	406.422	
1,200.00	1,194.61	1,067.63	1,067.61	4.26	19.22	-95.01	-1,089.32	-8,828.91	8,902.03	8,878.55	23.49	379.041	
1,300.00	1,292.57	1,165.58	1,165.57	4.66	21.11	-95.14	-1,089.32	-8,828.91	8,903.85	8,878.08	25.77	345.465	
1,400.00	1,390.52	1,262.76	1,262.75	5.07	22.98	-95.26	-1,088.79	-8,828.91	8,905.64	8,877.59	28.05	317.466	
1,500.00	1,488.48	1,358.63	1,358.61	5.48	24.83	-95.38	-1,088.93	-8,828.91	8,907.57	8,877.26	30.31	293.881	
1,600.00	1,586.43	1,454.43	1,454.41	5.90	26.68	-95.51	-1,089.24	-8,828.91	8,909.56	8,876.99	32.57	273.548	
1,700.00	1,684.38	1,557.44	1,557.38	6.31	28.78	-95.64	-1,089.32	-8,828.91	8,911.57	8,876.48	35.09	253.977	
1,800.00	1,782.34	1,655.40	1,655.34	6.73	30.80	-95.77	-1,089.32	-8,828.91	8,913.61	8,876.08	37.53	237.511	
1,900.00	1,880.29	1,753.30	1,753.23	7.15	32.82	-95.89	-1,088.10	-8,828.91	8,915.52	8,875.55	39.97	223.049	
2,000.00	1,978.25	1,847.37	1,847.29	7.58	34.76	-96.01	-1,088.24	-8,828.91	8,917.67	8,875.33	42.34	210.642	
2,100.00	2,076.20	1,941.33	1,941.25	8.00	36.70	-96.13	-1,088.66	-8,828.91	8,919.91	8,875.21	44.70	199.555	
2,200.00	2,174.15	2,047.30	2,047.15	8.43	38.90	-96.27	-1,089.32	-8,828.91	8,922.23	8,874.90	47.33	188.522	
2,300.00	2,272.11	2,145.25	2,145.11	8.85	41.02	-96.40	-1,089.32	-8,828.91	8,924.49	8,874.62	49.87	178.956	
2,400.00	2,370.06	2,243.20	2,243.06	9.28	43.14	-96.52	-1,089.32	-8,828.91	8,926.80	8,874.39	52.41	170.316	
2,500.00	2,468.02	2,338.98	2,338.83	9.71	45.21	-96.64	-1,088.21	-8,828.91	8,928.98	8,874.07	54.91	162.611	
2,600.00	2,565.97	2,432.42	2,432.26	10.14	47.23	-96.76	-1,088.50	-8,828.91	8,931.43	8,874.07	57.36	155.716	
2,700.00	2,663.92	2,525.75	2,525.59	10.57	49.24	-96.88	-1,089.08	-8,828.91	8,933.97	8,874.17	59.80	149.392	
2,800.00	2,761.88	2,635.12	2,634.88	11.00	51.62	-97.03	-1,089.32	-8,828.91	8,936.50	8,873.88	62.61	142.726	
2,900.00	2,859.83	2,733.08	2,732.83	11.43	53.76	-97.15	-1,089.32	-8,828.91	8,939.03	8,873.85	65.18	137.142	
3,000.00	2,957.79	2,831.03	2,830.79	11.86	55.90	-97.28	-1,089.32	-8,828.91	8,941.61	8,873.86	67.75	131.981	
3,100.00	3,055.74	2,928.98	2,928.74	12.29	58.04	-97.40	-1,089.32	-8,828.91	8,944.23	8,873.92	70.32	127.197	
3,200.00	3,153.69	3,026.94	3,026.69	12.72	60.18	-97.53	-1,089.32	-8,828.91	8,946.90	8,874.01	72.89	122.751	
3,300.00	3,251.65	3,124.89	3,124.65	13.15	62.32	-97.65	-1,089.32	-8,828.91	8,949.61	8,874.16	75.46	118.607	
3,400.00	3,349.60	3,135.00	3,134.64	13.59	62.54	-97.67	-1,089.32	-8,828.91	8,952.80	8,876.70	76.10	117.643	
3,500.00	3,447.56	3,135.00	3,134.64	14.02	62.54	-97.67	-1,089.32	-8,828.91	8,957.10	8,880.58	76.52	117.059	
3,600.00	3,545.51	3,135.00	3,134.64	14.45	62.54	-97.67	-1,089.32	-8,828.91	8,962.51	8,885.59	76.92	116.510	
3,700.00	3,643.46	3,135.00	3,134.64	14.88	62.54	-97.67	-1,089.32	-8,828.91	8,969.04	8,891.72	77.32	115.995	
3,800.00	3,741.42	3,135.00	3,134.64	15.32	62.54	-97.67	-1,089.32	-8,828.91	8,976.67	8,898.96	77.71	115.513	
3,900.00	3,839.37	3,135.00	3,134.64	15.75	62.54	-97.67	-1,089.32	-8,828.91	8,985.41	8,907.32	78.09	115.064	
4,000.00	3,937.33	3,135.00	3,134.64	16.18	62.54	-97.67	-1,089.32	-8,828.91	8,995.26	8,916.80	78.46	114.647	
4,100.00	4,035.28	3,135.00	3,134.64	16.62	62.54	-97.67	-1,089.32	-8,828.91	9,006.20	8,927.38	78.82	114.262	
4,200.00	4,133.23	3,135.00	3,134.64	17.05	62.54	-97.67	-1,089.32	-8,828.91	9,018.24	8,939.07	79.17	113.907	
4,300.00	4,231.19	3,135.00	3,134.64	17.48	62.54	-97.67	-1,089.32	-8,828.91	9,031.37	8,951.86	79.51	113.583	
4,400.00	4,329.14	3,135.00	3,134.64	17.92	62.54	-97.67	-1,089.32	-8,828.91	9,045.59	8,965.74	79.85	113.289	
4,500.00	4,427.10	3,135.00	3,134.64	18.35	62.54	-97.67	-1,089.32	-8,828.91	9,060.88	8,980.72	80.17	113.024	
4,600.00	4,525.05	3,135.00	3,134.64	18.78	62.54	-97.67	-1,089.32	-8,828.91	9,077.26	8,996.78	80.48	112.789	
4,700.00	4,623.00	3,135.00	3,134.64	19.22	62.54	-97.67	-1,089.32	-8,828.91	9,094.70	9,013.92	80.78	112.581	
4,800.00	4,720.96	3,135.00	3,134.64	19.65	62.54	-97.67	-1,089.32	-8,828.91	9,113.21	9,032.13	81.08	112.402	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		406-A027Ua_INC-ONLY					Rule Assigned:			Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,900.00	4,818.91	3,135.00	3,134.64	20.09	62.54	-97.67	-1,089.32	-8,828.91	9,132.77	9,051.41	81.36	112.250		
5,000.00	4,916.87	3,135.00	3,134.64	20.52	62.54	-97.67	-1,089.32	-8,828.91	9,153.39	9,071.76	81.64	112.125		
5,100.00	5,014.82	3,135.00	3,134.64	20.96	62.54	-97.67	-1,089.32	-8,828.91	9,175.05	9,093.15	81.90	112.026		
5,200.00	5,112.77	3,135.00	3,134.64	21.39	62.54	-97.67	-1,089.32	-8,828.91	9,197.75	9,115.59	82.16	111.953		
5,300.00	5,210.73	3,135.00	3,134.64	21.82	62.54	-97.67	-1,089.32	-8,828.91	9,221.47	9,139.07	82.40	111.906		
5,400.00	5,308.68	3,135.00	3,134.64	22.26	62.54	-97.67	-1,089.32	-8,828.91	9,246.22	9,163.58	82.64	111.883		
5,493.23	5,400.00	3,135.00	3,134.64	22.66	62.54	-97.67	-1,089.32	-8,828.91	9,270.20	9,187.34	82.86	111.884		
5,500.00	5,406.64	3,135.00	3,134.64	22.69	62.54	-97.67	-1,089.32	-8,828.91	9,271.98	9,189.11	82.87	111.885		
5,600.00	5,504.69	3,135.00	3,134.64	23.12	62.54	-97.81	-1,089.32	-8,828.91	9,298.67	9,215.59	83.09	111.915		
5,700.00	5,602.91	3,135.00	3,134.64	23.55	62.54	-97.95	-1,089.32	-8,828.91	9,326.25	9,242.96	83.29	111.974		
5,800.00	5,701.29	3,135.00	3,134.64	23.97	62.54	-98.10	-1,089.32	-8,828.91	9,354.71	9,271.23	83.48	112.063		
5,900.00	5,799.82	3,135.00	3,134.64	24.39	62.54	-98.25	-1,089.32	-8,828.91	9,384.02	9,300.37	83.65	112.180		
6,000.00	5,898.50	3,135.00	3,134.64	24.79	62.54	-98.41	-1,089.32	-8,828.91	9,414.19	9,330.37	83.81	112.325		
6,100.00	5,997.31	3,135.00	3,134.64	25.20	62.54	-98.57	-1,089.32	-8,828.91	9,445.19	9,361.24	83.96	112.498		
6,200.00	6,096.26	3,135.00	3,134.64	25.60	62.54	-98.74	-1,089.32	-8,828.91	9,477.03	9,392.94	84.09	112.698		
6,300.00	6,195.33	3,135.00	3,134.64	25.99	62.54	-98.91	-1,089.32	-8,828.91	9,509.69	9,425.48	84.21	112.925		
6,400.00	6,294.51	3,135.00	3,134.64	26.37	62.54	-99.08	-1,089.32	-8,828.91	9,543.16	9,458.84	84.32	113.179		
6,498.19	6,392.00	3,135.00	3,134.64	26.75	62.54	-99.26	-1,089.32	-8,828.91	9,576.79	9,492.38	84.41	113.453		
6,500.00	6,393.80	3,135.00	3,134.64	26.76	62.54	-98.02	-1,089.32	-8,828.91	9,577.42	9,493.01	84.41	113.458		
6,550.00	6,443.29	3,135.00	3,134.64	26.95	62.54	-74.30	-1,089.32	-8,828.91	9,593.34	9,508.88	84.46	113.581		
6,600.00	6,492.24	3,135.00	3,134.64	27.16	62.54	-62.74	-1,089.32	-8,828.91	9,606.57	9,522.05	84.52	113.658		
6,650.00	6,540.33	3,135.00	3,134.64	27.38	62.54	-56.30	-1,089.32	-8,828.91	9,617.06	9,532.47	84.59	113.687		
6,700.00	6,587.28	3,135.00	3,134.64	27.60	62.54	-52.29	-1,089.32	-8,828.91	9,624.74	9,540.06	84.67	113.669		
6,750.00	6,632.80	3,135.00	3,134.64	27.84	62.54	-49.65	-1,089.32	-8,828.91	9,629.57	9,544.81	84.77	113.603		
6,800.00	6,676.60	3,135.00	3,134.64	28.09	62.54	-47.86	-1,089.32	-8,828.91	9,631.53	9,546.66	84.87	113.489		
6,850.00	6,718.42	3,135.00	3,134.64	28.34	62.54	-46.66	-1,089.32	-8,828.91	9,630.61	9,545.63	84.98	113.328		
6,900.00	6,758.00	3,135.00	3,134.64	28.60	62.54	-45.92	-1,089.32	-8,828.91	9,626.81	9,541.71	85.10	113.121		
6,950.00	6,795.09	3,135.00	3,134.64	28.87	62.54	-45.56	-1,089.32	-8,828.91	9,620.15	9,534.92	85.23	112.867		
7,000.00	6,829.46	3,135.00	3,134.64	29.14	62.54	-45.51	-1,089.32	-8,828.91	9,610.67	9,525.29	85.38	112.567		
7,050.00	6,860.91	3,135.00	3,134.64	29.43	62.54	-45.75	-1,089.32	-8,828.91	9,598.42	9,512.89	85.53	112.221		
7,100.00	6,889.24	3,135.00	3,134.64	29.73	62.54	-46.27	-1,089.32	-8,828.91	9,583.46	9,497.76	85.70	111.830		
7,150.00	6,914.27	3,135.00	3,134.64	30.05	62.54	-47.06	-1,089.32	-8,828.91	9,565.87	9,480.00	85.87	111.396		
7,200.00	6,935.85	3,135.00	3,134.64	30.37	62.54	-48.13	-1,089.32	-8,828.91	9,545.75	9,459.69	86.06	110.919		
7,250.00	6,953.84	3,135.00	3,134.64	30.71	62.54	-49.49	-1,089.32	-8,828.91	9,523.21	9,436.95	86.26	110.400		
7,300.00	6,968.15	3,135.00	3,134.64	31.06	62.54	-51.16	-1,089.32	-8,828.91	9,498.36	9,411.89	86.47	109.843		
7,350.00	6,978.67	3,135.00	3,134.64	31.42	62.54	-53.15	-1,089.32	-8,828.91	9,471.34	9,384.65	86.69	109.249		
7,400.00	6,985.34	3,135.00	3,134.64	31.79	62.54	-55.50	-1,089.32	-8,828.91	9,442.31	9,355.38	86.93	108.621		
7,450.00	6,988.13	3,135.00	3,134.64	32.17	62.54	-58.23	-1,089.32	-8,828.91	9,411.42	9,324.25	87.17	107.963		
7,461.13	6,988.22	3,135.00	3,134.64	32.26	62.54	-58.89	-1,089.32	-8,828.91	9,404.31	9,317.08	87.23	107.810		
7,500.00	6,988.19	3,135.00	3,134.64	32.56	62.54	-58.55	-1,089.32	-8,828.91	9,379.21	9,291.78	87.42	107.284		
7,600.00	6,988.12	3,135.00	3,134.64	33.37	62.54	-57.63	-1,089.32	-8,828.91	9,313.48	9,225.55	87.93	105.922		
7,700.00	6,988.05	3,135.00	3,134.64	34.21	62.54	-56.65	-1,089.32	-8,828.91	9,246.15	9,157.72	88.44	104.550		
7,800.00	6,987.98	3,135.00	3,134.64	35.09	62.54	-55.59	-1,089.32	-8,828.91	9,177.27	9,088.32	88.95	103.175		
7,900.00	6,987.91	3,135.00	3,134.64	35.99	62.54	-54.46	-1,089.32	-8,828.91	9,106.88	9,017.43	89.46	101.802		
8,000.00	6,987.83	3,135.00	3,134.64	36.93	62.54	-53.24	-1,089.32	-8,828.91	9,035.04	8,945.08	89.96	100.434		
8,100.00	6,987.76	3,135.00	3,134.64	37.88	62.54	-51.93	-1,089.32	-8,828.91	8,961.80	8,871.34	90.45	99.075		
8,200.00	6,987.68	3,135.00	3,134.64	38.86	62.54	-50.53	-1,089.32	-8,828.91	8,887.21	8,796.27	90.94	97.728		
8,300.00	6,987.61	3,135.00	3,134.64	39.86	62.54	-49.03	-1,089.32	-8,828.91	8,811.34	8,719.93	91.41	96.398		
8,400.00	6,987.53	3,135.00	3,134.64	40.87	62.54	-47.42	-1,089.32	-8,828.91	8,734.24	8,642.38	91.86	95.086		
8,500.00	6,987.46	3,135.00	3,134.64	41.90	62.54	-45.69	-1,089.32	-8,828.91	8,655.97	8,563.68	92.29	93.794		
8,600.00	6,987.38	3,135.00	3,134.64	42.93	62.54	-43.84	-1,089.32	-8,828.91	8,576.61	8,483.91	92.69	92.526		
8,700.00	6,987.31	3,135.00	3,134.64	43.98	62.54	-41.86	-1,089.32	-8,828.91	8,496.21	8,403.13	93.08	91.283		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		406-A027Ua_INC-ONLY				Rule Assigned:								Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)		
8,800.00	6,987.23	3,135.00	3,134.64	45.03	62.54	-39.74	-1,089.32	-8,828.91	8,414.85	8,321.42	93.43	90.066			
8,872.16	6,987.18	3,135.00	3,134.64	45.79	62.54	-38.13	-1,089.32	-8,828.91	8,355.59	8,261.92	93.67	89.206			
8,900.00	6,987.16	3,135.00	3,134.64	46.08	62.54	-38.13	-1,089.32	-8,828.91	8,332.65	8,238.90	93.75	88.877			
9,000.00	6,987.09	3,135.00	3,134.64	47.16	62.54	-38.13	-1,089.32	-8,828.91	8,250.51	8,156.43	94.08	87.698			
9,100.00	6,987.01	3,135.00	3,134.64	48.27	62.54	-38.13	-1,089.32	-8,828.91	8,168.78	8,074.36	94.41	86.520			
9,200.00	6,986.94	3,135.00	3,134.64	49.40	62.54	-38.13	-1,089.32	-8,828.91	8,087.45	7,992.69	94.76	85.345			
9,300.00	6,986.86	3,135.00	3,134.64	50.56	62.54	-38.13	-1,089.32	-8,828.91	8,006.54	7,911.42	95.12	84.171			
9,400.00	6,986.79	3,135.00	3,134.64	51.75	62.54	-38.13	-1,089.32	-8,828.91	7,926.07	7,830.58	95.49	83.001			
9,500.00	6,986.71	3,135.00	3,134.64	52.95	62.54	-38.13	-1,089.32	-8,828.91	7,846.05	7,750.18	95.88	81.834			
9,600.00	6,986.64	3,135.00	3,134.64	54.18	62.54	-38.13	-1,089.32	-8,828.91	7,766.50	7,670.22	96.27	80.670			
9,700.00	6,986.56	3,135.00	3,134.64	55.42	62.54	-38.13	-1,089.32	-8,828.91	7,687.42	7,590.73	96.68	79.511			
9,800.00	6,986.49	3,135.00	3,134.64	56.69	62.54	-38.13	-1,089.32	-8,828.91	7,608.83	7,511.72	97.11	78.356			
9,900.00	6,986.41	3,135.00	3,134.64	57.97	62.54	-38.13	-1,089.32	-8,828.91	7,530.75	7,433.21	97.54	77.207			
10,000.00	6,986.34	3,135.00	3,134.64	59.26	62.54	-38.13	-1,089.32	-8,828.91	7,453.20	7,355.21	97.99	76.063			
10,100.00	6,986.27	3,135.00	3,134.64	60.57	62.54	-38.13	-1,089.32	-8,828.91	7,376.18	7,277.73	98.45	74.925			
10,200.00	6,986.19	3,135.00	3,134.64	61.90	62.54	-38.13	-1,089.32	-8,828.91	7,299.72	7,200.80	98.92	73.794			
10,300.00	6,986.12	3,135.00	3,134.64	63.23	62.54	-38.13	-1,089.32	-8,828.91	7,223.84	7,124.43	99.41	72.669			
10,400.00	6,986.04	3,135.00	3,134.64	64.58	62.54	-38.13	-1,089.32	-8,828.91	7,148.55	7,048.64	99.91	71.552			
10,500.00	6,985.97	3,135.00	3,134.64	65.94	62.54	-38.13	-1,089.32	-8,828.91	7,073.87	6,973.45	100.42	70.443			
10,600.00	6,985.89	3,135.00	3,134.64	67.32	62.54	-38.13	-1,089.32	-8,828.91	6,999.83	6,898.88	100.95	69.343			
10,700.00	6,985.82	3,135.00	3,134.64	68.70	62.54	-38.13	-1,089.32	-8,828.91	6,926.44	6,824.95	101.48	68.251			
10,800.00	6,985.74	3,135.00	3,134.64	70.09	62.54	-38.13	-1,089.32	-8,828.91	6,853.72	6,751.68	102.04	67.169			
10,900.00	6,985.67	3,135.00	3,134.64	71.49	62.54	-38.13	-1,089.32	-8,828.91	6,781.69	6,679.09	102.60	66.097			
11,000.00	6,985.59	3,135.00	3,134.64	72.90	62.54	-38.13	-1,089.32	-8,828.91	6,710.39	6,607.20	103.18	65.035			
11,100.00	6,985.52	3,135.00	3,134.64	74.31	62.54	-38.13	-1,089.32	-8,828.91	6,639.82	6,536.05	103.77	63.984			
11,200.00	6,985.45	3,135.00	3,134.64	75.74	62.54	-38.13	-1,089.32	-8,828.91	6,570.02	6,465.64	104.38	62.944			
11,300.00	6,985.37	3,135.00	3,134.64	77.17	62.54	-38.13	-1,089.32	-8,828.91	6,501.00	6,396.01	105.00	61.917			
11,400.00	6,985.30	3,135.00	3,134.64	78.61	62.54	-38.13	-1,089.32	-8,828.91	6,432.80	6,327.17	105.63	60.901			
11,500.00	6,985.22	3,135.00	3,134.64	80.05	62.54	-38.13	-1,089.32	-8,828.91	6,365.44	6,259.17	106.27	59.898			
11,600.00	6,985.15	3,135.00	3,134.64	81.50	62.54	-38.13	-1,089.32	-8,828.91	6,298.95	6,192.02	106.93	58.909			
11,700.00	6,985.07	3,135.00	3,134.64	82.96	62.54	-38.13	-1,089.32	-8,828.91	6,233.35	6,125.76	107.60	57.933			
11,800.00	6,985.00	3,135.00	3,134.64	84.42	62.54	-38.13	-1,089.32	-8,828.91	6,168.68	6,060.40	108.28	56.972			
11,900.00	6,984.92	3,135.00	3,134.64	85.89	62.54	-38.13	-1,089.32	-8,828.91	6,104.96	5,995.99	108.97	56.025			
12,000.00	6,984.85	3,135.00	3,134.64	87.36	62.54	-38.13	-1,089.32	-8,828.91	6,042.22	5,932.55	109.67	55.093			
12,100.00	6,984.77	3,135.00	3,134.64	88.83	62.54	-38.13	-1,089.32	-8,828.91	5,980.50	5,870.11	110.39	54.176			
12,200.00	6,984.70	3,135.00	3,134.64	90.31	62.54	-38.13	-1,089.32	-8,828.91	5,919.82	5,808.70	111.12	53.275			
12,300.00	6,984.63	3,135.00	3,134.64	91.80	62.54	-38.13	-1,089.32	-8,828.91	5,860.22	5,748.36	111.86	52.391			
12,400.00	6,984.55	3,135.00	3,134.64	93.29	62.54	-38.13	-1,089.32	-8,828.91	5,801.73	5,689.13	112.60	51.523			
12,500.00	6,984.48	3,135.00	3,134.64	94.78	62.54	-38.13	-1,089.32	-8,828.91	5,744.39	5,631.03	113.36	50.673			
12,600.00	6,984.40	3,135.00	3,134.64	96.28	62.54	-38.13	-1,089.32	-8,828.91	5,688.23	5,574.09	114.13	49.839			
12,700.00	6,984.33	3,135.00	3,134.64	97.78	62.54	-38.13	-1,089.32	-8,828.91	5,633.28	5,518.37	114.91	49.024			
12,800.00	6,984.25	3,135.00	3,134.64	99.28	62.54	-38.13	-1,089.32	-8,828.91	5,579.58	5,463.89	115.70	48.226			
12,900.00	6,984.18	3,135.00	3,134.64	100.78	62.54	-38.13	-1,089.32	-8,828.91	5,527.17	5,410.68	116.49	47.447			
13,000.00	6,984.10	3,135.00	3,134.64	102.29	62.54	-38.13	-1,089.32	-8,828.91	5,476.09	5,358.80	117.29	46.687			
13,100.00	6,984.03	3,135.00	3,134.64	103.80	62.54	-38.13	-1,089.32	-8,828.91	5,426.37	5,308.27	118.10	45.946			
13,200.00	6,983.95	3,135.00	3,134.64	105.32	62.54	-38.13	-1,089.32	-8,828.91	5,378.05	5,259.13	118.92	45.224			
13,300.00	6,983.88	3,135.00	3,134.64	106.84	62.54	-38.13	-1,089.32	-8,828.91	5,331.16	5,211.42	119.74	44.522			
13,400.00	6,983.81	3,135.00	3,134.64	108.36	62.54	-38.13	-1,089.32	-8,828.91	5,285.76	5,165.19	120.57	43.840			
13,500.00	6,983.73	3,135.00	3,134.64	109.88	62.54	-38.13	-1,089.32	-8,828.91	5,241.87	5,120.46	121.40	43.178			
13,600.00	6,983.66	3,135.00	3,134.64	111.40	62.54	-38.13	-1,089.32	-8,828.91	5,199.53	5,077.29	122.24	42.536			
13,700.00	6,983.58	3,135.00	3,134.64	112.93	62.54	-38.13	-1,089.32	-8,828.91	5,158.78	5,035.70	123.08	41.914			
13,800.00	6,983.51	3,135.00	3,134.64	114.46	62.54	-38.13	-1,089.32	-8,828.91	5,119.66	4,995.74	123.92	41.314			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		406-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
13,900.00	6,983.43	3,135.00	3,134.64	115.99	62.54	-38.13	-1,089.32	-8,828.91	5,082.21	4,957.44	124.77	40.733	
14,000.00	6,983.36	3,135.00	3,134.64	117.52	62.54	-38.13	-1,089.32	-8,828.91	5,046.46	4,920.84	125.61	40.174	
14,100.00	6,983.28	3,135.00	3,134.64	119.06	62.54	-38.13	-1,089.32	-8,828.91	5,012.45	4,885.99	126.46	39.636	
14,200.00	6,983.21	3,135.00	3,134.64	120.59	62.54	-38.13	-1,089.32	-8,828.91	4,980.22	4,852.91	127.31	39.119	
14,300.00	6,983.13	3,135.00	3,134.64	122.13	62.54	-38.13	-1,089.32	-8,828.91	4,949.80	4,821.64	128.16	38.623	
14,400.00	6,983.06	3,135.00	3,134.64	123.67	62.54	-38.13	-1,089.32	-8,828.91	4,921.22	4,792.22	129.00	38.148	
14,500.00	6,982.99	3,135.00	3,134.64	125.21	62.54	-38.13	-1,089.32	-8,828.91	4,894.52	4,764.67	129.85	37.695	
14,600.00	6,982.91	3,135.00	3,134.64	126.75	62.54	-38.13	-1,089.32	-8,828.91	4,869.72	4,739.04	130.69	37.262	
14,700.00	6,982.84	3,135.00	3,134.64	128.30	62.54	-38.13	-1,089.32	-8,828.91	4,846.87	4,715.34	131.53	36.851	
14,800.00	6,982.76	3,135.00	3,134.64	129.85	62.54	-38.13	-1,089.32	-8,828.91	4,825.98	4,693.62	132.36	36.461	
14,900.00	6,982.69	3,135.00	3,134.64	131.39	62.54	-38.13	-1,089.32	-8,828.91	4,807.07	4,673.88	133.19	36.092	
15,000.00	6,982.61	3,135.00	3,134.64	132.94	62.54	-38.13	-1,089.32	-8,828.91	4,790.19	4,656.17	134.01	35.744	
15,100.00	6,982.54	3,135.00	3,134.64	134.49	62.54	-38.13	-1,089.32	-8,828.91	4,775.33	4,640.50	134.83	35.417	
15,200.00	6,982.46	3,135.00	3,134.64	136.04	62.54	-38.13	-1,089.32	-8,828.91	4,762.53	4,626.89	135.64	35.111	
15,300.00	6,982.39	3,135.00	3,134.64	137.60	62.54	-38.13	-1,089.32	-8,828.91	4,751.80	4,615.36	136.45	34.826	
15,400.00	6,982.31	3,135.00	3,134.64	139.15	62.54	-38.13	-1,089.32	-8,828.91	4,743.16	4,605.92	137.24	34.561	
15,500.00	6,982.24	3,135.00	3,134.64	140.70	62.54	-38.13	-1,089.32	-8,828.91	4,736.61	4,598.58	138.02	34.317	
15,600.00	6,982.17	3,135.00	3,134.64	142.26	62.54	-38.13	-1,089.32	-8,828.91	4,732.16	4,593.36	138.80	34.094	
15,700.00	6,982.09	3,135.00	3,134.64	143.82	62.54	-38.13	-1,089.32	-8,828.91	4,729.83	4,590.27	139.56	33.891	
15,760.42	6,982.05	3,135.00	3,134.64	144.76	62.54	-38.13	-1,089.32	-8,828.91	4,729.44	4,589.43	140.02	33.778	CC
15,800.00	6,982.02	3,135.00	3,134.64	145.38	62.54	-38.13	-1,089.32	-8,828.91	4,729.61	4,589.30	140.31	33.708	ES
15,900.00	6,981.94	3,135.00	3,134.64	146.94	62.54	-38.13	-1,089.32	-8,828.91	4,731.50	4,590.46	141.05	33.546	
16,000.00	6,981.87	3,135.00	3,134.64	148.50	62.54	-38.13	-1,089.32	-8,828.91	4,735.51	4,593.74	141.77	33.403	
16,100.00	6,981.79	3,135.00	3,134.64	150.06	62.54	-38.13	-1,089.32	-8,828.91	4,741.62	4,599.15	142.47	33.281	
16,200.00	6,981.72	3,135.00	3,134.64	151.62	62.54	-38.13	-1,089.32	-8,828.91	4,749.83	4,606.67	143.16	33.178	
16,300.00	6,981.64	3,135.00	3,134.64	153.18	62.54	-38.13	-1,089.32	-8,828.91	4,760.12	4,616.29	143.83	33.095	
16,400.00	6,981.57	3,135.00	3,134.64	154.74	62.54	-38.13	-1,089.32	-8,828.91	4,772.49	4,628.01	144.48	33.032	
16,500.00	6,981.49	3,135.00	3,134.64	156.31	62.54	-38.13	-1,089.32	-8,828.91	4,786.92	4,641.81	145.11	32.987	
16,600.00	6,981.42	3,135.00	3,134.64	157.87	62.54	-38.13	-1,089.32	-8,828.91	4,803.39	4,657.66	145.72	32.962	
16,700.00	6,981.35	3,135.00	3,134.64	159.44	62.54	-38.13	-1,089.32	-8,828.91	4,821.87	4,675.56	146.31	32.956	SF
16,800.00	6,981.27	3,135.00	3,134.64	161.01	62.54	-38.13	-1,089.32	-8,828.91	4,842.35	4,695.47	146.88	32.969	
16,900.00	6,981.20	3,135.00	3,134.64	162.58	62.54	-38.13	-1,089.32	-8,828.91	4,864.80	4,717.38	147.42	33.000	
17,000.00	6,981.12	3,135.00	3,134.64	164.14	62.54	-38.13	-1,089.32	-8,828.91	4,889.19	4,741.26	147.93	33.050	
17,100.00	6,981.05	3,135.00	3,134.64	165.71	62.54	-38.13	-1,089.32	-8,828.91	4,915.50	4,767.07	148.42	33.118	
17,200.00	6,980.97	3,135.00	3,134.64	167.28	62.54	-38.13	-1,089.32	-8,828.91	4,943.68	4,794.79	148.89	33.204	
17,300.00	6,980.90	3,135.00	3,134.64	168.85	62.54	-38.13	-1,089.32	-8,828.91	4,973.72	4,824.39	149.33	33.307	
17,400.00	6,980.82	3,135.00	3,134.64	170.42	62.54	-38.13	-1,089.32	-8,828.91	5,005.58	4,855.84	149.74	33.428	
17,500.00	6,980.75	3,135.00	3,134.64	172.00	62.54	-38.13	-1,089.32	-8,828.91	5,039.22	4,889.09	150.13	33.565	
17,600.00	6,980.67	3,135.00	3,134.64	173.57	62.54	-38.13	-1,089.32	-8,828.91	5,074.61	4,924.12	150.49	33.720	
17,700.00	6,980.60	3,135.00	3,134.64	175.14	62.54	-38.13	-1,089.32	-8,828.91	5,111.71	4,960.88	150.83	33.891	
17,800.00	6,980.53	3,135.00	3,134.64	176.71	62.54	-38.13	-1,089.32	-8,828.91	5,150.49	4,999.35	151.14	34.079	
17,900.00	6,980.45	3,135.00	3,134.64	178.29	62.54	-38.13	-1,089.32	-8,828.91	5,190.90	5,039.48	151.42	34.282	
18,000.00	6,980.38	3,135.00	3,134.64	179.86	62.54	-38.13	-1,089.32	-8,828.91	5,232.91	5,081.23	151.68	34.501	
18,100.00	6,980.30	3,135.00	3,134.64	181.44	62.54	-38.13	-1,089.32	-8,828.91	5,276.48	5,124.57	151.91	34.735	
18,200.00	6,980.23	3,135.00	3,134.64	183.01	62.54	-38.13	-1,089.32	-8,828.91	5,321.58	5,169.46	152.12	34.984	
18,300.00	6,980.15	3,135.00	3,134.64	184.59	62.54	-38.13	-1,089.32	-8,828.91	5,368.15	5,215.85	152.30	35.247	
18,400.00	6,980.08	3,135.00	3,134.64	186.16	62.54	-38.13	-1,089.32	-8,828.91	5,416.18	5,263.72	152.46	35.525	
18,500.00	6,980.00	3,135.00	3,134.64	187.74	62.54	-38.13	-1,089.32	-8,828.91	5,465.61	5,313.01	152.60	35.817	
18,600.00	6,979.93	3,135.00	3,134.64	189.32	62.54	-38.13	-1,089.32	-8,828.91	5,516.41	5,363.70	152.71	36.122	
18,700.00	6,979.85	3,135.00	3,134.64	190.90	62.54	-38.13	-1,089.32	-8,828.91	5,568.55	5,415.74	152.81	36.441	
18,800.00	6,979.78	3,135.00	3,134.64	192.48	62.54	-38.13	-1,089.32	-8,828.91	5,621.98	5,469.09	152.89	36.772	
18,900.00	6,979.71	3,135.00	3,134.64	194.05	62.54	-38.13	-1,089.32	-8,828.91	5,676.67	5,523.73	152.94	37.116	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		406-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,000.00	6,979.63	3,135.00	3,134.64	195.63	62.54	-38.13	-1,089.32	-8,828.91	5,732.58	5,579.60	152.98	37.473		
19,100.00	6,979.56	3,135.00	3,134.64	197.21	62.54	-38.13	-1,089.32	-8,828.91	5,789.68	5,636.68	153.00	37.841		
19,200.00	6,979.48	3,135.00	3,134.64	198.79	62.54	-38.13	-1,089.32	-8,828.91	5,847.93	5,694.93	153.00	38.221		
19,300.00	6,979.41	3,135.00	3,134.64	200.37	62.54	-38.13	-1,089.32	-8,828.91	5,907.30	5,754.31	152.99	38.612		
19,400.00	6,979.33	3,135.00	3,134.64	201.95	62.54	-38.13	-1,089.32	-8,828.91	5,967.76	5,814.79	152.96	39.014		
19,500.00	6,979.26	3,135.00	3,134.64	203.54	62.54	-38.13	-1,089.32	-8,828.91	6,029.27	5,876.34	152.92	39.427		
19,600.00	6,979.18	3,135.00	3,134.64	205.12	62.54	-38.13	-1,089.32	-8,828.91	6,091.80	5,938.93	152.87	39.850		
19,700.00	6,979.11	3,135.00	3,134.64	206.70	62.54	-38.13	-1,089.32	-8,828.91	6,155.31	6,002.51	152.80	40.283		
19,800.00	6,979.03	3,135.00	3,134.64	208.28	62.54	-38.13	-1,089.32	-8,828.91	6,219.79	6,067.07	152.72	40.726		
19,900.00	6,978.96	3,135.00	3,134.64	209.86	62.54	-38.13	-1,089.32	-8,828.91	6,285.20	6,132.57	152.63	41.179		
20,000.00	6,978.89	3,135.00	3,134.64	211.45	62.54	-38.13	-1,089.32	-8,828.91	6,351.51	6,198.98	152.53	41.641		
20,100.00	6,978.81	3,135.00	3,134.64	213.03	62.54	-38.13	-1,089.32	-8,828.91	6,418.69	6,266.27	152.42	42.111		
20,200.00	6,978.74	3,135.00	3,134.64	214.61	62.54	-38.13	-1,089.32	-8,828.91	6,486.71	6,334.41	152.30	42.591		
20,300.00	6,978.66	3,135.00	3,134.64	216.20	62.54	-38.13	-1,089.32	-8,828.91	6,555.56	6,403.38	152.18	43.079		
20,400.00	6,978.59	3,135.00	3,134.64	217.78	62.54	-38.13	-1,089.32	-8,828.91	6,625.20	6,473.16	152.04	43.575		
20,500.00	6,978.51	3,135.00	3,134.64	219.37	62.54	-38.13	-1,089.32	-8,828.91	6,695.61	6,543.71	151.90	44.079		
20,600.00	6,978.44	3,135.00	3,134.64	220.95	62.54	-38.13	-1,089.32	-8,828.91	6,766.77	6,615.01	151.75	44.590		
20,700.00	6,978.36	3,135.00	3,134.64	222.53	62.54	-38.13	-1,089.32	-8,828.91	6,838.64	6,687.04	151.60	45.109		
20,800.00	6,978.29	3,135.00	3,134.64	224.12	62.54	-38.13	-1,089.32	-8,828.91	6,911.22	6,759.78	151.44	45.636		
20,900.00	6,978.21	3,135.00	3,134.64	225.71	62.54	-38.13	-1,089.32	-8,828.91	6,984.47	6,833.19	151.28	46.169		
21,000.00	6,978.14	3,135.00	3,134.64	227.29	62.54	-38.13	-1,089.32	-8,828.91	7,058.38	6,907.27	151.11	46.709		
21,100.00	6,978.07	3,135.00	3,134.64	228.88	62.54	-38.13	-1,089.32	-8,828.91	7,132.93	6,981.99	150.94	47.256		
21,200.00	6,977.99	3,135.00	3,134.64	230.46	62.54	-38.13	-1,089.32	-8,828.91	7,208.09	7,057.33	150.77	47.809		
21,300.00	6,977.92	3,135.00	3,134.64	232.05	62.54	-38.13	-1,089.32	-8,828.91	7,283.85	7,133.26	150.59	48.369		
21,400.00	6,977.84	3,135.00	3,134.64	233.64	62.54	-38.13	-1,089.32	-8,828.91	7,360.19	7,209.78	150.41	48.934		
21,500.00	6,977.77	3,135.00	3,134.64	235.22	62.54	-38.13	-1,089.32	-8,828.91	7,437.09	7,286.86	150.23	49.505		
21,600.00	6,977.69	3,135.00	3,134.64	236.81	62.54	-38.13	-1,089.32	-8,828.91	7,514.54	7,364.49	150.04	50.082		
21,700.00	6,977.62	3,135.00	3,134.64	238.40	62.54	-38.13	-1,089.32	-8,828.91	7,592.51	7,442.65	149.86	50.664		
21,800.00	6,977.54	3,135.00	3,134.64	239.99	62.54	-38.13	-1,089.32	-8,828.91	7,670.99	7,521.32	149.67	51.252		
21,900.00	6,977.47	3,135.00	3,134.64	241.57	62.54	-38.13	-1,089.32	-8,828.91	7,749.97	7,600.48	149.49	51.844		
22,000.00	6,977.39	3,135.00	3,134.64	243.16	62.54	-38.13	-1,089.32	-8,828.91	7,829.43	7,680.13	149.30	52.442		
22,100.00	6,977.32	3,135.00	3,134.64	244.75	62.54	-38.13	-1,089.32	-8,828.91	7,909.35	7,760.24	149.11	53.044		
22,200.00	6,977.25	3,135.00	3,134.64	246.34	62.54	-38.13	-1,089.32	-8,828.91	7,989.73	7,840.81	148.92	53.651		
22,300.00	6,977.17	3,135.00	3,134.64	247.93	62.54	-38.13	-1,089.32	-8,828.91	8,070.54	7,921.81	148.73	54.263		
22,400.00	6,977.10	3,135.00	3,134.64	249.52	62.54	-38.13	-1,089.32	-8,828.91	8,151.79	8,003.24	148.54	54.878		
22,500.00	6,977.02	3,135.00	3,134.64	251.11	62.54	-38.13	-1,089.32	-8,828.91	8,233.44	8,085.08	148.35	55.498		
22,529.62	6,977.00	3,135.00	3,134.64	251.58	62.54	-38.13	-1,089.32	-8,828.91	8,257.70	8,109.40	148.30	55.683		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 200-MWD OWSG Rev5												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	5,392.00	3,078.35	0.00	62.35	-86.59	499.09	-8,376.98	8,951.44				
100.00	100.00	5,392.00	3,078.35	0.25	62.35	-86.59	499.09	-8,376.98	8,917.13	8,885.76	31.36	284.311	
200.00	200.00	5,392.00	3,078.35	0.61	62.35	-86.59	499.09	-8,376.98	8,883.81	8,852.26	31.56	281.520	
300.00	300.00	5,392.00	3,078.35	0.97	62.35	-86.59	499.09	-8,376.98	8,851.50	8,819.66	31.84	278.036	
400.00	400.00	5,392.00	3,078.35	1.33	62.35	-86.59	499.09	-8,376.98	8,820.20	8,788.04	32.16	274.238	
500.00	500.00	5,392.00	3,078.35	1.68	62.35	-86.59	499.09	-8,376.98	8,789.93	8,757.42	32.52	270.333	
550.00	550.00	5,392.00	3,078.35	1.86	62.35	-86.59	499.09	-8,376.98	8,775.18	8,742.49	32.70	268.375	
600.00	600.00	5,392.00	3,078.35	2.04	62.35	-84.51	499.09	-8,376.98	8,760.66	8,727.78	32.88	266.437	
700.00	699.93	5,392.00	3,078.35	2.40	62.35	-85.10	499.09	-8,376.98	8,732.15	8,698.91	33.24	262.710	
800.00	799.68	5,392.00	3,078.35	2.77	62.35	-85.68	499.09	-8,376.98	8,704.41	8,670.83	33.58	259.181	
900.00	899.13	5,392.00	3,078.35	3.13	62.35	-86.23	499.09	-8,376.98	8,677.49	8,643.57	33.92	255.843	
1,000.00	998.15	5,392.00	3,078.35	3.49	62.35	-86.77	499.09	-8,376.98	8,651.41	8,617.17	34.24	252.672	
1,100.00	1,096.63	5,392.00	3,078.35	3.87	62.35	-87.29	499.09	-8,376.98	8,626.22	8,591.67	34.55	249.643	
1,130.50	1,126.54	5,392.00	3,078.35	3.99	62.35	-87.45	499.09	-8,376.98	8,618.72	8,584.07	34.65	248.745	
1,200.00	1,194.61	5,392.00	3,078.35	4.26	62.35	-87.45	499.09	-8,376.98	8,602.00	8,567.13	34.87	246.717	
1,300.00	1,292.57	5,392.00	3,078.35	4.66	62.35	-87.45	499.09	-8,376.98	8,578.86	8,543.68	35.18	243.823	
1,400.00	1,390.52	5,392.00	3,078.35	5.07	62.35	-87.45	499.09	-8,376.98	8,556.83	8,521.32	35.51	240.972	
1,500.00	1,488.48	5,392.00	3,078.35	5.48	62.35	-87.45	499.09	-8,376.98	8,535.92	8,500.08	35.84	238.178	
1,600.00	1,586.43	5,392.00	3,078.35	5.90	62.35	-87.45	499.09	-8,376.98	8,516.13	8,479.96	36.17	235.446	
1,700.00	1,684.38	5,392.00	3,078.35	6.31	62.35	-87.45	499.09	-8,376.98	8,497.47	8,460.97	36.50	232.782	
1,800.00	1,782.34	5,392.00	3,078.35	6.73	62.35	-87.45	499.09	-8,376.98	8,479.95	8,443.11	36.84	230.189	
1,900.00	1,880.29	5,392.00	3,078.35	7.15	62.35	-87.45	499.09	-8,376.98	8,463.57	8,426.40	37.17	227.670	
2,000.00	1,978.25	5,392.00	3,078.35	7.58	62.35	-87.45	499.09	-8,376.98	8,448.35	8,410.84	37.51	225.226	
2,100.00	2,076.20	5,392.00	3,078.35	8.00	62.35	-87.45	499.09	-8,376.98	8,434.28	8,396.44	37.85	222.858	
2,200.00	2,174.15	5,392.00	3,078.35	8.43	62.35	-87.45	499.09	-8,376.98	8,421.38	8,383.20	38.18	220.566	
2,300.00	2,272.11	5,392.00	3,078.35	8.85	62.35	-87.45	499.09	-8,376.98	8,409.65	8,371.13	38.51	218.349	
2,400.00	2,370.06	5,392.00	3,078.35	9.28	62.35	-87.45	499.09	-8,376.98	8,399.09	8,360.24	38.85	216.209	
2,500.00	2,468.02	5,392.00	3,078.35	9.71	62.35	-87.45	499.09	-8,376.98	8,389.71	8,350.53	39.18	214.142	
2,600.00	2,565.97	5,392.00	3,078.35	10.14	62.35	-87.45	499.09	-8,376.98	8,381.51	8,342.01	39.51	212.150	
2,700.00	2,663.92	5,392.00	3,078.35	10.57	62.35	-87.45	499.09	-8,376.98	8,374.50	8,334.67	39.83	210.232	
2,800.00	2,761.88	5,392.00	3,078.35	11.00	62.35	-87.45	499.09	-8,376.98	8,368.68	8,328.52	40.16	208.385	
2,900.00	2,859.83	5,392.00	3,078.35	11.43	62.35	-87.45	499.09	-8,376.98	8,364.05	8,323.57	40.48	206.609	
3,000.00	2,957.79	5,392.00	3,078.35	11.86	62.35	-87.45	499.09	-8,376.98	8,360.62	8,319.81	40.80	204.904	
3,100.00	3,055.74	5,392.00	3,078.35	12.29	62.35	-87.45	499.09	-8,376.98	8,358.38	8,317.26	41.12	203.267	
3,200.00	3,153.69	5,392.00	3,078.35	12.72	62.35	-87.45	499.09	-8,376.98	8,357.33	8,315.90	41.43	201.698	
3,237.34	3,190.27	5,392.00	3,078.35	12.88	62.35	-87.45	499.09	-8,376.98	8,357.25	8,315.70	41.55	201.129	
3,300.00	3,251.65	5,392.00	3,078.35	13.15	62.35	-87.45	499.09	-8,376.98	8,357.48	8,315.74	41.75	200.195	
3,400.00	3,349.60	5,392.00	3,078.35	13.59	62.35	-87.45	499.09	-8,376.98	8,358.83	8,316.77	42.06	198.757	
3,500.00	3,447.56	5,392.00	3,078.35	14.02	62.35	-87.45	499.09	-8,376.98	8,361.37	8,319.01	42.36	197.384	
3,600.00	3,545.51	5,392.00	3,078.35	14.45	62.35	-87.45	499.09	-8,376.98	8,365.11	8,322.45	42.66	196.073	
3,700.00	3,643.46	5,392.00	3,078.35	14.88	62.35	-87.45	499.09	-8,376.98	8,370.04	8,327.08	42.96	194.823	
3,800.00	3,741.42	5,392.00	3,078.35	15.32	62.35	-87.45	499.09	-8,376.98	8,376.17	8,332.91	43.26	193.633	
3,900.00	3,839.37	5,392.00	3,078.35	15.75	62.35	-87.45	499.09	-8,376.98	8,383.48	8,339.93	43.55	192.502	
4,000.00	3,937.33	5,392.00	3,078.35	16.18	62.35	-87.45	499.09	-8,376.98	8,391.97	8,348.14	43.84	191.429	
4,100.00	4,035.28	5,392.00	3,078.35	16.62	62.35	-87.45	499.09	-8,376.98	8,401.65	8,357.53	44.12	190.412	
4,200.00	4,133.23	5,392.00	3,078.35	17.05	62.35	-87.45	499.09	-8,376.98	8,412.51	8,368.10	44.40	189.451	
4,300.00	4,231.19	5,392.00	3,078.35	17.48	62.35	-87.45	499.09	-8,376.98	8,424.54	8,379.86	44.68	188.543	
4,400.00	4,329.14	5,392.00	3,078.35	17.92	62.35	-87.45	499.09	-8,376.98	8,437.73	8,392.78	44.96	187.687	
4,500.00	4,427.10	5,392.00	3,078.35	18.35	62.35	-87.45	499.09	-8,376.98	8,452.09	8,406.87	45.23	186.883	
4,600.00	4,525.05	5,392.00	3,078.35	18.78	62.35	-87.45	499.09	-8,376.98	8,467.61	8,422.12	45.49	186.130	
4,700.00	4,623.00	5,392.00	3,078.35	19.22	62.35	-87.45	499.09	-8,376.98	8,484.28	8,438.52	45.76	185.425	
4,800.00	4,720.96	5,392.00	3,078.35	19.65	62.35	-87.45	499.09	-8,376.98	8,502.09	8,456.07	46.01	184.768	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY											Offset Site Error:		0.00 usft	
Survey Program:		200-MWD OWSG Rev5							Rule Assigned:				Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)					
4,900.00	4,818.91	5,392.00	3,078.35	20.09	62.35	-87.45	499.09	-8,376.98	8,521.03	8,474.76	46.27	184.158				
5,000.00	4,916.87	5,392.00	3,078.35	20.52	62.35	-87.45	499.09	-8,376.98	8,541.11	8,494.59	46.52	183.594				
5,100.00	5,014.82	5,392.00	3,078.35	20.96	62.35	-87.45	499.09	-8,376.98	8,562.31	8,515.54	46.77	183.074				
5,200.00	5,112.77	5,392.00	3,078.35	21.39	62.35	-87.45	499.09	-8,376.98	8,584.62	8,537.60	47.01	182.597				
5,300.00	5,210.73	5,392.00	3,078.35	21.82	62.35	-87.45	499.09	-8,376.98	8,608.03	8,560.77	47.25	182.162				
5,400.00	5,308.68	5,392.00	3,078.35	22.26	62.35	-87.45	499.09	-8,376.98	8,632.54	8,585.04	47.49	181.768				
5,493.23	5,400.00	5,392.00	3,078.35	22.66	62.35	-87.45	499.09	-8,376.98	8,656.36	8,608.65	47.71	181.437				
5,500.00	5,406.64	5,392.00	3,078.35	22.69	62.35	-87.46	499.09	-8,376.98	8,658.13	8,610.40	47.73	181.414				
5,600.00	5,504.69	5,392.00	3,078.35	23.12	62.35	-87.59	499.09	-8,376.98	8,684.82	8,636.87	47.96	181.102				
5,700.00	5,602.91	5,392.00	3,078.35	23.55	62.35	-87.74	499.09	-8,376.98	8,712.61	8,664.43	48.18	180.831				
5,800.00	5,701.29	5,392.00	3,078.35	23.97	62.35	-87.89	499.09	-8,376.98	8,741.49	8,693.09	48.40	180.601				
5,900.00	5,799.82	5,392.00	3,078.35	24.39	62.35	-88.05	499.09	-8,376.98	8,771.45	8,722.83	48.62	180.411				
6,000.00	5,898.50	5,392.00	3,078.35	24.79	62.35	-88.21	499.09	-8,376.98	8,802.47	8,753.64	48.83	180.261				
6,100.00	5,997.31	5,392.00	3,078.35	25.20	62.35	-88.38	499.09	-8,376.98	8,834.54	8,785.49	49.04	180.149				
6,200.00	6,096.26	5,392.00	3,078.35	25.60	62.35	-88.55	499.09	-8,376.98	8,867.64	8,818.39	49.24	180.074				
6,300.00	6,195.33	5,392.00	3,078.35	25.99	62.35	-88.74	499.09	-8,376.98	8,901.76	8,852.32	49.44	180.034				
6,400.00	6,294.51	5,392.00	3,078.35	26.37	62.35	-88.92	499.09	-8,376.98	8,936.89	8,887.25	49.64	180.030				
6,498.19	6,392.00	5,392.00	3,078.35	26.75	62.35	-89.11	499.09	-8,376.98	8,972.35	8,922.52	49.83	180.059				
6,500.00	6,393.80	5,392.00	3,078.35	26.76	62.35	-87.88	499.09	-8,376.98	8,973.01	8,923.18	49.83	180.060				
6,550.00	6,443.29	5,392.00	3,078.35	26.95	62.35	-64.34	499.09	-8,376.98	8,989.72	8,939.79	49.93	180.056				
6,600.00	6,492.24	5,392.00	3,078.35	27.16	62.35	-52.93	499.09	-8,376.98	9,003.41	8,953.39	50.02	179.990				
6,650.00	6,540.33	5,392.00	3,078.35	27.38	62.35	-46.62	499.09	-8,376.98	9,014.02	8,963.90	50.12	179.858				
6,700.00	6,587.28	5,392.00	3,078.35	27.60	62.35	-42.73	499.09	-8,376.98	9,021.48	8,971.27	50.21	179.662				
6,750.00	6,632.80	5,392.00	3,078.35	27.84	62.35	-40.16	499.09	-8,376.98	9,025.76	8,975.45	50.31	179.404				
6,800.00	6,676.60	5,392.00	3,078.35	28.09	62.35	-38.43	499.09	-8,376.98	9,026.84	8,976.44	50.41	179.085				
6,850.00	6,718.42	5,392.00	3,078.35	28.34	62.35	-37.28	499.09	-8,376.98	9,024.71	8,974.21	50.50	178.707				
6,900.00	6,758.00	5,392.00	3,078.35	28.60	62.35	-36.56	499.09	-8,376.98	9,019.39	8,968.80	50.59	178.271				
6,950.00	6,795.09	5,392.00	3,078.35	28.87	62.35	-36.19	499.09	-8,376.98	9,010.89	8,960.21	50.69	177.778				
7,000.00	6,829.46	5,392.00	3,078.35	29.14	62.35	-36.12	499.09	-8,376.98	8,999.27	8,948.49	50.78	177.230				
7,050.00	6,860.91	5,392.00	3,078.35	29.43	62.35	-36.32	499.09	-8,376.98	8,984.58	8,933.72	50.87	176.627				
7,100.00	6,889.24	5,392.00	3,078.35	29.73	62.35	-36.80	499.09	-8,376.98	8,966.90	8,915.95	50.96	175.970				
7,150.00	6,914.27	5,392.00	3,078.35	30.05	62.35	-37.53	499.09	-8,376.98	8,946.33	8,895.28	51.05	175.262				
7,200.00	6,935.85	5,392.00	3,078.35	30.37	62.35	-38.55	499.09	-8,376.98	8,922.96	8,871.82	51.13	174.502				
7,250.00	6,953.84	5,392.00	3,078.35	30.71	62.35	-39.87	499.09	-8,376.98	8,896.92	8,845.69	51.22	173.695				
7,300.00	6,968.15	5,392.00	3,078.35	31.06	62.35	-41.52	499.09	-8,376.98	8,868.34	8,817.04	51.31	172.842				
7,350.00	6,978.67	5,392.00	3,078.35	31.42	62.35	-43.54	499.09	-8,376.98	8,837.39	8,786.00	51.40	171.945				
7,400.00	6,985.34	5,392.00	3,078.35	31.79	62.35	-46.00	499.09	-8,376.98	8,804.23	8,752.75	51.48	171.009				
7,450.00	6,988.13	5,392.00	3,078.35	32.17	62.35	-48.95	499.09	-8,376.98	8,769.04	8,717.47	51.57	170.037				
7,461.13	6,988.22	5,392.00	3,078.35	32.26	62.35	-49.68	499.09	-8,376.98	8,760.95	8,709.35	51.59	169.809				
7,500.00	6,988.19	5,392.00	3,078.35	32.56	62.35	-49.13	499.09	-8,376.98	8,732.44	8,680.78	51.66	169.041				
7,600.00	6,988.12	5,392.00	3,078.35	33.37	62.35	-47.66	499.09	-8,376.98	8,658.22	8,606.38	51.84	167.025				
7,700.00	6,988.05	5,392.00	3,078.35	34.21	62.35	-46.09	499.09	-8,376.98	8,582.79	8,530.77	52.03	164.961				
7,800.00	6,987.98	5,392.00	3,078.35	35.09	62.35	-44.42	499.09	-8,376.98	8,506.23	8,454.00	52.23	162.862				
7,900.00	6,987.91	5,392.00	3,078.35	35.99	62.35	-42.64	499.09	-8,376.98	8,428.59	8,376.15	52.44	160.739				
8,000.00	6,987.83	5,392.00	3,078.35	36.93	62.35	-40.74	499.09	-8,376.98	8,349.93	8,297.28	52.65	158.600				
8,100.00	6,987.76	5,392.00	3,078.35	37.88	62.35	-38.71	499.09	-8,376.98	8,270.33	8,217.47	52.86	156.456				
8,200.00	6,987.68	5,392.00	3,078.35	38.86	62.35	-36.57	499.09	-8,376.98	8,189.85	8,136.78	53.07	154.314				
8,300.00	6,987.61	5,392.00	3,078.35	39.86	62.35	-34.30	499.09	-8,376.98	8,108.58	8,055.29	53.28	152.182				
8,400.00	6,987.53	5,392.00	3,078.35	40.87	62.35	-31.90	499.09	-8,376.98	8,026.57	7,973.09	53.49	150.067				
8,500.00	6,987.46	5,392.00	3,078.35	41.90	62.35	-29.37	499.09	-8,376.98	7,943.93	7,890.24	53.68	147.975				
8,600.00	6,987.38	5,392.00	3,078.35	42.93	62.35	-26.73	499.09	-8,376.98	7,860.72	7,806.84	53.87	145.911				
8,700.00	6,987.31	5,392.00	3,078.35	43.98	62.35	-23.97	499.09	-8,376.98	7,777.03	7,722.98	54.05	143.880				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
8,800.00	6,987.23	5,392.00	3,078.35	45.03	62.35	-21.10	499.09	-8,376.98	7,692.95	7,638.73	54.22	141.887		
8,872.16	6,987.18	5,392.00	3,078.35	45.79	62.35	-18.97	499.09	-8,376.98	7,632.09	7,577.76	54.33	140.473		
8,900.00	6,987.16	5,392.00	3,078.35	46.08	62.35	-18.97	499.09	-8,376.98	7,608.60	7,554.22	54.37	139.932		
9,000.00	6,987.09	5,392.00	3,078.35	47.16	62.35	-18.97	499.09	-8,376.98	7,524.46	7,469.93	54.53	137.984		
9,100.00	6,987.01	5,392.00	3,078.35	48.27	62.35	-18.97	499.09	-8,376.98	7,440.71	7,386.01	54.70	136.026		
9,200.00	6,986.94	5,392.00	3,078.35	49.40	62.35	-18.97	499.09	-8,376.98	7,357.37	7,302.49	54.88	134.060		
9,300.00	6,986.86	5,392.00	3,078.35	50.56	62.35	-18.97	499.09	-8,376.98	7,274.45	7,219.38	55.07	132.086		
9,400.00	6,986.79	5,392.00	3,078.35	51.75	62.35	-18.97	499.09	-8,376.98	7,191.97	7,136.69	55.28	130.103		
9,500.00	6,986.71	5,392.00	3,078.35	52.95	62.35	-18.97	499.09	-8,376.98	7,109.93	7,054.43	55.50	128.113		
9,600.00	6,986.64	5,392.00	3,078.35	54.18	62.35	-18.97	499.09	-8,376.98	7,028.36	6,972.63	55.73	126.116		
9,700.00	6,986.56	5,392.00	3,078.35	55.42	62.35	-18.97	499.09	-8,376.98	6,947.27	6,891.30	55.98	124.114		
9,800.00	6,986.49	5,392.00	3,078.35	56.69	62.35	-18.97	499.09	-8,376.98	6,866.68	6,810.45	56.24	122.105		
9,900.00	6,986.41	5,392.00	3,078.35	57.97	62.35	-18.97	499.09	-8,376.98	6,786.61	6,730.10	56.51	120.093		
10,000.00	6,986.34	5,392.00	3,078.35	59.26	62.35	-18.97	499.09	-8,376.98	6,707.07	6,650.27	56.80	118.076		
10,100.00	6,986.27	5,392.00	3,078.35	60.57	62.35	-18.97	499.09	-8,376.98	6,628.08	6,570.97	57.11	116.056		
10,200.00	6,986.19	5,392.00	3,078.35	61.90	62.35	-18.97	499.09	-8,376.98	6,549.67	6,492.24	57.44	114.034		
10,300.00	6,986.12	5,392.00	3,078.35	63.23	62.35	-18.97	499.09	-8,376.98	6,471.86	6,414.08	57.78	112.011		
10,400.00	6,986.04	5,392.00	3,078.35	64.58	62.35	-18.97	499.09	-8,376.98	6,394.66	6,336.52	58.14	109.988		
10,500.00	6,985.97	5,392.00	3,078.35	65.94	62.35	-18.97	499.09	-8,376.98	6,318.10	6,259.58	58.52	107.965		
10,600.00	6,985.89	5,392.00	3,078.35	67.32	62.35	-18.97	499.09	-8,376.98	6,242.21	6,183.29	58.92	105.945		
10,700.00	6,985.82	5,392.00	3,078.35	68.70	62.35	-18.97	499.09	-8,376.98	6,167.00	6,107.66	59.34	103.928		
10,800.00	6,985.74	5,392.00	3,078.35	70.09	62.35	-18.97	499.09	-8,376.98	6,092.50	6,032.72	59.78	101.915		
10,900.00	6,985.67	5,392.00	3,078.35	71.49	62.35	-18.97	499.09	-8,376.98	6,018.75	5,958.51	60.24	99.908		
11,000.00	6,985.59	5,392.00	3,078.35	72.90	62.35	-18.97	499.09	-8,376.98	5,945.76	5,885.03	60.73	97.908		
11,100.00	6,985.52	5,392.00	3,078.35	74.31	62.35	-18.97	499.09	-8,376.98	5,873.57	5,812.33	61.24	95.916		
11,200.00	6,985.45	5,392.00	3,078.35	75.74	62.35	-18.97	499.09	-8,376.98	5,802.20	5,740.43	61.77	93.935		
11,300.00	6,985.37	5,392.00	3,078.35	77.17	62.35	-18.97	499.09	-8,376.98	5,731.69	5,669.36	62.33	91.964		
11,400.00	6,985.30	5,392.00	3,078.35	78.61	62.35	-18.97	499.09	-8,376.98	5,662.06	5,599.16	62.91	90.007		
11,500.00	6,985.22	5,392.00	3,078.35	80.05	62.35	-18.97	499.09	-8,376.98	5,593.36	5,529.85	63.52	88.063		
11,600.00	6,985.15	5,392.00	3,078.35	81.50	62.35	-18.97	499.09	-8,376.98	5,525.62	5,461.47	64.15	86.136		
11,700.00	6,985.07	5,392.00	3,078.35	82.96	62.35	-18.97	499.09	-8,376.98	5,458.86	5,394.05	64.81	84.227		
11,800.00	6,985.00	5,392.00	3,078.35	84.42	62.35	-18.97	499.09	-8,376.98	5,393.13	5,327.63	65.50	82.337		
11,900.00	6,984.92	5,392.00	3,078.35	85.89	62.35	-18.97	499.09	-8,376.98	5,328.47	5,262.25	66.22	80.468		
12,000.00	6,984.85	5,392.00	3,078.35	87.36	62.35	-18.97	499.09	-8,376.98	5,264.92	5,197.95	66.97	78.621		
12,100.00	6,984.77	5,392.00	3,078.35	88.83	62.35	-18.97	499.09	-8,376.98	5,202.51	5,134.77	67.74	76.800		
12,200.00	6,984.70	5,392.00	3,078.35	90.31	62.35	-18.97	499.09	-8,376.98	5,141.28	5,072.74	68.55	75.004		
12,300.00	6,984.63	5,392.00	3,078.35	91.80	62.35	-18.97	499.09	-8,376.98	5,081.29	5,011.91	69.38	73.237		
12,400.00	6,984.55	5,392.00	3,078.35	93.29	62.35	-18.97	499.09	-8,376.98	5,022.58	4,952.33	70.25	71.500		
12,500.00	6,984.48	5,392.00	3,078.35	94.78	62.35	-18.97	499.09	-8,376.98	4,965.18	4,894.04	71.14	69.794		
12,600.00	6,984.40	5,392.00	3,078.35	96.28	62.35	-18.97	499.09	-8,376.98	4,909.15	4,837.08	72.06	68.121		
12,700.00	6,984.33	5,392.00	3,078.35	97.78	62.35	-18.97	499.09	-8,376.98	4,854.53	4,781.51	73.02	66.484		
12,800.00	6,984.25	5,392.00	3,078.35	99.28	62.35	-18.97	499.09	-8,376.98	4,801.37	4,727.37	74.00	64.883		
12,900.00	6,984.18	5,392.00	3,078.35	100.78	62.35	-18.97	499.09	-8,376.98	4,749.73	4,674.72	75.01	63.321		
13,000.00	6,984.10	5,392.00	3,078.35	102.29	62.35	-18.97	499.09	-8,376.98	4,699.64	4,623.59	76.05	61.798		
13,100.00	6,984.03	5,392.00	3,078.35	103.80	62.35	-18.97	499.09	-8,376.98	4,651.17	4,574.06	77.11	60.317		
13,200.00	6,983.95	5,392.00	3,078.35	105.32	62.35	-18.97	499.09	-8,376.98	4,604.36	4,526.16	78.20	58.878		
13,300.00	6,983.88	5,392.00	3,078.35	106.84	62.35	-18.97	499.09	-8,376.98	4,559.26	4,479.94	79.31	57.484		
13,400.00	6,983.81	5,392.00	3,078.35	108.36	62.35	-18.97	499.09	-8,376.98	4,515.92	4,435.48	80.45	56.135		
13,500.00	6,983.73	5,392.00	3,078.35	109.88	62.35	-18.97	499.09	-8,376.98	4,474.40	4,392.80	81.60	54.832		
13,600.00	6,983.66	5,392.00	3,078.35	111.40	62.35	-18.97	499.09	-8,376.98	4,434.75	4,351.98	82.77	53.577		
13,700.00	6,983.58	5,392.00	3,078.35	112.93	62.35	-18.97	499.09	-8,376.98	4,397.02	4,313.05	83.96	52.370		
13,800.00	6,983.51	5,392.00	3,078.35	114.46	62.35	-18.97	499.09	-8,376.98	4,361.25	4,276.09	85.16	51.211		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,900.00	6,983.43	5,392.00	3,078.35	115.99	62.35	-18.97	499.09	-8,376.98	4,327.49	4,241.12	86.37	50.103		
14,000.00	6,983.36	5,392.00	3,078.35	117.52	62.35	-18.97	499.09	-8,376.98	4,295.80	4,208.22	87.59	49.045		
14,100.00	6,983.28	5,392.00	3,078.35	119.06	62.35	-18.97	499.09	-8,376.98	4,266.22	4,177.41	88.81	48.038		
14,200.00	6,983.21	5,392.00	3,078.35	120.59	62.35	-18.97	499.09	-8,376.98	4,238.80	4,148.76	90.03	47.081		
14,300.00	6,983.13	5,392.00	3,078.35	122.13	62.35	-18.97	499.09	-8,376.98	4,213.56	4,122.31	91.25	46.176		
14,400.00	6,983.06	5,392.00	3,078.35	123.67	62.35	-18.97	499.09	-8,376.98	4,190.57	4,098.10	92.46	45.321		
14,500.00	6,982.99	5,392.00	3,078.35	125.21	62.35	-18.97	499.09	-8,376.98	4,169.84	4,076.18	93.67	44.518		
14,600.00	6,982.91	5,392.00	3,078.35	126.75	62.35	-18.97	499.09	-8,376.98	4,151.42	4,056.57	94.86	43.766		
14,700.00	6,982.84	5,392.00	3,078.35	128.30	62.35	-18.97	499.09	-8,376.98	4,135.34	4,039.31	96.03	43.064		
14,800.00	6,982.76	5,392.00	3,078.35	129.85	62.35	-18.97	499.09	-8,376.98	4,121.62	4,024.44	97.18	42.413		
14,900.00	6,982.69	5,392.00	3,078.35	131.39	62.35	-18.97	499.09	-8,376.98	4,110.29	4,011.99	98.31	41.811		
15,000.00	6,982.61	5,392.00	3,078.35	132.94	62.35	-18.97	499.09	-8,376.98	4,101.37	4,001.96	99.41	41.258		
15,100.00	6,982.54	5,392.00	3,078.35	134.49	62.35	-18.97	499.09	-8,376.98	4,094.87	3,994.39	100.48	40.755		
15,200.00	6,982.46	5,392.00	3,078.35	136.04	62.35	-18.97	499.09	-8,376.98	4,090.81	3,989.29	101.51	40.299		
15,300.00	6,982.39	5,392.00	3,078.35	137.60	62.35	-18.97	499.09	-8,376.98	4,089.18	3,986.67	102.51	39.890		
15,316.35	6,982.38	5,392.00	3,078.35	137.85	62.35	-18.97	499.09	-8,376.98	4,089.15	3,986.48	102.67	39.828	CC, ES	
15,400.00	6,982.31	5,392.00	3,078.35	139.15	62.35	-18.97	499.09	-8,376.98	4,090.01	3,986.53	103.47	39.528		
15,500.00	6,982.24	5,392.00	3,078.35	140.70	62.35	-18.97	499.09	-8,376.98	4,093.27	3,988.88	104.39	39.211		
15,600.00	6,982.17	5,392.00	3,078.35	142.26	62.35	-18.97	499.09	-8,376.98	4,098.98	3,993.71	105.27	38.939		
15,700.00	6,982.09	5,392.00	3,078.35	143.82	62.35	-18.97	499.09	-8,376.98	4,107.11	4,001.01	106.10	38.711		
15,800.00	6,982.02	5,392.00	3,078.35	145.38	62.35	-18.97	499.09	-8,376.98	4,117.65	4,010.77	106.88	38.526		
15,900.00	6,981.94	5,334.00	3,080.97	146.94	61.09	-19.35	471.79	-8,428.08	4,130.18	4,022.53	107.65	38.367		
16,000.00	6,981.87	5,222.97	3,085.55	148.50	58.66	-20.05	420.62	-8,526.51	4,143.33	4,034.91	108.42	38.215		
16,100.00	6,981.79	5,102.52	3,091.75	150.06	56.05	-20.80	365.74	-8,633.55	4,155.81	4,046.61	109.20	38.056		
16,200.00	6,981.72	4,985.93	3,097.67	151.62	53.52	-21.51	314.17	-8,737.94	4,168.37	4,058.41	109.96	37.907		
16,300.00	6,981.64	4,921.31	3,100.89	153.18	52.12	-21.89	285.79	-8,795.91	4,181.39	4,070.71	110.68	37.780		
16,400.00	6,981.57	4,846.22	3,104.29	154.74	50.52	-22.34	252.37	-8,863.06	4,195.38	4,083.99	111.40	37.662		
16,500.00	6,981.49	4,734.76	3,108.89	156.31	48.13	-22.99	203.89	-8,963.32	4,209.79	4,097.67	112.13	37.545		
16,600.00	6,981.42	4,671.58	3,111.13	157.87	46.77	-23.33	177.86	-9,020.85	4,224.22	4,111.45	112.76	37.461		
16,700.00	6,981.35	4,635.00	3,111.87	159.44	45.99	-23.53	162.66	-9,054.11	4,240.21	4,126.87	113.35	37.409		
16,800.00	6,981.27	4,588.15	3,112.42	161.01	45.01	-23.79	142.77	-9,096.52	4,257.63	4,143.70	113.93	37.372		
16,900.00	6,981.20	4,539.61	3,112.74	162.58	43.99	-24.05	121.83	-9,140.31	4,276.22	4,161.74	114.48	37.352		
17,000.00	6,981.12	4,492.34	3,112.37	164.14	43.01	-24.30	101.67	-9,183.07	4,296.08	4,181.08	115.00	37.357		
17,100.00	6,981.05	4,255.30	3,113.22	165.71	38.16	-25.53	3.42	-9,398.74	4,314.26	4,198.39	115.87	37.233		
17,200.00	6,980.97	4,153.46	3,115.16	167.28	36.15	-26.06	-38.83	-9,491.39	4,332.11	4,215.55	116.55	37.169		
17,300.00	6,980.90	4,036.41	3,119.47	168.85	33.92	-26.70	-89.42	-9,596.83	4,349.67	4,232.31	117.35	37.065		
17,400.00	6,980.82	3,998.00	3,121.31	170.42	33.21	-26.92	-106.69	-9,631.09	4,367.84	4,249.94	117.90	37.048	SF	
17,500.00	6,980.75	3,959.36	3,122.71	172.00	32.52	-27.14	-124.17	-9,665.52	4,387.43	4,269.03	118.40	37.056		
17,600.00	6,980.67	3,934.00	3,123.12	173.57	32.06	-27.28	-135.63	-9,688.15	4,408.72	4,289.90	118.82	37.105		
17,700.00	6,980.60	3,903.89	3,123.20	175.14	31.54	-27.44	-149.34	-9,714.95	4,431.60	4,312.37	119.23	37.169		
17,800.00	6,980.53	3,870.00	3,122.88	176.71	30.95	-27.63	-165.05	-9,744.98	4,456.06	4,336.43	119.63	37.248		
17,900.00	6,980.45	3,841.41	3,122.28	178.29	30.47	-27.78	-178.46	-9,770.22	4,481.99	4,362.01	119.98	37.356		
18,000.00	6,980.38	3,806.00	3,121.16	179.86	29.87	-27.97	-195.14	-9,801.43	4,509.31	4,388.97	120.34	37.471		
18,100.00	6,980.30	3,759.07	3,119.03	181.44	29.11	-28.22	-217.13	-9,842.84	4,537.87	4,417.12	120.75	37.580		
18,200.00	6,980.23	3,487.00	3,107.81	183.01	25.14	-29.56	-339.10	-10,085.70	4,565.29	4,442.82	122.46	37.279		
18,300.00	6,980.15	3,487.00	3,107.81	184.59	25.14	-29.56	-339.10	-10,085.70	4,592.13	4,469.54	122.58	37.461		
18,400.00	6,980.08	3,457.51	3,106.57	186.16	24.78	-29.70	-351.69	-10,112.33	4,620.15	4,497.42	122.73	37.646		
18,500.00	6,980.00	3,427.00	3,103.68	187.74	24.41	-29.83	-365.01	-10,139.63	4,650.70	4,527.85	122.85	37.856		
18,600.00	6,979.93	3,427.00	3,103.68	189.32	24.41	-29.83	-365.01	-10,139.63	4,682.32	4,559.46	122.86	38.110		
18,700.00	6,979.85	3,427.00	3,103.68	190.90	24.41	-29.83	-365.01	-10,139.63	4,715.84	4,593.01	122.83	38.392		
18,800.00	6,979.78	3,427.00	3,103.68	192.48	24.41	-29.83	-365.01	-10,139.63	4,751.23	4,628.47	122.76	38.702		
18,900.00	6,979.71	3,412.25	3,101.60	194.05	24.24	-29.89	-371.52	-10,152.70	4,788.18	4,665.42	122.76	39.004		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #226A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		200-MWD OWSG Rev5					Rule Assigned:		Offset Well Error:		0.00 usft			
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Warning						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,000.00	6,979.63	3,395.00	3,098.47	195.63	24.05	-29.96	-379.15	-10,167.85	4,826.97	4,704.22	122.74	39.325		
19,100.00	6,979.56	3,395.00	3,098.47	197.21	24.05	-29.96	-379.15	-10,167.85	4,867.14	4,744.56	122.58	39.706		
19,200.00	6,979.48	3,395.00	3,098.47	198.79	24.05	-29.96	-379.15	-10,167.85	4,909.02	4,786.63	122.38	40.112		
19,300.00	6,979.41	3,395.00	3,098.47	200.37	24.05	-29.96	-379.15	-10,167.85	4,952.56	4,830.40	122.16	40.542		
19,400.00	6,979.33	3,363.00	3,090.64	201.95	23.72	-30.06	-393.24	-10,195.48	4,997.48	4,875.30	122.18	40.904		
19,500.00	6,979.26	3,363.00	3,090.64	203.54	23.72	-30.06	-393.24	-10,195.48	5,043.68	4,921.77	121.91	41.374		
19,600.00	6,979.18	3,363.00	3,090.64	205.12	23.72	-30.06	-393.24	-10,195.48	5,091.42	4,969.81	121.61	41.867		
19,700.00	6,979.11	3,344.84	3,085.23	206.70	23.54	-30.12	-401.10	-10,210.93	5,140.49	5,019.02	121.47	42.320		
19,800.00	6,979.03	3,330.00	3,080.46	208.28	23.39	-30.16	-407.37	-10,223.50	5,190.78	5,069.50	121.28	42.801		
19,900.00	6,978.96	3,298.00	3,069.30	209.86	23.10	-30.23	-420.49	-10,250.48	5,242.27	5,121.03	121.24	43.237		
20,000.00	6,978.89	3,298.00	3,069.30	211.45	23.10	-30.23	-420.49	-10,250.48	5,294.75	5,173.87	120.88	43.801		
20,100.00	6,978.81	3,282.24	3,063.41	213.03	22.97	-30.27	-426.83	-10,263.64	5,348.41	5,227.75	120.66	44.328		
20,200.00	6,978.74	3,266.00	3,057.05	214.61	22.84	-30.30	-433.41	-10,277.06	5,403.24	5,282.81	120.43	44.868		
20,300.00	6,978.66	3,266.00	3,057.05	216.20	22.84	-30.30	-433.41	-10,277.06	5,459.18	5,339.16	120.02	45.484		
20,400.00	6,978.59	3,266.00	3,057.05	217.78	22.84	-30.30	-433.41	-10,277.06	5,516.36	5,396.76	119.61	46.120		
20,500.00	6,978.51	3,235.00	3,043.62	219.37	22.60	-30.35	-445.88	-10,302.05	5,574.61	5,455.10	119.51	46.647		
20,600.00	6,978.44	3,235.00	3,043.62	220.95	22.60	-30.35	-445.88	-10,302.05	5,633.73	5,514.65	119.07	47.313		
20,700.00	6,978.36	3,235.00	3,043.62	222.53	22.60	-30.35	-445.88	-10,302.05	5,693.99	5,575.36	118.63	47.996		
20,800.00	6,978.29	3,235.00	3,043.62	224.12	22.60	-30.35	-445.88	-10,302.05	5,755.36	5,637.17	118.19	48.698		
20,900.00	6,978.21	3,203.00	3,028.14	225.71	22.38	-30.39	-458.70	-10,326.95	5,817.69	5,699.58	118.10	49.259		
21,000.00	6,978.14	3,203.00	3,028.14	227.29	22.38	-30.39	-458.70	-10,326.95	5,880.74	5,763.10	117.65	49.986		
21,100.00	6,978.07	3,203.00	3,028.14	228.88	22.38	-30.39	-458.70	-10,326.95	5,944.81	5,827.63	117.19	50.730		
21,200.00	6,977.99	3,171.00	3,011.69	230.46	22.19	-30.43	-471.53	-10,351.21	6,009.75	5,892.64	117.11	51.317		
21,300.00	6,977.92	3,171.00	3,011.69	232.05	22.19	-30.43	-471.53	-10,351.21	6,075.35	5,958.71	116.64	52.084		
21,400.00	6,977.84	3,171.00	3,011.69	233.64	22.19	-30.43	-471.53	-10,351.21	6,141.88	6,025.70	116.18	52.866		
21,500.00	6,977.77	3,139.00	2,994.31	235.22	22.01	-30.46	-484.18	-10,374.92	6,209.08	6,092.97	116.11	53.477		
21,600.00	6,977.69	3,139.00	2,994.31	236.81	22.01	-30.46	-484.18	-10,374.92	6,277.00	6,161.36	115.64	54.280		
21,700.00	6,977.62	3,125.35	2,986.60	238.40	21.94	-30.46	-489.49	-10,384.85	6,345.69	6,230.34	115.35	55.013		
21,800.00	6,977.54	3,107.00	2,975.98	239.99	21.85	-30.47	-496.53	-10,398.05	6,415.08	6,299.96	115.12	55.726		
21,900.00	6,977.47	3,107.00	2,975.98	241.57	21.85	-30.47	-496.53	-10,398.05	6,485.11	6,370.46	114.65	56.563		
22,000.00	6,977.39	3,075.00	2,956.89	243.16	21.71	-30.48	-508.54	-10,420.75	6,555.73	6,441.12	114.61	57.200		
22,100.00	6,977.32	3,062.11	2,949.04	244.75	21.66	-30.49	-513.30	-10,429.80	6,626.92	6,512.60	114.32	57.967		
22,200.00	6,977.25	3,043.00	2,937.31	246.34	21.58	-30.49	-520.32	-10,443.15	6,698.64	6,584.51	114.12	58.697		
22,300.00	6,977.17	3,028.55	2,928.32	247.93	21.53	-30.49	-525.60	-10,453.16	6,770.90	6,657.04	113.86	59.465		
22,400.00	6,977.10	3,011.00	2,917.24	249.52	21.46	-30.49	-531.97	-10,465.19	6,843.74	6,730.09	113.65	60.217		
22,500.00	6,977.02	3,011.00	2,917.24	251.11	21.46	-30.49	-531.97	-10,465.19	6,917.14	6,803.94	113.20	61.104		
22,529.62	6,977.00	2,994.70	2,906.80	251.58	21.41	-30.48	-537.82	-10,476.26	6,938.93	6,825.64	113.29	61.247		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 352-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-105.94	-1,465.20	-5,128.86	5,335.26				
100.00	100.00	0.00	0.00	0.25	0.00	-105.94	-1,465.20	-5,128.86	5,334.06	5,333.81	0.25	N/A	
200.00	200.00	92.35	92.35	0.61	1.10	-105.94	-1,465.29	-5,128.78	5,333.99	5,332.29	1.70	3,134.937	
300.00	300.00	199.74	199.74	0.97	2.37	-105.95	-1,465.63	-5,128.47	5,333.80	5,330.47	3.33	1,601.965	
400.00	400.00	307.12	307.11	1.33	3.64	-105.96	-1,466.22	-5,127.93	5,333.48	5,328.52	4.96	1,075.826	
496.99	496.99	383.00	382.99	1.67	4.21	-105.96	-1,466.74	-5,127.51	5,333.17	5,327.31	5.87	909.307	
500.00	500.00	383.00	382.99	1.68	4.21	-105.96	-1,466.74	-5,127.51	5,333.17	5,327.30	5.88	907.638	
550.00	550.00	413.00	412.99	1.86	4.22	-105.96	-1,466.77	-5,127.58	5,333.30	5,327.23	6.07	879.118	
600.00	600.00	435.04	435.03	2.04	4.23	-103.57	-1,466.63	-5,127.79	5,333.75	5,327.50	6.26	852.707	
700.00	699.93	474.00	473.98	2.40	4.25	-103.53	-1,465.91	-5,128.55	5,336.03	5,329.40	6.63	804.925	
800.00	799.68	505.00	504.94	2.77	4.28	-103.45	-1,464.85	-5,129.68	5,340.36	5,333.36	7.00	762.437	
900.00	899.13	550.12	549.94	3.13	4.32	-103.35	-1,462.62	-5,132.06	5,346.62	5,339.23	7.39	723.368	
1,000.00	998.15	580.65	580.31	3.49	4.36	-103.20	-1,460.50	-5,134.29	5,354.94	5,347.17	7.78	688.587	
1,100.00	1,096.63	617.36	616.74	3.87	4.40	-103.02	-1,457.40	-5,137.57	5,365.27	5,357.09	8.18	656.209	
1,130.50	1,126.54	627.00	626.29	3.99	4.42	-102.96	-1,456.47	-5,138.54	5,368.81	5,360.51	8.30	646.931	
1,200.00	1,194.61	657.00	655.94	4.26	4.46	-102.98	-1,453.30	-5,141.79	5,377.31	5,368.72	8.59	626.081	
1,300.00	1,292.57	698.37	696.69	4.66	4.52	-103.00	-1,448.25	-5,146.84	5,390.44	5,381.43	9.01	598.006	
1,400.00	1,390.52	733.88	731.49	5.07	4.59	-103.01	-1,443.24	-5,151.84	5,404.74	5,395.30	9.44	572.388	
1,500.00	1,488.48	780.00	776.43	5.48	4.68	-103.01	-1,435.92	-5,159.13	5,420.17	5,410.28	9.89	547.932	
1,600.00	1,586.43	811.00	806.44	5.90	4.75	-103.00	-1,430.37	-5,164.57	5,436.68	5,426.35	10.33	526.286	
1,700.00	1,684.38	842.00	836.27	6.31	4.83	-102.99	-1,424.32	-5,170.45	5,454.33	5,443.55	10.77	506.226	
1,800.00	1,782.34	874.00	866.86	6.73	4.91	-102.97	-1,417.57	-5,176.98	5,473.10	5,461.87	11.23	487.484	
1,900.00	1,880.29	915.33	906.05	7.15	5.02	-102.93	-1,408.18	-5,186.14	5,493.01	5,481.30	11.71	469.049	
2,000.00	1,978.25	954.23	942.64	7.58	5.12	-102.88	-1,398.76	-5,195.39	5,514.02	5,501.83	12.20	452.031	
2,100.00	2,076.20	999.00	984.45	8.00	5.25	-102.82	-1,387.37	-5,206.64	5,536.04	5,523.33	12.72	435.386	
2,200.00	2,174.15	1,042.82	1,024.91	8.43	5.38	-102.75	-1,375.24	-5,218.27	5,558.95	5,545.70	13.25	419.516	
2,300.00	2,272.11	1,078.73	1,057.78	8.85	5.50	-102.69	-1,364.83	-5,228.32	5,582.92	5,569.16	13.77	405.454	
2,400.00	2,370.06	1,110.71	1,086.68	9.28	5.61	-102.63	-1,354.88	-5,237.75	5,607.97	5,593.68	14.28	392.585	
2,500.00	2,468.02	1,155.00	1,126.30	9.71	5.76	-102.53	-1,340.64	-5,251.49	5,634.16	5,619.29	14.87	378.856	
2,600.00	2,565.97	1,197.01	1,163.30	10.14	5.98	-102.42	-1,326.13	-5,265.08	5,661.24	5,645.74	15.50	365.206	
2,700.00	2,663.92	1,257.15	1,215.51	10.57	6.23	-102.26	-1,304.03	-5,285.16	5,689.06	5,672.81	16.24	350.237	
2,800.00	2,761.88	1,297.29	1,249.89	11.00	6.37	-102.14	-1,288.60	-5,298.97	5,717.66	5,700.79	16.87	338.904	
2,900.00	2,859.83	1,311.00	1,261.52	11.43	6.43	-102.10	-1,283.17	-5,303.80	5,747.37	5,730.06	17.31	331.992	
3,000.00	2,957.79	1,374.00	1,314.38	11.86	6.92	-101.89	-1,257.85	-5,326.88	5,778.08	5,759.92	18.16	318.128	
3,100.00	3,055.74	1,405.00	1,340.10	12.29	7.17	-101.79	-1,245.17	-5,338.67	5,809.82	5,791.06	18.75	309.805	
3,200.00	3,153.69	1,436.00	1,365.60	12.72	7.43	-101.69	-1,232.27	-5,350.69	5,842.52	5,823.17	19.35	301.994	
3,300.00	3,251.65	1,436.00	1,365.60	13.15	7.43	-101.69	-1,232.27	-5,350.69	5,876.45	5,856.78	19.67	298.689	
3,400.00	3,349.60	1,498.00	1,416.09	13.59	8.03	-101.47	-1,206.60	-5,375.90	5,911.37	5,890.80	20.57	287.327	
3,500.00	3,447.56	1,498.00	1,416.09	14.02	8.03	-101.47	-1,206.60	-5,375.90	5,947.36	5,926.47	20.89	284.700	
3,600.00	3,545.51	1,542.93	1,452.37	14.45	8.46	-101.32	-1,188.23	-5,395.00	5,984.42	5,962.80	21.62	276.815	
3,700.00	3,643.46	1,592.00	1,491.75	14.88	8.94	-101.15	-1,168.05	-5,416.21	6,022.27	5,999.88	22.39	268.968	
3,800.00	3,741.42	1,658.95	1,544.84	15.32	9.64	-100.91	-1,139.73	-5,445.55	6,060.71	6,037.34	23.37	259.334	
3,900.00	3,839.37	1,726.44	1,597.76	15.75	10.37	-100.66	-1,110.31	-5,475.38	6,099.57	6,075.20	24.36	250.342	
4,000.00	3,937.33	3,253.00	2,925.31	16.18	22.92	-97.57	-607.81	-5,956.08	6,124.76	6,087.69	37.07	165.218	
4,100.00	4,035.28	3,253.00	2,925.31	16.62	22.92	-97.57	-607.81	-5,956.08	6,143.18	6,105.71	37.47	163.949	
4,200.00	4,133.23	3,253.00	2,925.31	17.05	22.92	-97.57	-607.81	-5,956.08	6,163.17	6,125.31	37.86	162.793	
4,300.00	4,231.19	3,253.00	2,925.31	17.48	22.92	-97.57	-607.81	-5,956.08	6,184.71	6,146.47	38.24	161.747	
4,400.00	4,329.14	3,253.00	2,925.31	17.92	22.92	-97.57	-607.81	-5,956.08	6,207.79	6,169.18	38.60	160.805	
4,500.00	4,427.10	3,253.00	2,925.31	18.35	22.92	-97.57	-607.81	-5,956.08	6,232.39	6,193.43	38.96	159.965	
4,600.00	4,525.05	3,253.00	2,925.31	18.78	22.92	-97.57	-607.81	-5,956.08	6,258.49	6,219.18	39.31	159.221	
4,700.00	4,623.00	3,253.00	2,925.31	19.22	22.92	-97.57	-607.81	-5,956.08	6,286.07	6,246.42	39.64	158.569	
4,800.00	4,720.96	3,253.00	2,925.31	19.65	22.92	-97.57	-607.81	-5,956.08	6,315.11	6,275.14	39.97	158.007	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,900.00	4,818.91	3,253.00	2,925.31	20.09	22.92	-97.57	-607.81	-5,956.08	6,345.60	6,305.32	40.28	157.531		
5,000.00	4,916.87	3,253.00	2,925.31	20.52	22.92	-97.57	-607.81	-5,956.08	6,377.51	6,336.92	40.59	157.136		
5,100.00	5,014.82	3,253.00	2,925.31	20.96	22.92	-97.57	-607.81	-5,956.08	6,410.82	6,369.94	40.88	156.821		
5,200.00	5,112.77	3,253.00	2,925.31	21.39	22.92	-97.57	-607.81	-5,956.08	6,445.51	6,404.35	41.16	156.582		
5,300.00	5,210.73	3,253.00	2,925.31	21.82	22.92	-97.57	-607.81	-5,956.08	6,481.56	6,440.12	41.44	156.415		
5,400.00	5,308.68	3,253.00	2,925.31	22.26	22.92	-97.57	-607.81	-5,956.08	6,518.94	6,477.24	41.70	156.319		
5,493.23	5,400.00	3,253.00	2,925.31	22.66	22.92	-97.57	-607.81	-5,956.08	6,554.98	6,513.03	41.94	156.290		
5,500.00	5,406.64	3,253.00	2,925.31	22.69	22.92	-97.59	-607.81	-5,956.08	6,557.64	6,515.68	41.96	156.290		
5,600.00	5,504.69	3,253.00	2,925.31	23.12	22.92	-97.80	-607.81	-5,956.08	6,597.56	6,555.36	42.20	156.335		
5,700.00	5,602.91	3,253.00	2,925.31	23.55	22.92	-98.03	-607.81	-5,956.08	6,638.64	6,596.21	42.43	156.461		
5,800.00	5,701.29	3,253.00	2,925.31	23.97	22.92	-98.26	-607.81	-5,956.08	6,680.86	6,638.22	42.65	156.662		
5,900.00	5,799.82	3,253.00	2,925.31	24.39	22.92	-98.49	-607.81	-5,956.08	6,724.19	6,681.34	42.85	156.937		
6,000.00	5,898.50	3,253.00	2,925.31	24.79	22.92	-98.74	-607.81	-5,956.08	6,768.60	6,725.56	43.03	157.282		
6,100.00	5,997.31	3,253.00	2,925.31	25.20	22.92	-98.99	-607.81	-5,956.08	6,814.07	6,770.86	43.21	157.696		
6,200.00	6,096.26	3,253.00	2,925.31	25.60	22.92	-99.25	-607.81	-5,956.08	6,860.58	6,817.20	43.37	158.174		
6,300.00	6,195.33	3,253.00	2,925.31	25.99	22.92	-99.52	-607.81	-5,956.08	6,908.10	6,864.57	43.53	158.715		
6,400.00	6,294.51	3,253.00	2,925.31	26.37	22.92	-99.79	-607.81	-5,956.08	6,956.60	6,912.94	43.67	159.316		
6,498.19	6,392.00	3,253.00	2,925.31	26.75	22.92	-100.07	-607.81	-5,956.08	7,005.17	6,961.37	43.79	159.962		
6,500.00	6,393.80	3,253.00	2,925.31	26.76	22.92	-98.80	-607.81	-5,956.08	7,006.07	6,962.28	43.79	159.975		
6,550.00	6,443.29	3,253.00	2,925.31	26.95	22.92	-74.49	-607.81	-5,956.08	7,029.77	6,985.91	43.86	160.274		
6,600.00	6,492.24	3,253.00	2,925.31	27.16	22.92	-62.38	-607.81	-5,956.08	7,051.04	7,007.10	43.94	160.481		
6,650.00	6,540.33	3,253.00	2,925.31	27.38	22.92	-55.43	-607.81	-5,956.08	7,069.77	7,025.74	44.02	160.587		
6,700.00	6,587.28	3,253.00	2,925.31	27.60	22.92	-50.95	-607.81	-5,956.08	7,085.85	7,041.73	44.12	160.596		
6,750.00	6,632.80	3,253.00	2,925.31	27.84	22.92	-47.84	-607.81	-5,956.08	7,099.22	7,054.99	44.23	160.507		
6,800.00	6,676.60	3,253.00	2,925.31	28.09	22.92	-45.60	-607.81	-5,956.08	7,109.81	7,065.46	44.35	160.322		
6,850.00	6,718.42	3,253.00	2,925.31	28.34	22.92	-43.95	-607.81	-5,956.08	7,117.55	7,073.08	44.47	160.044		
6,900.00	6,758.00	3,253.00	2,925.31	28.60	22.92	-42.76	-607.81	-5,956.08	7,122.42	7,077.82	44.61	159.671		
6,950.00	6,795.09	3,253.00	2,925.31	28.87	22.92	-41.93	-607.81	-5,956.08	7,124.39	7,079.64	44.75	159.207		
7,000.00	6,829.46	3,253.00	2,925.31	29.14	22.92	-41.40	-607.81	-5,956.08	7,123.45	7,078.55	44.90	158.651		
7,050.00	6,860.91	3,253.00	2,925.31	29.43	22.92	-41.13	-607.81	-5,956.08	7,119.60	7,074.54	45.06	158.005		
7,100.00	6,889.24	3,253.00	2,925.31	29.73	22.92	-41.10	-607.81	-5,956.08	7,112.87	7,067.64	45.23	157.269		
7,150.00	6,914.27	3,253.00	2,925.31	30.05	22.92	-41.30	-607.81	-5,956.08	7,103.28	7,057.88	45.40	156.446		
7,200.00	6,935.85	3,253.00	2,925.31	30.37	22.92	-41.73	-607.81	-5,956.08	7,090.89	7,045.30	45.59	155.538		
7,250.00	6,953.84	3,253.00	2,925.31	30.71	22.92	-42.39	-607.81	-5,956.08	7,075.75	7,029.97	45.78	154.547		
7,300.00	6,968.15	3,253.00	2,925.31	31.06	22.92	-43.28	-607.81	-5,956.08	7,057.95	7,011.96	45.99	153.478		
7,350.00	6,978.67	3,253.00	2,925.31	31.42	22.92	-44.42	-607.81	-5,956.08	7,037.57	6,991.37	46.20	152.335		
7,400.00	6,985.34	3,253.00	2,925.31	31.79	22.92	-45.83	-607.81	-5,956.08	7,014.71	6,968.30	46.42	151.124		
7,450.00	6,988.13	3,253.00	2,925.31	32.17	22.92	-47.53	-607.81	-5,956.08	6,989.50	6,942.86	46.64	149.849		
7,461.13	6,988.22	3,253.00	2,925.31	32.26	22.92	-47.95	-607.81	-5,956.08	6,983.58	6,936.89	46.70	149.552		
7,500.00	6,988.19	3,253.00	2,925.31	32.56	22.92	-47.62	-607.81	-5,956.08	6,962.63	6,915.75	46.87	148.538		
7,600.00	6,988.12	3,253.00	2,925.31	33.37	22.92	-46.73	-607.81	-5,956.08	6,907.93	6,860.59	47.34	145.925		
7,700.00	6,988.05	3,253.00	2,925.31	34.21	22.92	-45.80	-607.81	-5,956.08	6,852.11	6,804.30	47.81	143.315		
7,800.00	6,987.98	3,253.00	2,925.31	35.09	22.92	-44.83	-607.81	-5,956.08	6,795.23	6,746.94	48.29	140.721		
7,900.00	6,987.91	3,253.00	2,925.31	35.99	22.92	-43.82	-607.81	-5,956.08	6,737.31	6,688.55	48.77	138.152		
8,000.00	6,987.83	3,253.00	2,925.31	36.93	22.92	-42.76	-607.81	-5,956.08	6,678.42	6,629.17	49.24	135.618		
8,100.00	6,987.76	3,253.00	2,925.31	37.88	22.92	-41.65	-607.81	-5,956.08	6,618.58	6,568.86	49.72	133.125		
8,200.00	6,987.68	3,253.00	2,925.31	38.86	22.92	-40.50	-607.81	-5,956.08	6,557.85	6,507.67	50.18	130.679		
8,300.00	6,987.61	3,253.00	2,925.31	39.86	22.92	-39.31	-607.81	-5,956.08	6,496.29	6,445.65	50.64	128.285		
8,400.00	6,987.53	3,253.00	2,925.31	40.87	22.92	-38.06	-607.81	-5,956.08	6,433.94	6,382.85	51.08	125.949		
8,500.00	6,987.46	3,253.00	2,925.31	41.90	22.92	-36.77	-607.81	-5,956.08	6,370.85	6,319.34	51.51	123.674		
8,600.00	6,987.38	3,253.00	2,925.31	42.93	22.92	-35.44	-607.81	-5,956.08	6,307.09	6,255.17	51.93	121.463		
8,700.00	6,987.31	3,253.00	2,925.31	43.98	22.92	-34.05	-607.81	-5,956.08	6,242.71	6,190.39	52.32	119.318		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					Rule Assigned:			Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,800.00	6,987.23	3,253.00	2,925.31	45.03	22.92	-32.63	-607.81	-5,956.08	6,177.77	6,125.08	52.69	117.241		
8,872.16	6,987.18	3,253.00	2,925.31	45.79	22.92	-31.57	-607.81	-5,956.08	6,130.60	6,077.65	52.95	115.786		
8,900.00	6,987.16	3,253.00	2,925.31	46.08	22.92	-31.57	-607.81	-5,956.08	6,112.39	6,059.34	53.04	115.232		
9,000.00	6,987.09	3,253.00	2,925.31	47.16	22.92	-31.57	-607.81	-5,956.08	6,047.58	5,994.18	53.40	113.254		
9,100.00	6,987.01	3,253.00	2,925.31	48.27	22.92	-31.57	-607.81	-5,956.08	5,983.75	5,929.98	53.77	111.290		
9,200.00	6,986.94	3,253.00	2,925.31	49.40	22.92	-31.57	-607.81	-5,956.08	5,920.91	5,866.76	54.15	109.344		
9,300.00	6,986.86	3,253.00	2,925.31	50.56	22.92	-31.57	-607.81	-5,956.08	5,859.11	5,804.56	54.55	107.417		
9,400.00	6,986.79	3,253.00	2,925.31	51.75	22.92	-31.57	-607.81	-5,956.08	5,798.37	5,743.42	54.96	105.510		
9,500.00	6,986.71	3,253.00	2,925.31	52.95	22.92	-31.57	-607.81	-5,956.08	5,738.74	5,683.36	55.38	103.627		
9,600.00	6,986.64	3,253.00	2,925.31	54.18	22.92	-31.57	-607.81	-5,956.08	5,680.24	5,624.42	55.81	101.770		
9,700.00	6,986.56	3,253.00	2,925.31	55.42	22.92	-31.57	-607.81	-5,956.08	5,622.90	5,566.64	56.26	99.939		
9,800.00	6,986.49	3,253.00	2,925.31	56.69	22.92	-31.57	-607.81	-5,956.08	5,566.78	5,510.05	56.72	98.138		
9,900.00	6,986.41	3,253.00	2,925.31	57.97	22.92	-31.57	-607.81	-5,956.08	5,511.90	5,454.70	57.20	96.369		
10,000.00	6,986.34	3,253.00	2,925.31	59.26	22.92	-31.57	-607.81	-5,956.08	5,458.29	5,400.61	57.68	94.633		
10,100.00	6,986.27	3,253.00	2,925.31	60.57	22.92	-31.57	-607.81	-5,956.08	5,406.01	5,347.84	58.17	92.932		
10,200.00	6,986.19	3,253.00	2,925.31	61.90	22.92	-31.57	-607.81	-5,956.08	5,355.08	5,296.41	58.67	91.268		
10,300.00	6,986.12	3,253.00	2,925.31	63.23	22.92	-31.57	-607.81	-5,956.08	5,305.55	5,246.37	59.19	89.642		
10,400.00	6,986.04	3,253.00	2,925.31	64.58	22.92	-31.57	-607.81	-5,956.08	5,257.46	5,197.75	59.70	88.057		
10,500.00	6,985.97	3,253.00	2,925.31	65.94	22.92	-31.57	-607.81	-5,956.08	5,210.84	5,150.61	60.23	86.514		
10,600.00	6,985.89	3,253.00	2,925.31	67.32	22.92	-31.57	-607.81	-5,956.08	5,165.73	5,104.97	60.76	85.014		
10,700.00	6,985.82	3,253.00	2,925.31	68.70	22.92	-31.57	-607.81	-5,956.08	5,122.18	5,060.88	61.30	83.559		
10,800.00	6,985.74	3,253.00	2,925.31	70.09	22.92	-31.57	-607.81	-5,956.08	5,080.23	5,018.39	61.84	82.149		
10,900.00	6,985.67	3,253.00	2,925.31	71.49	22.92	-31.57	-607.81	-5,956.08	5,039.91	4,977.53	62.39	80.787		
11,000.00	6,985.59	3,253.00	2,925.31	72.90	22.92	-31.57	-607.81	-5,956.08	5,001.27	4,938.34	62.93	79.473		
11,100.00	6,985.52	3,253.00	2,925.31	74.31	22.92	-31.57	-607.81	-5,956.08	4,964.34	4,900.86	63.48	78.208		
11,200.00	6,985.45	3,253.00	2,925.31	75.74	22.92	-31.57	-607.81	-5,956.08	4,929.16	4,865.14	64.02	76.993		
11,300.00	6,985.37	3,253.00	2,925.31	77.17	22.92	-31.57	-607.81	-5,956.08	4,895.77	4,831.21	64.56	75.828		
11,400.00	6,985.30	3,253.00	2,925.31	78.61	22.92	-31.57	-607.81	-5,956.08	4,864.21	4,799.11	65.10	74.715		
11,500.00	6,985.22	3,253.00	2,925.31	80.05	22.92	-31.57	-607.81	-5,956.08	4,834.51	4,768.88	65.64	73.654		
11,600.00	6,985.15	3,253.00	2,925.31	81.50	22.92	-31.57	-607.81	-5,956.08	4,806.71	4,740.55	66.17	72.646		
11,700.00	6,985.07	3,253.00	2,925.31	82.96	22.92	-31.57	-607.81	-5,956.08	4,780.84	4,714.16	66.69	71.690		
11,800.00	6,985.00	3,253.00	2,925.31	84.42	22.92	-31.57	-607.81	-5,956.08	4,756.94	4,689.74	67.20	70.787		
11,900.00	6,984.92	3,253.00	2,925.31	85.89	22.92	-31.57	-607.81	-5,956.08	4,735.02	4,667.32	67.70	69.938		
12,000.00	6,984.85	3,253.00	2,925.31	87.36	22.92	-31.57	-607.81	-5,956.08	4,715.12	4,646.93	68.20	69.141		
12,100.00	6,984.77	3,253.00	2,925.31	88.83	22.92	-31.57	-607.81	-5,956.08	4,697.27	4,628.60	68.68	68.398		
12,200.00	6,984.70	3,253.00	2,925.31	90.31	22.92	-31.57	-607.81	-5,956.08	4,681.49	4,612.35	69.14	67.708		
12,300.00	6,984.63	3,253.00	2,925.31	91.80	22.92	-31.57	-607.81	-5,956.08	4,667.79	4,598.20	69.59	67.071		
12,400.00	6,984.55	3,253.00	2,925.31	93.29	22.92	-31.57	-607.81	-5,956.08	4,656.21	4,586.18	70.03	66.487		
12,500.00	6,984.48	3,253.00	2,925.31	94.78	22.92	-31.57	-607.81	-5,956.08	4,646.74	4,576.29	70.45	65.954		
12,600.00	6,984.40	3,253.00	2,925.31	96.28	22.92	-31.57	-607.81	-5,956.08	4,639.42	4,568.56	70.86	65.473		
12,700.00	6,984.33	3,253.00	2,925.31	97.78	22.92	-31.57	-607.81	-5,956.08	4,634.24	4,562.99	71.25	65.043		
12,800.00	6,984.25	3,253.00	2,925.31	99.28	22.92	-31.57	-607.81	-5,956.08	4,631.21	4,559.59	71.62	64.663		
12,890.15	6,984.19	3,253.00	2,925.31	100.64	22.92	-31.57	-607.81	-5,956.08	4,630.34	4,558.40	71.94	64.363 CC		
12,900.00	6,984.18	3,253.00	2,925.31	100.78	22.92	-31.57	-607.81	-5,956.08	4,630.35	4,558.37	71.98	64.332 ES		
13,000.00	6,984.10	3,253.00	2,925.31	102.29	22.92	-31.57	-607.81	-5,956.08	4,631.64	4,559.33	72.31	64.050		
13,100.00	6,984.03	3,253.00	2,925.31	103.80	22.92	-31.57	-607.81	-5,956.08	4,635.09	4,562.46	72.63	63.814		
13,200.00	6,983.95	3,253.00	2,925.31	105.32	22.92	-31.57	-607.81	-5,956.08	4,640.69	4,567.75	72.94	63.625		
13,300.00	6,983.88	3,253.00	2,925.31	106.84	22.92	-31.57	-607.81	-5,956.08	4,648.44	4,575.21	73.23	63.480		
13,400.00	6,983.81	3,253.00	2,925.31	108.36	22.92	-31.57	-607.81	-5,956.08	4,658.32	4,584.82	73.50	63.378		
13,500.00	6,983.73	3,253.00	2,925.31	109.88	22.92	-31.57	-607.81	-5,956.08	4,670.33	4,596.57	73.76	63.317		
13,600.00	6,983.66	3,253.00	2,925.31	111.40	22.92	-31.57	-607.81	-5,956.08	4,684.43	4,610.43	74.01	63.296 SF		
13,700.00	6,983.58	3,253.00	2,925.31	112.93	22.92	-31.57	-607.81	-5,956.08	4,700.63	4,626.38	74.24	63.314		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY											Offset Site Error: 0.00 usft
Survey Program: 352-MWD OWSG Rev5											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	
13,800.00	6,983.51	3,253.00	2,925.31	114.46	22.92	-31.57	-607.81	-5,956.08	4,718.88	4,644.41	63.367
13,900.00	6,983.43	3,253.00	2,925.31	115.99	22.92	-31.57	-607.81	-5,956.08	4,739.18	4,664.49	63.454
14,000.00	6,983.36	3,253.00	2,925.31	117.52	22.92	-31.57	-607.81	-5,956.08	4,761.49	4,686.59	63.574
14,100.00	6,983.28	3,253.00	2,925.31	119.06	22.92	-31.57	-607.81	-5,956.08	4,785.79	4,710.69	63.724
14,200.00	6,983.21	3,253.00	2,925.31	120.59	22.92	-31.57	-607.81	-5,956.08	4,812.04	4,736.74	63.902
14,300.00	6,983.13	3,253.00	2,925.31	122.13	22.92	-31.57	-607.81	-5,956.08	4,840.22	4,764.71	64.106
14,400.00	6,983.06	3,253.00	2,925.31	123.67	22.92	-31.57	-607.81	-5,956.08	4,870.29	4,794.58	64.335
14,500.00	6,982.99	3,253.00	2,925.31	125.21	22.92	-31.57	-607.81	-5,956.08	4,902.21	4,826.31	64.588
14,600.00	6,982.91	3,253.00	2,925.31	126.75	22.92	-31.57	-607.81	-5,956.08	4,935.95	4,859.85	64.862
14,700.00	6,982.84	3,253.00	2,925.31	128.30	22.92	-31.57	-607.81	-5,956.08	4,971.48	4,895.18	65.158
14,800.00	6,982.76	3,253.00	2,925.31	129.85	22.92	-31.57	-607.81	-5,956.08	5,008.75	4,932.25	65.475
14,900.00	6,982.69	3,253.00	2,925.31	131.39	22.92	-31.57	-607.81	-5,956.08	5,047.73	4,971.03	65.811
15,000.00	6,982.61	3,253.00	2,925.31	132.94	22.92	-31.57	-607.81	-5,956.08	5,088.37	5,011.47	66.167
15,100.00	6,982.54	3,253.00	2,925.31	134.49	22.92	-31.57	-607.81	-5,956.08	5,130.64	5,053.54	66.543
15,200.00	6,982.46	3,253.00	2,925.31	136.04	22.92	-31.57	-607.81	-5,956.08	5,174.50	5,097.20	66.938
15,300.00	6,982.39	3,253.00	2,925.31	137.60	22.92	-31.57	-607.81	-5,956.08	5,219.91	5,142.41	67.354
15,400.00	6,982.31	3,253.00	2,925.31	139.15	22.92	-31.57	-607.81	-5,956.08	5,266.82	5,189.13	67.789
15,500.00	6,982.24	3,253.00	2,925.31	140.70	22.92	-31.57	-607.81	-5,956.08	5,315.20	5,237.32	68.245
15,600.00	6,982.17	3,253.00	2,925.31	142.26	22.92	-31.57	-607.81	-5,956.08	5,365.01	5,286.94	68.721
15,700.00	6,982.09	3,253.00	2,925.31	143.82	22.92	-31.57	-607.81	-5,956.08	5,416.21	5,337.96	69.217
15,800.00	6,982.02	3,253.00	2,925.31	145.38	22.92	-31.57	-607.81	-5,956.08	5,468.75	5,390.33	69.734
15,900.00	6,981.94	3,253.00	2,925.31	146.94	22.92	-31.57	-607.81	-5,956.08	5,522.61	5,444.02	70.272
16,000.00	6,981.87	3,253.00	2,925.31	148.50	22.92	-31.57	-607.81	-5,956.08	5,577.74	5,498.99	70.830
16,100.00	6,981.79	3,253.00	2,925.31	150.06	22.92	-31.57	-607.81	-5,956.08	5,634.11	5,555.21	71.409
16,200.00	6,981.72	3,253.00	2,925.31	151.62	22.92	-31.57	-607.81	-5,956.08	5,691.67	5,612.63	72.007
16,300.00	6,981.64	3,253.00	2,925.31	153.18	22.92	-31.57	-607.81	-5,956.08	5,750.40	5,671.22	72.625
16,400.00	6,981.57	3,253.00	2,925.31	154.74	22.92	-31.57	-607.81	-5,956.08	5,810.26	5,730.95	73.263
16,500.00	6,981.49	3,253.00	2,925.31	156.31	22.92	-31.57	-607.81	-5,956.08	5,871.21	5,791.78	73.920
16,600.00	6,981.42	3,253.00	2,925.31	157.87	22.92	-31.57	-607.81	-5,956.08	5,933.22	5,853.68	74.596
16,700.00	6,981.35	3,253.00	2,925.31	159.44	22.92	-31.57	-607.81	-5,956.08	5,996.25	5,916.61	75.289
16,800.00	6,981.27	3,253.00	2,925.31	161.01	22.92	-31.57	-607.81	-5,956.08	6,060.28	5,980.54	76.001
16,900.00	6,981.20	3,253.00	2,925.31	162.58	22.92	-31.57	-607.81	-5,956.08	6,125.27	6,045.44	76.731
17,000.00	6,981.12	3,253.00	2,925.31	164.14	22.92	-31.57	-607.81	-5,956.08	6,191.20	6,111.29	77.477
17,100.00	6,981.05	3,253.00	2,925.31	165.71	22.92	-31.57	-607.81	-5,956.08	6,258.03	6,178.04	78.240
17,200.00	6,980.97	3,253.00	2,925.31	167.28	22.92	-31.57	-607.81	-5,956.08	6,325.73	6,245.68	79.019
17,300.00	6,980.90	3,253.00	2,925.31	168.85	22.92	-31.57	-607.81	-5,956.08	6,394.28	6,314.17	79.813
17,400.00	6,980.82	3,253.00	2,925.31	170.42	22.92	-31.57	-607.81	-5,956.08	6,463.65	6,383.48	80.623
17,500.00	6,980.75	3,253.00	2,925.31	172.00	22.92	-31.57	-607.81	-5,956.08	6,533.82	6,453.60	81.447
17,600.00	6,980.67	3,253.00	2,925.31	173.57	22.92	-31.57	-607.81	-5,956.08	6,604.75	6,524.49	82.285
17,700.00	6,980.60	3,253.00	2,925.31	175.14	22.92	-31.57	-607.81	-5,956.08	6,676.43	6,596.12	83.137
17,800.00	6,980.53	3,253.00	2,925.31	176.71	22.92	-31.57	-607.81	-5,956.08	6,748.83	6,668.49	84.002
17,900.00	6,980.45	3,253.00	2,925.31	178.29	22.92	-31.57	-607.81	-5,956.08	6,821.93	6,741.55	84.880
18,000.00	6,980.38	3,253.00	2,925.31	179.86	22.92	-31.57	-607.81	-5,956.08	6,895.70	6,815.30	85.770
18,100.00	6,980.30	3,253.00	2,925.31	181.44	22.92	-31.57	-607.81	-5,956.08	6,970.12	6,889.70	86.672
18,200.00	6,980.23	3,253.00	2,925.31	183.01	22.92	-31.57	-607.81	-5,956.08	7,045.18	6,964.74	87.586
18,300.00	6,980.15	3,253.00	2,925.31	184.59	22.92	-31.57	-607.81	-5,956.08	7,120.85	7,040.40	88.510
18,400.00	6,980.08	3,253.00	2,925.31	186.16	22.92	-31.57	-607.81	-5,956.08	7,197.12	7,116.66	89.446
18,500.00	6,980.00	3,253.00	2,925.31	187.74	22.92	-31.57	-607.81	-5,956.08	7,273.96	7,193.49	90.391
18,600.00	6,979.93	3,253.00	2,925.31	189.32	22.92	-31.57	-607.81	-5,956.08	7,351.36	7,270.88	91.347
18,700.00	6,979.85	3,253.00	2,925.31	190.90	22.92	-31.57	-607.81	-5,956.08	7,429.30	7,348.81	92.312
18,800.00	6,979.78	3,253.00	2,925.31	192.48	22.92	-31.57	-607.81	-5,956.08	7,507.76	7,427.27	93.286
18,900.00	6,979.71	3,253.00	2,925.31	194.05	22.92	-31.57	-607.81	-5,956.08	7,586.72	7,506.24	94.269

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #228A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		352-MWD OWSG Rev5					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
19,000.00	6,979.63	3,253.00	2,925.31	195.63	22.92	-31.57	-607.81	-5,956.08	7,666.18	7,585.71	80.48	95.260		
19,100.00	6,979.56	3,253.00	2,925.31	197.21	22.92	-31.57	-607.81	-5,956.08	7,746.12	7,665.65	80.47	96.260		
19,200.00	6,979.48	3,253.00	2,925.31	198.79	22.92	-31.57	-607.81	-5,956.08	7,826.51	7,746.05	80.46	97.267		
19,300.00	6,979.41	3,253.00	2,925.31	200.37	22.92	-31.57	-607.81	-5,956.08	7,907.35	7,826.90	80.46	98.282		
19,400.00	6,979.33	3,253.00	2,925.31	201.95	22.92	-31.57	-607.81	-5,956.08	7,988.63	7,908.18	80.45	99.304		
19,500.00	6,979.26	3,253.00	2,925.31	203.54	22.92	-31.57	-607.81	-5,956.08	8,070.33	7,989.89	80.44	100.333		
19,600.00	6,979.18	3,253.00	2,925.31	205.12	22.92	-31.57	-607.81	-5,956.08	8,152.43	8,072.01	80.42	101.368		
19,700.00	6,979.11	3,253.00	2,925.31	206.70	22.92	-31.57	-607.81	-5,956.08	8,234.93	8,154.52	80.41	102.410		
19,800.00	6,979.03	3,253.00	2,925.31	208.28	22.92	-31.57	-607.81	-5,956.08	8,317.82	8,237.42	80.40	103.458		
19,900.00	6,978.96	3,253.00	2,925.31	209.86	22.92	-31.57	-607.81	-5,956.08	8,401.08	8,320.69	80.38	104.512		
20,000.00	6,978.89	3,253.00	2,925.31	211.45	22.92	-31.57	-607.81	-5,956.08	8,484.70	8,404.33	80.37	105.572		
20,100.00	6,978.81	3,253.00	2,925.31	213.03	22.92	-31.57	-607.81	-5,956.08	8,568.67	8,488.31	80.35	106.636		
20,200.00	6,978.74	3,253.00	2,925.31	214.61	22.92	-31.57	-607.81	-5,956.08	8,652.98	8,572.64	80.34	107.706		
20,300.00	6,978.66	3,253.00	2,925.31	216.20	22.92	-31.57	-607.81	-5,956.08	8,737.62	8,657.29	80.32	108.781		
20,400.00	6,978.59	3,253.00	2,925.31	217.78	22.92	-31.57	-607.81	-5,956.08	8,822.58	8,742.27	80.31	109.860		
20,500.00	6,978.51	3,253.00	2,925.31	219.37	22.92	-31.57	-607.81	-5,956.08	8,907.86	8,827.57	80.29	110.944		
20,600.00	6,978.44	3,253.00	2,925.31	220.95	22.92	-31.57	-607.81	-5,956.08	8,993.44	8,913.16	80.28	112.032		
20,700.00	6,978.36	3,253.00	2,925.31	222.53	22.92	-31.57	-607.81	-5,956.08	9,079.31	8,999.05	80.26	113.124		
20,800.00	6,978.29	3,253.00	2,925.31	224.12	22.92	-31.57	-607.81	-5,956.08	9,165.47	9,085.22	80.24	114.220		
20,900.00	6,978.21	3,253.00	2,925.31	225.71	22.92	-31.57	-607.81	-5,956.08	9,251.91	9,171.68	80.23	115.319		
21,000.00	6,978.14	3,253.00	2,925.31	227.29	22.92	-31.57	-607.81	-5,956.08	9,338.62	9,258.40	80.21	116.422		
21,100.00	6,978.07	3,253.00	2,925.31	228.88	22.92	-31.57	-607.81	-5,956.08	9,425.59	9,345.39	80.20	117.528		
21,200.00	6,977.99	3,253.00	2,925.31	230.46	22.92	-31.57	-607.81	-5,956.08	9,512.82	9,432.63	80.18	118.637		
21,300.00	6,977.92	3,253.00	2,925.31	232.05	22.92	-31.57	-607.81	-5,956.08	9,600.30	9,520.13	80.17	119.749		
21,400.00	6,977.84	3,253.00	2,925.31	233.64	22.92	-31.57	-607.81	-5,956.08	9,688.02	9,607.86	80.16	120.863		
21,500.00	6,977.77	3,253.00	2,925.31	235.22	22.92	-31.57	-607.81	-5,956.08	9,775.97	9,695.83	80.14	121.981		
21,600.00	6,977.69	3,253.00	2,925.31	236.81	22.92	-31.57	-607.81	-5,956.08	9,864.16	9,784.03	80.13	123.100		
21,700.00	6,977.62	3,253.00	2,925.31	238.40	22.92	-31.57	-607.81	-5,956.08	9,952.57	9,872.45	80.12	124.222		
21,800.00	6,977.54	3,253.00	2,925.31	239.99	22.92	-31.57	-607.81	-5,956.08	10,041.19	9,961.08	80.11	125.346		
21,900.00	6,977.47	3,253.00	2,925.31	241.57	22.92	-31.57	-607.81	-5,956.08	10,130.03	10,049.93	80.10	126.472		
22,000.00	6,977.39	3,253.00	2,925.31	243.16	22.92	-31.57	-607.81	-5,956.08	10,219.07	10,138.99	80.09	127.600		
22,100.00	6,977.32	3,253.00	2,925.31	244.75	22.92	-31.57	-607.81	-5,956.08	10,308.32	10,228.24	80.08	128.730		
22,200.00	6,977.25	3,253.00	2,925.31	246.34	22.92	-31.57	-607.81	-5,956.08	10,397.76	10,317.69	80.07	129.861		
22,300.00	6,977.17	3,253.00	2,925.31	247.93	22.92	-31.57	-607.81	-5,956.08	10,487.39	10,407.33	80.06	130.993		
22,400.00	6,977.10	3,253.00	2,925.31	249.52	22.92	-31.57	-607.81	-5,956.08	10,577.21	10,497.16	80.05	132.127		
22,500.00	6,977.02	3,253.00	2,925.31	251.11	22.92	-31.57	-607.81	-5,956.08	10,667.21	10,587.16	80.05	133.262		
22,529.62	6,977.00	3,253.00	2,925.31	251.58	22.92	-31.57	-607.81	-5,956.08	10,693.89	10,613.85	80.04	133.599		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 359-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-158.91	-166.74	-64.31	180.90				
100.00	100.00	72.00	72.00	0.25	1.33	-158.91	-166.74	-64.31	178.72	177.13	1.58	112.966	
200.00	200.00	172.00	172.00	0.61	3.18	-158.91	-166.74	-64.31	178.72	174.93	3.79	47.167	
300.00	300.00	272.00	272.00	0.97	5.03	-158.91	-166.74	-64.31	178.72	172.72	6.00	29.806	
400.00	400.00	372.00	372.00	1.33	6.88	-158.91	-166.74	-64.31	178.72	170.51	8.21	21.768	
500.00	500.00	472.00	472.00	1.68	8.79	-158.91	-166.74	-64.31	178.72	168.25	10.47	17.069	
550.00	550.00	522.00	522.00	1.86	9.74	-158.91	-166.74	-64.31	178.72	167.12	11.60	15.406	CC
600.00	600.00	572.00	572.00	2.04	10.69	-156.58	-166.74	-64.31	179.12	166.39	12.73	14.070	ES
700.00	699.93	671.75	671.74	2.40	12.58	-156.93	-166.24	-64.31	181.85	166.86	14.99	12.133	
800.00	799.68	771.19	771.18	2.77	14.48	-157.73	-166.43	-64.31	188.47	171.23	17.24	10.932	
900.00	899.13	871.16	871.13	3.13	16.39	-158.84	-166.74	-64.31	198.49	178.96	19.52	10.167	
1,000.00	998.15	970.19	970.15	3.49	18.40	-160.11	-166.74	-64.31	211.53	189.64	21.90	9.660	
1,100.00	1,096.63	1,068.66	1,068.63	3.87	20.40	-161.48	-166.74	-64.31	227.96	203.70	24.26	9.396	
1,130.50	1,126.54	1,098.57	1,098.54	3.99	21.01	-161.91	-166.74	-64.31	233.65	208.66	24.98	9.352	
1,200.00	1,194.61	1,166.47	1,166.43	4.26	22.38	-162.86	-165.85	-64.31	246.14	219.53	26.61	9.249	
1,300.00	1,292.57	1,263.83	1,263.78	4.66	24.36	-164.14	-166.03	-64.31	265.65	236.70	28.95	9.176	
1,400.00	1,390.52	1,361.09	1,361.05	5.07	26.33	-165.26	-166.44	-64.31	285.49	254.20	31.29	9.124	
1,500.00	1,488.48	1,460.58	1,460.48	5.48	28.50	-166.24	-166.74	-64.31	305.32	271.49	33.83	9.026	
1,600.00	1,586.43	1,558.53	1,558.43	5.90	30.79	-167.09	-166.74	-64.31	324.92	288.43	36.49	8.905	
1,700.00	1,684.38	1,656.48	1,656.38	6.31	33.08	-167.83	-166.74	-64.31	344.58	305.43	39.15	8.801	
1,800.00	1,782.34	1,753.91	1,753.80	6.73	35.36	-168.47	-165.51	-64.31	363.07	321.27	41.80	8.686	
1,900.00	1,880.29	1,850.76	1,850.64	7.15	37.63	-169.07	-165.79	-64.31	383.11	338.67	44.44	8.621	
2,000.00	1,978.25	1,947.50	1,947.38	7.58	39.89	-169.62	-166.35	-64.31	403.47	356.40	47.07	8.572	
2,100.00	2,076.20	2,048.47	2,048.20	8.00	42.45	-170.13	-166.74	-64.31	423.67	373.67	50.00	8.473	
2,200.00	2,174.15	2,144.54	2,144.25	8.43	45.05	-170.55	-165.94	-64.31	442.73	389.75	52.98	8.356	
2,300.00	2,272.11	2,244.50	2,244.11	8.85	47.81	-170.98	-166.74	-64.31	463.40	407.28	56.11	8.258	
2,400.00	2,370.06	2,342.46	2,342.06	9.28	50.72	-171.35	-166.74	-64.31	483.30	423.90	59.40	8.137	
2,500.00	2,468.02	2,440.41	2,440.02	9.71	53.63	-171.70	-166.74	-64.31	503.21	440.53	62.68	8.028	
2,600.00	2,565.97	2,538.06	2,537.62	10.14	56.52	-171.99	-164.12	-64.31	520.53	454.58	65.95	7.893	
2,700.00	2,663.92	2,633.10	2,632.64	10.57	59.34	-172.28	-164.44	-64.31	540.80	471.66	69.14	7.822	
2,800.00	2,761.88	2,727.94	2,727.46	11.00	62.16	-172.56	-165.28	-64.31	561.62	489.30	72.32	7.766	
2,900.00	2,859.83	2,832.64	2,831.83	11.43	65.28	-172.84	-166.74	-64.31	583.01	507.18	75.83	7.688	
3,000.00	2,957.79	2,930.60	2,929.79	11.86	68.43	-173.08	-166.74	-64.31	602.99	523.63	79.36	7.598	SF
3,100.00	3,055.74	2,977.00	2,976.06	12.29	69.93	-173.19	-166.74	-64.31	625.12	544.27	80.85	7.732	
3,200.00	3,153.69	2,977.00	2,976.06	12.72	69.93	-173.19	-166.74	-64.31	660.16	580.93	79.22	8.333	
3,300.00	3,251.65	2,977.00	2,976.06	13.15	69.93	-173.19	-166.74	-64.31	707.70	631.24	76.46	9.256	
3,400.00	3,349.60	2,977.00	2,976.06	13.59	69.93	-173.19	-166.74	-64.31	765.43	692.31	73.11	10.469	
3,500.00	3,447.56	2,977.00	2,976.06	14.02	69.93	-173.19	-166.74	-64.31	831.21	761.60	69.61	11.940	
3,600.00	3,545.51	2,977.00	2,976.06	14.45	69.93	-173.19	-166.74	-64.31	903.30	837.09	66.21	13.643	
3,700.00	3,643.46	2,977.00	2,976.06	14.88	69.93	-173.19	-166.74	-64.31	980.30	917.26	63.04	15.551	
3,800.00	3,741.42	2,977.00	2,976.06	15.32	69.93	-173.19	-166.74	-64.31	1,061.14	1,000.99	60.15	17.641	
3,900.00	3,839.37	2,977.00	2,976.06	15.75	69.93	-173.19	-166.74	-64.31	1,145.01	1,087.45	57.56	19.893	
4,000.00	3,937.33	2,977.00	2,976.06	16.18	69.93	-173.19	-166.74	-64.31	1,231.29	1,176.05	55.25	22.287	
4,100.00	4,035.28	2,977.00	2,976.06	16.62	69.93	-173.19	-166.74	-64.31	1,319.51	1,266.32	53.19	24.806	
4,200.00	4,133.23	2,977.00	2,976.06	17.05	69.93	-173.19	-166.74	-64.31	1,409.31	1,357.94	51.37	27.435	
4,300.00	4,231.19	2,977.00	2,976.06	17.48	69.93	-173.19	-166.74	-64.31	1,500.40	1,450.65	49.75	30.159	
4,400.00	4,329.14	2,977.00	2,976.06	17.92	69.93	-173.19	-166.74	-64.31	1,592.55	1,544.24	48.31	32.965	
4,500.00	4,427.10	2,977.00	2,976.06	18.35	69.93	-173.19	-166.74	-64.31	1,685.60	1,638.57	47.03	35.842	
4,600.00	4,525.05	2,977.00	2,976.06	18.78	69.93	-173.19	-166.74	-64.31	1,779.41	1,733.52	45.89	38.779	
4,700.00	4,623.00	2,977.00	2,976.06	19.22	69.93	-173.19	-166.74	-64.31	1,873.85	1,828.99	44.87	41.765	
4,800.00	4,720.96	2,977.00	2,976.06	19.65	69.93	-173.19	-166.74	-64.31	1,968.85	1,924.89	43.95	44.793	
4,900.00	4,818.91	2,977.00	2,976.06	20.09	69.93	-173.19	-166.74	-64.31	2,064.31	2,021.18	43.14	47.854	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		359-A027Ua_INC-ONLY				Rule Assigned:				Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,916.87	2,977.00	2,976.06	20.52	69.93	-173.19	-166.74	-64.31	2,160.19	2,117.79	42.41	50.941	
5,100.00	5,014.82	2,977.00	2,976.06	20.96	69.93	-173.19	-166.74	-64.31	2,256.43	2,214.68	41.75	54.047	
5,200.00	5,112.77	2,977.00	2,976.06	21.39	69.93	-173.19	-166.74	-64.31	2,352.98	2,311.82	41.16	57.166	
5,300.00	5,210.73	2,977.00	2,976.06	21.82	69.93	-173.19	-166.74	-64.31	2,449.80	2,409.17	40.63	60.292	
5,400.00	5,308.68	2,977.00	2,976.06	22.26	69.93	-173.19	-166.74	-64.31	2,546.87	2,506.72	40.16	63.421	
5,493.23	5,400.00	2,977.00	2,976.06	22.66	69.93	-173.19	-166.74	-64.31	2,637.57	2,597.80	39.76	66.336	
5,500.00	5,406.64	2,977.00	2,976.06	22.69	69.93	-173.20	-166.74	-64.31	2,644.16	2,604.43	39.73	66.548	
5,600.00	5,504.69	2,977.00	2,976.06	23.12	69.93	-173.45	-166.74	-64.31	2,741.54	2,702.20	39.34	69.686	
5,700.00	5,602.91	2,977.00	2,976.06	23.55	69.93	-173.69	-166.74	-64.31	2,838.91	2,799.94	38.97	72.847	
5,800.00	5,701.29	2,977.00	2,976.06	23.97	69.93	-173.92	-166.74	-64.31	2,936.26	2,897.64	38.62	76.029	
5,900.00	5,799.82	2,977.00	2,976.06	24.39	69.93	-174.14	-166.74	-64.31	3,033.59	2,995.30	38.29	79.231	
6,000.00	5,898.50	2,977.00	2,976.06	24.79	69.93	-174.35	-166.74	-64.31	3,130.90	3,092.93	37.97	82.450	
6,100.00	5,997.31	2,977.00	2,976.06	25.20	69.93	-174.56	-166.74	-64.31	3,228.18	3,190.50	37.67	85.686	
6,200.00	6,096.26	2,977.00	2,976.06	25.60	69.93	-174.75	-166.74	-64.31	3,325.42	3,288.03	37.39	88.936	
6,300.00	6,195.33	2,977.00	2,976.06	25.99	69.93	-174.94	-166.74	-64.31	3,422.62	3,385.50	37.12	92.200	
6,400.00	6,294.51	2,977.00	2,976.06	26.37	69.93	-175.11	-166.74	-64.31	3,519.79	3,482.92	36.87	95.476	
6,498.19	6,392.00	2,977.00	2,976.06	26.75	69.93	-175.28	-166.74	-64.31	3,615.14	3,578.51	36.63	98.704	
6,500.00	6,393.80	2,977.00	2,976.06	26.76	69.93	-173.48	-166.74	-64.31	3,616.90	3,580.28	36.62	98.764	
6,550.00	6,443.29	2,977.00	2,976.06	26.95	69.93	-131.97	-166.74	-64.31	3,665.63	3,629.11	36.52	100.360	
6,600.00	6,492.24	2,977.00	2,976.06	27.16	69.93	-100.63	-166.74	-64.31	3,714.49	3,678.03	36.47	101.864	
6,650.00	6,540.33	2,977.00	2,976.06	27.38	69.93	-77.09	-166.74	-64.31	3,763.18	3,726.74	36.44	103.274	
6,700.00	6,587.28	2,977.00	2,976.06	27.60	69.93	-60.57	-166.74	-64.31	3,811.41	3,774.96	36.45	104.578	
6,750.00	6,632.80	2,977.00	2,976.06	27.84	69.93	-49.21	-166.74	-64.31	3,858.90	3,822.42	36.48	105.767	
6,800.00	6,676.60	2,977.00	2,976.06	28.09	69.93	-41.26	-166.74	-64.31	3,905.40	3,868.85	36.56	106.830	
6,850.00	6,718.42	2,977.00	2,976.06	28.34	69.93	-35.52	-166.74	-64.31	3,950.66	3,914.00	36.66	107.758	
6,900.00	6,758.00	2,977.00	2,976.06	28.60	69.93	-31.24	-166.74	-64.31	3,994.45	3,957.65	36.80	108.541	
6,950.00	6,795.09	2,977.00	2,976.06	28.87	69.93	-27.97	-166.74	-64.31	4,036.55	3,999.57	36.97	109.171	
7,000.00	6,829.46	2,977.00	2,976.06	29.14	69.93	-25.42	-166.74	-64.31	4,076.75	4,039.56	37.18	109.641	
7,050.00	6,860.91	2,977.00	2,976.06	29.43	69.93	-23.40	-166.74	-64.31	4,114.87	4,077.44	37.43	109.943	
7,100.00	6,889.24	2,977.00	2,976.06	29.73	69.93	-21.77	-166.74	-64.31	4,150.73	4,113.02	37.71	110.072	
7,150.00	6,914.27	2,977.00	2,976.06	30.05	69.93	-20.46	-166.74	-64.31	4,184.17	4,146.14	38.03	110.025	
7,200.00	6,935.85	2,977.00	2,976.06	30.37	69.93	-19.39	-166.74	-64.31	4,215.05	4,176.66	38.39	109.800	
7,250.00	6,953.84	2,977.00	2,976.06	30.71	69.93	-18.52	-166.74	-64.31	4,243.23	4,204.44	38.79	109.397	
7,300.00	6,968.15	2,977.00	2,976.06	31.06	69.93	-17.82	-166.74	-64.31	4,268.60	4,229.37	39.23	108.819	
7,350.00	6,978.67	2,977.00	2,976.06	31.42	69.93	-17.26	-166.74	-64.31	4,291.04	4,251.34	39.71	108.072	
7,400.00	6,985.34	2,977.00	2,976.06	31.79	69.93	-16.83	-166.74	-64.31	4,310.48	4,270.25	40.22	107.161	
7,450.00	6,988.13	2,977.00	2,976.06	32.17	69.93	-16.51	-166.74	-64.31	4,326.82	4,286.04	40.78	106.098	
7,461.13	6,988.22	2,977.00	2,976.06	32.26	69.93	-16.45	-166.74	-64.31	4,330.03	4,289.13	40.91	105.851	
7,500.00	6,988.19	2,977.00	2,976.06	32.56	69.93	-16.67	-166.74	-64.31	4,341.06	4,299.69	41.37	104.935	
7,600.00	6,988.12	2,977.00	2,976.06	33.37	69.93	-17.25	-166.74	-64.31	4,370.22	4,327.64	42.58	102.636	
7,700.00	6,988.05	2,977.00	2,976.06	34.21	69.93	-17.86	-166.74	-64.31	4,400.48	4,356.67	43.81	100.439	
7,800.00	6,987.98	2,977.00	2,976.06	35.09	69.93	-18.49	-166.74	-64.31	4,431.78	4,386.72	45.06	98.348	
7,900.00	6,987.91	2,977.00	2,976.06	35.99	69.93	-19.13	-166.74	-64.31	4,464.05	4,417.73	46.32	96.368	
8,000.00	6,987.83	2,977.00	2,976.06	36.93	69.93	-19.80	-166.74	-64.31	4,497.25	4,449.66	47.59	94.498	
8,100.00	6,987.76	2,977.00	2,976.06	37.88	69.93	-20.48	-166.74	-64.31	4,531.30	4,482.44	48.86	92.739	
8,200.00	6,987.68	2,977.00	2,976.06	38.86	69.93	-21.18	-166.74	-64.31	4,566.15	4,516.02	50.13	91.088	
8,300.00	6,987.61	2,977.00	2,976.06	39.86	69.93	-21.89	-166.74	-64.31	4,601.74	4,550.34	51.39	89.541	
8,400.00	6,987.53	2,977.00	2,976.06	40.87	69.93	-22.61	-166.74	-64.31	4,638.00	4,585.35	52.65	88.094	
8,500.00	6,987.46	2,977.00	2,976.06	41.90	69.93	-23.34	-166.74	-64.31	4,674.89	4,620.99	53.89	86.743	
8,600.00	6,987.38	2,977.00	2,976.06	42.93	69.93	-24.08	-166.74	-64.31	4,712.33	4,657.20	55.13	85.482	
8,700.00	6,987.31	2,977.00	2,976.06	43.98	69.93	-24.83	-166.74	-64.31	4,750.27	4,693.93	56.34	84.307	
8,800.00	6,987.23	2,977.00	2,976.06	45.03	69.93	-25.58	-166.74	-64.31	4,788.66	4,731.12	57.55	83.212	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC												Offset Site Error:	0.00 usft										
Survey Program: 359-A027Ua_INC-ONLY				Reference		Offset		Semi Major Axis		Highside		Offset Wellbore Centre		Rule Assigned:		Distance		Minimum		Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor											
8,872.16	6,987.18	2,977.00	2,976.06	45.79	69.93	-26.13	-166.74	-64.31	4,816.61	4,758.20	58.40	82.470											
8,900.00	6,987.16	2,977.00	2,976.06	46.08	69.93	-26.13	-166.74	-64.31	4,827.49	4,768.76	58.73	82.194											
9,000.00	6,987.09	2,977.00	2,976.06	47.16	69.93	-26.13	-166.74	-64.31	4,867.71	4,807.79	59.92	81.237											
9,100.00	6,987.01	2,977.00	2,976.06	48.27	69.93	-26.13	-166.74	-64.31	4,909.63	4,848.52	61.11	80.345											
9,200.00	6,986.94	2,977.00	2,976.06	49.40	69.93	-26.13	-166.74	-64.31	4,953.21	4,890.92	62.29	79.519											
9,300.00	6,986.86	2,977.00	2,976.06	50.56	69.93	-26.13	-166.74	-64.31	4,998.42	4,934.95	63.47	78.758											
9,400.00	6,986.79	2,977.00	2,976.06	51.75	69.93	-26.13	-166.74	-64.31	5,045.20	4,980.57	64.63	78.061											
9,500.00	6,986.71	2,977.00	2,976.06	52.95	69.93	-26.13	-166.74	-64.31	5,093.52	5,027.73	65.79	77.426											
9,600.00	6,986.64	2,977.00	2,976.06	54.18	69.93	-26.13	-166.74	-64.31	5,143.33	5,076.40	66.92	76.853											
9,700.00	6,986.56	2,977.00	2,976.06	55.42	69.93	-26.13	-166.74	-64.31	5,194.58	5,126.54	68.05	76.340											
9,800.00	6,986.49	2,977.00	2,976.06	56.69	69.93	-26.13	-166.74	-64.31	5,247.24	5,178.10	69.15	75.883											
9,900.00	6,986.41	2,977.00	2,976.06	57.97	69.93	-26.13	-166.74	-64.31	5,301.27	5,231.04	70.23	75.482											
10,000.00	6,986.34	2,977.00	2,976.06	59.26	69.93	-26.13	-166.74	-64.31	5,356.61	5,285.32	71.30	75.133											
10,100.00	6,986.27	2,977.00	2,976.06	60.57	69.93	-26.13	-166.74	-64.31	5,413.24	5,340.91	72.34	74.834											
10,200.00	6,986.19	2,977.00	2,976.06	61.90	69.93	-26.13	-166.74	-64.31	5,471.11	5,397.76	73.36	74.583											
10,300.00	6,986.12	2,977.00	2,976.06	63.23	69.93	-26.13	-166.74	-64.31	5,530.18	5,455.83	74.35	74.378											
10,400.00	6,986.04	2,977.00	2,976.06	64.58	69.93	-26.13	-166.74	-64.31	5,590.42	5,515.10	75.33	74.217											
10,500.00	6,985.97	2,977.00	2,976.06	65.94	69.93	-26.13	-166.74	-64.31	5,651.79	5,575.51	76.28	74.097											
10,600.00	6,985.89	2,977.00	2,976.06	67.32	69.93	-26.13	-166.74	-64.31	5,714.24	5,637.04	77.20	74.017											
10,700.00	6,985.82	2,977.00	2,976.06	68.70	69.93	-26.13	-166.74	-64.31	5,777.75	5,699.65	78.11	73.973											
10,800.00	6,985.74	2,977.00	2,976.06	70.09	69.93	-26.13	-166.74	-64.31	5,842.29	5,763.30	78.99	73.966											
10,900.00	6,985.67	2,977.00	2,976.06	71.49	69.93	-26.13	-166.74	-64.31	5,907.81	5,827.96	79.84	73.992											
11,000.00	6,985.59	2,977.00	2,976.06	72.90	69.93	-26.13	-166.74	-64.31	5,974.28	5,893.61	80.68	74.051											
11,100.00	6,985.52	2,977.00	2,976.06	74.31	69.93	-26.13	-166.74	-64.31	6,041.68	5,960.19	81.49	74.139											
11,200.00	6,985.45	2,977.00	2,976.06	75.74	69.93	-26.13	-166.74	-64.31	6,109.98	6,027.70	82.28	74.257											
11,300.00	6,985.37	2,977.00	2,976.06	77.17	69.93	-26.13	-166.74	-64.31	6,179.13	6,096.08	83.05	74.402											
11,400.00	6,985.30	2,977.00	2,976.06	78.61	69.93	-26.13	-166.74	-64.31	6,249.13	6,165.33	83.80	74.573											
11,500.00	6,985.22	2,977.00	2,976.06	80.05	69.93	-26.13	-166.74	-64.31	6,319.92	6,235.40	84.53	74.769											
11,600.00	6,985.15	2,977.00	2,976.06	81.50	69.93	-26.13	-166.74	-64.31	6,391.50	6,306.27	85.23	74.989											
11,700.00	6,985.07	2,977.00	2,976.06	82.96	69.93	-26.13	-166.74	-64.31	6,463.84	6,377.92	85.92	75.231											
11,800.00	6,985.00	2,977.00	2,976.06	84.42	69.93	-26.13	-166.74	-64.31	6,536.90	6,450.31	86.59	75.494											
11,900.00	6,984.92	2,977.00	2,976.06	85.89	69.93	-26.13	-166.74	-64.31	6,610.67	6,523.43	87.24	75.778											
12,000.00	6,984.85	2,977.00	2,976.06	87.36	69.93	-26.13	-166.74	-64.31	6,685.12	6,597.25	87.87	76.080											
12,100.00	6,984.77	2,977.00	2,976.06	88.83	69.93	-26.13	-166.74	-64.31	6,760.23	6,671.75	88.48	76.401											
12,200.00	6,984.70	2,977.00	2,976.06	90.31	69.93	-26.13	-166.74	-64.31	6,835.98	6,746.90	89.08	76.740											
12,300.00	6,984.63	2,977.00	2,976.06	91.80	69.93	-26.13	-166.74	-64.31	6,912.34	6,822.68	89.66	77.095											
12,400.00	6,984.55	2,977.00	2,976.06	93.29	69.93	-26.13	-166.74	-64.31	6,989.30	6,899.08	90.22	77.466											
12,500.00	6,984.48	2,977.00	2,976.06	94.78	69.93	-26.13	-166.74	-64.31	7,066.84	6,976.06	90.77	77.852											
12,600.00	6,984.40	2,977.00	2,976.06	96.28	69.93	-26.13	-166.74	-64.31	7,144.93	7,053.63	91.31	78.252											
12,700.00	6,984.33	2,977.00	2,976.06	97.78	69.93	-26.13	-166.74	-64.31	7,223.57	7,131.74	91.83	78.666											
12,800.00	6,984.25	2,977.00	2,976.06	99.28	69.93	-26.13	-166.74	-64.31	7,302.73	7,210.40	92.33	79.093											
12,900.00	6,984.18	2,977.00	2,976.06	100.78	69.93	-26.13	-166.74	-64.31	7,382.39	7,289.57	92.82	79.532											
13,000.00	6,984.10	2,977.00	2,976.06	102.29	69.93	-26.13	-166.74	-64.31	7,462.54	7,369.24	93.30	79.984											
13,100.00	6,984.03	2,977.00	2,976.06	103.80	69.93	-26.13	-166.74	-64.31	7,543.17	7,449.41	93.77	80.447											
13,200.00	6,983.95	2,977.00	2,976.06	105.32	69.93	-26.13	-166.74	-64.31	7,624.26	7,530.04	94.22	80.920											
13,300.00	6,983.88	2,977.00	2,976.06	106.84	69.93	-26.13	-166.74	-64.31	7,705.79	7,611.13	94.66	81.404											
13,400.00	6,983.81	2,977.00	2,976.06	108.36	69.93	-26.13	-166.74	-64.31	7,787.75	7,692.66	95.09	81.898											
13,500.00	6,983.73	2,977.00	2,976.06	109.88	69.93	-26.13	-166.74	-64.31	7,870.13	7,774.62	95.51	82.401											
13,600.00	6,983.66	2,977.00	2,976.06	111.40	69.93	-26.13	-166.74	-64.31	7,952.91	7,857.00	95.92	82.914											
13,700.00	6,983.58	2,977.00	2,976.06	112.93	69.93	-26.13	-166.74	-64.31	8,036.09	7,939.77	96.32	83.435											
13,800.00	6,983.51	2,977.00	2,976.06	114.46	69.93	-26.13	-166.74	-64.31	8,119.64	8,022.94	96.70	83.964											
13,900.00	6,983.43	2,977.00	2,976.06	115.99	69.93	-26.13	-166.74	-64.31	8,203.56	8,106.48	97.08	84.501											

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		359-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
14,000.00	6,983.36	2,977.00	2,976.06	117.52	69.93	-26.13	-166.74	-64.31	8,287.84	8,190.39	97.45	85.046	
14,100.00	6,983.28	2,977.00	2,976.06	119.06	69.93	-26.13	-166.74	-64.31	8,372.47	8,274.65	97.81	85.597	
14,200.00	6,983.21	2,977.00	2,976.06	120.59	69.93	-26.13	-166.74	-64.31	8,457.43	8,359.26	98.16	86.156	
14,300.00	6,983.13	2,977.00	2,976.06	122.13	69.93	-26.13	-166.74	-64.31	8,542.71	8,444.21	98.51	86.722	
14,400.00	6,983.06	2,977.00	2,976.06	123.67	69.93	-26.13	-166.74	-64.31	8,628.32	8,529.47	98.84	87.293	
14,500.00	6,982.99	2,977.00	2,976.06	125.21	69.93	-26.13	-166.74	-64.31	8,714.22	8,615.05	99.17	87.871	
14,600.00	6,982.91	2,977.00	2,976.06	126.75	69.93	-26.13	-166.74	-64.31	8,800.43	8,700.94	99.49	88.455	
14,700.00	6,982.84	2,977.00	2,976.06	128.30	69.93	-26.13	-166.74	-64.31	8,886.93	8,787.12	99.80	89.044	
14,800.00	6,982.76	2,977.00	2,976.06	129.85	69.93	-26.13	-166.74	-64.31	8,973.70	8,873.59	100.11	89.639	
14,900.00	6,982.69	2,977.00	2,976.06	131.39	69.93	-26.13	-166.74	-64.31	9,060.75	8,960.34	100.41	90.238	
15,000.00	6,982.61	2,977.00	2,976.06	132.94	69.93	-26.13	-166.74	-64.31	9,148.06	9,047.36	100.70	90.843	
15,100.00	6,982.54	2,977.00	2,976.06	134.49	69.93	-26.13	-166.74	-64.31	9,235.64	9,134.65	100.99	91.452	
15,200.00	6,982.46	2,977.00	2,976.06	136.04	69.93	-26.13	-166.74	-64.31	9,323.46	9,222.19	101.27	92.065	
15,300.00	6,982.39	2,977.00	2,976.06	137.60	69.93	-26.13	-166.74	-64.31	9,411.52	9,309.97	101.54	92.683	
15,400.00	6,982.31	2,977.00	2,976.06	139.15	69.93	-26.13	-166.74	-64.31	9,499.82	9,398.01	101.81	93.305	
15,500.00	6,982.24	2,977.00	2,976.06	140.70	69.93	-26.13	-166.74	-64.31	9,588.35	9,486.27	102.08	93.931	
15,600.00	6,982.17	2,977.00	2,976.06	142.26	69.93	-26.13	-166.74	-64.31	9,677.10	9,574.77	102.34	94.561	
15,700.00	6,982.09	2,977.00	2,976.06	143.82	69.93	-26.13	-166.74	-64.31	9,766.07	9,663.48	102.59	95.194	
15,800.00	6,982.02	2,977.00	2,976.06	145.38	69.93	-26.13	-166.74	-64.31	9,855.26	9,752.42	102.84	95.831	
15,900.00	6,981.94	2,977.00	2,976.06	146.94	69.93	-26.13	-166.74	-64.31	9,944.64	9,841.56	103.08	96.471	
16,000.00	6,981.87	2,977.00	2,976.06	148.50	69.93	-26.13	-166.74	-64.31	10,034.23	9,930.91	103.32	97.114	
16,100.00	6,981.79	2,977.00	2,976.06	150.06	69.93	-26.13	-166.74	-64.31	10,124.02	10,020.46	103.56	97.760	
16,200.00	6,981.72	2,977.00	2,976.06	151.62	69.93	-26.13	-166.74	-64.31	10,213.99	10,110.20	103.79	98.409	
16,300.00	6,981.64	2,977.00	2,976.06	153.18	69.93	-26.13	-166.74	-64.31	10,304.15	10,200.13	104.02	99.061	
16,400.00	6,981.57	2,977.00	2,976.06	154.74	69.93	-26.13	-166.74	-64.31	10,394.49	10,290.24	104.24	99.715	
16,500.00	6,981.49	2,977.00	2,976.06	156.31	69.93	-26.13	-166.74	-64.31	10,485.00	10,380.54	104.46	100.372	
16,600.00	6,981.42	2,977.00	2,976.06	157.87	69.93	-26.13	-166.74	-64.31	10,575.68	10,471.01	104.68	101.032	
16,700.00	6,981.35	2,977.00	2,976.06	159.44	69.93	-26.13	-166.74	-64.31	10,666.53	10,561.65	104.89	101.693	
16,800.00	6,981.27	2,977.00	2,976.06	161.01	69.93	-26.13	-166.74	-64.31	10,757.55	10,652.45	105.10	102.357	
16,900.00	6,981.20	2,977.00	2,976.06	162.58	69.93	-26.13	-166.74	-64.31	10,848.72	10,743.42	105.30	103.023	
17,000.00	6,981.12	2,977.00	2,976.06	164.14	69.93	-26.13	-166.74	-64.31	10,940.05	10,834.54	105.51	103.691	
17,100.00	6,981.05	2,977.00	2,976.06	165.71	69.93	-26.13	-166.74	-64.31	11,031.52	10,925.82	105.71	104.361	
17,200.00	6,980.97	2,977.00	2,976.06	167.28	69.93	-26.13	-166.74	-64.31	11,123.14	11,017.24	105.90	105.032	
17,300.00	6,980.90	2,977.00	2,976.06	168.85	69.93	-26.13	-166.74	-64.31	11,214.91	11,108.81	106.10	105.705	
17,400.00	6,980.82	2,977.00	2,976.06	170.42	69.93	-26.13	-166.74	-64.31	11,306.82	11,200.53	106.29	106.380	
17,500.00	6,980.75	2,977.00	2,976.06	172.00	69.93	-26.13	-166.74	-64.31	11,398.86	11,292.38	106.47	107.057	
17,600.00	6,980.67	2,977.00	2,976.06	173.57	69.93	-26.13	-166.74	-64.31	11,491.03	11,384.37	106.66	107.735	
17,700.00	6,980.60	2,977.00	2,976.06	175.14	69.93	-26.13	-166.74	-64.31	11,583.34	11,476.49	106.84	108.414	
17,800.00	6,980.53	2,977.00	2,976.06	176.71	69.93	-26.13	-166.74	-64.31	11,675.77	11,568.74	107.02	109.094	
17,900.00	6,980.45	2,977.00	2,976.06	178.29	69.93	-26.13	-166.74	-64.31	11,768.32	11,661.12	107.20	109.776	
18,000.00	6,980.38	2,977.00	2,976.06	179.86	69.93	-26.13	-166.74	-64.31	11,861.00	11,753.62	107.38	110.459	
18,100.00	6,980.30	2,977.00	2,976.06	181.44	69.93	-26.13	-166.74	-64.31	11,953.79	11,846.24	107.55	111.143	
18,200.00	6,980.23	2,977.00	2,976.06	183.01	69.93	-26.13	-166.74	-64.31	12,046.70	11,938.98	107.72	111.828	
18,300.00	6,980.15	2,977.00	2,976.06	184.59	69.93	-26.13	-166.74	-64.31	12,139.73	12,031.83	107.89	112.514	
18,400.00	6,980.08	2,977.00	2,976.06	186.16	69.93	-26.13	-166.74	-64.31	12,232.86	12,124.80	108.06	113.201	
18,500.00	6,980.00	2,977.00	2,976.06	187.74	69.93	-26.13	-166.74	-64.31	12,326.10	12,217.87	108.23	113.889	
18,600.00	6,979.93	2,977.00	2,976.06	189.32	69.93	-26.13	-166.74	-64.31	12,419.44	12,311.05	108.39	114.578	
18,700.00	6,979.85	2,977.00	2,976.06	190.90	69.93	-26.13	-166.74	-64.31	12,512.89	12,404.34	108.56	115.267	
18,800.00	6,979.78	2,977.00	2,976.06	192.48	69.93	-26.13	-166.74	-64.31	12,606.44	12,497.72	108.72	115.957	
18,900.00	6,979.71	2,977.00	2,976.06	194.05	69.93	-26.13	-166.74	-64.31	12,700.09	12,591.21	108.88	116.648	
19,000.00	6,979.63	2,977.00	2,976.06	195.63	69.93	-26.13	-166.74	-64.31	12,793.83	12,684.80	109.03	117.339	
19,100.00	6,979.56	2,977.00	2,976.06	197.21	69.93	-26.13	-166.74	-64.31	12,887.67	12,778.48	109.19	118.031	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		359-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,200.00	6,979.48	2,977.00	2,976.06	198.79	69.93	-26.13	-166.74	-64.31	12,981.60	12,872.25	109.34	118.723		
19,300.00	6,979.41	2,977.00	2,976.06	200.37	69.93	-26.13	-166.74	-64.31	13,075.62	12,966.12	109.50	119.416		
19,400.00	6,979.33	2,977.00	2,976.06	201.95	69.93	-26.13	-166.74	-64.31	13,169.72	13,060.07	109.65	120.109		
19,500.00	6,979.26	2,977.00	2,976.06	203.54	69.93	-26.13	-166.74	-64.31	13,263.92	13,154.12	109.80	120.803		
19,600.00	6,979.18	2,977.00	2,976.06	205.12	69.93	-26.13	-166.74	-64.31	13,358.19	13,248.25	109.95	121.497		
19,700.00	6,979.11	2,977.00	2,976.06	206.70	69.93	-26.13	-166.74	-64.31	13,452.55	13,342.46	110.09	122.191		
19,800.00	6,979.03	2,977.00	2,976.06	208.28	69.93	-26.13	-166.74	-64.31	13,547.00	13,436.75	110.24	122.885		
19,900.00	6,978.96	2,977.00	2,976.06	209.86	69.93	-26.13	-166.74	-64.31	13,641.52	13,531.13	110.39	123.579		
20,000.00	6,978.89	2,977.00	2,976.06	211.45	69.93	-26.13	-166.74	-64.31	13,736.11	13,625.58	110.53	124.274		
20,100.00	6,978.81	2,977.00	2,976.06	213.03	69.93	-26.13	-166.74	-64.31	13,830.79	13,720.11	110.67	124.969		
20,200.00	6,978.74	2,977.00	2,976.06	214.61	69.93	-26.13	-166.74	-64.31	13,925.54	13,814.72	110.82	125.664		
20,300.00	6,978.66	2,977.00	2,976.06	216.20	69.93	-26.13	-166.74	-64.31	14,020.36	13,909.40	110.96	126.358		
20,400.00	6,978.59	2,977.00	2,976.06	217.78	69.93	-26.13	-166.74	-64.31	14,115.25	14,004.16	111.10	127.053		
20,500.00	6,978.51	2,977.00	2,976.06	219.37	69.93	-26.13	-166.74	-64.31	14,210.22	14,098.98	111.24	127.748		
20,600.00	6,978.44	2,977.00	2,976.06	220.95	69.93	-26.13	-166.74	-64.31	14,305.25	14,193.87	111.37	128.443		
20,700.00	6,978.36	2,977.00	2,976.06	222.53	69.93	-26.13	-166.74	-64.31	14,400.35	14,288.83	111.51	129.138		
20,800.00	6,978.29	2,977.00	2,976.06	224.12	69.93	-26.13	-166.74	-64.31	14,495.51	14,383.86	111.65	129.832		
20,900.00	6,978.21	2,977.00	2,976.06	225.71	69.93	-26.13	-166.74	-64.31	14,590.74	14,478.96	111.78	130.527		
21,000.00	6,978.14	2,977.00	2,976.06	227.29	69.93	-26.13	-166.74	-64.31	14,686.03	14,574.12	111.92	131.221		
21,100.00	6,978.07	2,977.00	2,976.06	228.88	69.93	-26.13	-166.74	-64.31	14,781.39	14,669.34	112.05	131.915		
21,200.00	6,977.99	2,977.00	2,976.06	230.46	69.93	-26.13	-166.74	-64.31	14,876.81	14,764.62	112.19	132.609		
21,300.00	6,977.92	2,977.00	2,976.06	232.05	69.93	-26.13	-166.74	-64.31	14,972.28	14,859.96	112.32	133.302		
21,400.00	6,977.84	2,977.00	2,976.06	233.64	69.93	-26.13	-166.74	-64.31	15,067.82	14,955.37	112.45	133.996		
21,500.00	6,977.77	2,977.00	2,976.06	235.22	69.93	-26.13	-166.74	-64.31	15,163.41	15,050.83	112.58	134.689		
21,600.00	6,977.69	2,977.00	2,976.06	236.81	69.93	-26.13	-166.74	-64.31	15,259.06	15,146.35	112.71	135.381		
21,700.00	6,977.62	2,977.00	2,976.06	238.40	69.93	-26.13	-166.74	-64.31	15,354.76	15,241.92	112.84	136.074		
21,800.00	6,977.54	2,977.00	2,976.06	239.99	69.93	-26.13	-166.74	-64.31	15,450.52	15,337.55	112.97	136.766		
21,900.00	6,977.47	2,977.00	2,976.06	241.57	69.93	-26.13	-166.74	-64.31	15,546.33	15,433.23	113.10	137.457		
22,000.00	6,977.39	2,977.00	2,976.06	243.16	69.93	-26.13	-166.74	-64.31	15,642.20	15,528.97	113.23	138.148		
22,100.00	6,977.32	2,977.00	2,976.06	244.75	69.93	-26.13	-166.74	-64.31	15,738.11	15,624.76	113.36	138.839		
22,200.00	6,977.25	2,977.00	2,976.06	246.34	69.93	-26.13	-166.74	-64.31	15,834.08	15,720.60	113.48	139.529		
22,300.00	6,977.17	2,977.00	2,976.06	247.93	69.93	-26.13	-166.74	-64.31	15,930.10	15,816.49	113.61	140.219		
22,400.00	6,977.10	2,977.00	2,976.06	249.52	69.93	-26.13	-166.74	-64.31	16,026.16	15,912.43	113.73	140.908		
22,500.00	6,977.02	2,977.00	2,976.06	251.11	69.93	-26.13	-166.74	-64.31	16,122.27	16,008.41	113.86	141.597		
22,529.62	6,977.00	2,977.00	2,976.06	251.58	69.93	-26.13	-166.74	-64.31	16,150.75	16,036.85	113.90	141.801		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program: Reference		343-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-110.31	-887.83	-2,398.84	2,559.06					
100.00	100.00	22.00	22.00	0.25	0.41	-110.31	-887.83	-2,398.84	2,557.87	2,557.21	0.66	3,888.542		
200.00	200.00	122.00	122.00	0.61	2.26	-110.31	-887.83	-2,398.84	2,557.87	2,555.00	2.86	892.877		
300.00	300.00	222.00	222.00	0.97	4.10	-110.31	-887.83	-2,398.84	2,557.87	2,552.80	5.07	504.341		
400.00	400.00	322.00	322.00	1.33	5.95	-110.31	-887.83	-2,398.84	2,557.87	2,550.59	7.28	351.420		
500.00	500.00	422.00	422.00	1.68	7.94	-110.31	-887.83	-2,398.84	2,557.87	2,548.24	9.63	265.700		
550.00	550.00	472.00	472.00	1.86	8.96	-110.31	-887.83	-2,398.84	2,557.87	2,547.05	10.82	236.407 CC		
600.00	600.00	522.00	522.00	2.04	9.97	-107.93	-887.83	-2,398.84	2,558.00	2,545.99	12.01	212.946		
700.00	699.93	621.47	621.46	2.40	11.99	-107.97	-887.29	-2,398.84	2,558.89	2,544.51	14.39	177.865		
800.00	799.68	719.67	719.66	2.77	13.98	-108.08	-887.43	-2,398.84	2,561.11	2,544.37	16.74	153.024 ES		
900.00	899.13	817.54	817.53	3.13	15.96	-108.24	-887.73	-2,398.84	2,564.49	2,545.41	19.08	134.383		
1,000.00	998.15	920.22	920.15	3.49	18.31	-108.46	-887.83	-2,398.84	2,568.94	2,547.15	21.80	117.853		
1,100.00	1,096.63	1,018.69	1,018.63	3.87	20.63	-108.71	-887.83	-2,398.84	2,574.56	2,550.06	24.50	105.097		
1,130.50	1,126.54	1,048.60	1,048.54	3.99	21.33	-108.80	-887.83	-2,398.84	2,576.51	2,551.19	25.32	101.760		
1,200.00	1,194.61	1,115.15	1,115.07	4.26	22.90	-109.06	-886.55	-2,398.84	2,580.66	2,553.50	27.16	95.021		
1,300.00	1,292.57	1,208.93	1,208.84	4.66	25.11	-109.46	-886.90	-2,398.84	2,587.57	2,557.80	29.76	86.935		
1,400.00	1,390.52	1,302.55	1,302.45	5.07	27.31	-109.87	-887.65	-2,398.84	2,594.77	2,562.40	32.37	80.157		
1,500.00	1,488.48	1,410.68	1,410.48	5.48	29.73	-110.32	-887.83	-2,398.84	2,601.87	2,566.68	35.20	73.925		
1,600.00	1,586.43	1,508.63	1,508.43	5.90	31.90	-110.73	-887.83	-2,398.84	2,609.06	2,571.28	37.77	69.071		
1,700.00	1,684.38	1,604.67	1,604.44	6.31	34.03	-111.10	-886.22	-2,398.84	2,615.73	2,575.42	40.31	64.890		
1,800.00	1,782.34	1,697.39	1,697.15	6.73	36.08	-111.48	-886.62	-2,398.84	2,623.34	2,580.57	42.78	61.329		
1,900.00	1,880.29	1,789.93	1,789.68	7.15	38.13	-111.88	-887.46	-2,398.84	2,631.30	2,586.06	45.24	58.167		
2,000.00	1,978.25	1,900.55	1,900.25	7.58	40.31	-112.34	-887.83	-2,398.84	2,639.14	2,591.31	47.83	55.179		
2,100.00	2,076.20	1,998.50	1,998.20	8.00	42.14	-112.73	-887.83	-2,398.84	2,646.99	2,596.91	50.08	52.855		
2,200.00	2,174.15	2,096.46	2,096.15	8.43	43.98	-113.13	-887.83	-2,398.84	2,654.97	2,602.64	52.33	50.733		
2,300.00	2,272.11	2,192.23	2,191.91	8.85	45.77	-113.49	-886.96	-2,398.84	2,662.69	2,608.14	54.54	48.817		
2,400.00	2,370.06	2,287.57	2,287.26	9.28	47.56	-113.88	-887.24	-2,398.84	2,671.05	2,614.30	56.75	47.069		
2,500.00	2,468.02	2,382.83	2,382.51	9.71	49.35	-114.26	-887.72	-2,398.84	2,679.63	2,620.68	58.95	45.457		
2,600.00	2,565.97	2,488.31	2,487.97	10.14	51.40	-114.68	-887.83	-2,398.84	2,688.15	2,626.73	61.42	43.765		
2,700.00	2,663.92	2,582.97	2,582.63	10.57	53.26	-115.04	-887.67	-2,398.84	2,696.69	2,632.99	63.70	42.336		
2,800.00	2,761.88	2,684.24	2,683.88	11.00	55.43	-115.44	-887.83	-2,398.84	2,705.49	2,639.21	66.28	40.817		
2,900.00	2,859.83	2,782.19	2,781.83	11.43	57.67	-115.82	-887.83	-2,398.84	2,714.34	2,645.40	68.94	39.371		
3,000.00	2,957.79	2,809.00	2,808.60	11.86	58.29	-115.92	-887.83	-2,398.84	2,724.24	2,654.31	69.93	38.954 SF		
3,100.00	3,055.74	2,809.00	2,808.60	12.29	58.29	-115.92	-887.83	-2,398.84	2,737.63	2,667.41	70.22	38.986		
3,200.00	3,153.69	2,809.00	2,808.60	12.72	58.29	-115.92	-887.83	-2,398.84	2,754.59	2,684.17	70.42	39.116		
3,300.00	3,251.65	2,809.00	2,808.60	13.15	58.29	-115.92	-887.83	-2,398.84	2,775.05	2,704.51	70.54	39.342		
3,400.00	3,349.60	2,809.00	2,808.60	13.59	58.29	-115.92	-887.83	-2,398.84	2,798.94	2,728.37	70.57	39.661		
3,500.00	3,447.56	2,809.00	2,808.60	14.02	58.29	-115.92	-887.83	-2,398.84	2,826.16	2,755.63	70.53	40.071		
3,600.00	3,545.51	2,809.00	2,808.60	14.45	58.29	-115.92	-887.83	-2,398.84	2,856.63	2,786.21	70.41	40.569		
3,700.00	3,643.46	2,809.00	2,808.60	14.88	58.29	-115.92	-887.83	-2,398.84	2,890.23	2,820.00	70.23	41.152		
3,800.00	3,741.42	2,809.00	2,808.60	15.32	58.29	-115.92	-887.83	-2,398.84	2,926.87	2,856.88	69.99	41.818		
3,900.00	3,839.37	2,809.00	2,808.60	15.75	58.29	-115.92	-887.83	-2,398.84	2,966.43	2,896.74	69.69	42.565		
4,000.00	3,937.33	2,809.00	2,808.60	16.18	58.29	-115.92	-887.83	-2,398.84	3,008.80	2,939.45	69.34	43.389		
4,100.00	4,035.28	2,809.00	2,808.60	16.62	58.29	-115.92	-887.83	-2,398.84	3,053.85	2,984.90	68.95	44.289		
4,200.00	4,133.23	2,809.00	2,808.60	17.05	58.29	-115.92	-887.83	-2,398.84	3,101.47	3,032.95	68.52	45.262		
4,300.00	4,231.19	2,809.00	2,808.60	17.48	58.29	-115.92	-887.83	-2,398.84	3,151.55	3,083.49	68.06	46.305		
4,400.00	4,329.14	2,809.00	2,808.60	17.92	58.29	-115.92	-887.83	-2,398.84	3,203.97	3,136.39	67.57	47.416		
4,500.00	4,427.10	2,809.00	2,808.60	18.35	58.29	-115.92	-887.83	-2,398.84	3,258.61	3,191.55	67.06	48.592		
4,600.00	4,525.05	2,809.00	2,808.60	18.78	58.29	-115.92	-887.83	-2,398.84	3,315.37	3,248.84	66.53	49.832		
4,700.00	4,623.00	2,809.00	2,808.60	19.22	58.29	-115.92	-887.83	-2,398.84	3,374.14	3,308.15	65.99	51.133		
4,800.00	4,720.96	2,809.00	2,808.60	19.65	58.29	-115.92	-887.83	-2,398.84	3,434.81	3,369.38	65.43	52.492		
4,900.00	4,818.91	2,809.00	2,808.60	20.09	58.29	-115.92	-887.83	-2,398.84	3,497.30	3,432.42	64.87	53.908		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC												Offset Site Error: 0.00 usft					
Survey Program: 343-A027Ua_INC-ONLY				Reference		Offset		Semi Major Axis		Highside		Offset Wellbore Centre		Rule Assigned:		Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning				
5,000.00	4,916.87	2,809.00	2,808.60	20.52	58.29	-115.92	-887.83	-2,398.84	3,561.49	3,497.18	64.31	55.378					
5,100.00	5,014.82	2,809.00	2,808.60	20.96	58.29	-115.92	-887.83	-2,398.84	3,627.31	3,563.56	63.75	56.900					
5,200.00	5,112.77	2,809.00	2,808.60	21.39	58.29	-115.92	-887.83	-2,398.84	3,694.66	3,631.47	63.19	58.471					
5,300.00	5,210.73	2,809.00	2,808.60	21.82	58.29	-115.92	-887.83	-2,398.84	3,763.46	3,700.83	62.63	60.089					
5,400.00	5,308.68	2,809.00	2,808.60	22.26	58.29	-115.92	-887.83	-2,398.84	3,833.63	3,771.55	62.08	61.753					
5,493.23	5,400.00	2,809.00	2,808.60	22.66	58.29	-115.92	-887.83	-2,398.84	3,900.23	3,838.65	61.57	63.342					
5,500.00	5,406.64	2,809.00	2,808.60	22.69	58.29	-115.95	-887.83	-2,398.84	3,905.11	3,843.57	61.54	63.459					
5,600.00	5,504.69	2,809.00	2,808.60	23.12	58.29	-116.42	-887.83	-2,398.84	3,977.67	3,916.67	61.00	65.209					
5,700.00	5,602.91	2,809.00	2,808.60	23.55	58.29	-116.91	-887.83	-2,398.84	4,051.13	3,990.67	60.46	67.001					
5,800.00	5,701.29	2,809.00	2,808.60	23.97	58.29	-117.40	-887.83	-2,398.84	4,125.45	4,065.52	59.93	68.835					
5,900.00	5,799.82	2,809.00	2,808.60	24.39	58.29	-117.91	-887.83	-2,398.84	4,200.58	4,141.17	59.41	70.709					
6,000.00	5,898.50	2,809.00	2,808.60	24.79	58.29	-118.42	-887.83	-2,398.84	4,276.46	4,217.57	58.89	72.622					
6,100.00	5,997.31	2,809.00	2,808.60	25.20	58.29	-118.94	-887.83	-2,398.84	4,353.05	4,294.67	58.37	74.573					
6,200.00	6,096.26	2,809.00	2,808.60	25.60	58.29	-119.47	-887.83	-2,398.84	4,430.31	4,372.44	57.87	76.561					
6,300.00	6,195.33	2,809.00	2,808.60	25.99	58.29	-120.01	-887.83	-2,398.84	4,508.19	4,450.82	57.37	78.583					
6,400.00	6,294.51	2,809.00	2,808.60	26.37	58.29	-120.56	-887.83	-2,398.84	4,586.67	4,529.79	56.88	80.640					
6,498.19	6,392.00	2,809.00	2,808.60	26.75	58.29	-121.10	-887.83	-2,398.84	4,664.26	4,607.86	56.41	82.691					
6,500.00	6,393.80	2,809.00	2,808.60	26.76	58.29	-119.71	-887.83	-2,398.84	4,665.70	4,609.30	56.40	82.730					
6,550.00	6,443.29	2,809.00	2,808.60	26.95	58.29	-92.10	-887.83	-2,398.84	4,704.80	4,648.65	56.16	83.779					
6,600.00	6,492.24	2,809.00	2,808.60	27.16	58.29	-77.04	-887.83	-2,398.84	4,742.75	4,686.84	55.92	84.816					
6,650.00	6,540.33	2,809.00	2,808.60	27.38	58.29	-67.45	-887.83	-2,398.84	4,779.35	4,723.67	55.68	85.833					
6,700.00	6,587.28	2,809.00	2,808.60	27.60	58.29	-60.63	-887.83	-2,398.84	4,814.39	4,758.94	55.45	86.824					
6,750.00	6,632.80	2,809.00	2,808.60	27.84	58.29	-55.45	-887.83	-2,398.84	4,847.71	4,792.49	55.22	87.782					
6,800.00	6,676.60	2,809.00	2,808.60	28.09	58.29	-51.35	-887.83	-2,398.84	4,879.13	4,824.13	55.01	88.703					
6,850.00	6,718.42	2,809.00	2,808.60	28.34	58.29	-48.04	-887.83	-2,398.84	4,908.50	4,853.70	54.80	89.579					
6,900.00	6,758.00	2,809.00	2,808.60	28.60	58.29	-45.33	-887.83	-2,398.84	4,935.67	4,881.07	54.60	90.404					
6,950.00	6,795.09	2,809.00	2,808.60	28.87	58.29	-43.09	-887.83	-2,398.84	4,960.51	4,906.11	54.41	91.172					
7,000.00	6,829.46	2,809.00	2,808.60	29.14	58.29	-41.23	-887.83	-2,398.84	4,982.92	4,928.68	54.24	91.874					
7,050.00	6,860.91	2,809.00	2,808.60	29.43	58.29	-39.70	-887.83	-2,398.84	5,002.77	4,948.69	54.08	92.504					
7,100.00	6,889.24	2,809.00	2,808.60	29.73	58.29	-38.45	-887.83	-2,398.84	5,019.99	4,966.04	53.95	93.054					
7,150.00	6,914.27	2,809.00	2,808.60	30.05	58.29	-37.45	-887.83	-2,398.84	5,034.49	4,980.65	53.83	93.518					
7,200.00	6,935.85	2,809.00	2,808.60	30.37	58.29	-36.66	-887.83	-2,398.84	5,046.20	4,992.46	53.75	93.890					
7,250.00	6,953.84	2,809.00	2,808.60	30.71	58.29	-36.06	-887.83	-2,398.84	5,055.08	5,001.40	53.68	94.162					
7,300.00	6,968.15	2,809.00	2,808.60	31.06	58.29	-35.65	-887.83	-2,398.84	5,061.09	5,007.44	53.65	94.331					
7,350.00	6,978.67	2,809.00	2,808.60	31.42	58.29	-35.41	-887.83	-2,398.84	5,064.19	5,010.54	53.65	94.394					
7,400.00	6,985.34	2,809.00	2,808.60	31.79	58.29	-35.35	-887.83	-2,398.84	5,064.38	5,010.70	53.68	94.347					
7,450.00	6,988.13	2,809.00	2,808.60	32.17	58.29	-35.44	-887.83	-2,398.84	5,061.65	5,007.91	53.74	94.189					
7,461.13	6,988.22	2,809.00	2,808.60	32.26	58.29	-35.49	-887.83	-2,398.84	5,060.64	5,006.88	53.76	94.138					
7,500.00	6,988.19	2,809.00	2,808.60	32.56	58.29	-35.43	-887.83	-2,398.84	5,056.88	5,003.06	53.82	93.952					
7,600.00	6,988.12	2,809.00	2,808.60	33.37	58.29	-35.27	-887.83	-2,398.84	5,047.17	4,993.15	54.02	93.437					
7,700.00	6,988.05	2,809.00	2,808.60	34.21	58.29	-35.11	-887.83	-2,398.84	5,037.41	4,983.17	54.24	92.879					
7,800.00	6,987.98	2,809.00	2,808.60	35.09	58.29	-34.95	-887.83	-2,398.84	5,027.62	4,973.14	54.48	92.281					
7,900.00	6,987.91	2,809.00	2,808.60	35.99	58.29	-34.79	-887.83	-2,398.84	5,017.81	4,963.06	54.75	91.651					
8,000.00	6,987.83	2,809.00	2,808.60	36.93	58.29	-34.63	-887.83	-2,398.84	5,007.99	4,952.95	55.04	90.994					
8,100.00	6,987.76	2,809.00	2,808.60	37.88	58.29	-34.47	-887.83	-2,398.84	4,998.17	4,942.83	55.34	90.314					
8,200.00	6,987.68	2,809.00	2,808.60	38.86	58.29	-34.31	-887.83	-2,398.84	4,988.37	4,932.71	55.66	89.617					
8,300.00	6,987.61	2,809.00	2,808.60	39.86	58.29	-34.15	-887.83	-2,398.84	4,978.60	4,922.60	56.00	88.907					
8,400.00	6,987.53	2,809.00	2,808.60	40.87	58.29	-33.99	-887.83	-2,398.84	4,968.86	4,912.52	56.34	88.189					
8,500.00	6,987.46	2,809.00	2,808.60	41.90	58.29	-33.83	-887.83	-2,398.84	4,959.18	4,902.48	56.70	87.467					
8,600.00	6,987.38	2,809.00	2,808.60	42.93	58.29	-33.67	-887.83	-2,398.84	4,949.56	4,892.50	57.06	86.743					
8,700.00	6,987.31	2,809.00	2,808.60	43.98	58.29	-33.51	-887.83	-2,398.84	4,940.02	4,882.59	57.43	86.021					
8,800.00	6,987.23	2,809.00	2,808.60	45.03	58.29	-33.35	-887.83	-2,398.84	4,930.56	4,872.76	57.80	85.304					

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC												Offset Site Error:	0.00 usft	
Survey Program:		343-A027Ua_INC-ONLY					Offset		Semi Major Axis		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,872.16	6,987.18	2,809.00	2,808.60	45.79	58.29	-33.24	-887.83	-2,398.84	4,923.80	4,865.73	58.07	84.791		
8,900.00	6,987.16	2,809.00	2,808.60	46.08	58.29	-33.24	-887.83	-2,398.84	4,921.28	4,863.10	58.18	84.594		
9,000.00	6,987.09	2,809.00	2,808.60	47.16	58.29	-33.24	-887.83	-2,398.84	4,913.52	4,854.93	58.59	83.868		
9,100.00	6,987.01	2,809.00	2,808.60	48.27	58.29	-33.24	-887.83	-2,398.84	4,907.78	4,848.74	59.04	83.124		
9,200.00	6,986.94	2,809.00	2,808.60	49.40	58.29	-33.24	-887.83	-2,398.84	4,904.08	4,844.54	59.54	82.366		
9,300.00	6,986.86	2,809.00	2,808.60	50.56	58.29	-33.24	-887.83	-2,398.84	4,902.41	4,842.33	60.08	81.597		
9,331.70	6,986.84	2,809.00	2,808.60	50.94	58.29	-33.24	-887.83	-2,398.84	4,902.31	4,842.05	60.26	81.349		
9,400.00	6,986.79	2,809.00	2,808.60	51.75	58.29	-33.24	-887.83	-2,398.84	4,902.78	4,842.12	60.66	80.822		
9,500.00	6,986.71	2,809.00	2,808.60	52.95	58.29	-33.24	-887.83	-2,398.84	4,905.20	4,843.92	61.28	80.046		
9,600.00	6,986.64	2,809.00	2,808.60	54.18	58.29	-33.24	-887.83	-2,398.84	4,909.64	4,847.71	61.93	79.272		
9,700.00	6,986.56	2,809.00	2,808.60	55.42	58.29	-33.24	-887.83	-2,398.84	4,916.12	4,853.50	62.62	78.505		
9,800.00	6,986.49	2,809.00	2,808.60	56.69	58.29	-33.24	-887.83	-2,398.84	4,924.62	4,861.29	63.34	77.749		
9,900.00	6,986.41	2,809.00	2,808.60	57.97	58.29	-33.24	-887.83	-2,398.84	4,935.14	4,871.05	64.09	77.007		
10,000.00	6,986.34	2,809.00	2,808.60	59.26	58.29	-33.24	-887.83	-2,398.84	4,947.65	4,882.79	64.86	76.283		
10,100.00	6,986.27	2,809.00	2,808.60	60.57	58.29	-33.24	-887.83	-2,398.84	4,962.15	4,896.49	65.65	75.580		
10,200.00	6,986.19	2,809.00	2,808.60	61.90	58.29	-33.24	-887.83	-2,398.84	4,978.61	4,912.14	66.47	74.901		
10,300.00	6,986.12	2,809.00	2,808.60	63.23	58.29	-33.24	-887.83	-2,398.84	4,997.02	4,929.72	67.30	74.248		
10,400.00	6,986.04	2,809.00	2,808.60	64.58	58.29	-33.24	-887.83	-2,398.84	5,017.36	4,949.21	68.15	73.623		
10,500.00	6,985.97	2,809.00	2,808.60	65.94	58.29	-33.24	-887.83	-2,398.84	5,039.60	4,970.59	69.01	73.028		
10,600.00	6,985.89	2,809.00	2,808.60	67.32	58.29	-33.24	-887.83	-2,398.84	5,063.72	4,993.84	69.88	72.465		
10,700.00	6,985.82	2,809.00	2,808.60	68.70	58.29	-33.24	-887.83	-2,398.84	5,089.68	5,018.93	70.75	71.935		
10,800.00	6,985.74	2,809.00	2,808.60	70.09	58.29	-33.24	-887.83	-2,398.84	5,117.47	5,045.84	71.63	71.440		
10,900.00	6,985.67	2,809.00	2,808.60	71.49	58.29	-33.24	-887.83	-2,398.84	5,147.06	5,074.54	72.52	70.979		
11,000.00	6,985.59	2,809.00	2,808.60	72.90	58.29	-33.24	-887.83	-2,398.84	5,178.40	5,105.01	73.40	70.553		
11,100.00	6,985.52	2,809.00	2,808.60	74.31	58.29	-33.24	-887.83	-2,398.84	5,211.48	5,137.20	74.28	70.163		
11,200.00	6,985.45	2,809.00	2,808.60	75.74	58.29	-33.24	-887.83	-2,398.84	5,246.25	5,171.10	75.15	69.808		
11,300.00	6,985.37	2,809.00	2,808.60	77.17	58.29	-33.24	-887.83	-2,398.84	5,282.69	5,206.67	76.02	69.489		
11,400.00	6,985.30	2,809.00	2,808.60	78.61	58.29	-33.24	-887.83	-2,398.84	5,320.76	5,243.88	76.88	69.206		
11,500.00	6,985.22	2,809.00	2,808.60	80.05	58.29	-33.24	-887.83	-2,398.84	5,360.42	5,282.69	77.74	68.957		
11,600.00	6,985.15	2,809.00	2,808.60	81.50	58.29	-33.24	-887.83	-2,398.84	5,401.65	5,323.07	78.58	68.742		
11,700.00	6,985.07	2,809.00	2,808.60	82.96	58.29	-33.24	-887.83	-2,398.84	5,444.40	5,364.99	79.41	68.562		
11,800.00	6,985.00	2,809.00	2,808.60	84.42	58.29	-33.24	-887.83	-2,398.84	5,488.64	5,408.41	80.23	68.414		
11,900.00	6,984.92	2,809.00	2,808.60	85.89	58.29	-33.24	-887.83	-2,398.84	5,534.33	5,453.30	81.03	68.299		
12,000.00	6,984.85	2,809.00	2,808.60	87.36	58.29	-33.24	-887.83	-2,398.84	5,581.44	5,499.62	81.82	68.215		
12,100.00	6,984.77	2,809.00	2,808.60	88.83	58.29	-33.24	-887.83	-2,398.84	5,629.93	5,547.33	82.60	68.162		
12,200.00	6,984.70	2,809.00	2,808.60	90.31	58.29	-33.24	-887.83	-2,398.84	5,679.77	5,596.41	83.36	68.138		
12,300.00	6,984.63	2,809.00	2,808.60	91.80	58.29	-33.24	-887.83	-2,398.84	5,730.92	5,646.82	84.10	68.144		
12,400.00	6,984.55	2,809.00	2,808.60	93.29	58.29	-33.24	-887.83	-2,398.84	5,783.35	5,698.52	84.83	68.178		
12,500.00	6,984.48	2,809.00	2,808.60	94.78	58.29	-33.24	-887.83	-2,398.84	5,837.02	5,751.48	85.54	68.239		
12,600.00	6,984.40	2,809.00	2,808.60	96.28	58.29	-33.24	-887.83	-2,398.84	5,891.89	5,805.66	86.23	68.326		
12,700.00	6,984.33	2,809.00	2,808.60	97.78	58.29	-33.24	-887.83	-2,398.84	5,947.95	5,861.04	86.91	68.439		
12,800.00	6,984.25	2,809.00	2,808.60	99.28	58.29	-33.24	-887.83	-2,398.84	6,005.14	5,917.57	87.57	68.576		
12,900.00	6,984.18	2,809.00	2,808.60	100.78	58.29	-33.24	-887.83	-2,398.84	6,063.45	5,975.23	88.21	68.737		
13,000.00	6,984.10	2,809.00	2,808.60	102.29	58.29	-33.24	-887.83	-2,398.84	6,122.83	6,033.99	88.84	68.920		
13,100.00	6,984.03	2,809.00	2,808.60	103.80	58.29	-33.24	-887.83	-2,398.84	6,183.26	6,093.81	89.45	69.126		
13,200.00	6,983.95	2,809.00	2,808.60	105.32	58.29	-33.24	-887.83	-2,398.84	6,244.71	6,154.66	90.04	69.353		
13,300.00	6,983.88	2,809.00	2,808.60	106.84	58.29	-33.24	-887.83	-2,398.84	6,307.14	6,216.52	90.62	69.600		
13,400.00	6,983.81	2,809.00	2,808.60	108.36	58.29	-33.24	-887.83	-2,398.84	6,370.53	6,279.35	91.18	69.867		
13,500.00	6,983.73	2,809.00	2,808.60	109.88	58.29	-33.24	-887.83	-2,398.84	6,434.85	6,343.13	91.73	70.152		
13,600.00	6,983.66	2,809.00	2,808.60	111.40	58.29	-33.24	-887.83	-2,398.84	6,500.08	6,407.82	92.26	70.456		
13,700.00	6,983.58	2,809.00	2,808.60	112.93	58.29	-33.24	-887.83	-2,398.84	6,566.18	6,473.40	92.77	70.778		
13,800.00	6,983.51	2,809.00	2,808.60	114.46	58.29	-33.24	-887.83	-2,398.84	6,633.12	6,539.85	93.27	71.116		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		343-A027Ua_INC-ONLY										Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance			Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
13,900.00	6,983.43	2,809.00	2,808.60	115.99	58.29	-33.24	-887.83	-2,398.84	6,700.90	6,607.14	93.76	71.470	
14,000.00	6,983.36	2,809.00	2,808.60	117.52	58.29	-33.24	-887.83	-2,398.84	6,769.46	6,675.24	94.23	71.840	
14,100.00	6,983.28	2,809.00	2,808.60	119.06	58.29	-33.24	-887.83	-2,398.84	6,838.81	6,744.12	94.69	72.225	
14,200.00	6,983.21	2,809.00	2,808.60	120.59	58.29	-33.24	-887.83	-2,398.84	6,908.91	6,813.77	95.13	72.624	
14,300.00	6,983.13	2,809.00	2,808.60	122.13	58.29	-33.24	-887.83	-2,398.84	6,979.73	6,884.17	95.56	73.037	
14,400.00	6,983.06	2,809.00	2,808.60	123.67	58.29	-33.24	-887.83	-2,398.84	7,051.26	6,955.28	95.98	73.464	
14,500.00	6,982.99	2,809.00	2,808.60	125.21	58.29	-33.24	-887.83	-2,398.84	7,123.48	7,027.09	96.39	73.903	
14,600.00	6,982.91	2,809.00	2,808.60	126.75	58.29	-33.24	-887.83	-2,398.84	7,196.36	7,099.58	96.78	74.354	
14,700.00	6,982.84	2,809.00	2,808.60	128.30	58.29	-33.24	-887.83	-2,398.84	7,269.89	7,172.72	97.17	74.818	
14,800.00	6,982.76	2,809.00	2,808.60	129.85	58.29	-33.24	-887.83	-2,398.84	7,344.04	7,246.50	97.54	75.292	
14,900.00	6,982.69	2,809.00	2,808.60	131.39	58.29	-33.24	-887.83	-2,398.84	7,418.80	7,320.90	97.90	75.778	
15,000.00	6,982.61	2,809.00	2,808.60	132.94	58.29	-33.24	-887.83	-2,398.84	7,494.15	7,395.89	98.25	76.274	
15,100.00	6,982.54	2,809.00	2,808.60	134.49	58.29	-33.24	-887.83	-2,398.84	7,570.07	7,471.47	98.59	76.780	
15,200.00	6,982.46	2,809.00	2,808.60	136.04	58.29	-33.24	-887.83	-2,398.84	7,646.54	7,547.61	98.93	77.296	
15,300.00	6,982.39	2,809.00	2,808.60	137.60	58.29	-33.24	-887.83	-2,398.84	7,723.55	7,624.30	99.25	77.821	
15,400.00	6,982.31	2,809.00	2,808.60	139.15	58.29	-33.24	-887.83	-2,398.84	7,801.08	7,701.52	99.56	78.355	
15,500.00	6,982.24	2,809.00	2,808.60	140.70	58.29	-33.24	-887.83	-2,398.84	7,879.12	7,779.26	99.86	78.898	
15,600.00	6,982.17	2,809.00	2,808.60	142.26	58.29	-33.24	-887.83	-2,398.84	7,957.65	7,857.49	100.16	79.449	
15,700.00	6,982.09	2,809.00	2,808.60	143.82	58.29	-33.24	-887.83	-2,398.84	8,036.66	7,936.21	100.45	80.008	
15,800.00	6,982.02	2,809.00	2,808.60	145.38	58.29	-33.24	-887.83	-2,398.84	8,116.13	8,015.40	100.73	80.575	
15,900.00	6,981.94	2,809.00	2,808.60	146.94	58.29	-33.24	-887.83	-2,398.84	8,196.05	8,095.05	101.00	81.149	
16,000.00	6,981.87	2,809.00	2,808.60	148.50	58.29	-33.24	-887.83	-2,398.84	8,276.40	8,175.14	101.26	81.730	
16,100.00	6,981.79	2,809.00	2,808.60	150.06	58.29	-33.24	-887.83	-2,398.84	8,357.18	8,255.66	101.52	82.319	
16,200.00	6,981.72	2,809.00	2,808.60	151.62	58.29	-33.24	-887.83	-2,398.84	8,438.38	8,336.60	101.77	82.913	
16,300.00	6,981.64	2,809.00	2,808.60	153.18	58.29	-33.24	-887.83	-2,398.84	8,519.97	8,417.95	102.02	83.514	
16,400.00	6,981.57	2,809.00	2,808.60	154.74	58.29	-33.24	-887.83	-2,398.84	8,601.95	8,499.69	102.26	84.121	
16,500.00	6,981.49	2,809.00	2,808.60	156.31	58.29	-33.24	-887.83	-2,398.84	8,684.31	8,581.82	102.49	84.734	
16,600.00	6,981.42	2,809.00	2,808.60	157.87	58.29	-33.24	-887.83	-2,398.84	8,767.03	8,664.32	102.71	85.353	
16,700.00	6,981.35	2,809.00	2,808.60	159.44	58.29	-33.24	-887.83	-2,398.84	8,850.11	8,747.18	102.94	85.977	
16,800.00	6,981.27	2,809.00	2,808.60	161.01	58.29	-33.24	-887.83	-2,398.84	8,933.54	8,830.39	103.15	86.606	
16,900.00	6,981.20	2,809.00	2,808.60	162.58	58.29	-33.24	-887.83	-2,398.84	9,017.31	8,913.94	103.36	87.241	
17,000.00	6,981.12	2,809.00	2,808.60	164.14	58.29	-33.24	-887.83	-2,398.84	9,101.40	8,997.83	103.57	87.880	
17,100.00	6,981.05	2,809.00	2,808.60	165.71	58.29	-33.24	-887.83	-2,398.84	9,185.81	9,082.04	103.77	88.523	
17,200.00	6,980.97	2,809.00	2,808.60	167.28	58.29	-33.24	-887.83	-2,398.84	9,270.53	9,166.57	103.96	89.172	
17,300.00	6,980.90	2,809.00	2,808.60	168.85	58.29	-33.24	-887.83	-2,398.84	9,355.56	9,251.40	104.15	89.824	
17,400.00	6,980.82	2,809.00	2,808.60	170.42	58.29	-33.24	-887.83	-2,398.84	9,440.87	9,336.53	104.34	90.481	
17,500.00	6,980.75	2,809.00	2,808.60	172.00	58.29	-33.24	-887.83	-2,398.84	9,526.48	9,421.95	104.52	91.141	
17,600.00	6,980.67	2,809.00	2,808.60	173.57	58.29	-33.24	-887.83	-2,398.84	9,612.36	9,507.65	104.70	91.805	
17,700.00	6,980.60	2,809.00	2,808.60	175.14	58.29	-33.24	-887.83	-2,398.84	9,698.51	9,593.63	104.88	92.473	
17,800.00	6,980.53	2,809.00	2,808.60	176.71	58.29	-33.24	-887.83	-2,398.84	9,784.92	9,679.87	105.05	93.145	
17,900.00	6,980.45	2,809.00	2,808.60	178.29	58.29	-33.24	-887.83	-2,398.84	9,871.60	9,766.38	105.22	93.820	
18,000.00	6,980.38	2,809.00	2,808.60	179.86	58.29	-33.24	-887.83	-2,398.84	9,958.52	9,853.13	105.38	94.498	
18,100.00	6,980.30	2,809.00	2,808.60	181.44	58.29	-33.24	-887.83	-2,398.84	10,045.68	9,940.14	105.55	95.179	
18,200.00	6,980.23	2,809.00	2,808.60	183.01	58.29	-33.24	-887.83	-2,398.84	10,133.08	10,027.38	105.70	95.863	
18,300.00	6,980.15	2,809.00	2,808.60	184.59	58.29	-33.24	-887.83	-2,398.84	10,220.72	10,114.86	105.86	96.550	
18,400.00	6,980.08	2,809.00	2,808.60	186.16	58.29	-33.24	-887.83	-2,398.84	10,308.57	10,202.56	106.01	97.240	
18,500.00	6,980.00	2,809.00	2,808.60	187.74	58.29	-33.24	-887.83	-2,398.84	10,396.65	10,290.49	106.16	97.933	
18,600.00	6,979.93	2,809.00	2,808.60	189.32	58.29	-33.24	-887.83	-2,398.84	10,484.94	10,378.63	106.31	98.628	
18,700.00	6,979.85	2,809.00	2,808.60	190.90	58.29	-33.24	-887.83	-2,398.84	10,573.44	10,466.99	106.45	99.325	
18,800.00	6,979.78	2,809.00	2,808.60	192.48	58.29	-33.24	-887.83	-2,398.84	10,662.15	10,555.55	106.60	100.025	
18,900.00	6,979.71	2,809.00	2,808.60	194.05	58.29	-33.24	-887.83	-2,398.84	10,751.05	10,644.31	106.73	100.727	
19,000.00	6,979.63	2,809.00	2,808.60	195.63	58.29	-33.24	-887.83	-2,398.84	10,840.14	10,733.27	106.87	101.431	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #336A - OH - OH-INC											Offset Site Error: 0.00 usft		
Survey Program: 343-A027Ua_INC-ONLY							Rule Assigned:					Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,100.00	6,979.56	2,809.00	2,808.60	197.21	58.29	-33.24	-887.83	-2,398.84	10,929.42	10,822.42	107.01	102.137	
19,200.00	6,979.48	2,809.00	2,808.60	198.79	58.29	-33.24	-887.83	-2,398.84	11,018.89	10,911.75	107.14	102.845	
19,300.00	6,979.41	2,809.00	2,808.60	200.37	58.29	-33.24	-887.83	-2,398.84	11,108.54	11,001.27	107.27	103.554	
19,400.00	6,979.33	2,809.00	2,808.60	201.95	58.29	-33.24	-887.83	-2,398.84	11,198.36	11,090.96	107.40	104.266	
19,500.00	6,979.26	2,809.00	2,808.60	203.54	58.29	-33.24	-887.83	-2,398.84	11,288.36	11,180.83	107.53	104.979	
19,600.00	6,979.18	2,809.00	2,808.60	205.12	58.29	-33.24	-887.83	-2,398.84	11,378.52	11,270.86	107.66	105.694	
19,700.00	6,979.11	2,809.00	2,808.60	206.70	58.29	-33.24	-887.83	-2,398.84	11,468.84	11,361.06	107.78	106.411	
19,800.00	6,979.03	2,809.00	2,808.60	208.28	58.29	-33.24	-887.83	-2,398.84	11,559.32	11,451.42	107.90	107.128	
19,900.00	6,978.96	2,809.00	2,808.60	209.86	58.29	-33.24	-887.83	-2,398.84	11,649.96	11,541.94	108.02	107.848	
20,000.00	6,978.89	2,809.00	2,808.60	211.45	58.29	-33.24	-887.83	-2,398.84	11,740.75	11,632.61	108.14	108.568	
20,100.00	6,978.81	2,809.00	2,808.60	213.03	58.29	-33.24	-887.83	-2,398.84	11,831.69	11,723.43	108.26	109.290	
20,200.00	6,978.74	2,809.00	2,808.60	214.61	58.29	-33.24	-887.83	-2,398.84	11,922.78	11,814.40	108.38	110.013	
20,300.00	6,978.66	2,809.00	2,808.60	216.20	58.29	-33.24	-887.83	-2,398.84	12,014.00	11,905.51	108.49	110.737	
20,400.00	6,978.59	2,809.00	2,808.60	217.78	58.29	-33.24	-887.83	-2,398.84	12,105.37	11,996.76	108.61	111.462	
20,500.00	6,978.51	2,809.00	2,808.60	219.37	58.29	-33.24	-887.83	-2,398.84	12,196.87	12,088.15	108.72	112.188	
20,600.00	6,978.44	2,809.00	2,808.60	220.95	58.29	-33.24	-887.83	-2,398.84	12,288.50	12,179.67	108.83	112.915	
20,700.00	6,978.36	2,809.00	2,808.60	222.53	58.29	-33.24	-887.83	-2,398.84	12,380.26	12,271.32	108.94	113.643	
20,800.00	6,978.29	2,809.00	2,808.60	224.12	58.29	-33.24	-887.83	-2,398.84	12,472.15	12,363.10	109.05	114.372	
20,900.00	6,978.21	2,809.00	2,808.60	225.71	58.29	-33.24	-887.83	-2,398.84	12,564.16	12,455.01	109.16	115.101	
21,000.00	6,978.14	2,809.00	2,808.60	227.29	58.29	-33.24	-887.83	-2,398.84	12,656.30	12,547.03	109.26	115.831	
21,100.00	6,978.07	2,809.00	2,808.60	228.88	58.29	-33.24	-887.83	-2,398.84	12,748.55	12,639.18	109.37	116.562	
21,200.00	6,977.99	2,809.00	2,808.60	230.46	58.29	-33.24	-887.83	-2,398.84	12,840.92	12,731.44	109.48	117.293	
21,300.00	6,977.92	2,809.00	2,808.60	232.05	58.29	-33.24	-887.83	-2,398.84	12,933.40	12,823.82	109.58	118.025	
21,400.00	6,977.84	2,809.00	2,808.60	233.64	58.29	-33.24	-887.83	-2,398.84	13,025.99	12,916.31	109.69	118.758	
21,500.00	6,977.77	2,809.00	2,808.60	235.22	58.29	-33.24	-887.83	-2,398.84	13,118.70	13,008.91	109.79	119.491	
21,600.00	6,977.69	2,809.00	2,808.60	236.81	58.29	-33.24	-887.83	-2,398.84	13,211.50	13,101.61	109.89	120.224	
21,700.00	6,977.62	2,809.00	2,808.60	238.40	58.29	-33.24	-887.83	-2,398.84	13,304.42	13,194.42	109.99	120.958	
21,800.00	6,977.54	2,809.00	2,808.60	239.99	58.29	-33.24	-887.83	-2,398.84	13,397.43	13,287.34	110.09	121.692	
21,900.00	6,977.47	2,809.00	2,808.60	241.57	58.29	-33.24	-887.83	-2,398.84	13,490.55	13,380.35	110.19	122.426	
22,000.00	6,977.39	2,809.00	2,808.60	243.16	58.29	-33.24	-887.83	-2,398.84	13,583.76	13,473.46	110.29	123.161	
22,100.00	6,977.32	2,809.00	2,808.60	244.75	58.29	-33.24	-887.83	-2,398.84	13,677.07	13,566.67	110.39	123.896	
22,200.00	6,977.25	2,809.00	2,808.60	246.34	58.29	-33.24	-887.83	-2,398.84	13,770.47	13,659.98	110.49	124.631	
22,300.00	6,977.17	2,809.00	2,808.60	247.93	58.29	-33.24	-887.83	-2,398.84	13,863.96	13,753.37	110.59	125.366	
22,400.00	6,977.10	2,809.00	2,808.60	249.52	58.29	-33.24	-887.83	-2,398.84	13,957.55	13,846.86	110.69	126.101	
22,500.00	6,977.02	2,809.00	2,808.60	251.11	58.29	-33.24	-887.83	-2,398.84	14,051.22	13,940.44	110.78	126.836	
22,529.62	6,977.00	2,809.00	2,808.60	251.58	58.29	-33.24	-887.83	-2,398.84	14,078.98	13,968.17	110.81	127.054	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 100-MWD OWSG Rev5												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Offset												Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	284.22	284.21	0.00	1.81	89.42	73.23	7,249.45	7,249.85				
100.00	100.00	365.41	365.40	0.25	2.14	89.42	73.63	7,249.80	7,250.28	7,247.97	2.31	3,138.260	ES
200.00	200.00	428.32	428.31	0.61	2.37	89.42	73.77	7,250.25	7,251.04	7,248.15	2.89	2,505.396	
300.00	300.00	500.00	499.98	0.97	2.61	89.42	73.70	7,251.39	7,252.54	7,249.04	3.50	2,072.962	
400.00	400.00	542.22	542.19	1.33	2.74	89.42	73.63	7,252.31	7,254.53	7,250.53	4.00	1,814.426	
500.00	500.00	600.00	599.95	1.68	2.93	89.42	73.69	7,253.68	7,256.98	7,252.43	4.55	1,595.094	
550.00	550.00	641.92	641.86	1.86	3.07	89.42	73.78	7,254.82	7,258.35	7,253.48	4.87	1,491.166	
600.00	600.00	669.60	669.52	2.04	3.16	91.77	73.81	7,255.67	7,259.92	7,254.78	5.14	1,412.947	
700.00	699.93	700.00	699.91	2.40	3.26	91.70	73.83	7,256.72	7,263.67	7,258.07	5.60	1,298.124	
800.00	799.68	765.66	765.51	2.77	3.48	91.65	73.71	7,259.43	7,268.12	7,261.95	6.17	1,177.332	
900.00	899.13	800.00	799.81	3.13	3.59	91.57	73.54	7,261.14	7,273.52	7,266.87	6.65	1,093.971	
1,000.00	998.15	844.35	844.08	3.49	3.77	91.49	73.22	7,263.71	7,279.83	7,272.61	7.22	1,008.412	
1,100.00	1,096.63	900.00	899.59	3.87	4.02	91.43	72.66	7,267.60	7,287.20	7,279.35	7.85	928.015	
1,130.50	1,126.54	900.00	899.59	3.99	4.02	91.38	72.66	7,267.60	7,289.56	7,281.59	7.97	914.757	
1,200.00	1,194.61	929.71	929.21	4.26	4.15	91.43	72.29	7,269.90	7,295.34	7,286.96	8.37	871.356	
1,300.00	1,292.57	1,000.00	999.27	4.66	4.45	91.55	71.28	7,275.54	7,304.06	7,294.98	9.08	803.973	
1,400.00	1,390.52	1,041.80	1,040.91	5.07	4.60	91.62	70.66	7,279.13	7,313.40	7,303.77	9.63	759.294	
1,500.00	1,488.48	1,100.00	1,098.84	5.48	4.80	91.72	69.88	7,284.64	7,323.56	7,313.32	10.24	715.099	
1,600.00	1,586.43	1,100.00	1,098.84	5.90	4.80	91.72	69.88	7,284.64	7,334.55	7,323.90	10.64	689.139	
1,700.00	1,684.38	1,163.86	1,162.33	6.31	5.07	91.83	68.96	7,291.42	7,346.19	7,334.86	11.33	648.643	
1,800.00	1,782.34	1,200.00	1,198.22	6.73	5.22	91.89	68.31	7,295.62	7,358.76	7,346.87	11.89	619.028	
1,900.00	1,880.29	1,274.85	1,272.50	7.15	5.54	92.02	66.84	7,304.72	7,371.92	7,359.30	12.62	583.967	
2,000.00	1,978.25	1,300.00	1,297.45	7.58	5.64	92.06	66.33	7,307.84	7,385.69	7,372.55	13.14	562.110	
2,100.00	2,076.20	1,364.93	1,361.81	8.00	5.92	92.18	64.97	7,316.36	7,400.03	7,386.20	13.83	535.039	
2,200.00	2,174.15	1,400.00	1,396.52	8.43	6.07	92.24	64.21	7,321.29	7,415.28	7,400.89	14.39	515.341	
2,300.00	2,272.11	1,456.37	1,452.26	8.85	6.31	92.33	63.12	7,329.61	7,431.24	7,416.20	15.05	493.862	
2,400.00	2,370.06	1,500.00	1,495.37	9.28	6.50	92.41	62.46	7,336.32	7,447.87	7,432.22	15.65	476.009	
2,500.00	2,468.02	1,544.99	1,539.77	9.71	6.69	92.48	61.87	7,343.54	7,465.22	7,448.97	16.25	459.269	
2,600.00	2,565.97	1,600.00	1,593.97	10.14	6.94	92.57	61.17	7,352.91	7,483.41	7,466.50	16.91	442.561	
2,700.00	2,663.92	1,630.07	1,623.56	10.57	7.07	92.62	60.74	7,358.24	7,502.27	7,484.83	17.45	430.005	
2,800.00	2,761.88	1,700.00	1,692.30	11.00	7.38	92.74	59.35	7,371.03	7,521.89	7,503.72	18.18	413.825	
2,900.00	2,859.83	1,732.70	1,724.40	11.43	7.52	92.79	58.53	7,377.20	7,542.04	7,523.32	18.71	402.996	
3,000.00	2,957.79	1,800.00	1,790.40	11.86	7.80	92.91	56.58	7,390.19	7,562.83	7,543.42	19.41	389.605	
3,100.00	3,055.74	1,800.00	1,790.40	12.29	7.80	92.91	56.58	7,390.19	7,584.37	7,564.58	19.79	383.157	
3,200.00	3,153.69	1,863.70	1,852.74	12.72	8.09	93.02	54.45	7,403.12	7,606.45	7,585.95	20.51	370.927	
3,300.00	3,251.65	1,900.00	1,888.18	13.15	8.26	93.09	53.13	7,410.86	7,629.48	7,608.40	21.07	362.029	
3,400.00	3,349.60	1,953.36	1,940.20	13.59	8.52	93.18	51.17	7,422.58	7,653.19	7,631.45	21.73	352.139	
3,500.00	3,447.56	2,000.00	1,985.62	14.02	8.74	93.26	49.54	7,433.06	7,677.46	7,655.10	22.36	343.429	
3,600.00	3,545.51	2,036.75	2,021.36	14.45	8.92	93.32	48.20	7,441.55	7,702.45	7,679.52	22.93	335.910	
3,700.00	3,643.46	2,100.00	2,082.65	14.88	9.23	93.44	45.58	7,456.92	7,728.46	7,704.81	23.65	326.756	
3,800.00	3,741.42	2,100.00	2,082.65	15.32	9.23	93.44	45.58	7,456.92	7,754.91	7,730.90	24.01	322.933	
3,900.00	3,839.37	2,154.55	2,135.37	15.75	9.50	93.53	43.34	7,470.74	7,782.22	7,757.54	24.69	315.248	
4,000.00	3,937.33	2,200.00	2,179.25	16.18	9.72	93.61	41.80	7,482.49	7,810.08	7,784.78	25.30	308.639	
4,100.00	4,035.28	2,241.54	2,219.28	16.62	9.92	93.68	40.51	7,493.49	7,838.61	7,812.71	25.89	302.732	
4,200.00	4,133.23	2,300.00	2,275.46	17.05	10.21	93.78	38.62	7,509.56	7,867.96	7,841.38	26.58	296.057	
4,300.00	4,231.19	2,300.00	2,275.46	17.48	10.21	93.78	38.62	7,509.56	7,897.91	7,870.99	26.92	293.378	
4,400.00	4,329.14	2,374.38	2,346.75	17.92	10.57	93.90	36.50	7,530.68	7,928.41	7,900.71	27.70	286.258	
4,500.00	4,427.10	2,429.20	2,399.20	18.35	10.83	93.98	35.32	7,546.59	7,959.45	7,931.10	28.35	280.752	
4,600.00	4,525.05	2,500.00	2,466.82	18.78	11.16	94.09	33.99	7,567.52	7,991.01	7,961.92	29.09	274.716	
4,700.00	4,623.00	2,531.90	2,497.23	19.22	11.31	94.14	33.38	7,577.11	8,023.03	7,993.43	29.61	270.997	
4,800.00	4,720.96	2,600.00	2,562.03	19.65	11.63	94.24	31.75	7,597.99	8,055.75	8,025.42	30.33	265.597	
4,900.00	4,818.91	2,600.00	2,562.03	20.09	11.63	94.24	31.75	7,597.99	8,088.98	8,058.32	30.66	263.856	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 100-MWD OWSG Rev5												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,000.00	4,916.87	2,666.69	2,625.31	20.52	11.95	94.35	29.45	7,618.92	8,122.75	8,091.37	31.38	258.884	
5,100.00	5,014.82	2,700.00	2,656.85	20.96	12.11	94.41	27.94	7,629.54	8,157.16	8,125.27	31.89	255.757	
5,200.00	5,112.77	2,745.46	2,699.78	21.39	12.34	94.48	25.47	7,644.26	8,192.20	8,159.70	32.50	252.089	
5,300.00	5,210.73	2,800.00	2,751.12	21.82	12.61	94.58	21.85	7,662.33	8,227.97	8,194.82	33.16	248.159	
5,400.00	5,308.68	2,800.00	2,751.12	22.26	12.61	94.58	21.85	7,662.33	8,264.35	8,230.88	33.46	246.960	
5,493.23	5,400.00	2,800.00	2,751.12	22.66	12.61	94.58	21.85	7,662.33	8,299.20	8,265.45	33.75	245.926	
5,500.00	5,406.64	2,836.94	2,785.74	22.69	12.82	94.66	19.10	7,674.91	8,301.47	8,267.44	34.04	243.896	
5,600.00	5,504.69	2,861.94	2,809.08	23.12	12.97	94.91	17.15	7,683.64	8,339.35	8,304.84	34.52	241.601	
5,700.00	5,602.91	2,900.00	2,844.49	23.55	13.18	95.19	14.08	7,697.27	8,377.96	8,342.87	35.09	238.787	
5,800.00	5,701.29	2,900.00	2,844.49	23.97	13.18	95.40	14.08	7,697.27	8,417.19	8,381.83	35.36	238.012	
5,900.00	5,799.82	2,950.42	2,891.19	24.39	13.46	95.70	10.20	7,715.86	8,456.96	8,420.97	35.99	234.981	
6,000.00	5,898.50	3,645.00	3,540.64	24.79	17.80	96.78	-23.88	7,956.66	8,496.51	8,454.77	41.74	203.572	
6,100.00	5,997.31	3,645.00	3,540.64	25.20	17.80	96.96	-23.88	7,956.66	8,530.50	8,488.48	42.02	202.987	
6,200.00	6,096.26	3,645.00	3,540.64	25.60	17.80	97.14	-23.88	7,956.66	8,565.44	8,523.13	42.30	202.484	
6,300.00	6,195.33	3,645.00	3,540.64	25.99	17.80	97.34	-23.88	7,956.66	8,601.29	8,558.72	42.57	202.060	
6,400.00	6,294.51	3,645.00	3,540.64	26.37	17.80	97.53	-23.88	7,956.66	8,638.05	8,595.22	42.82	201.711	
6,498.19	6,392.00	3,645.00	3,540.64	26.75	17.80	97.73	-23.88	7,956.66	8,675.00	8,631.94	43.07	201.439	
6,500.00	6,393.80	3,645.00	3,540.64	26.76	17.80	98.90	-23.88	7,956.66	8,675.70	8,632.63	43.07	201.435	
6,550.00	6,443.29	3,645.00	3,540.64	26.95	17.80	120.84	-23.88	7,956.66	8,696.63	8,653.43	43.20	201.332	
6,600.00	6,492.24	3,645.00	3,540.64	27.16	17.80	130.59	-23.88	7,956.66	8,720.99	8,677.66	43.33	201.274 SF	
6,650.00	6,540.33	3,645.00	3,540.64	27.38	17.80	135.15	-23.88	7,956.66	8,748.60	8,705.14	43.47	201.275	
6,700.00	6,587.28	3,645.00	3,540.64	27.60	17.80	137.15	-23.88	7,956.66	8,779.26	8,735.66	43.61	201.336	
6,750.00	6,632.80	3,645.00	3,540.64	27.84	17.80	137.58	-23.88	7,956.66	8,812.75	8,769.01	43.75	201.455	
6,800.00	6,676.60	3,645.00	3,540.64	28.09	17.80	136.85	-23.88	7,956.66	8,848.84	8,804.95	43.89	201.631	
6,850.00	6,718.42	3,645.00	3,540.64	28.34	17.80	135.10	-23.88	7,956.66	8,887.26	8,843.23	44.03	201.861	
6,900.00	6,758.00	3,645.00	3,540.64	28.60	17.80	132.30	-23.88	7,956.66	8,927.75	8,883.59	44.17	202.141	
6,950.00	6,795.09	3,645.00	3,540.64	28.87	17.80	128.33	-23.88	7,956.66	8,970.05	8,925.74	44.30	202.467	
7,000.00	6,829.46	3,645.00	3,540.64	29.14	17.80	122.97	-23.88	7,956.66	9,013.85	8,969.41	44.44	202.833	
7,050.00	6,860.91	3,645.00	3,540.64	29.43	17.80	115.97	-23.88	7,956.66	9,058.89	9,014.31	44.57	203.234	
7,100.00	6,889.24	3,645.00	3,540.64	29.73	17.80	107.10	-23.88	7,956.66	9,104.85	9,060.14	44.71	203.661	
7,150.00	6,914.27	3,645.00	3,540.64	30.05	17.80	96.43	-23.88	7,956.66	9,151.44	9,106.61	44.84	204.108	
7,200.00	6,935.85	3,645.00	3,540.64	30.37	17.80	84.52	-23.88	7,956.66	9,198.38	9,153.42	44.97	204.567	
7,250.00	6,953.84	3,645.00	3,540.64	30.71	17.80	72.42	-23.88	7,956.66	9,245.36	9,200.27	45.09	205.029	
7,300.00	6,968.15	3,645.00	3,540.64	31.06	17.80	61.25	-23.88	7,956.66	9,292.11	9,246.89	45.22	205.485	
7,350.00	6,978.67	3,645.00	3,540.64	31.42	17.80	51.70	-23.88	7,956.66	9,338.33	9,292.98	45.35	205.927	
7,400.00	6,985.34	3,645.00	3,540.64	31.79	17.80	43.90	-23.88	7,956.66	9,383.75	9,338.28	45.48	206.343	
7,450.00	6,988.13	3,645.00	3,540.64	32.17	17.80	37.66	-23.88	7,956.66	9,428.11	9,382.51	45.61	206.726	
7,461.13	6,988.22	3,645.00	3,540.64	32.26	17.80	36.45	-23.88	7,956.66	9,437.82	9,392.18	45.63	206.813	
7,500.00	6,988.19	3,645.00	3,540.64	32.56	17.80	35.33	-23.88	7,956.66	9,471.68	9,425.94	45.74	207.081	
7,600.00	6,988.12	3,645.00	3,540.64	33.37	17.80	32.25	-23.88	7,956.66	9,559.64	9,513.65	46.00	207.833	
7,700.00	6,988.05	3,645.00	3,540.64	34.21	17.80	28.88	-23.88	7,956.66	9,648.70	9,602.46	46.23	208.689	
7,800.00	6,987.98	3,645.00	3,540.64	35.09	17.80	25.20	-23.88	7,956.66	9,738.70	9,692.25	46.45	209.651	
7,900.00	6,987.91	3,645.00	3,540.64	35.99	17.80	21.20	-23.88	7,956.66	9,829.53	9,782.89	46.65	210.722	
8,000.00	6,987.83	3,645.00	3,540.64	36.93	17.80	16.91	-23.88	7,956.66	9,921.05	9,874.23	46.82	211.899	
8,100.00	6,987.76	3,645.00	3,540.64	37.88	17.80	12.34	-23.88	7,956.66	10,013.13	9,966.16	46.97	213.183	
8,200.00	6,987.68	3,645.00	3,540.64	38.86	17.80	7.54	-23.88	7,956.66	10,105.65	10,058.55	47.10	214.571	
8,300.00	6,987.61	3,645.00	3,540.64	39.86	17.80	2.57	-23.88	7,956.66	10,198.47	10,151.27	47.20	216.061	
8,400.00	6,987.53	3,645.00	3,540.64	40.87	17.80	-2.50	-23.88	7,956.66	10,291.49	10,244.20	47.28	217.648	
8,500.00	6,987.46	3,645.00	3,540.64	41.90	17.80	-7.58	-23.88	7,956.66	10,384.58	10,337.23	47.35	219.331	
8,600.00	6,987.38	3,645.00	3,540.64	42.93	17.80	-12.58	-23.88	7,956.66	10,477.63	10,430.24	47.39	221.103	
8,700.00	6,987.31	3,645.00	3,540.64	43.98	17.80	-17.43	-23.88	7,956.66	10,570.53	10,523.12	47.41	222.962	
8,800.00	6,987.23	3,645.00	3,540.64	45.03	17.80	-22.06	-23.88	7,956.66	10,663.17	10,615.76	47.41	224.900	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 100-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,872.16	6,987.18	3,645.00	3,540.64	45.79	17.80	-25.24	-23.88	7,956.66	10,729.80	10,682.40	47.40	226.347	
8,900.00	6,987.16	3,645.00	3,540.64	46.08	17.80	-25.24	-23.88	7,956.66	10,755.48	10,708.08	47.40	226.912	
9,000.00	6,987.09	3,645.00	3,540.64	47.16	17.80	-25.24	-23.88	7,956.66	10,847.78	10,800.39	47.39	228.926	
9,100.00	6,987.01	3,645.00	3,540.64	48.27	17.80	-25.24	-23.88	7,956.66	10,940.21	10,892.83	47.38	230.925	
9,200.00	6,986.94	3,645.00	3,540.64	49.40	17.80	-25.24	-23.88	7,956.66	11,032.78	10,985.41	47.37	232.909	
9,300.00	6,986.86	3,645.00	3,540.64	50.56	17.80	-25.24	-23.88	7,956.66	11,125.47	11,078.10	47.37	234.879	
9,400.00	6,986.79	3,645.00	3,540.64	51.75	17.80	-25.24	-23.88	7,956.66	11,218.29	11,170.92	47.37	236.835	
9,500.00	6,986.71	3,645.00	3,540.64	52.95	17.80	-25.24	-23.88	7,956.66	11,311.23	11,263.86	47.37	238.776	
9,600.00	6,986.64	3,645.00	3,540.64	54.18	17.80	-25.24	-23.88	7,956.66	11,404.29	11,356.92	47.38	240.703	
9,700.00	6,986.56	3,645.00	3,540.64	55.42	17.80	-25.24	-23.88	7,956.66	11,497.47	11,450.08	47.39	242.616	
9,800.00	6,986.49	3,645.00	3,540.64	56.69	17.80	-25.24	-23.88	7,956.66	11,590.76	11,543.36	47.40	244.515	
9,900.00	6,986.41	2,934.63	2,876.58	57.97	13.37	-21.46	11.35	7,709.98	11,683.00	11,640.75	42.25	276.529	
10,000.00	6,986.34	2,900.00	2,844.49	59.26	13.18	-21.29	14.08	7,697.27	11,774.47	11,732.39	42.08	279.781	
10,100.00	6,986.27	2,900.00	2,844.49	60.57	13.18	-21.29	14.08	7,697.27	11,865.92	11,823.78	42.14	281.567	
10,200.00	6,986.19	2,900.00	2,844.49	61.90	13.18	-21.29	14.08	7,697.27	11,957.51	11,915.31	42.20	283.335	
10,300.00	6,986.12	2,900.00	2,844.49	63.23	13.18	-21.29	14.08	7,697.27	12,049.23	12,006.97	42.27	285.086	
10,400.00	6,986.04	2,900.00	2,844.49	64.58	13.18	-21.29	14.08	7,697.27	12,141.08	12,098.75	42.33	286.821	
10,500.00	6,985.97	2,900.00	2,844.49	65.94	13.18	-21.29	14.08	7,697.27	12,233.06	12,190.67	42.40	288.539	
10,600.00	6,985.89	2,900.00	2,844.49	67.32	13.18	-21.29	14.08	7,697.27	12,325.17	12,282.70	42.47	290.241	
10,700.00	6,985.82	2,900.00	2,844.49	68.70	13.18	-21.29	14.08	7,697.27	12,417.39	12,374.86	42.54	291.928	
10,800.00	6,985.74	2,855.29	2,802.88	70.09	12.93	-21.07	17.68	7,681.30	12,509.35	12,467.02	42.33	295.537	
10,900.00	6,985.67	2,848.17	2,796.24	71.49	12.89	-21.03	18.23	7,678.81	12,601.68	12,559.32	42.36	297.493	
11,000.00	6,985.59	2,841.14	2,789.66	72.90	12.85	-21.00	18.77	7,676.36	12,694.10	12,651.71	42.39	299.429	
11,100.00	6,985.52	2,800.00	2,751.12	74.31	12.61	-20.80	21.85	7,662.33	12,786.85	12,744.63	42.22	302.848	
11,200.00	6,985.45	2,800.00	2,751.12	75.74	12.61	-20.80	21.85	7,662.33	12,879.38	12,837.08	42.31	304.437	
11,300.00	6,985.37	2,800.00	2,751.12	77.17	12.61	-20.80	21.85	7,662.33	12,972.02	12,929.63	42.39	306.012	
11,400.00	6,985.30	2,800.00	2,751.12	78.61	12.61	-20.80	21.85	7,662.33	13,064.77	13,022.30	42.48	307.573	
11,500.00	6,985.22	2,800.00	2,751.12	80.05	12.61	-20.80	21.85	7,662.33	13,157.63	13,115.06	42.56	309.121	
11,600.00	6,985.15	2,800.00	2,751.12	81.50	12.61	-20.80	21.85	7,662.33	13,250.59	13,207.94	42.65	310.657	
11,700.00	6,985.07	2,800.00	2,751.12	82.96	12.61	-20.80	21.85	7,662.33	13,343.65	13,300.91	42.74	312.179	
11,800.00	6,985.00	2,800.00	2,751.12	84.42	12.61	-20.80	21.85	7,662.33	13,436.81	13,393.98	42.83	313.690	
11,900.00	6,984.92	2,800.00	2,751.12	85.89	12.61	-20.80	21.85	7,662.33	13,530.07	13,487.15	42.93	315.189	
12,000.00	6,984.85	2,800.00	2,751.12	87.36	12.61	-20.80	21.85	7,662.33	13,623.43	13,580.41	43.02	316.675	
12,100.00	6,984.77	2,754.74	2,708.53	88.83	12.38	-20.59	24.90	7,647.30	13,716.60	13,673.71	42.89	319.775	
12,200.00	6,984.70	2,745.76	2,700.07	90.31	12.34	-20.55	25.45	7,644.36	13,810.03	13,767.08	42.95	321.551	
12,300.00	6,984.63	2,736.85	2,691.67	91.80	12.29	-20.51	25.98	7,641.45	13,903.52	13,860.52	43.00	323.310	
12,400.00	6,984.55	2,700.00	2,656.85	93.29	12.11	-20.35	27.94	7,629.54	13,997.19	13,954.26	42.93	326.066	
12,500.00	6,984.48	2,700.00	2,656.85	94.78	12.11	-20.35	27.94	7,629.54	14,090.76	14,047.73	43.03	327.471	
12,600.00	6,984.40	2,700.00	2,656.85	96.28	12.11	-20.35	27.94	7,629.54	14,184.42	14,141.29	43.13	328.866	
12,700.00	6,984.33	2,700.00	2,656.85	97.78	12.11	-20.35	27.94	7,629.54	14,278.17	14,234.94	43.23	330.251	
12,800.00	6,984.25	2,700.00	2,656.85	99.28	12.11	-20.35	27.94	7,629.54	14,372.01	14,328.67	43.34	331.626	
12,900.00	6,984.18	2,700.00	2,656.85	100.78	12.11	-20.35	27.94	7,629.54	14,465.92	14,422.48	43.44	332.992	
13,000.00	6,984.10	2,700.00	2,656.85	102.29	12.11	-20.35	27.94	7,629.54	14,559.92	14,516.37	43.55	334.349	
13,100.00	6,984.03	2,658.46	2,617.51	103.80	11.91	-20.18	29.78	7,616.32	14,653.82	14,610.35	43.48	337.038	
13,200.00	6,983.95	2,647.62	2,607.24	105.32	11.86	-20.13	30.20	7,612.89	14,747.88	14,704.34	43.54	338.717	
13,300.00	6,983.88	2,636.86	2,597.03	106.84	11.81	-20.09	30.60	7,609.51	14,841.99	14,798.38	43.60	340.380	
13,400.00	6,983.81	2,600.00	2,562.03	108.36	11.63	-19.94	31.75	7,597.99	14,936.22	14,892.65	43.56	342.874	
13,500.00	6,983.73	2,600.00	2,562.03	109.88	11.63	-19.94	31.75	7,597.99	15,030.39	14,986.72	43.67	344.160	
13,600.00	6,983.66	2,600.00	2,562.03	111.40	11.63	-19.94	31.75	7,597.99	15,124.63	15,080.85	43.78	345.439	
13,700.00	6,983.58	2,600.00	2,562.03	112.93	11.63	-19.94	31.75	7,597.99	15,218.95	15,175.06	43.90	346.710	
13,800.00	6,983.51	2,600.00	2,562.03	114.46	11.63	-19.94	31.75	7,597.99	15,313.35	15,269.34	44.01	347.973	
13,900.00	6,983.43	2,600.00	2,562.03	115.99	11.63	-19.94	31.75	7,597.99	15,407.81	15,363.69	44.12	349.229	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		100-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,000.00	6,983.36	2,564.80	2,528.57	117.52	11.46	-19.80	32.65	7,587.13	15,502.22	15,458.12	44.10	351.546	
14,100.00	6,983.28	2,554.99	2,519.22	119.06	11.42	-19.76	32.88	7,584.13	15,596.74	15,552.57	44.17	353.076	
14,200.00	6,983.21	2,545.24	2,509.95	120.59	11.37	-19.72	33.10	7,581.16	15,691.31	15,647.06	44.25	354.592	
14,300.00	6,983.13	2,535.57	2,500.73	122.13	11.33	-19.69	33.31	7,578.22	15,785.93	15,741.60	44.33	356.095	
14,400.00	6,983.06	2,500.00	2,466.82	123.67	11.16	-19.55	33.99	7,567.52	15,880.66	15,836.35	44.31	358.364	
14,500.00	6,982.99	2,500.00	2,466.82	125.21	11.16	-19.55	33.99	7,567.52	15,975.34	15,930.90	44.43	359.553	
14,600.00	6,982.91	2,500.00	2,466.82	126.75	11.16	-19.55	33.99	7,567.52	16,070.07	16,025.53	44.55	360.735	
14,700.00	6,982.84	2,500.00	2,466.82	128.30	11.16	-19.55	33.99	7,567.52	16,164.87	16,120.21	44.67	361.911	
14,800.00	6,982.76	2,500.00	2,466.82	129.85	11.16	-19.55	33.99	7,567.52	16,259.74	16,214.95	44.78	363.081	
14,900.00	6,982.69	2,500.00	2,466.82	131.39	11.16	-19.55	33.99	7,567.52	16,354.66	16,309.76	44.90	364.245	
15,000.00	6,982.61	2,459.44	2,428.09	132.94	10.97	-19.40	34.73	7,555.48	16,449.53	16,404.65	44.88	366.539	
15,100.00	6,982.54	2,447.16	2,416.36	134.49	10.91	-19.36	34.97	7,551.86	16,544.49	16,499.53	44.95	368.026	
15,200.00	6,982.46	2,434.97	2,404.71	136.04	10.86	-19.31	35.20	7,548.28	16,639.48	16,594.45	45.03	369.498	
15,300.00	6,982.39	2,400.00	2,371.27	137.60	10.69	-19.18	35.92	7,538.08	16,734.56	16,689.52	45.04	371.585	
15,400.00	6,982.31	2,400.00	2,371.27	139.15	10.69	-19.18	35.92	7,538.08	16,829.60	16,784.44	45.16	372.696	
15,500.00	6,982.24	2,400.00	2,371.27	140.70	10.69	-19.18	35.92	7,538.08	16,924.70	16,879.42	45.28	373.802	
15,600.00	6,982.17	2,400.00	2,371.27	142.26	10.69	-19.18	35.92	7,538.08	17,019.85	16,974.45	45.40	374.904	
15,700.00	6,982.09	2,400.00	2,371.27	143.82	10.69	-19.18	35.92	7,538.08	17,115.06	17,069.54	45.52	376.000	
15,800.00	6,982.02	2,364.04	2,336.85	145.38	10.52	-19.05	36.75	7,527.71	17,210.23	17,164.72	45.52	378.113	
15,900.00	6,981.94	2,352.60	2,325.88	146.94	10.46	-19.01	37.05	7,524.44	17,305.48	17,259.88	45.60	379.514	
16,000.00	6,981.87	2,341.23	2,315.00	148.50	10.41	-18.97	37.36	7,521.20	17,400.77	17,355.08	45.68	380.904	
16,100.00	6,981.79	2,300.00	2,275.46	150.06	10.21	-18.82	38.62	7,509.56	17,496.15	17,450.48	45.67	383.117	
16,200.00	6,981.72	2,300.00	2,275.46	151.62	10.21	-18.82	38.62	7,509.56	17,591.46	17,545.67	45.79	384.166	
16,300.00	6,981.64	2,300.00	2,275.46	153.18	10.21	-18.82	38.62	7,509.56	17,686.83	17,640.91	45.91	385.211	
16,400.00	6,981.57	2,300.00	2,275.46	154.74	10.21	-18.82	38.62	7,509.56	17,782.24	17,736.20	46.04	386.252	
16,500.00	6,981.49	2,300.00	2,275.46	156.31	10.21	-18.82	38.62	7,509.56	17,877.71	17,831.54	46.16	387.289	
16,600.00	6,981.42	2,300.00	2,275.46	157.87	10.21	-18.82	38.62	7,509.56	17,973.22	17,926.93	46.28	388.321	
16,700.00	6,981.35	2,300.00	2,275.46	159.44	10.21	-18.82	38.62	7,509.56	18,068.78	18,022.37	46.41	389.349	
16,800.00	6,981.27	2,300.00	2,275.46	161.01	10.21	-18.82	38.62	7,509.56	18,164.39	18,117.86	46.53	390.373	
16,900.00	6,981.20	2,300.00	2,275.46	162.58	10.21	-18.82	38.62	7,509.56	18,260.05	18,213.40	46.65	391.393	
17,000.00	6,981.12	2,300.00	2,275.46	164.14	10.21	-18.82	38.62	7,509.56	18,355.75	18,308.98	46.78	392.409	
17,100.00	6,981.05	2,256.90	2,234.06	165.71	10.00	-18.66	40.02	7,497.65	18,451.26	18,404.49	46.77	394.517	
17,200.00	6,980.97	2,251.20	2,228.58	167.28	9.97	-18.64	40.20	7,496.10	18,546.99	18,500.11	46.88	395.660	
17,300.00	6,980.90	2,245.54	2,223.13	168.85	9.94	-18.62	40.38	7,494.57	18,642.75	18,595.77	46.98	396.797	
17,400.00	6,980.82	2,239.93	2,217.74	170.42	9.92	-18.60	40.56	7,493.06	18,738.55	18,691.46	47.09	397.926	
17,500.00	6,980.75	2,200.00	2,179.25	172.00	9.72	-18.46	41.80	7,482.49	18,834.54	18,787.44	47.10	399.908	
17,600.00	6,980.67	2,200.00	2,179.25	173.57	9.72	-18.46	41.80	7,482.49	18,930.37	18,883.15	47.22	400.881	
17,700.00	6,980.60	2,200.00	2,179.25	175.14	9.72	-18.46	41.80	7,482.49	19,026.24	18,978.89	47.35	401.850	
17,800.00	6,980.53	2,200.00	2,179.25	176.71	9.72	-18.46	41.80	7,482.49	19,122.15	19,074.68	47.47	402.816	
17,900.00	6,980.45	2,200.00	2,179.25	178.29	9.72	-18.46	41.80	7,482.49	19,218.10	19,170.50	47.60	403.778	
18,000.00	6,980.38	2,200.00	2,179.25	179.86	9.72	-18.46	41.80	7,482.49	19,314.09	19,266.37	47.72	404.736	
18,100.00	6,980.30	2,200.00	2,179.25	181.44	9.72	-18.46	41.80	7,482.49	19,410.13	19,362.28	47.84	405.691	
18,200.00	6,980.23	2,200.00	2,179.25	183.01	9.72	-18.46	41.80	7,482.49	19,506.20	19,458.23	47.97	406.642	
18,300.00	6,980.15	2,200.00	2,179.25	184.59	9.72	-18.46	41.80	7,482.49	19,602.31	19,554.22	48.09	407.590	
18,400.00	6,980.08	2,200.00	2,179.25	186.16	9.72	-18.46	41.80	7,482.49	19,698.47	19,650.25	48.22	408.534	
18,500.00	6,980.00	2,166.55	2,146.96	187.74	9.56	-18.34	42.91	7,473.82	19,794.58	19,746.33	48.24	410.299	
18,600.00	6,979.93	2,157.51	2,138.23	189.32	9.51	-18.31	43.23	7,471.50	19,890.75	19,842.41	48.34	411.451	
18,700.00	6,979.85	2,148.53	2,129.56	190.90	9.47	-18.28	43.57	7,469.20	19,986.96	19,938.52	48.44	412.595	
18,800.00	6,979.78	2,139.62	2,120.95	192.48	9.42	-18.24	43.91	7,466.93	20,083.19	20,034.65	48.54	413.731	
18,900.00	6,979.71	2,100.00	2,082.65	194.05	9.23	-18.10	45.58	7,456.92	20,179.51	20,130.95	48.56	415.591	
19,000.00	6,979.63	2,100.00	2,082.65	195.63	9.23	-18.10	45.58	7,456.92	20,275.76	20,227.08	48.68	416.498	
19,100.00	6,979.56	2,100.00	2,082.65	197.21	9.23	-18.10	45.58	7,456.92	20,372.04	20,323.24	48.81	417.402	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #350A - OH - OH-SVY													Offset Site Error: 0.00 usft			
Survey Program: Reference		100-MWD OWSG Rev5 Offset					Semi Major Axis		Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
19,200.00	6,979.48	2,100.00	2,082.65	198.79	9.23	-18.10	45.58	7,456.92	20,468.36	20,419.43	48.93	418.303				
19,300.00	6,979.41	2,100.00	2,082.65	200.37	9.23	-18.10	45.58	7,456.92	20,564.72	20,515.66	49.06	419.201				
19,400.00	6,979.33	2,100.00	2,082.65	201.95	9.23	-18.10	45.58	7,456.92	20,661.10	20,611.92	49.18	420.096				
19,500.00	6,979.26	2,100.00	2,082.65	203.54	9.23	-18.10	45.58	7,456.92	20,757.53	20,708.22	49.31	420.987				
19,600.00	6,979.18	2,100.00	2,082.65	205.12	9.23	-18.10	45.58	7,456.92	20,853.98	20,804.55	49.43	421.875				
19,700.00	6,979.11	2,100.00	2,082.65	206.70	9.23	-18.10	45.58	7,456.92	20,950.47	20,900.92	49.56	422.760				
19,800.00	6,979.03	2,100.00	2,082.65	208.28	9.23	-18.10	45.58	7,456.92	21,047.00	20,997.32	49.68	423.642				
19,900.00	6,978.96	2,100.00	2,082.65	209.86	9.23	-18.10	45.58	7,456.92	21,143.55	21,093.75	49.81	424.521				
20,000.00	6,978.89	2,100.00	2,082.65	211.45	9.23	-18.10	45.58	7,456.92	21,240.14	21,190.21	49.93	425.397				
20,100.00	6,978.81	2,100.00	2,082.65	213.03	9.23	-18.10	45.58	7,456.92	21,336.76	21,286.70	50.05	426.269				
20,200.00	6,978.74	2,100.00	2,082.65	214.61	9.23	-18.10	45.58	7,456.92	21,433.41	21,383.23	50.18	427.139				
20,300.00	6,978.66	2,100.00	2,082.65	216.20	9.23	-18.10	45.58	7,456.92	21,530.09	21,479.78	50.30	428.005				
20,400.00	6,978.59	2,055.42	2,039.47	217.78	9.01	-17.95	47.47	7,445.99	21,626.50	21,576.19	50.32	429.820				
20,500.00	6,978.51	2,051.71	2,035.87	219.37	8.99	-17.93	47.62	7,445.10	21,723.19	21,672.76	50.43	430.753				
20,600.00	6,978.44	2,048.02	2,032.29	220.95	8.97	-17.92	47.77	7,444.22	21,819.90	21,769.36	50.55	431.683				
20,700.00	6,978.36	2,044.36	2,028.74	222.53	8.95	-17.91	47.91	7,443.35	21,916.64	21,865.98	50.66	432.607				
20,800.00	6,978.29	2,000.00	1,985.62	224.12	8.74	-17.76	49.54	7,433.06	22,013.66	21,962.98	50.68	434.395				
20,900.00	6,978.21	2,000.00	1,985.62	225.71	8.74	-17.76	49.54	7,433.06	22,110.40	22,059.60	50.80	435.230				
21,000.00	6,978.14	2,000.00	1,985.62	227.29	8.74	-17.76	49.54	7,433.06	22,207.18	22,156.25	50.93	436.062				
21,100.00	6,978.07	2,000.00	1,985.62	228.88	8.74	-17.76	49.54	7,433.06	22,303.99	22,252.94	51.05	436.892				
21,200.00	6,977.99	2,000.00	1,985.62	230.46	8.74	-17.76	49.54	7,433.06	22,400.82	22,349.64	51.18	437.718				
21,300.00	6,977.92	2,000.00	1,985.62	232.05	8.74	-17.76	49.54	7,433.06	22,497.68	22,446.38	51.30	438.541				
21,400.00	6,977.84	2,000.00	1,985.62	233.64	8.74	-17.76	49.54	7,433.06	22,594.57	22,543.14	51.43	439.362				
21,500.00	6,977.77	2,000.00	1,985.62	235.22	8.74	-17.76	49.54	7,433.06	22,691.49	22,639.94	51.55	440.179				
21,600.00	6,977.69	2,000.00	1,985.62	236.81	8.74	-17.76	49.54	7,433.06	22,788.43	22,736.75	51.68	440.994				
21,700.00	6,977.62	2,000.00	1,985.62	238.40	8.74	-17.76	49.54	7,433.06	22,885.40	22,833.60	51.80	441.806				
21,800.00	6,977.54	2,000.00	1,985.62	239.99	8.74	-17.76	49.54	7,433.06	22,982.39	22,930.47	51.92	442.614				
21,900.00	6,977.47	2,000.00	1,985.62	241.57	8.74	-17.76	49.54	7,433.06	23,079.41	23,027.36	52.05	443.420				
22,000.00	6,977.39	2,000.00	1,985.62	243.16	8.74	-17.76	49.54	7,433.06	23,176.46	23,124.28	52.17	444.223				
22,100.00	6,977.32	2,000.00	1,985.62	244.75	8.74	-17.76	49.54	7,433.06	23,273.53	23,221.23	52.30	445.023				
22,200.00	6,977.25	2,000.00	1,985.62	246.34	8.74	-17.76	49.54	7,433.06	23,370.62	23,318.20	52.42	445.820				
22,300.00	6,977.17	2,000.00	1,985.62	247.93	8.74	-17.76	49.54	7,433.06	23,467.74	23,415.20	52.55	446.614				
22,400.00	6,977.10	2,000.00	1,985.62	249.52	8.74	-17.76	49.54	7,433.06	23,564.89	23,512.22	52.67	447.406				
22,500.00	6,977.02	1,963.32	1,949.90	251.11	8.56	-17.63	50.82	7,424.80	23,661.96	23,609.24	52.72	448.841				
22,529.62	6,977.00	1,961.29	1,947.93	251.58	8.55	-17.63	50.89	7,424.35	23,690.73	23,637.98	52.75	449.109				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 60-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	153.32	-151.82	76.30	173.68				
100.00	100.00	64.00	64.00	0.25	1.14	153.32	-151.82	76.30	169.91	168.52	1.39	122.586	
197.64	197.64	161.64	161.64	0.60	2.90	153.30	-151.71	76.30	169.81	166.32	3.50	48.570	
200.00	200.00	163.99	163.99	0.61	2.94	153.30	-151.71	76.30	169.81	166.26	3.55	47.874	
300.00	300.00	264.00	264.00	0.97	4.74	153.32	-151.82	76.30	169.91	164.20	5.71	29.757	
400.00	400.00	364.00	364.00	1.33	6.69	153.32	-151.82	76.30	169.91	161.89	8.02	21.191	
500.00	500.00	464.00	464.00	1.68	8.64	153.32	-151.82	76.30	169.91	159.59	10.33	16.455	
526.84	526.84	490.84	490.83	1.78	9.16	153.24	-151.32	76.30	169.47	158.53	10.95	15.484 CC	
550.00	550.00	513.93	513.93	1.86	9.61	153.24	-151.33	76.30	169.48	158.00	11.48	14.765	
600.00	600.00	563.79	563.78	2.04	10.59	155.69	-151.38	76.30	169.92	157.29	12.63	13.454 ES	
700.00	699.93	663.42	663.41	2.40	12.53	156.17	-151.62	76.30	173.32	158.39	14.93	11.607	
800.00	799.68	763.73	763.68	2.77	14.56	157.05	-151.82	76.30	179.90	162.58	17.32	10.387	
900.00	899.13	863.17	863.13	3.13	16.64	158.21	-151.82	76.30	189.58	169.81	19.77	9.590	
1,000.00	998.15	961.50	961.45	3.49	18.70	159.50	-151.21	76.30	202.02	179.82	22.20	9.101	
1,100.00	1,096.63	1,060.72	1,060.63	3.87	20.78	161.06	-151.82	76.30	218.96	194.32	24.64	8.886	
1,130.50	1,126.54	1,090.63	1,090.54	3.99	21.37	161.51	-151.82	76.30	224.63	199.28	25.35	8.863	
1,200.00	1,194.61	1,158.71	1,158.61	4.26	22.71	162.58	-151.82	76.30	237.96	211.02	26.94	8.833	
1,300.00	1,292.57	1,256.66	1,256.57	4.66	24.64	163.92	-151.82	76.30	257.27	228.03	29.23	8.801	
1,400.00	1,390.52	1,354.62	1,354.52	5.07	26.57	165.07	-151.82	76.30	276.69	245.16	31.53	8.776	
1,500.00	1,488.48	1,452.35	1,452.24	5.48	28.50	165.99	-150.26	76.30	294.71	260.89	33.82	8.714	
1,600.00	1,586.43	1,549.59	1,549.48	5.90	30.41	166.88	-150.45	76.30	314.48	278.37	36.10	8.710	
1,700.00	1,684.38	1,646.74	1,646.62	6.31	32.33	167.67	-150.87	76.30	334.54	296.15	38.39	8.715	
1,800.00	1,782.34	1,743.81	1,743.68	6.73	34.24	168.39	-151.52	76.30	354.88	314.21	40.67	8.726	
1,900.00	1,880.29	1,844.45	1,844.29	7.15	36.13	169.03	-151.82	76.30	374.91	331.97	42.94	8.731	
2,000.00	1,978.25	1,942.41	1,942.25	7.58	37.93	169.59	-151.82	76.30	394.70	349.59	45.11	8.750	
2,100.00	2,076.20	2,040.03	2,039.87	8.00	39.72	170.08	-151.36	76.30	414.07	366.80	47.27	8.760	
2,200.00	2,174.15	2,137.15	2,136.99	8.43	41.50	170.53	-151.53	76.30	434.09	384.67	49.42	8.783	
2,300.00	2,272.11	2,236.29	2,236.11	8.85	43.31	170.96	-151.82	76.30	454.25	402.64	51.61	8.802	
2,400.00	2,370.06	2,334.24	2,334.06	9.28	45.05	171.35	-151.82	76.30	474.14	420.42	53.72	8.826	
2,500.00	2,468.02	2,432.19	2,432.02	9.71	46.79	171.70	-151.82	76.30	494.06	438.22	55.84	8.848	
2,600.00	2,565.97	2,530.15	2,529.97	10.14	48.53	172.02	-151.82	76.30	513.99	456.03	57.96	8.869	
2,700.00	2,663.92	2,627.83	2,627.65	10.57	50.27	172.31	-151.03	76.30	533.16	473.09	60.07	8.876	
2,800.00	2,761.88	2,725.14	2,724.96	11.00	52.00	172.58	-151.14	76.30	553.22	491.05	62.17	8.898	
2,900.00	2,859.83	2,822.41	2,822.23	11.43	53.73	172.85	-151.36	76.30	573.41	509.13	64.28	8.921	
3,000.00	2,957.79	2,919.64	2,919.45	11.86	55.46	173.09	-151.69	76.30	593.72	527.34	66.38	8.944	
3,100.00	3,055.74	3,019.93	3,019.74	12.29	57.25	173.32	-151.82	76.30	613.83	545.28	68.55	8.954	
3,200.00	3,153.69	3,117.89	3,117.69	12.72	59.00	173.54	-151.82	76.30	633.83	563.15	70.68	8.968	
3,300.00	3,251.65	3,215.75	3,215.55	13.15	60.75	173.73	-151.55	76.30	653.56	580.76	72.80	8.977	
3,400.00	3,349.60	3,313.13	3,312.94	13.59	62.49	173.92	-151.60	76.30	673.63	598.72	74.92	8.992	
3,500.00	3,447.56	3,410.48	3,410.29	14.02	64.23	174.09	-151.74	76.30	693.79	616.76	77.03	9.006	
3,600.00	3,545.51	3,509.72	3,509.51	14.45	66.19	174.26	-151.82	76.30	713.89	634.52	79.37	8.994	
3,700.00	3,643.46	3,607.67	3,607.46	14.88	68.23	174.42	-151.82	76.30	733.92	652.13	81.79	8.973	
3,800.00	3,741.42	3,705.62	3,705.42	15.32	70.27	174.57	-151.82	76.30	753.96	669.75	84.21	8.953	
3,900.00	3,839.37	3,803.58	3,803.37	15.75	72.31	174.71	-151.82	76.30	774.00	687.37	86.63	8.935	
4,000.00	3,937.33	3,901.04	3,900.83	16.18	74.35	174.84	-150.97	76.30	793.20	704.16	89.04	8.909	
4,100.00	4,035.28	3,998.12	3,997.91	16.62	76.37	174.96	-151.08	76.30	813.36	721.93	91.44	8.895	
4,200.00	4,133.23	4,095.16	4,094.95	17.05	78.40	175.08	-151.30	76.30	833.63	739.80	93.84	8.884	
4,300.00	4,231.19	4,192.16	4,191.95	17.48	80.42	175.20	-151.62	76.30	854.01	757.78	96.23	8.874	
4,400.00	4,329.14	4,293.48	4,293.14	17.92	82.68	175.32	-151.82	76.30	874.26	775.38	98.88	8.842	
4,500.00	4,427.10	4,386.82	4,386.47	18.35	84.88	175.41	-151.24	76.30	893.76	792.31	101.45	8.810	
4,600.00	4,525.05	4,489.46	4,489.05	18.78	87.39	175.52	-151.82	76.30	914.38	810.03	104.35	8.763	
4,700.00	4,623.00	4,587.29	4,586.87	19.22	89.93	175.61	-150.93	76.30	933.57	826.30	107.27	8.703	

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

SDT

Anticollision Report

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Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		60-A027Ua_INC-ONLY				Rule Assigned:				Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor	
4,800.00	4,720.96	4,677.09	4,676.66	19.65	92.26	175.70	-151.33	76.30	954.07	844.13	109.95	8.678		
4,900.00	4,818.91	4,783.47	4,782.91	20.09	95.04	175.80	-151.82	76.30	974.59	861.46	113.13	8.615		
5,000.00	4,916.87	4,871.80	4,871.21	20.52	97.36	175.87	-151.08	76.30	993.98	878.18	115.80	8.584		
5,100.00	5,014.82	4,979.48	4,978.82	20.96	100.12	175.97	-151.82	76.30	1,014.74	895.78	118.97	8.530		
5,200.00	5,112.77	5,069.66	5,068.98	21.39	102.37	176.04	-151.41	76.30	1,034.45	912.87	121.57	8.509		
5,300.00	5,210.73	5,175.47	5,174.73	21.82	104.97	176.12	-151.82	76.30	1,054.90	930.32	124.58	8.468		
5,400.00	5,308.68	5,264.52	5,263.76	22.26	107.14	176.18	-151.28	76.30	1,074.49	947.39	127.10	8.454		
5,493.23	5,400.00	5,364.81	5,364.00	22.66	109.45	176.26	-151.82	76.30	1,093.70	963.91	129.79	8.427		
5,500.00	5,406.64	5,371.45	5,370.64	22.69	109.60	176.26	-151.82	76.30	1,095.06	965.10	129.96	8.426		
5,600.00	5,504.69	5,469.50	5,468.69	23.12	111.76	176.34	-151.82	76.30	1,114.66	982.16	132.50	8.412 SF		
5,700.00	5,602.91	5,494.00	5,493.16	23.55	112.30	176.36	-151.82	76.30	1,135.81	1,002.86	132.95	8.543		
5,800.00	5,701.29	5,494.00	5,493.16	23.97	112.30	176.37	-151.82	76.30	1,164.10	1,032.18	131.92	8.824		
5,900.00	5,799.82	5,494.00	5,493.16	24.39	112.30	176.38	-151.82	76.30	1,199.28	1,069.14	130.14	9.215		
6,000.00	5,898.50	5,494.00	5,493.16	24.79	112.30	176.39	-151.82	76.30	1,240.76	1,113.00	127.76	9.712		
6,100.00	5,997.31	5,494.00	5,493.16	25.20	112.30	176.41	-151.82	76.30	1,287.93	1,162.99	124.94	10.309		
6,200.00	6,096.26	5,494.00	5,493.16	25.60	112.30	176.43	-151.82	76.30	1,340.19	1,218.38	121.81	11.003		
6,300.00	6,195.33	5,494.00	5,493.16	25.99	112.30	176.45	-151.82	76.30	1,396.95	1,278.46	118.49	11.790		
6,400.00	6,294.51	5,494.00	5,493.16	26.37	112.30	176.47	-151.82	76.30	1,457.70	1,342.62	115.08	12.666		
6,498.19	6,392.00	5,494.00	5,493.16	26.75	112.30	176.50	-151.82	76.30	1,520.75	1,409.03	111.72	13.612		
6,500.00	6,393.80	5,494.00	5,493.16	26.76	112.30	177.82	-151.82	76.30	1,521.95	1,410.29	111.66	13.630		
6,550.00	6,443.29	5,494.00	5,493.16	26.95	112.30	-155.85	-151.82	76.30	1,556.17	1,446.16	110.01	14.146		
6,600.00	6,492.24	5,494.00	5,493.16	27.16	112.30	-140.85	-151.82	76.30	1,592.60	1,484.13	108.47	14.683		
6,650.00	6,540.33	5,494.00	5,493.16	27.38	112.30	-130.10	-151.82	76.30	1,630.87	1,523.82	107.05	15.234		
6,700.00	6,587.28	5,494.00	5,493.16	27.60	112.30	-120.92	-151.82	76.30	1,670.64	1,564.87	105.78	15.794		
6,750.00	6,632.80	5,494.00	5,493.16	27.84	112.30	-112.29	-151.82	76.30	1,711.57	1,606.91	104.66	16.354		
6,800.00	6,676.60	5,494.00	5,493.16	28.09	112.30	-103.82	-151.82	76.30	1,753.32	1,649.62	103.69	16.909		
6,850.00	6,718.42	5,494.00	5,493.16	28.34	112.30	-95.46	-151.82	76.30	1,795.59	1,692.70	102.89	17.452		
6,900.00	6,758.00	5,494.00	5,493.16	28.60	112.30	-87.32	-151.82	76.30	1,838.09	1,735.84	102.25	17.976		
6,950.00	6,795.09	5,494.00	5,493.16	28.87	112.30	-79.60	-151.82	76.30	1,880.56	1,778.78	101.78	18.477		
7,000.00	6,829.46	5,494.00	5,493.16	29.14	112.30	-72.45	-151.82	76.30	1,922.74	1,821.28	101.46	18.950		
7,050.00	6,860.91	5,494.00	5,493.16	29.43	112.30	-66.01	-151.82	76.30	1,964.41	1,863.10	101.31	19.391		
7,100.00	6,889.24	5,494.00	5,493.16	29.73	112.30	-60.31	-151.82	76.30	2,005.34	1,904.04	101.30	19.796		
7,150.00	6,914.27	5,494.00	5,493.16	30.05	112.30	-55.33	-151.82	76.30	2,045.33	1,943.89	101.44	20.162		
7,200.00	6,935.85	5,494.00	5,493.16	30.37	112.30	-51.04	-151.82	76.30	2,084.20	1,982.48	101.73	20.488		
7,250.00	6,953.84	5,494.00	5,493.16	30.71	112.30	-47.35	-151.82	76.30	2,121.78	2,019.64	102.14	20.773		
7,300.00	6,968.15	5,494.00	5,493.16	31.06	112.30	-44.19	-151.82	76.30	2,157.90	2,055.23	102.68	21.016		
7,350.00	6,978.67	5,494.00	5,493.16	31.42	112.30	-41.51	-151.82	76.30	2,192.43	2,089.10	103.33	21.218		
7,400.00	6,985.34	5,494.00	5,493.16	31.79	112.30	-39.22	-151.82	76.30	2,225.23	2,121.14	104.09	21.378		
7,450.00	6,988.13	5,494.00	5,493.16	32.17	112.30	-37.29	-151.82	76.30	2,256.17	2,151.23	104.95	21.498		
7,461.13	6,988.22	5,494.00	5,493.16	32.26	112.30	-36.90	-151.82	76.30	2,262.80	2,157.65	105.15	21.521		
7,500.00	6,988.19	5,494.00	5,493.16	32.56	112.30	-37.36	-151.82	76.30	2,285.85	2,179.99	105.86	21.593		
7,600.00	6,988.12	5,494.00	5,493.16	33.37	112.30	-38.54	-151.82	76.30	2,345.90	2,238.29	107.62	21.799		
7,700.00	6,988.05	5,494.00	5,493.16	34.21	112.30	-39.74	-151.82	76.30	2,406.93	2,297.67	109.26	22.029		
7,800.00	6,987.98	5,494.00	5,493.16	35.09	112.30	-40.94	-151.82	76.30	2,468.78	2,357.98	110.80	22.281		
7,900.00	6,987.91	5,494.00	5,493.16	35.99	112.30	-42.14	-151.82	76.30	2,531.33	2,419.08	112.25	22.551		
8,000.00	6,987.83	5,494.00	5,493.16	36.93	112.30	-43.34	-151.82	76.30	2,594.44	2,480.84	113.60	22.837		
8,100.00	6,987.76	5,494.00	5,493.16	37.88	112.30	-44.53	-151.82	76.30	2,658.01	2,543.13	114.88	23.138		
8,200.00	6,987.68	5,494.00	5,493.16	38.86	112.30	-45.70	-151.82	76.30	2,721.92	2,605.85	116.07	23.450		
8,300.00	6,987.61	5,494.00	5,493.16	39.86	112.30	-46.86	-151.82	76.30	2,786.09	2,668.89	117.20	23.773		
8,400.00	6,987.53	5,494.00	5,493.16	40.87	112.30	-48.00	-151.82	76.30	2,850.41	2,732.15	118.25	24.104		
8,500.00	6,987.46	5,494.00	5,493.16	41.90	112.30	-49.11	-151.82	76.30	2,914.79	2,795.54	119.25	24.442		
8,600.00	6,987.38	5,494.00	5,493.16	42.93	112.30	-50.20	-151.82	76.30	2,979.17	2,858.98	120.19	24.787		

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

SDT

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Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

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Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,700.00	6,987.31	5,494.00	5,493.16	43.98	112.30	-51.27	-151.82	76.30	3,043.47	2,922.39	121.08	25.136		
8,800.00	6,987.23	5,494.00	5,493.16	45.03	112.30	-52.30	-151.82	76.30	3,107.60	2,985.68	121.92	25.489		
8,872.16	6,987.18	5,494.00	5,493.16	45.79	112.30	-53.03	-151.82	76.30	3,153.75	3,031.25	122.50	25.745		
8,900.00	6,987.16	5,494.00	5,493.16	46.08	112.30	-53.03	-151.82	76.30	3,171.60	3,048.88	122.72	25.845		
9,000.00	6,987.09	5,494.00	5,493.16	47.16	112.30	-53.03	-151.82	76.30	3,236.88	3,113.39	123.49	26.212		
9,100.00	6,987.01	5,494.00	5,493.16	48.27	112.30	-53.03	-151.82	76.30	3,303.90	3,179.67	124.24	26.594		
9,200.00	6,986.94	5,494.00	5,493.16	49.40	112.30	-53.03	-151.82	76.30	3,372.55	3,247.60	124.96	26.989		
9,300.00	6,986.86	5,494.00	5,493.16	50.56	112.30	-53.03	-151.82	76.30	3,442.74	3,317.09	125.66	27.398		
9,400.00	6,986.79	5,494.00	5,493.16	51.75	112.30	-53.03	-151.82	76.30	3,514.38	3,388.05	126.33	27.820		
9,500.00	6,986.71	5,494.00	5,493.16	52.95	112.30	-53.03	-151.82	76.30	3,587.37	3,460.40	126.97	28.254		
9,600.00	6,986.64	5,494.00	5,493.16	54.18	112.30	-53.03	-151.82	76.30	3,661.63	3,534.05	127.59	28.699		
9,700.00	6,986.56	5,494.00	5,493.16	55.42	112.30	-53.03	-151.82	76.30	3,737.10	3,608.92	128.18	29.155		
9,800.00	6,986.49	5,494.00	5,493.16	56.69	112.30	-53.03	-151.82	76.30	3,813.70	3,684.95	128.75	29.621		
9,900.00	6,986.41	5,494.00	5,493.16	57.97	112.30	-53.03	-151.82	76.30	3,891.35	3,762.06	129.29	30.097		
10,000.00	6,986.34	5,494.00	5,493.16	59.26	112.30	-53.03	-151.82	76.30	3,970.01	3,840.20	129.82	30.582		
10,100.00	6,986.27	5,494.00	5,493.16	60.57	112.30	-53.03	-151.82	76.30	4,049.61	3,919.30	130.32	31.075		
10,200.00	6,986.19	5,494.00	5,493.16	61.90	112.30	-53.03	-151.82	76.30	4,130.10	3,999.30	130.79	31.577		
10,300.00	6,986.12	5,494.00	5,493.16	63.23	112.30	-53.03	-151.82	76.30	4,211.42	4,080.17	131.25	32.087		
10,400.00	6,986.04	5,494.00	5,493.16	64.58	112.30	-53.03	-151.82	76.30	4,293.53	4,161.84	131.69	32.603		
10,500.00	6,985.97	5,494.00	5,493.16	65.94	112.30	-53.03	-151.82	76.30	4,376.39	4,244.28	132.11	33.127		
10,600.00	6,985.89	5,494.00	5,493.16	67.32	112.30	-53.03	-151.82	76.30	4,459.95	4,327.43	132.51	33.656		
10,700.00	6,985.82	5,494.00	5,493.16	68.70	112.30	-53.03	-151.82	76.30	4,544.17	4,411.27	132.90	34.192		
10,800.00	6,985.74	5,494.00	5,493.16	70.09	112.30	-53.03	-151.82	76.30	4,629.02	4,495.75	133.27	34.734		
10,900.00	6,985.67	5,494.00	5,493.16	71.49	112.30	-53.03	-151.82	76.30	4,714.47	4,580.84	133.63	35.281		
11,000.00	6,985.59	5,494.00	5,493.16	72.90	112.30	-53.03	-151.82	76.30	4,800.48	4,666.51	133.97	35.833		
11,100.00	6,985.52	5,494.00	5,493.16	74.31	112.30	-53.03	-151.82	76.30	4,887.02	4,752.72	134.30	36.389		
11,200.00	6,985.45	5,494.00	5,493.16	75.74	112.30	-53.03	-151.82	76.30	4,974.06	4,839.45	134.61	36.950		
11,300.00	6,985.37	5,494.00	5,493.16	77.17	112.30	-53.03	-151.82	76.30	5,061.59	4,926.67	134.92	37.516		
11,400.00	6,985.30	5,494.00	5,493.16	78.61	112.30	-53.03	-151.82	76.30	5,149.56	5,014.35	135.21	38.085		
11,500.00	6,985.22	5,494.00	5,493.16	80.05	112.30	-53.03	-151.82	76.30	5,237.97	5,102.48	135.49	38.658		
11,600.00	6,985.15	5,494.00	5,493.16	81.50	112.30	-53.03	-151.82	76.30	5,326.79	5,191.03	135.77	39.235		
11,700.00	6,985.07	5,494.00	5,493.16	82.96	112.30	-53.03	-151.82	76.30	5,416.00	5,279.97	136.03	39.815		
11,800.00	6,985.00	5,494.00	5,493.16	84.42	112.30	-53.03	-151.82	76.30	5,505.58	5,369.30	136.28	40.398		
11,900.00	6,984.92	5,494.00	5,493.16	85.89	112.30	-53.03	-151.82	76.30	5,595.52	5,458.99	136.53	40.984		
12,000.00	6,984.85	5,494.00	5,493.16	87.36	112.30	-53.03	-151.82	76.30	5,685.79	5,549.02	136.77	41.573		
12,100.00	6,984.77	5,494.00	5,493.16	88.83	112.30	-53.03	-151.82	76.30	5,776.38	5,639.38	137.00	42.164		
12,200.00	6,984.70	5,494.00	5,493.16	90.31	112.30	-53.03	-151.82	76.30	5,867.27	5,730.05	137.22	42.758		
12,300.00	6,984.63	5,494.00	5,493.16	91.80	112.30	-53.03	-151.82	76.30	5,958.46	5,821.02	137.44	43.354		
12,400.00	6,984.55	5,494.00	5,493.16	93.29	112.30	-53.03	-151.82	76.30	6,049.92	5,912.28	137.65	43.952		
12,500.00	6,984.48	5,494.00	5,493.16	94.78	112.30	-53.03	-151.82	76.30	6,141.66	6,003.81	137.85	44.553		
12,600.00	6,984.40	5,494.00	5,493.16	96.28	112.30	-53.03	-151.82	76.30	6,233.64	6,095.59	138.05	45.155		
12,700.00	6,984.33	5,494.00	5,493.16	97.78	112.30	-53.03	-151.82	76.30	6,325.87	6,187.63	138.24	45.759		
12,800.00	6,984.25	5,494.00	5,493.16	99.28	112.30	-53.03	-151.82	76.30	6,418.33	6,279.90	138.43	46.365		
12,900.00	6,984.18	5,494.00	5,493.16	100.78	112.30	-53.03	-151.82	76.30	6,511.02	6,372.41	138.61	46.972		
13,000.00	6,984.10	5,494.00	5,493.16	102.29	112.30	-53.03	-151.82	76.30	6,603.92	6,465.13	138.79	47.581		
13,100.00	6,984.03	5,494.00	5,493.16	103.80	112.30	-53.03	-151.82	76.30	6,697.02	6,558.05	138.97	48.191		
13,200.00	6,983.95	5,494.00	5,493.16	105.32	112.30	-53.03	-151.82	76.30	6,790.32	6,651.18	139.14	48.803		
13,300.00	6,983.88	5,494.00	5,493.16	106.84	112.30	-53.03	-151.82	76.30	6,883.81	6,744.50	139.31	49.415		
13,400.00	6,983.81	5,494.00	5,493.16	108.36	112.30	-53.03	-151.82	76.30	6,977.48	6,838.01	139.47	50.029		
13,500.00	6,983.73	5,494.00	5,493.16	109.88	112.30	-53.03	-151.82	76.30	7,071.32	6,931.69	139.63	50.644		
13,600.00	6,983.66	5,494.00	5,493.16	111.40	112.30	-53.03	-151.82	76.30	7,165.33	7,025.54	139.78	51.260		
13,700.00	6,983.58	5,494.00	5,493.16	112.93	112.30	-53.03	-151.82	76.30	7,259.49	7,119.56	139.94	51.876		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 60-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
13,800.00	6,983.51	5,494.00	5,493.16	114.46	112.30	-53.03	-151.82	76.30	7,353.82	7,213.73	140.09	52.494	
13,900.00	6,983.43	5,494.00	5,493.16	115.99	112.30	-53.03	-151.82	76.30	7,448.29	7,308.05	140.24	53.112	
14,000.00	6,983.36	5,494.00	5,493.16	117.52	112.30	-53.03	-151.82	76.30	7,542.90	7,402.52	140.38	53.731	
14,100.00	6,983.28	5,494.00	5,493.16	119.06	112.30	-53.03	-151.82	76.30	7,637.65	7,497.12	140.53	54.351	
14,200.00	6,983.21	5,494.00	5,493.16	120.59	112.30	-53.03	-151.82	76.30	7,732.53	7,591.87	140.67	54.971	
14,300.00	6,983.13	5,494.00	5,493.16	122.13	112.30	-53.03	-151.82	76.30	7,827.54	7,686.74	140.80	55.592	
14,400.00	6,983.06	5,494.00	5,493.16	123.67	112.30	-53.03	-151.82	76.30	7,922.67	7,781.73	140.94	56.213	
14,500.00	6,982.99	5,494.00	5,493.16	125.21	112.30	-53.03	-151.82	76.30	8,017.92	7,876.85	141.08	56.834	
14,600.00	6,982.91	5,494.00	5,493.16	126.75	112.30	-53.03	-151.82	76.30	8,113.29	7,972.08	141.21	57.456	
14,700.00	6,982.84	5,494.00	5,493.16	128.30	112.30	-53.03	-151.82	76.30	8,208.77	8,067.43	141.34	58.079	
14,800.00	6,982.76	5,494.00	5,493.16	129.85	112.30	-53.03	-151.82	76.30	8,304.35	8,162.88	141.47	58.701	
14,900.00	6,982.69	5,494.00	5,493.16	131.39	112.30	-53.03	-151.82	76.30	8,400.03	8,258.44	141.60	59.324	
15,000.00	6,982.61	5,494.00	5,493.16	132.94	112.30	-53.03	-151.82	76.30	8,495.82	8,354.10	141.72	59.947	
15,100.00	6,982.54	5,494.00	5,493.16	134.49	112.30	-53.03	-151.82	76.30	8,591.70	8,449.85	141.85	60.570	
15,200.00	6,982.46	5,494.00	5,493.16	136.04	112.30	-53.03	-151.82	76.30	8,687.67	8,545.70	141.97	61.194	
15,300.00	6,982.39	5,494.00	5,493.16	137.60	112.30	-53.03	-151.82	76.30	8,783.73	8,641.64	142.09	61.817	
15,400.00	6,982.31	5,494.00	5,493.16	139.15	112.30	-53.03	-151.82	76.30	8,879.88	8,737.67	142.21	62.440	
15,500.00	6,982.24	5,494.00	5,493.16	140.70	112.30	-53.03	-151.82	76.30	8,976.12	8,833.78	142.33	63.064	
15,600.00	6,982.17	5,494.00	5,493.16	142.26	112.30	-53.03	-151.82	76.30	9,072.43	8,929.98	142.45	63.687	
15,700.00	6,982.09	5,494.00	5,493.16	143.82	112.30	-53.03	-151.82	76.30	9,168.83	9,026.26	142.57	64.311	
15,800.00	6,982.02	5,494.00	5,493.16	145.38	112.30	-53.03	-151.82	76.30	9,265.30	9,122.61	142.69	64.934	
15,900.00	6,981.94	5,494.00	5,493.16	146.94	112.30	-53.03	-151.82	76.30	9,361.84	9,219.04	142.80	65.557	
16,000.00	6,981.87	5,494.00	5,493.16	148.50	112.30	-53.03	-151.82	76.30	9,458.46	9,315.54	142.92	66.181	
16,100.00	6,981.79	5,494.00	5,493.16	150.06	112.30	-53.03	-151.82	76.30	9,555.15	9,412.11	143.03	66.804	
16,200.00	6,981.72	5,494.00	5,493.16	151.62	112.30	-53.03	-151.82	76.30	9,651.90	9,508.75	143.15	67.426	
16,300.00	6,981.64	5,494.00	5,493.16	153.18	112.30	-53.03	-151.82	76.30	9,748.72	9,605.46	143.26	68.049	
16,400.00	6,981.57	5,494.00	5,493.16	154.74	112.30	-53.03	-151.82	76.30	9,845.60	9,702.23	143.37	68.671	
16,500.00	6,981.49	5,494.00	5,493.16	156.31	112.30	-53.03	-151.82	76.30	9,942.55	9,799.06	143.48	69.293	
16,600.00	6,981.42	5,494.00	5,493.16	157.87	112.30	-53.03	-151.82	76.30	10,039.55	9,895.96	143.60	69.915	
16,700.00	6,981.35	5,494.00	5,493.16	159.44	112.30	-53.03	-151.82	76.30	10,136.62	9,992.91	143.71	70.537	
16,800.00	6,981.27	5,494.00	5,493.16	161.01	112.30	-53.03	-151.82	76.30	10,233.74	10,089.92	143.82	71.158	
16,900.00	6,981.20	5,494.00	5,493.16	162.58	112.30	-53.03	-151.82	76.30	10,330.91	10,186.98	143.93	71.779	
17,000.00	6,981.12	5,494.00	5,493.16	164.14	112.30	-53.03	-151.82	76.30	10,428.14	10,284.10	144.04	72.399	
17,100.00	6,981.05	5,494.00	5,493.16	165.71	112.30	-53.03	-151.82	76.30	10,525.42	10,381.27	144.15	73.020	
17,200.00	6,980.97	5,494.00	5,493.16	167.28	112.30	-53.03	-151.82	76.30	10,622.75	10,478.50	144.25	73.639	
17,300.00	6,980.90	5,494.00	5,493.16	168.85	112.30	-53.03	-151.82	76.30	10,720.13	10,575.77	144.36	74.259	
17,400.00	6,980.82	5,494.00	5,493.16	170.42	112.30	-53.03	-151.82	76.30	10,817.56	10,673.09	144.47	74.878	
17,500.00	6,980.75	5,494.00	5,493.16	172.00	112.30	-53.03	-151.82	76.30	10,915.03	10,770.45	144.58	75.496	
17,600.00	6,980.67	5,494.00	5,493.16	173.57	112.30	-53.03	-151.82	76.30	11,012.55	10,867.86	144.68	76.114	
17,700.00	6,980.60	5,494.00	5,493.16	175.14	112.30	-53.03	-151.82	76.30	11,110.11	10,965.32	144.79	76.731	
17,800.00	6,980.53	5,494.00	5,493.16	176.71	112.30	-53.03	-151.82	76.30	11,207.72	11,062.82	144.90	77.349	
17,900.00	6,980.45	5,494.00	5,493.16	178.29	112.30	-53.03	-151.82	76.30	11,305.37	11,160.36	145.01	77.965	
18,000.00	6,980.38	5,494.00	5,493.16	179.86	112.30	-53.03	-151.82	76.30	11,403.05	11,257.94	145.11	78.581	
18,100.00	6,980.30	5,494.00	5,493.16	181.44	112.30	-53.03	-151.82	76.30	11,500.78	11,355.57	145.22	79.196	
18,200.00	6,980.23	5,494.00	5,493.16	183.01	112.30	-53.03	-151.82	76.30	11,598.55	11,453.23	145.32	79.811	
18,300.00	6,980.15	5,494.00	5,493.16	184.59	112.30	-53.03	-151.82	76.30	11,696.36	11,550.93	145.43	80.426	
18,400.00	6,980.08	5,494.00	5,493.16	186.16	112.30	-53.03	-151.82	76.30	11,794.20	11,648.66	145.54	81.040	
18,500.00	6,980.00	5,494.00	5,493.16	187.74	112.30	-53.03	-151.82	76.30	11,892.08	11,746.43	145.64	81.653	
18,600.00	6,979.93	5,494.00	5,493.16	189.32	112.30	-53.03	-151.82	76.30	11,989.99	11,844.24	145.75	82.265	
18,700.00	6,979.85	5,494.00	5,493.16	190.90	112.30	-53.03	-151.82	76.30	12,087.93	11,942.08	145.85	82.877	
18,800.00	6,979.78	5,494.00	5,493.16	192.48	112.30	-53.03	-151.82	76.30	12,185.92	12,039.96	145.96	83.489	
18,900.00	6,979.71	5,494.00	5,493.16	194.05	112.30	-53.03	-151.82	76.30	12,283.93	12,137.86	146.06	84.099	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #46 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 60-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,000.00	6,979.63	5,494.00	5,493.16	195.63	112.30	-53.03	-151.82	76.30	12,381.97	12,235.80	146.17	84.709	
19,100.00	6,979.56	5,494.00	5,493.16	197.21	112.30	-53.03	-151.82	76.30	12,480.05	12,333.77	146.28	85.319	
19,200.00	6,979.48	5,494.00	5,493.16	198.79	112.30	-53.03	-151.82	76.30	12,578.15	12,431.77	146.38	85.928	
19,300.00	6,979.41	5,494.00	5,493.16	200.37	112.30	-53.03	-151.82	76.30	12,676.29	12,529.80	146.49	86.536	
19,400.00	6,979.33	5,494.00	5,493.16	201.95	112.30	-53.03	-151.82	76.30	12,774.45	12,627.86	146.59	87.143	
19,500.00	6,979.26	5,494.00	5,493.16	203.54	112.30	-53.03	-151.82	76.30	12,872.65	12,725.95	146.70	87.750	
19,600.00	6,979.18	5,494.00	5,493.16	205.12	112.30	-53.03	-151.82	76.30	12,970.87	12,824.06	146.80	88.356	
19,700.00	6,979.11	5,494.00	5,493.16	206.70	112.30	-53.03	-151.82	76.30	13,069.11	12,922.21	146.91	88.961	
19,800.00	6,979.03	5,494.00	5,493.16	208.28	112.30	-53.03	-151.82	76.30	13,167.39	13,020.37	147.01	89.566	
19,900.00	6,978.96	5,494.00	5,493.16	209.86	112.30	-53.03	-151.82	76.30	13,265.69	13,118.57	147.12	90.170	
20,000.00	6,978.89	5,494.00	5,493.16	211.45	112.30	-53.03	-151.82	76.30	13,364.01	13,216.79	147.22	90.773	
20,100.00	6,978.81	5,494.00	5,493.16	213.03	112.30	-53.03	-151.82	76.30	13,462.36	13,315.03	147.33	91.375	
20,200.00	6,978.74	5,494.00	5,493.16	214.61	112.30	-53.03	-151.82	76.30	13,560.74	13,413.30	147.44	91.977	
20,300.00	6,978.66	5,494.00	5,493.16	216.20	112.30	-53.03	-151.82	76.30	13,659.13	13,511.59	147.54	92.578	
20,400.00	6,978.59	5,494.00	5,493.16	217.78	112.30	-53.03	-151.82	76.30	13,757.55	13,609.91	147.65	93.178	
20,500.00	6,978.51	5,494.00	5,493.16	219.37	112.30	-53.03	-151.82	76.30	13,856.00	13,708.24	147.75	93.778	
20,600.00	6,978.44	5,494.00	5,493.16	220.95	112.30	-53.03	-151.82	76.30	13,954.46	13,806.60	147.86	94.376	
20,700.00	6,978.36	5,494.00	5,493.16	222.53	112.30	-53.03	-151.82	76.30	14,052.95	13,904.98	147.97	94.974	
20,800.00	6,978.29	5,494.00	5,493.16	224.12	112.30	-53.03	-151.82	76.30	14,151.46	14,003.38	148.07	95.571	
20,900.00	6,978.21	5,494.00	5,493.16	225.71	112.30	-53.03	-151.82	76.30	14,249.98	14,101.81	148.18	96.167	
21,000.00	6,978.14	5,494.00	5,493.16	227.29	112.30	-53.03	-151.82	76.30	14,348.53	14,200.25	148.29	96.763	
21,100.00	6,978.07	5,494.00	5,493.16	228.88	112.30	-53.03	-151.82	76.30	14,447.10	14,298.71	148.39	97.358	
21,200.00	6,977.99	5,494.00	5,493.16	230.46	112.30	-53.03	-151.82	76.30	14,545.69	14,397.19	148.50	97.952	
21,300.00	6,977.92	5,494.00	5,493.16	232.05	112.30	-53.03	-151.82	76.30	14,644.30	14,495.69	148.61	98.545	
21,400.00	6,977.84	5,494.00	5,493.16	233.64	112.30	-53.03	-151.82	76.30	14,742.93	14,594.21	148.71	99.137	
21,500.00	6,977.77	5,494.00	5,493.16	235.22	112.30	-53.03	-151.82	76.30	14,841.57	14,692.75	148.82	99.728	
21,600.00	6,977.69	5,494.00	5,493.16	236.81	112.30	-53.03	-151.82	76.30	14,940.23	14,791.31	148.93	100.319	
21,700.00	6,977.62	5,494.00	5,493.16	238.40	112.30	-53.03	-151.82	76.30	15,038.91	14,889.88	149.03	100.909	
21,800.00	6,977.54	5,494.00	5,493.16	239.99	112.30	-53.03	-151.82	76.30	15,137.61	14,988.47	149.14	101.498	
21,900.00	6,977.47	5,494.00	5,493.16	241.57	112.30	-53.03	-151.82	76.30	15,236.33	15,087.08	149.25	102.086	
22,000.00	6,977.39	5,494.00	5,493.16	243.16	112.30	-53.03	-151.82	76.30	15,335.06	15,185.70	149.36	102.673	
22,100.00	6,977.32	5,494.00	5,493.16	244.75	112.30	-53.03	-151.82	76.30	15,433.81	15,284.34	149.47	103.259	
22,200.00	6,977.25	5,494.00	5,493.16	246.34	112.30	-53.03	-151.82	76.30	15,532.57	15,383.00	149.57	103.845	
22,300.00	6,977.17	5,494.00	5,493.16	247.93	112.30	-53.03	-151.82	76.30	15,631.35	15,481.67	149.68	104.430	
22,400.00	6,977.10	5,494.00	5,493.16	249.52	112.30	-53.03	-151.82	76.30	15,730.14	15,580.35	149.79	105.014	
22,500.00	6,977.02	5,494.00	5,493.16	251.11	112.30	-53.03	-151.82	76.30	15,828.95	15,679.05	149.90	105.597	
22,529.62	6,977.00	5,494.00	5,493.16	251.58	112.30	-53.03	-151.82	76.30	15,858.22	15,708.29	149.93	105.769	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 300-MWD OWSG Rev5													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-109.39	-872.93	-2,479.56	2,629.51				
100.00	100.00	34.46	34.46	0.25	0.36	-109.39	-872.94	-2,479.56	2,628.74	2,628.13	0.61	4,297.367	
200.00	200.00	130.17	130.17	0.61	1.36	-109.40	-873.08	-2,479.66	2,628.88	2,626.91	1.97	1,333.239	
300.00	300.00	225.88	225.88	0.97	2.37	-109.40	-873.39	-2,479.85	2,629.18	2,625.85	3.33	789.098	
400.00	400.00	321.55	321.54	1.33	3.19	-109.41	-873.86	-2,480.16	2,629.65	2,625.14	4.51	583.034	
500.00	500.00	649.06	647.69	1.68	3.60	-108.97	-850.82	-2,474.96	2,625.67	2,620.50	5.17	507.797	
550.00	550.00	728.11	725.51	1.86	3.74	-108.71	-837.17	-2,472.46	2,621.31	2,615.88	5.43	482.878	
600.00	600.00	783.16	779.35	2.04	3.87	-106.19	-825.78	-2,471.00	2,616.80	2,611.12	5.68	460.749	
700.00	699.93	865.51	859.37	2.40	4.06	-106.01	-806.38	-2,469.73	2,608.69	2,602.52	6.17	422.948	
800.00	799.68	948.00	938.79	2.77	4.30	-105.78	-784.12	-2,470.11	2,602.40	2,595.70	6.70	388.434	
900.00	899.13	1,021.34	1,008.56	3.13	4.55	-105.54	-761.64	-2,472.09	2,598.07	2,590.81	7.26	357.947	
1,000.00	998.15	1,100.94	1,083.39	3.49	4.82	-105.22	-734.72	-2,475.62	2,595.48	2,587.60	7.88	329.433	
1,078.00	1,075.02	1,155.38	1,134.00	3.79	5.03	-104.99	-714.95	-2,478.92	2,594.80	2,586.42	8.38	309.717	
1,100.00	1,096.63	1,171.00	1,148.44	3.87	5.09	-104.92	-709.11	-2,480.03	2,594.86	2,586.33	8.52	304.429	
1,130.50	1,126.54	1,186.10	1,162.40	3.99	5.14	-104.85	-703.46	-2,481.17	2,595.14	2,586.43	8.71	298.117	
1,200.00	1,194.61	1,221.02	1,194.71	4.26	5.26	-104.70	-690.52	-2,484.06	2,596.52	2,587.39	9.13	284.478	
1,300.00	1,292.57	1,403.42	1,363.85	4.66	5.98	-103.96	-623.64	-2,497.42	2,597.92	2,587.56	10.37	250.610	
1,341.63	1,333.35	1,436.39	1,394.11	4.83	6.12	-103.81	-610.72	-2,499.51	2,597.82	2,587.12	10.70	242.678	
1,400.00	1,390.52	1,482.05	1,438.84	5.07	6.32	-103.59	-592.47	-2,502.78	2,598.02	2,586.84	11.19	232.252	
1,500.00	1,488.48	1,629.05	1,570.28	5.48	7.00	-102.89	-533.88	-2,512.56	2,598.27	2,585.85	12.41	209.298	
1,600.00	1,586.43	1,719.03	1,650.86	5.90	7.52	-102.38	-494.25	-2,518.35	2,597.19	2,583.79	13.40	193.790	
1,673.44	1,658.37	1,778.27	1,703.09	6.20	7.92	-102.01	-466.70	-2,522.93	2,596.98	2,582.86	14.12	183.970	
1,700.00	1,684.38	1,795.68	1,718.44	6.31	8.04	-101.90	-458.60	-2,524.33	2,597.03	2,582.68	14.35	180.991	
1,800.00	1,782.34	1,915.98	1,826.17	6.73	8.85	-101.21	-405.75	-2,532.67	2,596.93	2,581.36	15.57	166.750	
1,826.11	1,807.91	1,936.45	1,844.49	6.84	8.98	-101.10	-396.71	-2,534.05	2,596.90	2,581.08	15.82	164.123	
1,900.00	1,880.29	2,002.76	1,903.90	7.15	9.44	-100.72	-367.63	-2,538.69	2,597.12	2,580.54	16.59	156.593	
2,000.00	1,978.25	2,186.98	2,071.67	7.58	10.62	-99.82	-291.97	-2,545.74	2,594.64	2,576.46	18.19	142.674	
2,100.00	2,076.20	2,251.76	2,131.39	8.00	11.02	-99.55	-266.95	-2,547.69	2,592.71	2,573.70	19.01	136.394	
2,200.00	2,174.15	2,338.09	2,211.62	8.43	11.52	-99.21	-235.22	-2,550.65	2,591.72	2,571.78	19.94	129.982	
2,300.00	2,272.11	2,449.91	2,316.46	8.85	12.14	-98.84	-196.50	-2,553.91	2,590.79	2,569.81	20.98	123.479	
2,400.00	2,370.06	2,557.32	2,418.02	9.28	12.69	-98.53	-161.62	-2,556.33	2,589.74	2,567.77	21.97	117.897	
2,500.00	2,468.02	2,647.09	2,503.54	9.71	13.13	-98.32	-134.35	-2,557.83	2,588.58	2,565.75	22.83	113.373	
2,600.00	2,565.97	2,747.00	2,599.44	10.14	13.58	-98.14	-106.39	-2,559.05	2,587.46	2,563.75	23.71	109.122	
2,700.00	2,663.92	2,834.22	2,683.71	10.57	13.94	-98.03	-83.91	-2,559.97	2,586.64	2,562.14	24.51	105.553	
2,800.00	2,761.88	2,940.34	2,786.88	11.00	14.35	-97.95	-59.16	-2,561.41	2,586.60	2,561.26	25.34	102.070	
2,843.99	2,804.97	2,967.00	2,812.95	11.19	14.44	-97.95	-53.57	-2,561.59	2,586.45	2,560.83	25.62	100.945	
2,900.00	2,859.83	3,002.95	2,848.17	11.43	14.56	-97.95	-46.38	-2,562.02	2,586.67	2,560.69	25.98	99.558	
3,000.00	2,957.79	3,105.76	2,949.34	11.86	14.86	-98.00	-28.14	-2,563.04	2,587.24	2,560.53	26.71	96.849	
3,100.00	3,055.74	3,186.06	3,028.79	12.29	15.06	-98.10	-16.50	-2,563.73	2,588.29	2,560.96	27.34	94.673	
3,200.00	3,153.69	3,318.00	3,159.71	12.72	15.35	-98.33	-0.16	-2,563.86	2,588.97	2,560.92	28.05	92.291	
3,300.00	3,251.65	3,402.69	3,243.87	13.15	15.52	-98.50	9.27	-2,563.52	2,589.46	2,560.81	28.65	90.396	
3,400.00	3,349.60	3,478.70	3,319.49	13.59	15.69	-98.67	16.93	-2,563.88	2,590.97	2,561.76	29.21	88.703	
3,500.00	3,447.56	3,557.29	3,397.79	14.02	15.89	-98.87	23.61	-2,564.62	2,593.30	2,563.55	29.75	87.157	
3,600.00	3,545.51	3,635.00	3,475.38	14.45	16.11	-99.12	27.79	-2,565.17	2,596.17	2,565.91	30.26	85.796	
3,700.00	3,643.46	3,731.68	3,572.00	14.88	16.37	-99.47	30.97	-2,566.04	2,599.70	2,568.95	30.75	84.531	
3,800.00	3,741.42	3,834.98	3,675.29	15.32	16.61	-99.88	33.04	-2,566.61	2,603.26	2,569.38	31.89	83.824	
3,900.00	3,839.37	3,933.56	3,773.85	15.75	16.71	-100.26	35.00	-2,567.12	2,606.92	2,565.11	41.82	62.337	
4,000.00	3,937.33	4,032.14	3,872.40	16.18	16.71	-100.65	36.93	-2,567.61	2,610.70	2,560.94	49.75	52.471	
4,100.00	4,035.28	4,130.70	3,970.94	16.62	16.71	-101.03	38.84	-2,568.09	2,614.59	2,556.89	57.69	45.321	
4,200.00	4,133.23	4,229.25	4,069.47	17.05	16.71	-101.42	40.72	-2,568.56	2,618.58	2,552.96	65.63	39.902	
4,300.00	4,231.19	4,327.79	4,168.00	17.48	16.71	-101.80	42.57	-2,569.01	2,622.70	2,549.13	73.56	35.654	
4,400.00	4,329.14	4,426.32	4,266.51	17.92	16.71	-102.19	44.40	-2,569.44	2,626.92	2,545.43	81.49	32.235	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		300-MWD OWSG Rev5					Rule Assigned:				Offset Well Error:		0.00 usft	
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,500.00	4,427.10	4,524.85	4,365.02	18.35	71.72	-102.57	46.20	-2,569.86	2,631.25	2,541.83	89.42	29.424		
4,600.00	4,525.05	4,623.36	4,463.51	18.78	79.22	-102.95	47.98	-2,570.27	2,635.70	2,538.35	97.36	27.073		
4,700.00	4,623.00	4,721.86	4,562.00	19.22	86.72	-103.33	49.73	-2,570.66	2,640.26	2,534.98	105.28	25.077		
4,800.00	4,720.96	4,820.36	4,660.48	19.65	94.21	-103.71	51.45	-2,571.03	2,644.94	2,531.72	113.21	23.363		
4,900.00	4,818.91	4,918.84	4,758.95	20.09	101.71	-104.09	53.15	-2,571.39	2,649.72	2,528.58	121.14	21.873		
5,000.00	4,916.87	5,017.32	4,857.41	20.52	109.21	-104.47	54.82	-2,571.73	2,654.62	2,525.56	129.06	20.568		
5,100.00	5,014.82	5,115.78	4,955.86	20.96	116.70	-104.85	56.47	-2,572.06	2,659.63	2,522.64	136.99	19.415		
5,200.00	5,112.77	5,214.24	5,054.30	21.39	124.20	-105.23	58.09	-2,572.37	2,664.75	2,519.84	144.91	18.389		
5,300.00	5,210.73	5,312.68	5,152.73	21.82	131.69	-105.61	59.69	-2,572.67	2,669.99	2,517.15	152.83	17.470		
5,400.00	5,308.68	5,411.12	5,251.15	22.26	139.18	-105.98	61.26	-2,572.95	2,675.33	2,514.58	160.75	16.643		
5,493.23	5,400.00	5,502.87	5,342.90	22.66	146.17	-106.33	62.70	-2,573.20	2,680.42	2,512.28	168.14	15.942		
5,500.00	5,406.64	5,509.54	5,349.57	22.69	146.68	-106.36	62.80	-2,573.22	2,680.79	2,512.12	168.67	15.894		
5,600.00	5,504.69	5,608.05	5,448.06	23.12	154.18	-106.75	64.32	-2,573.47	2,686.21	2,509.62	176.59	15.211		
5,700.00	5,602.91	5,706.70	5,546.70	23.55	161.69	-107.12	65.82	-2,573.70	2,691.49	2,506.97	184.52	14.586		
5,800.00	5,701.29	5,805.49	5,645.48	23.97	169.21	-107.48	67.29	-2,573.93	2,696.60	2,504.15	192.45	14.012		
5,900.00	5,799.82	5,904.41	5,744.39	24.39	176.74	-107.81	68.74	-2,574.13	2,701.53	2,501.14	200.39	13.481		
6,000.00	5,898.50	6,003.46	5,843.43	24.79	184.28	-108.13	70.16	-2,574.32	2,706.26	2,497.93	208.33	12.990		
6,100.00	5,997.31	6,102.62	5,942.58	25.20	191.83	-108.43	71.56	-2,574.50	2,710.78	2,494.51	216.28	12.534		
6,200.00	6,096.26	6,201.90	6,041.85	25.60	199.38	-108.71	72.94	-2,574.66	2,715.09	2,490.86	224.22	12.109		
6,300.00	6,195.33	6,301.28	6,141.22	25.99	206.95	-108.97	74.29	-2,574.81	2,719.16	2,486.99	232.18	11.712		
6,400.00	6,294.51	6,400.75	6,240.68	26.37	214.52	-109.21	75.62	-2,574.94	2,722.99	2,482.86	240.13	11.340		
6,498.19	6,392.00	6,498.52	6,338.45	26.75	221.16	-109.43	76.90	-2,575.05	2,726.51	2,479.37	247.14	11.032		
6,500.00	6,393.80	6,500.33	6,340.25	26.76	221.26	-108.23	76.92	-2,575.06	2,726.57	2,479.33	247.24	11.028		
6,550.00	6,443.29	6,549.99	6,389.91	26.95	223.95	-85.58	77.58	-2,575.11	2,726.95	2,476.83	250.12	10.902		
6,600.00	6,492.24	6,599.13	6,439.04	27.16	226.62	-75.13	78.23	-2,575.17	2,724.85	2,471.86	252.99	10.770		
6,650.00	6,540.33	6,647.45	6,487.36	27.38	229.24	-69.85	78.88	-2,575.23	2,720.30	2,464.47	255.83	10.633		
6,700.00	6,587.28	6,694.65	6,534.56	27.60	231.80	-67.08	79.53	-2,575.29	2,713.38	2,454.76	258.62	10.492		
6,750.00	6,632.80	6,740.45	6,580.35	27.84	234.28	-65.72	80.15	-2,575.35	2,704.17	2,442.83	261.35	10.347		
6,800.00	6,676.60	6,784.56	6,624.45	28.09	236.67	-65.29	80.76	-2,575.40	2,692.79	2,428.80	263.99	10.200		
6,850.00	6,718.42	6,826.71	6,666.60	28.34	238.96	-65.53	81.35	-2,575.46	2,679.37	2,412.83	266.54	10.052		
6,900.00	6,758.00	6,866.64	6,706.52	28.60	241.12	-66.29	81.91	-2,575.51	2,664.06	2,395.08	268.98	9.904		
6,950.00	6,795.09	6,904.10	6,743.98	28.87	243.15	-67.46	82.44	-2,575.56	2,647.04	2,375.73	271.30	9.757		
7,000.00	6,829.46	6,938.87	6,778.75	29.14	245.04	-68.99	82.93	-2,575.60	2,628.47	2,354.98	273.49	9.611		
7,050.00	6,860.91	6,970.72	6,810.60	29.43	246.76	-70.80	83.39	-2,575.64	2,608.56	2,333.03	275.53	9.468		
7,100.00	6,889.24	6,999.47	6,839.35	29.73	248.32	-72.87	83.80	-2,575.68	2,587.51	2,310.10	277.41	9.328		
7,150.00	6,914.27	7,024.94	6,864.81	30.05	249.70	-75.12	84.17	-2,575.72	2,565.53	2,286.41	279.12	9.191		
7,200.00	6,935.85	7,046.96	6,886.83	30.37	250.90	-77.52	84.49	-2,575.75	2,542.84	2,262.18	280.66	9.060		
7,250.00	6,953.84	7,065.40	6,905.26	30.71	251.90	-80.02	84.76	-2,575.77	2,519.64	2,237.63	282.02	8.934		
7,300.00	6,968.15	7,080.15	6,920.01	31.06	252.70	-82.55	84.98	-2,575.79	2,496.16	2,212.97	283.19	8.815		
7,350.00	6,978.67	7,091.11	6,930.97	31.42	253.29	-85.08	85.14	-2,575.81	2,472.60	2,188.43	284.16	8.701		
7,400.00	6,985.34	7,098.22	6,938.08	31.79	253.68	-87.57	85.24	-2,575.82	2,449.14	2,164.21	284.93	8.595		
7,450.00	6,988.13	7,101.42	6,941.29	32.17	253.85	-89.96	85.29	-2,575.82	2,425.98	2,140.48	285.50	8.497		
7,461.13	6,988.22	7,101.61	6,941.47	32.26	253.86	-90.48	85.29	-2,575.82	2,420.89	2,135.29	285.60	8.477		
7,500.00	6,988.19	7,101.90	6,941.76	32.56	253.87	-90.49	85.29	-2,575.83	2,403.14	2,117.21	285.93	8.405		
7,600.00	6,988.12	7,102.61	6,942.48	33.37	253.91	-90.52	85.30	-2,575.83	2,357.62	2,070.83	286.79	8.221		
7,700.00	6,988.05	7,103.29	6,943.15	34.21	253.95	-90.55	85.31	-2,575.83	2,312.37	2,024.67	287.69	8.038		
7,800.00	6,987.98	7,103.91	6,943.78	35.09	253.98	-90.58	85.32	-2,575.83	2,267.44	1,978.82	288.62	7.856		
7,900.00	6,987.91	7,104.49	6,944.36	35.99	254.02	-90.61	85.33	-2,575.83	2,222.92	1,933.34	289.57	7.677		
8,000.00	6,987.83	7,105.03	6,944.89	36.93	254.04	-90.64	85.34	-2,575.83	2,178.88	1,888.34	290.54	7.499		
8,100.00	6,987.76	7,105.51	6,945.37	37.88	254.07	-90.66	85.35	-2,575.83	2,135.42	1,843.89	291.52	7.325		
8,200.00	6,987.68	7,105.95	6,945.81	38.86	254.09	-90.69	85.35	-2,575.83	2,092.62	1,800.10	292.51	7.154		
8,300.00	6,987.61	7,106.34	6,946.20	39.86	254.12	-90.71	85.36	-2,575.83	2,050.57	1,757.07	293.51	6.986		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		300-MWD OWSG Rev5						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
8,400.00	6,987.53	7,106.67	6,946.54	40.87	254.13	-90.74	85.36	-2,575.83	2,009.39	1,714.90	294.49	6.823	
8,500.00	6,987.46	7,106.96	6,946.82	41.90	254.15	-90.76	85.37	-2,575.83	1,969.17	1,673.70	295.47	6.665	
8,600.00	6,987.38	7,107.20	6,947.06	42.93	254.16	-90.78	85.37	-2,575.83	1,930.02	1,633.60	296.42	6.511	
8,700.00	6,987.31	7,107.38	6,947.25	43.98	254.17	-90.80	85.37	-2,575.83	1,892.07	1,594.72	297.35	6.363	
8,800.00	6,987.23	7,107.52	6,947.38	45.03	254.18	-90.82	85.38	-2,575.83	1,855.43	1,557.18	298.24	6.221	
8,872.16	6,987.18	7,107.59	6,947.45	45.79	254.18	-90.83	85.38	-2,575.83	1,829.87	1,531.02	298.85	6.123	
8,900.00	6,987.16	7,107.61	6,947.47	46.08	254.18	-90.83	85.38	-2,575.83	1,820.35	1,521.26	299.08	6.086	
9,000.00	6,987.09	7,107.68	6,947.54	47.16	254.19	-90.83	85.38	-2,575.83	1,789.30	1,489.42	299.88	5.967	
9,100.00	6,987.01	7,107.75	6,947.62	48.27	254.19	-90.83	85.38	-2,575.83	1,763.38	1,462.77	300.62	5.866	
9,200.00	6,986.94	7,107.83	6,947.69	49.40	254.20	-90.83	85.38	-2,575.83	1,742.83	1,441.55	301.28	5.785	
9,300.00	6,986.86	7,107.90	6,947.76	50.56	254.20	-90.84	85.38	-2,575.83	1,727.82	1,425.97	301.86	5.724	
9,400.00	6,986.79	7,107.97	6,947.84	51.75	254.20	-90.84	85.38	-2,575.83	1,718.52	1,416.19	302.33	5.684	
9,500.00	6,986.71	7,108.05	6,947.91	52.95	254.21	-90.84	85.38	-2,575.83	1,715.00	1,412.30	302.70	5.666	
9,510.36	6,986.71	7,108.05	6,947.92	53.08	254.21	-90.84	85.38	-2,575.83	1,714.97	1,412.24	302.73	5.665	CC, ES, SF
9,600.00	6,986.64	7,108.12	6,947.98	54.18	254.21	-90.84	85.39	-2,575.83	1,717.31	1,414.36	302.95	5.669	
9,700.00	6,986.56	7,108.19	6,948.06	55.42	254.22	-90.85	85.39	-2,575.83	1,725.42	1,422.35	303.08	5.693	
9,800.00	6,986.49	7,108.27	6,948.13	56.69	254.22	-90.85	85.39	-2,575.83	1,739.26	1,436.16	303.09	5.738	
9,900.00	6,986.41	7,108.34	6,948.20	57.97	254.22	-90.85	85.39	-2,575.83	1,758.68	1,455.68	303.00	5.804	
10,000.00	6,986.34	7,108.41	6,948.28	59.26	254.23	-90.85	85.39	-2,575.83	1,783.50	1,480.70	302.80	5.890	
10,100.00	6,986.27	7,108.49	6,948.35	60.57	254.23	-90.86	85.39	-2,575.83	1,813.51	1,510.99	302.51	5.995	
10,200.00	6,986.19	7,108.56	6,948.42	61.90	254.24	-90.86	85.39	-2,575.83	1,848.44	1,546.30	302.14	6.118	
10,300.00	6,986.12	7,108.63	6,948.50	63.23	254.24	-90.86	85.39	-2,575.83	1,888.03	1,586.32	301.71	6.258	
10,400.00	6,986.04	7,108.71	6,948.57	64.58	254.24	-90.86	85.39	-2,575.83	1,931.99	1,630.76	301.23	6.414	
10,500.00	6,985.97	7,108.78	6,948.64	65.94	254.25	-90.87	85.40	-2,575.83	1,980.03	1,679.32	300.70	6.585	
10,600.00	6,985.89	7,108.85	6,948.72	67.32	254.25	-90.87	85.40	-2,575.84	2,031.86	1,731.70	300.15	6.769	
10,700.00	6,985.82	7,108.93	6,948.79	68.70	254.26	-90.87	85.40	-2,575.84	2,087.19	1,787.61	299.59	6.967	
10,800.00	6,985.74	7,109.00	6,948.86	70.09	254.26	-90.87	85.40	-2,575.84	2,145.76	1,846.75	299.01	7.176	
10,900.00	6,985.67	7,109.07	6,948.94	71.49	254.26	-90.88	85.40	-2,575.84	2,207.31	1,908.88	298.43	7.396	
11,000.00	6,985.59	7,109.15	6,949.01	72.90	254.27	-90.88	85.40	-2,575.84	2,271.60	1,973.74	297.86	7.626	
11,100.00	6,985.52	7,109.22	6,949.08	74.31	254.27	-90.88	85.40	-2,575.84	2,338.39	2,041.09	297.30	7.865	
11,200.00	6,985.45	7,109.29	6,949.16	75.74	254.28	-90.88	85.40	-2,575.84	2,407.49	2,110.74	296.75	8.113	
11,300.00	6,985.37	7,109.37	6,949.23	77.17	254.28	-90.89	85.40	-2,575.84	2,478.70	2,182.47	296.23	8.368	
11,400.00	6,985.30	7,109.44	6,949.30	78.61	254.28	-90.89	85.41	-2,575.84	2,551.84	2,256.12	295.71	8.629	
11,500.00	6,985.22	7,109.51	6,949.38	80.05	254.29	-90.89	85.41	-2,575.84	2,626.75	2,331.52	295.23	8.897	
11,600.00	6,985.15	7,109.59	6,949.45	81.50	254.29	-90.89	85.41	-2,575.84	2,703.28	2,408.52	294.76	9.171	
11,700.00	6,985.07	7,109.66	6,949.52	82.96	254.30	-90.90	85.41	-2,575.84	2,781.30	2,486.99	294.31	9.450	
11,800.00	6,985.00	7,109.74	6,949.60	84.42	254.30	-90.90	85.41	-2,575.84	2,860.70	2,566.81	293.89	9.734	
11,900.00	6,984.92	7,109.81	6,949.67	85.89	254.30	-90.90	85.41	-2,575.84	2,941.35	2,647.86	293.48	10.022	
12,000.00	6,984.85	7,109.88	6,949.74	87.36	254.31	-90.90	85.41	-2,575.84	3,023.15	2,730.05	293.10	10.314	
12,100.00	6,984.77	7,109.96	6,949.82	88.83	254.31	-90.91	85.41	-2,575.84	3,106.02	2,813.28	292.74	10.610	
12,200.00	6,984.70	7,110.03	6,949.89	90.31	254.32	-90.91	85.41	-2,575.84	3,189.87	2,897.47	292.40	10.909	
12,300.00	6,984.63	7,110.10	6,949.96	91.80	254.32	-90.91	85.41	-2,575.84	3,274.63	2,982.55	292.08	11.211	
12,400.00	6,984.55	7,110.18	6,950.04	93.29	254.32	-90.91	85.42	-2,575.84	3,360.23	3,068.45	291.78	11.516	
12,500.00	6,984.48	7,110.25	6,950.11	94.78	254.33	-90.92	85.42	-2,575.84	3,446.60	3,155.11	291.49	11.824	
12,600.00	6,984.40	7,110.32	6,950.19	96.28	254.33	-90.92	85.42	-2,575.84	3,533.70	3,242.47	291.22	12.134	
12,700.00	6,984.33	7,110.40	6,950.26	97.78	254.34	-90.92	85.42	-2,575.84	3,621.45	3,330.48	290.97	12.446	
12,800.00	6,984.25	7,110.47	6,950.33	99.28	254.34	-90.92	85.42	-2,575.84	3,709.83	3,419.10	290.74	12.760	
12,900.00	6,984.18	7,110.54	6,950.41	100.78	254.34	-90.93	85.42	-2,575.84	3,798.79	3,508.27	290.51	13.076	
13,000.00	6,984.10	7,110.62	6,950.48	102.29	254.35	-90.93	85.42	-2,575.84	3,888.28	3,597.97	290.31	13.394	
13,100.00	6,984.03	7,110.69	6,950.55	103.80	254.35	-90.93	85.42	-2,575.84	3,978.27	3,688.16	290.11	13.713	
13,200.00	6,983.95	7,110.76	6,950.63	105.32	254.36	-90.93	85.42	-2,575.84	4,068.73	3,778.80	289.93	14.034	
13,300.00	6,983.88	7,110.84	6,950.70	106.84	254.36	-90.94	85.43	-2,575.84	4,159.63	3,869.87	289.76	14.356	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY											Offset Site Error: 0.00 usft		
Survey Program: 300-MWD OWSG Rev5				Rule Assigned:								Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
13,400.00	6,983.81	7,110.91	6,950.77	108.36	254.36	-90.94	85.43	-2,575.84	4,250.93	3,961.33	289.60	14.679	
13,500.00	6,983.73	7,110.98	6,950.85	109.88	254.37	-90.94	85.43	-2,575.84	4,342.62	4,053.17	289.45	15.003	
13,600.00	6,983.66	7,111.06	6,950.92	111.40	254.37	-90.94	85.43	-2,575.84	4,434.67	4,145.36	289.31	15.328	
13,700.00	6,983.58	7,111.13	6,950.99	112.93	254.38	-90.95	85.43	-2,575.84	4,527.05	4,237.87	289.18	15.655	
13,800.00	6,983.51	7,111.21	6,951.07	114.46	254.38	-90.95	85.43	-2,575.84	4,619.76	4,330.69	289.06	15.982	
13,900.00	6,983.43	7,111.28	6,951.14	115.99	254.38	-90.95	85.43	-2,575.84	4,712.76	4,423.80	288.95	16.310	
14,000.00	6,983.36	7,111.35	6,951.21	117.52	254.39	-90.95	85.43	-2,575.84	4,806.04	4,517.19	288.85	16.639	
14,100.00	6,983.28	7,111.43	6,951.29	119.06	254.39	-90.95	85.43	-2,575.84	4,899.58	4,610.83	288.75	16.968	
14,200.00	6,983.21	7,111.50	6,951.36	120.59	254.40	-90.96	85.44	-2,575.84	4,993.38	4,704.72	288.67	17.298	
14,300.00	6,983.13	7,111.57	6,951.44	122.13	254.40	-90.96	85.44	-2,575.84	5,087.41	4,798.83	288.58	17.629	
14,400.00	6,983.06	7,111.65	6,951.51	123.67	254.40	-90.96	85.44	-2,575.84	5,181.67	4,893.16	288.51	17.960	
14,500.00	6,982.99	7,111.72	6,951.58	125.21	254.41	-90.96	85.44	-2,575.84	5,276.14	4,987.70	288.44	18.292	
14,600.00	6,982.91	7,111.79	6,951.66	126.75	254.41	-90.97	85.44	-2,575.84	5,370.81	5,082.43	288.38	18.624	
14,700.00	6,982.84	7,111.87	6,951.73	128.30	254.42	-90.97	85.44	-2,575.84	5,465.67	5,177.34	288.32	18.957	
14,800.00	6,982.76	7,111.94	6,951.80	129.85	254.42	-90.97	85.44	-2,575.84	5,560.70	5,272.43	288.27	19.290	
14,900.00	6,982.69	7,112.02	6,951.88	131.39	254.42	-90.97	85.44	-2,575.84	5,655.91	5,367.69	288.23	19.623	
15,000.00	6,982.61	7,112.09	6,951.95	132.94	254.43	-90.98	85.44	-2,575.84	5,751.29	5,463.10	288.19	19.957	
15,100.00	6,982.54	7,112.16	6,952.02	134.49	254.43	-90.98	85.45	-2,575.84	5,846.81	5,558.66	288.15	20.291	
15,200.00	6,982.46	7,112.24	6,952.10	136.04	254.44	-90.98	85.45	-2,575.84	5,942.49	5,654.36	288.12	20.625	
15,300.00	6,982.39	7,112.31	6,952.17	137.60	254.44	-90.98	85.45	-2,575.84	6,038.30	5,750.21	288.09	20.959	
15,400.00	6,982.31	7,112.38	6,952.25	139.15	254.44	-90.99	85.45	-2,575.84	6,134.25	5,846.18	288.07	21.294	
15,500.00	6,982.24	7,112.46	6,952.32	140.70	254.45	-90.99	85.45	-2,575.84	6,230.32	5,942.27	288.05	21.629	
15,600.00	6,982.17	7,112.53	6,952.39	142.26	254.45	-90.99	85.45	-2,575.84	6,326.52	6,038.48	288.04	21.964	
15,700.00	6,982.09	7,112.60	6,952.47	143.82	254.46	-90.99	85.45	-2,575.84	6,422.83	6,134.80	288.03	22.299	
15,800.00	6,982.02	7,112.68	6,952.54	145.38	254.46	-91.00	85.45	-2,575.84	6,519.26	6,231.24	288.02	22.635	
15,900.00	6,981.94	7,112.75	6,952.61	146.94	254.46	-91.00	85.45	-2,575.84	6,615.79	6,327.77	288.02	22.970	
16,000.00	6,981.87	7,112.83	6,952.69	148.50	254.47	-91.00	85.46	-2,575.84	6,712.42	6,424.40	288.02	23.306	
16,100.00	6,981.79	7,112.90	6,952.76	150.06	254.47	-91.00	85.46	-2,575.84	6,809.15	6,521.13	288.02	23.641	
16,200.00	6,981.72	7,112.97	6,952.84	151.62	254.48	-91.01	85.46	-2,575.84	6,905.97	6,617.95	288.02	23.977	
16,300.00	6,981.64	7,113.05	6,952.91	153.18	254.48	-91.01	85.46	-2,575.84	7,002.88	6,714.85	288.03	24.313	
16,400.00	6,981.57	7,113.12	6,952.98	154.74	254.48	-91.01	85.46	-2,575.84	7,099.88	6,811.84	288.04	24.649	
16,500.00	6,981.49	7,113.19	6,953.06	156.31	254.49	-91.01	85.46	-2,575.84	7,196.96	6,908.90	288.06	24.985	
16,600.00	6,981.42	7,113.27	6,953.13	157.87	254.49	-91.02	85.46	-2,575.84	7,294.12	7,006.04	288.07	25.320	
16,700.00	6,981.35	7,113.34	6,953.20	159.44	254.50	-91.02	85.46	-2,575.84	7,391.35	7,103.26	288.09	25.656	
16,800.00	6,981.27	7,113.42	6,953.28	161.01	254.50	-91.02	85.46	-2,575.84	7,488.66	7,200.54	288.11	25.992	
16,900.00	6,981.20	7,113.49	6,953.35	162.58	254.50	-91.02	85.46	-2,575.84	7,586.03	7,297.90	288.14	26.328	
17,000.00	6,981.12	7,113.56	6,953.43	164.14	254.51	-91.03	85.47	-2,575.84	7,683.48	7,395.31	288.16	26.664	
17,100.00	6,981.05	7,113.64	6,953.50	165.71	254.51	-91.03	85.47	-2,575.84	7,780.99	7,492.80	288.19	26.999	
17,200.00	6,980.97	7,113.71	6,953.57	167.28	254.52	-91.03	85.47	-2,575.84	7,878.56	7,590.34	288.22	27.335	
17,300.00	6,980.90	7,113.78	6,953.65	168.85	254.52	-91.03	85.47	-2,575.84	7,976.19	7,687.94	288.25	27.671	
17,400.00	6,980.82	7,113.86	6,953.72	170.42	254.52	-91.04	85.47	-2,575.84	8,073.88	7,785.59	288.29	28.006	
17,500.00	6,980.75	7,113.93	6,953.79	172.00	254.53	-91.04	85.47	-2,575.84	8,171.63	7,883.30	288.33	28.342	
17,600.00	6,980.67	7,114.01	6,953.87	173.57	254.53	-91.04	85.47	-2,575.84	8,269.43	7,981.06	288.36	28.677	
17,700.00	6,980.60	7,114.08	6,953.94	175.14	254.54	-91.04	85.47	-2,575.84	8,367.28	8,078.87	288.40	29.012	
17,800.00	6,980.53	7,114.15	6,954.02	176.71	254.54	-91.05	85.47	-2,575.84	8,465.18	8,176.73	288.45	29.348	
17,900.00	6,980.45	7,114.23	6,954.09	178.29	254.54	-91.05	85.48	-2,575.84	8,563.13	8,274.64	288.49	29.683	
18,000.00	6,980.38	7,114.30	6,954.16	179.86	254.55	-91.05	85.48	-2,575.84	8,661.13	8,372.59	288.54	30.018	
18,100.00	6,980.30	7,114.38	6,954.24	181.44	254.55	-91.05	85.48	-2,575.84	8,759.17	8,470.59	288.58	30.352	
18,200.00	6,980.23	7,114.45	6,954.31	183.01	254.56	-91.06	85.48	-2,575.84	8,857.25	8,568.62	288.63	30.687	
18,300.00	6,980.15	7,114.52	6,954.39	184.59	254.56	-91.06	85.48	-2,575.84	8,955.38	8,666.70	288.68	31.022	
18,400.00	6,980.08	7,114.60	6,954.46	186.16	254.56	-91.06	85.48	-2,575.84	9,053.55	8,764.82	288.73	31.356	
18,500.00	6,980.00	7,114.67	6,954.53	187.74	254.57	-91.06	85.48	-2,575.84	9,151.76	8,862.98	288.79	31.691	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #80B - OH - OH-SVY											Offset Site Error: 0.00 usft
Survey Program: 300-MWD OWSG Rev5											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	
18,600.00	6,979.93	7,114.74	6,954.61	189.32	254.57	-91.07	85.48	-2,575.84	9,250.01	8,961.17	32.025
18,700.00	6,979.85	7,114.82	6,954.68	190.90	254.58	-91.07	85.48	-2,575.84	9,348.29	9,059.40	32.359
18,800.00	6,979.78	7,114.89	6,954.75	192.48	254.58	-91.07	85.49	-2,575.84	9,446.61	9,157.66	32.693
18,900.00	6,979.71	7,114.97	6,954.83	194.05	254.58	-91.07	85.49	-2,575.84	9,544.97	9,255.96	33.026
19,000.00	6,979.63	7,115.04	6,954.90	195.63	254.59	-91.08	85.49	-2,575.84	9,643.36	9,354.29	33.360
19,100.00	6,979.56	7,115.11	6,954.98	197.21	254.59	-91.08	85.49	-2,575.84	9,741.78	9,452.65	33.693
19,200.00	6,979.48	7,115.19	6,955.05	198.79	254.60	-91.08	85.49	-2,575.84	9,840.24	9,551.04	34.026
19,300.00	6,979.41	7,115.26	6,955.12	200.37	254.60	-91.08	85.49	-2,575.84	9,938.72	9,649.46	34.359
19,400.00	6,979.33	7,115.34	6,955.20	201.95	254.60	-91.09	85.49	-2,575.84	10,037.24	9,747.91	34.692
19,500.00	6,979.26	7,115.41	6,955.27	203.54	254.61	-91.09	85.49	-2,575.84	10,135.78	9,846.39	35.025
19,600.00	6,979.18	7,115.48	6,955.35	205.12	254.61	-91.09	85.49	-2,575.84	10,234.35	9,944.90	35.357
19,700.00	6,979.11	7,115.56	6,955.42	206.70	254.62	-91.09	85.50	-2,575.84	10,332.95	10,043.43	35.689
19,800.00	6,979.03	7,115.63	6,955.49	208.28	254.62	-91.10	85.50	-2,575.84	10,431.58	10,141.98	36.022
19,900.00	6,978.96	7,115.71	6,955.57	209.86	254.62	-91.10	85.50	-2,575.84	10,530.23	10,240.57	36.353
20,000.00	6,978.89	7,115.78	6,955.64	211.45	254.63	-91.10	85.50	-2,575.84	10,628.91	10,339.17	36.685
20,100.00	6,978.81	7,115.85	6,955.72	213.03	254.63	-91.10	85.50	-2,575.84	10,727.61	10,437.80	37.016
20,200.00	6,978.74	7,115.93	6,955.79	214.61	254.64	-91.11	85.50	-2,575.84	10,826.33	10,536.45	37.348
20,300.00	6,978.66	7,116.00	6,955.86	216.20	254.64	-91.11	85.50	-2,575.85	10,925.08	10,635.13	37.679
20,400.00	6,978.59	7,116.08	6,955.94	217.78	254.64	-91.11	85.50	-2,575.85	11,023.85	10,733.83	38.010
20,500.00	6,978.51	7,116.15	6,956.01	219.37	254.65	-91.11	85.50	-2,575.85	11,122.65	10,832.54	38.340
20,600.00	6,978.44	7,116.22	6,956.09	220.95	254.65	-91.12	85.51	-2,575.85	11,221.46	10,931.28	38.670
20,700.00	6,978.36	7,116.30	6,956.16	222.53	254.66	-91.12	85.51	-2,575.85	11,320.30	11,030.04	39.001
20,800.00	6,978.29	7,116.37	6,956.23	224.12	254.66	-91.12	85.51	-2,575.85	11,419.15	11,128.82	39.331
20,900.00	6,978.21	7,116.45	6,956.31	225.71	254.66	-91.12	85.51	-2,575.85	11,518.03	11,227.61	39.660
21,000.00	6,978.14	7,116.52	6,956.38	227.29	254.67	-91.13	85.51	-2,575.85	11,616.92	11,326.43	39.990
21,100.00	6,978.07	7,116.59	6,956.46	228.88	254.67	-91.13	85.51	-2,575.85	11,715.84	11,425.26	40.319
21,200.00	6,977.99	7,116.67	6,956.53	230.46	254.68	-91.13	85.51	-2,575.85	11,814.77	11,524.11	40.648
21,300.00	6,977.92	7,116.74	6,956.60	232.05	254.68	-91.13	85.51	-2,575.85	11,913.72	11,622.98	40.977
21,400.00	6,977.84	7,116.82	6,956.68	233.64	254.68	-91.14	85.51	-2,575.85	12,012.69	11,721.86	41.305
21,500.00	6,977.77	7,116.89	6,956.75	235.22	254.69	-91.14	85.51	-2,575.85	12,111.67	11,820.76	41.633
21,600.00	6,977.69	7,116.96	6,956.83	236.81	254.69	-91.14	85.52	-2,575.85	12,210.67	11,919.67	41.961
21,700.00	6,977.62	7,117.04	6,956.90	238.40	254.70	-91.14	85.52	-2,575.85	12,309.69	12,018.60	42.289
21,800.00	6,977.54	7,117.11	6,956.97	239.99	254.70	-91.14	85.52	-2,575.85	12,408.72	12,117.55	42.617
21,900.00	6,977.47	7,117.19	6,957.05	241.57	254.70	-91.15	85.52	-2,575.85	12,507.77	12,216.51	42.944
22,000.00	6,977.39	7,117.26	6,957.12	243.16	254.71	-91.15	85.52	-2,575.85	12,606.83	12,315.49	43.271
22,100.00	6,977.32	7,117.33	6,957.20	244.75	254.71	-91.15	85.52	-2,575.85	12,705.91	12,414.48	43.598
22,200.00	6,977.25	7,117.41	6,957.27	246.34	254.72	-91.15	85.52	-2,575.85	12,805.00	12,513.48	43.924
22,300.00	6,977.17	7,117.48	6,957.34	247.93	254.72	-91.16	85.52	-2,575.85	12,904.11	12,612.49	44.251
22,400.00	6,977.10	7,117.56	6,957.42	249.52	254.72	-91.16	85.52	-2,575.85	13,003.23	12,711.52	44.577
22,500.00	6,977.02	7,117.63	6,957.49	251.11	254.73	-91.16	85.53	-2,575.85	13,102.36	12,810.56	44.903
22,529.62	6,977.00	7,117.65	6,957.51	251.58	254.73	-91.16	85.53	-2,575.85	13,131.72	12,839.90	44.999

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 235-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	429.01	429.00	0.00	9.13	94.04	-433.12	6,136.47	6,151.74				
100.00	100.00	528.49	528.46	0.25	11.25	94.03	-432.02	6,136.47	6,151.66	6,140.16	11.50	534.980 CC	
200.00	200.00	627.06	627.03	0.61	13.35	94.03	-432.30	6,136.47	6,151.68	6,137.73	13.96	440.815	
300.00	300.00	725.64	725.60	0.97	15.44	94.04	-432.92	6,136.47	6,151.73	6,135.32	16.41	374.836	
400.00	400.00	829.09	829.00	1.33	17.65	94.04	-433.12	6,136.47	6,151.74	6,132.77	18.97	324.252	
500.00	500.00	929.09	929.00	1.68	19.77	94.04	-433.12	6,136.47	6,151.74	6,130.28	21.46	286.676	
550.00	550.00	979.09	979.00	1.86	20.84	94.04	-433.12	6,136.47	6,151.74	6,129.04	22.70	270.975	
571.41	571.41	1,000.49	1,000.39	1.94	21.29	96.41	-432.03	6,136.47	6,151.67	6,128.44	23.23	264.766	
600.00	600.00	1,028.66	1,028.56	2.04	21.89	96.42	-432.04	6,136.47	6,151.71	6,127.78	23.94	257.004	
700.00	699.93	1,127.10	1,127.00	2.40	23.99	96.44	-432.31	6,136.47	6,152.12	6,125.73	26.39	233.131	
800.00	799.68	1,225.33	1,225.21	2.77	26.08	96.49	-432.91	6,136.47	6,152.96	6,124.12	28.84	213.362	
900.00	899.13	1,328.30	1,328.13	3.13	28.34	96.57	-433.12	6,136.47	6,154.17	6,122.70	31.46	195.613	
1,000.00	998.15	1,427.32	1,427.15	3.49	30.53	96.67	-433.12	6,136.47	6,155.79	6,121.76	34.03	180.919	
1,100.00	1,096.63	1,525.23	1,525.06	3.87	32.70	96.77	-432.08	6,136.47	6,157.77	6,121.19	36.58	168.360	
1,130.50	1,126.54	1,554.62	1,554.44	3.99	33.36	96.81	-432.13	6,136.47	6,158.49	6,121.15	37.34	164.910	
1,200.00	1,194.61	1,621.47	1,621.29	4.26	34.84	96.94	-432.35	6,136.47	6,160.22	6,121.12	39.10	157.554	
1,300.00	1,292.57	1,717.54	1,717.35	4.66	36.97	97.12	-432.96	6,136.47	6,162.79	6,121.16	41.63	148.044	
1,400.00	1,390.52	1,819.78	1,819.52	5.07	39.31	97.31	-433.12	6,136.47	6,165.38	6,121.01	44.38	138.933	
1,500.00	1,488.48	1,917.74	1,917.48	5.48	41.57	97.50	-433.12	6,136.47	6,168.03	6,120.98	47.05	131.101	
1,600.00	1,586.43	2,014.95	2,014.68	5.90	43.82	97.66	-431.77	6,136.47	6,170.61	6,120.91	49.71	124.143 ES	
1,700.00	1,684.38	2,110.39	2,110.10	6.31	46.02	97.84	-432.09	6,136.47	6,173.42	6,121.09	52.32	117.983	
1,800.00	1,782.34	2,205.66	2,205.37	6.73	48.22	98.03	-432.81	6,136.47	6,176.33	6,121.39	54.94	112.415	
1,900.00	1,880.29	2,309.67	2,309.29	7.15	50.69	98.22	-433.12	6,136.47	6,179.26	6,121.43	57.84	106.843	
2,000.00	1,978.25	2,407.63	2,407.25	7.58	53.05	98.40	-433.12	6,136.47	6,182.23	6,121.62	60.61	101.995	
2,100.00	2,076.20	2,505.06	2,504.66	8.00	55.39	98.57	-431.75	6,136.47	6,185.11	6,121.73	63.38	97.589	
2,200.00	2,174.15	2,600.11	2,599.71	8.43	57.68	98.75	-432.02	6,136.47	6,188.23	6,122.14	66.09	93.634	
2,300.00	2,272.11	2,695.01	2,694.60	8.85	59.96	98.93	-432.68	6,136.47	6,191.47	6,122.67	68.80	89.996	
2,400.00	2,370.06	2,799.59	2,799.06	9.28	62.54	99.12	-433.12	6,136.47	6,194.74	6,122.94	71.80	86.279	
2,500.00	2,468.02	2,897.54	2,897.02	9.71	64.99	99.30	-433.12	6,136.47	6,198.03	6,123.35	74.68	82.994	
2,600.00	2,565.97	2,995.24	2,994.69	10.14	67.44	99.47	-431.48	6,136.47	6,201.17	6,123.62	77.56	79.957	
2,700.00	2,663.92	3,089.25	3,088.69	10.57	69.80	99.64	-431.75	6,136.47	6,204.62	6,124.28	80.34	77.230	
2,800.00	2,761.88	3,183.08	3,182.51	11.00	72.15	99.82	-432.47	6,136.47	6,208.19	6,125.07	83.12	74.690	
2,900.00	2,859.83	3,289.53	3,288.83	11.43	74.92	100.02	-433.12	6,136.47	6,211.82	6,125.50	86.32	71.964	
3,000.00	2,957.79	3,385.67	3,384.96	11.86	77.53	100.19	-432.31	6,136.47	6,215.31	6,125.96	89.35	69.561	
3,100.00	3,055.74	3,475.38	3,474.66	12.29	79.96	100.36	-432.92	6,136.47	6,219.07	6,126.86	92.21	67.446	
3,200.00	3,153.69	3,563.51	3,562.69	12.72	83.08	100.56	-433.12	6,136.47	6,222.82	6,127.05	95.76	64.981	
3,300.00	3,251.65	3,661.46	3,660.65	13.15	85.95	100.74	-433.12	6,136.47	6,226.61	6,127.55	99.06	62.859	
3,400.00	3,349.60	3,777.10	3,776.25	13.59	88.75	100.89	-430.98	6,136.47	6,230.14	6,127.86	102.28	60.911	
3,500.00	3,447.56	3,868.88	3,868.00	14.02	91.43	101.06	-431.50	6,136.47	6,234.14	6,128.75	105.40	59.150	
3,600.00	3,545.51	3,960.44	3,959.53	14.45	94.11	101.24	-432.61	6,136.47	6,238.30	6,129.80	108.50	57.495	
3,700.00	3,643.46	4,073.58	4,072.46	14.88	97.17	101.45	-433.12	6,136.47	6,242.41	6,130.41	112.00	55.737	
3,800.00	3,741.42	4,171.54	4,170.42	15.32	99.75	101.63	-433.12	6,136.47	6,246.52	6,131.52	115.00	54.318	
3,900.00	3,839.37	4,267.62	4,266.46	15.75	102.27	101.78	-430.96	6,136.47	6,250.32	6,132.37	117.95	52.990	
4,000.00	3,937.33	4,358.81	4,357.63	16.18	104.67	101.95	-431.41	6,136.47	6,254.63	6,133.85	120.78	51.787	
4,100.00	4,035.28	4,449.78	4,448.58	16.62	107.06	102.12	-432.45	6,136.47	6,259.11	6,135.51	123.59	50.643	
4,200.00	4,133.23	4,563.56	4,562.23	17.05	109.82	102.33	-433.12	6,136.47	6,263.56	6,136.77	126.79	49.402	
4,300.00	4,231.19	4,661.51	4,660.19	17.48	112.09	102.51	-433.12	6,136.47	6,267.97	6,138.49	129.48	48.407	
4,400.00	4,329.14	4,758.58	4,757.24	17.92	114.33	102.67	-431.77	6,136.47	6,272.20	6,140.04	132.16	47.460	
4,500.00	4,427.10	4,851.77	4,850.43	18.35	116.49	102.84	-432.03	6,136.47	6,276.79	6,142.04	134.74	46.583	
4,600.00	4,525.05	4,944.82	4,943.46	18.78	118.64	103.01	-432.67	6,136.47	6,281.51	6,144.19	137.32	45.742	
4,700.00	4,623.00	5,053.45	5,052.00	19.22	121.16	103.21	-433.12	6,136.47	6,286.25	6,145.98	140.27	44.816	
4,800.00	4,720.96	5,151.40	5,149.96	19.65	123.43	103.39	-433.12	6,136.47	6,290.97	6,148.00	142.96	44.004	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC											Offset Site Error: 0.00 usft		
Survey Program: Reference		235-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance			Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,900.00	4,818.91	5,248.87	5,247.41	20.09	125.68	103.55	-431.76	6,136.47	6,295.48	6,149.83	145.65	43.224	
5,000.00	4,916.87	5,341.70	5,340.23	20.52	127.83	103.72	-431.98	6,136.47	6,300.36	6,152.14	148.22	42.506	
5,100.00	5,014.82	5,434.38	5,432.91	20.96	129.98	103.89	-432.58	6,136.47	6,305.39	6,154.60	150.80	41.814	
5,200.00	5,112.77	5,543.34	5,541.77	21.39	132.55	104.08	-433.12	6,136.47	6,310.46	6,156.65	153.80	41.030	
5,300.00	5,210.73	5,641.29	5,639.73	21.82	134.92	104.26	-433.12	6,136.47	6,315.48	6,158.88	156.60	40.329	
5,400.00	5,308.68	5,739.24	5,737.68	22.26	137.29	104.43	-433.12	6,136.47	6,320.56	6,161.17	159.39	39.654	
5,493.23	5,400.00	5,830.56	5,829.00	22.66	139.50	104.59	-433.12	6,136.47	6,325.36	6,163.35	162.00	39.045	
5,500.00	5,406.64	5,837.20	5,835.64	22.69	139.66	104.61	-433.12	6,136.47	6,325.71	6,163.51	162.19	39.002	
5,600.00	5,504.69	5,935.25	5,933.69	23.12	142.03	104.80	-433.12	6,136.47	6,330.78	6,165.80	164.99	38.371	
5,700.00	5,602.91	5,990.00	5,988.29	23.55	143.36	104.91	-433.12	6,136.47	6,335.84	6,169.12	166.72	38.003	
5,800.00	5,701.29	5,990.00	5,988.29	23.97	143.36	104.94	-433.12	6,136.47	6,342.01	6,174.93	167.09	37.956	
5,900.00	5,799.82	5,990.00	5,988.29	24.39	143.36	104.98	-433.12	6,136.47	6,349.53	6,182.12	167.41	37.929	
6,000.00	5,898.50	5,990.00	5,988.29	24.79	143.36	105.02	-433.12	6,136.47	6,358.39	6,190.70	167.68	37.919 SF	
6,100.00	5,997.31	5,990.00	5,988.29	25.20	143.36	105.07	-433.12	6,136.47	6,368.58	6,200.66	167.91	37.928	
6,200.00	6,096.26	5,990.00	5,988.29	25.60	143.36	105.13	-433.12	6,136.47	6,380.09	6,211.99	168.10	37.954	
6,300.00	6,195.33	5,990.00	5,988.29	25.99	143.36	105.19	-433.12	6,136.47	6,392.93	6,224.69	168.24	37.999	
6,400.00	6,294.51	5,990.00	5,988.29	26.37	143.36	105.26	-433.12	6,136.47	6,407.07	6,238.73	168.34	38.060	
6,498.19	6,392.00	5,990.00	5,988.29	26.75	143.36	105.33	-433.12	6,136.47	6,422.22	6,253.83	168.39	38.138	
6,500.00	6,393.80	5,990.00	5,988.29	26.76	143.36	106.53	-433.12	6,136.47	6,422.52	6,254.12	168.39	38.140	
6,550.00	6,443.29	5,990.00	5,988.29	26.95	143.36	129.04	-433.12	6,136.47	6,432.74	6,264.33	168.41	38.196	
6,600.00	6,492.24	5,990.00	5,988.29	27.16	143.36	139.46	-433.12	6,136.47	6,447.00	6,278.57	168.43	38.277	
6,650.00	6,540.33	5,990.00	5,988.29	27.38	143.36	144.82	-433.12	6,136.47	6,465.17	6,296.72	168.45	38.380	
6,700.00	6,587.28	5,990.00	5,988.29	27.60	143.36	147.76	-433.12	6,136.47	6,487.11	6,318.64	168.47	38.506	
6,750.00	6,632.80	5,990.00	5,988.29	27.84	143.36	149.34	-433.12	6,136.47	6,512.64	6,344.15	168.49	38.653	
6,800.00	6,676.60	5,990.00	5,988.29	28.09	143.36	150.01	-433.12	6,136.47	6,541.58	6,373.07	168.51	38.820	
6,850.00	6,718.42	5,990.00	5,988.29	28.34	143.36	149.99	-433.12	6,136.47	6,573.69	6,405.16	168.53	39.005	
6,900.00	6,758.00	5,990.00	5,988.29	28.60	143.36	149.34	-433.12	6,136.47	6,608.74	6,440.18	168.56	39.207	
6,950.00	6,795.09	5,990.00	5,988.29	28.87	143.36	148.07	-433.12	6,136.47	6,646.46	6,477.87	168.59	39.424	
7,000.00	6,829.46	5,990.00	5,988.29	29.14	143.36	146.08	-433.12	6,136.47	6,686.58	6,517.96	168.62	39.654	
7,050.00	6,860.91	5,990.00	5,988.29	29.43	143.36	143.20	-433.12	6,136.47	6,728.81	6,560.15	168.66	39.896	
7,100.00	6,889.24	5,990.00	5,988.29	29.73	143.36	139.13	-433.12	6,136.47	6,772.85	6,604.15	168.71	40.146	
7,150.00	6,914.27	5,990.00	5,988.29	30.05	143.36	133.42	-433.12	6,136.47	6,818.40	6,649.64	168.76	40.404	
7,200.00	6,935.85	5,990.00	5,988.29	30.37	143.36	125.36	-433.12	6,136.47	6,865.15	6,696.33	168.82	40.666	
7,250.00	6,953.84	5,990.00	5,988.29	30.71	143.36	114.09	-433.12	6,136.47	6,912.79	6,743.91	168.89	40.932	
7,300.00	6,968.15	5,990.00	5,988.29	31.06	143.36	99.08	-433.12	6,136.47	6,961.01	6,792.05	168.96	41.198	
7,350.00	6,978.67	5,990.00	5,988.29	31.42	143.36	81.40	-433.12	6,136.47	7,009.51	6,840.46	169.05	41.464	
7,400.00	6,985.34	5,990.00	5,988.29	31.79	143.36	64.10	-433.12	6,136.47	7,057.99	6,888.84	169.15	41.727	
7,450.00	6,988.13	5,990.00	5,988.29	32.17	143.36	49.86	-433.12	6,136.47	7,106.14	6,936.88	169.26	41.984	
7,461.13	6,988.22	5,990.00	5,988.29	32.26	143.36	47.20	-433.12	6,136.47	7,116.78	6,947.50	169.28	42.041	
7,500.00	6,988.19	5,990.00	5,988.29	32.56	143.36	45.43	-433.12	6,136.47	7,153.97	6,984.60	169.37	42.238	
7,600.00	6,988.12	5,990.00	5,988.29	33.37	143.36	40.25	-433.12	6,136.47	7,250.19	7,080.60	169.59	42.751	
7,700.00	6,988.05	5,990.00	5,988.29	34.21	143.36	33.99	-433.12	6,136.47	7,347.09	7,177.31	169.78	43.273	
7,800.00	6,987.98	5,990.00	5,988.29	35.09	143.36	26.51	-433.12	6,136.47	7,444.53	7,274.58	169.95	43.804	
7,900.00	6,987.91	5,990.00	5,988.29	35.99	143.36	17.76	-433.12	6,136.47	7,542.36	7,372.27	170.09	44.343	
8,000.00	6,987.83	5,990.00	5,988.29	36.93	143.36	7.91	-433.12	6,136.47	7,640.46	7,470.25	170.21	44.888	
8,100.00	6,987.76	5,990.00	5,988.29	37.88	143.36	-2.57	-433.12	6,136.47	7,738.69	7,568.39	170.30	45.440	
8,200.00	6,987.68	5,990.00	5,988.29	38.86	143.36	-13.02	-433.12	6,136.47	7,836.95	7,666.57	170.38	45.998	
8,300.00	6,987.61	5,990.00	5,988.29	39.86	143.36	-22.77	-433.12	6,136.47	7,935.10	7,764.67	170.42	46.561	
8,400.00	6,987.53	5,990.00	5,988.29	40.87	143.36	-31.38	-433.12	6,136.47	8,033.03	7,862.58	170.45	47.128	
8,500.00	6,987.46	5,990.00	5,988.29	41.90	143.36	-38.73	-433.12	6,136.47	8,130.64	7,960.18	170.46	47.698	
8,600.00	6,987.38	5,990.00	5,988.29	42.93	143.36	-44.87	-433.12	6,136.47	8,227.82	8,057.37	170.45	48.271	
8,700.00	6,987.31	5,990.00	5,988.29	43.98	143.36	-49.97	-433.12	6,136.47	8,324.46	8,154.04	170.42	48.846	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC													Offset Site Error:	0.00 usft		
Survey Program:		235-A027Ua_INC-ONLY					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
8,800.00	6,987.23	5,990.00	5,988.29	45.03	143.36	-54.19	-433.12	6,136.47	8,420.48	8,250.10	170.38	49.422				
8,872.16	6,987.18	5,990.00	5,988.29	45.79	143.36	-56.79	-433.12	6,136.47	8,489.32	8,318.98	170.34	49.837				
8,900.00	6,987.16	5,990.00	5,988.29	46.08	143.36	-56.79	-433.12	6,136.47	8,515.81	8,345.48	170.32	49.998				
9,000.00	6,987.09	5,990.00	5,988.29	47.16	143.36	-56.79	-433.12	6,136.47	8,611.02	8,440.75	170.27	50.573				
9,100.00	6,987.01	5,990.00	5,988.29	48.27	143.36	-56.79	-433.12	6,136.47	8,706.34	8,536.12	170.22	51.147				
9,200.00	6,986.94	5,990.00	5,988.29	49.40	143.36	-56.79	-433.12	6,136.47	8,801.76	8,631.58	170.18	51.721				
9,300.00	6,986.86	5,990.00	5,988.29	50.56	143.36	-56.79	-433.12	6,136.47	8,897.28	8,727.14	170.14	52.295				
9,400.00	6,986.79	5,990.00	5,988.29	51.75	143.36	-56.79	-433.12	6,136.47	8,992.90	8,822.80	170.10	52.868				
9,500.00	6,986.71	5,990.00	5,988.29	52.95	143.36	-56.79	-433.12	6,136.47	9,088.62	8,918.54	170.07	53.440				
9,600.00	6,986.64	5,990.00	5,988.29	54.18	143.36	-56.79	-433.12	6,136.47	9,184.42	9,014.38	170.04	54.012				
9,700.00	6,986.56	5,990.00	5,988.29	55.42	143.36	-56.79	-433.12	6,136.47	9,280.31	9,110.29	170.02	54.583				
9,800.00	6,986.49	5,990.00	5,988.29	56.69	143.36	-56.79	-433.12	6,136.47	9,376.29	9,206.29	170.00	55.154				
9,900.00	6,986.41	5,990.00	5,988.29	57.97	143.36	-56.79	-433.12	6,136.47	9,472.36	9,302.37	169.99	55.724				
10,000.00	6,986.34	5,990.00	5,988.29	59.26	143.36	-56.79	-433.12	6,136.47	9,568.50	9,398.53	169.98	56.293				
10,100.00	6,986.27	5,990.00	5,988.29	60.57	143.36	-56.79	-433.12	6,136.47	9,664.72	9,494.76	169.97	56.862				
10,200.00	6,986.19	5,990.00	5,988.29	61.90	143.36	-56.79	-433.12	6,136.47	9,761.02	9,591.06	169.96	57.430				
10,300.00	6,986.12	5,990.00	5,988.29	63.23	143.36	-56.79	-433.12	6,136.47	9,857.39	9,687.43	169.96	57.998				
10,400.00	6,986.04	5,990.00	5,988.29	64.58	143.36	-56.79	-433.12	6,136.47	9,953.84	9,783.87	169.96	58.565				
10,500.00	6,985.97	5,990.00	5,988.29	65.94	143.36	-56.79	-433.12	6,136.47	10,050.35	9,880.38	169.97	59.131				
10,600.00	6,985.89	5,990.00	5,988.29	67.32	143.36	-56.79	-433.12	6,136.47	10,146.93	9,976.95	169.98	59.696				
10,700.00	6,985.82	5,990.00	5,988.29	68.70	143.36	-56.79	-433.12	6,136.47	10,243.57	10,073.59	169.99	60.261				
10,800.00	6,985.74	5,990.00	5,988.29	70.09	143.36	-56.79	-433.12	6,136.47	10,340.28	10,170.29	170.00	60.825				
10,900.00	6,985.67	5,990.00	5,988.29	71.49	143.36	-56.79	-433.12	6,136.47	10,437.06	10,267.04	170.02	61.389				
11,000.00	6,985.59	5,990.00	5,988.29	72.90	143.36	-56.79	-433.12	6,136.47	10,533.89	10,363.85	170.03	61.952				
11,100.00	6,985.52	5,990.00	5,988.29	74.31	143.36	-56.79	-433.12	6,136.47	10,630.78	10,460.72	170.05	62.514				
11,200.00	6,985.45	5,990.00	5,988.29	75.74	143.36	-56.79	-433.12	6,136.47	10,727.73	10,557.65	170.08	63.075				
11,300.00	6,985.37	5,990.00	5,988.29	77.17	143.36	-56.79	-433.12	6,136.47	10,824.73	10,654.63	170.10	63.636				
11,400.00	6,985.30	5,990.00	5,988.29	78.61	143.36	-56.79	-433.12	6,136.47	10,921.79	10,751.65	170.13	64.196				
11,500.00	6,985.22	5,990.00	5,988.29	80.05	143.36	-56.79	-433.12	6,136.47	11,018.90	10,848.73	170.16	64.755				
11,600.00	6,985.15	5,990.00	5,988.29	81.50	143.36	-56.79	-433.12	6,136.47	11,116.06	10,945.86	170.19	65.314				
11,700.00	6,985.07	5,990.00	5,988.29	82.96	143.36	-56.79	-433.12	6,136.47	11,213.27	11,043.04	170.23	65.872				
11,800.00	6,985.00	5,990.00	5,988.29	84.42	143.36	-56.79	-433.12	6,136.47	11,310.53	11,140.26	170.27	66.429				
11,900.00	6,984.92	5,990.00	5,988.29	85.89	143.36	-56.79	-433.12	6,136.47	11,407.84	11,237.53	170.30	66.985				
12,000.00	6,984.85	5,990.00	5,988.29	87.36	143.36	-56.79	-433.12	6,136.47	11,505.19	11,334.85	170.34	67.541				
12,100.00	6,984.77	5,990.00	5,988.29	88.83	143.36	-56.79	-433.12	6,136.47	11,602.59	11,432.20	170.39	68.096				
12,200.00	6,984.70	5,990.00	5,988.29	90.31	143.36	-56.79	-433.12	6,136.47	11,700.03	11,529.60	170.43	68.650				
12,300.00	6,984.63	5,990.00	5,988.29	91.80	143.36	-56.79	-433.12	6,136.47	11,797.51	11,627.04	170.48	69.204				
12,400.00	6,984.55	5,990.00	5,988.29	93.29	143.36	-56.79	-433.12	6,136.47	11,895.04	11,724.52	170.52	69.756				
12,500.00	6,984.48	5,990.00	5,988.29	94.78	143.36	-56.79	-433.12	6,136.47	11,992.61	11,822.04	170.57	70.308				
12,600.00	6,984.40	5,990.00	5,988.29	96.28	143.36	-56.79	-433.12	6,136.47	12,090.22	11,919.59	170.62	70.860				
12,700.00	6,984.33	5,990.00	5,988.29	97.78	143.36	-56.79	-433.12	6,136.47	12,187.86	12,017.19	170.67	71.410				
12,800.00	6,984.25	5,990.00	5,988.29	99.28	143.36	-56.79	-433.12	6,136.47	12,285.55	12,114.82	170.73	71.960				
12,900.00	6,984.18	5,990.00	5,988.29	100.78	143.36	-56.79	-433.12	6,136.47	12,383.27	12,212.48	170.78	72.509				
13,000.00	6,984.10	5,990.00	5,988.29	102.29	143.36	-56.79	-433.12	6,136.47	12,481.02	12,310.19	170.84	73.057				
13,100.00	6,984.03	5,990.00	5,988.29	103.80	143.36	-56.79	-433.12	6,136.47	12,578.82	12,407.92	170.90	73.605				
13,200.00	6,983.95	5,990.00	5,988.29	105.32	143.36	-56.79	-433.12	6,136.47	12,676.64	12,505.69	170.96	74.152				
13,300.00	6,983.88	5,990.00	5,988.29	106.84	143.36	-56.79	-433.12	6,136.47	12,774.50	12,603.49	171.02	74.698				
13,400.00	6,983.81	5,990.00	5,988.29	108.36	143.36	-56.79	-433.12	6,136.47	12,872.40	12,701.32	171.08	75.243				
13,500.00	6,983.73	5,990.00	5,988.29	109.88	143.36	-56.79	-433.12	6,136.47	12,970.32	12,799.18	171.14	75.788				
13,600.00	6,983.66	5,990.00	5,988.29	111.40	143.36	-56.79	-433.12	6,136.47	13,068.28	12,897.07	171.20	76.332				
13,700.00	6,983.58	5,990.00	5,988.29	112.93	143.36	-56.79	-433.12	6,136.47	13,166.27	12,995.00	171.27	76.875				
13,800.00	6,983.51	5,990.00	5,988.29	114.46	143.36	-56.79	-433.12	6,136.47	13,264.28	13,092.95	171.34	77.417				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		235-A027Ua_INC-ONLY					Offset		Semi Major Axis		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,900.00	6,983.43	5,990.00	5,988.29	115.99	143.36	-56.79	-433.12	6,136.47	13,362.33	13,190.93	171.40	77.959		
14,000.00	6,983.36	5,990.00	5,988.29	117.52	143.36	-56.79	-433.12	6,136.47	13,460.41	13,288.93	171.47	78.499		
14,100.00	6,983.28	5,990.00	5,988.29	119.06	143.36	-56.79	-433.12	6,136.47	13,558.51	13,386.97	171.54	79.039		
14,200.00	6,983.21	5,990.00	5,988.29	120.59	143.36	-56.79	-433.12	6,136.47	13,656.64	13,485.03	171.61	79.579		
14,300.00	6,983.13	5,990.00	5,988.29	122.13	143.36	-56.79	-433.12	6,136.47	13,754.80	13,583.12	171.68	80.117		
14,400.00	6,983.06	5,990.00	5,988.29	123.67	143.36	-56.79	-433.12	6,136.47	13,852.98	13,681.23	171.76	80.655		
14,500.00	6,982.99	5,990.00	5,988.29	125.21	143.36	-56.79	-433.12	6,136.47	13,951.19	13,779.37	171.83	81.192		
14,600.00	6,982.91	5,990.00	5,988.29	126.75	143.36	-56.79	-433.12	6,136.47	14,049.43	13,877.53	171.90	81.728		
14,700.00	6,982.84	5,990.00	5,988.29	128.30	143.36	-56.79	-433.12	6,136.47	14,147.69	13,975.71	171.98	82.264		
14,800.00	6,982.76	5,990.00	5,988.29	129.85	143.36	-56.79	-433.12	6,136.47	14,245.98	14,073.92	172.06	82.799		
14,900.00	6,982.69	5,990.00	5,988.29	131.39	143.36	-56.79	-433.12	6,136.47	14,344.28	14,172.15	172.13	83.333		
15,000.00	6,982.61	5,990.00	5,988.29	132.94	143.36	-56.79	-433.12	6,136.47	14,442.61	14,270.40	172.21	83.866		
15,100.00	6,982.54	5,990.00	5,988.29	134.49	143.36	-56.79	-433.12	6,136.47	14,540.97	14,368.68	172.29	84.398		
15,200.00	6,982.46	5,990.00	5,988.29	136.04	143.36	-56.79	-433.12	6,136.47	14,639.35	14,466.98	172.37	84.930		
15,300.00	6,982.39	5,990.00	5,988.29	137.60	143.36	-56.79	-433.12	6,136.47	14,737.74	14,565.29	172.45	85.461		
15,400.00	6,982.31	5,990.00	5,988.29	139.15	143.36	-56.79	-433.12	6,136.47	14,836.16	14,663.63	172.53	85.991		
15,500.00	6,982.24	5,990.00	5,988.29	140.70	143.36	-56.79	-433.12	6,136.47	14,934.60	14,761.99	172.61	86.521		
15,600.00	6,982.17	5,990.00	5,988.29	142.26	143.36	-56.79	-433.12	6,136.47	15,033.07	14,860.37	172.70	87.049		
15,700.00	6,982.09	5,990.00	5,988.29	143.82	143.36	-56.79	-433.12	6,136.47	15,131.55	14,958.77	172.78	87.577		
15,800.00	6,982.02	5,990.00	5,988.29	145.38	143.36	-56.79	-433.12	6,136.47	15,230.05	15,057.19	172.86	88.104		
15,900.00	6,981.94	5,990.00	5,988.29	146.94	143.36	-56.79	-433.12	6,136.47	15,328.57	15,155.62	172.95	88.631		
16,000.00	6,981.87	5,990.00	5,988.29	148.50	143.36	-56.79	-433.12	6,136.47	15,427.11	15,254.08	173.03	89.156		
16,100.00	6,981.79	5,990.00	5,988.29	150.06	143.36	-56.79	-433.12	6,136.47	15,525.67	15,352.55	173.12	89.681		
16,200.00	6,981.72	5,990.00	5,988.29	151.62	143.36	-56.79	-433.12	6,136.47	15,624.24	15,451.04	173.21	90.205		
16,300.00	6,981.64	5,990.00	5,988.29	153.18	143.36	-56.79	-433.12	6,136.47	15,722.84	15,549.54	173.29	90.729		
16,400.00	6,981.57	5,990.00	5,988.29	154.74	143.36	-56.79	-433.12	6,136.47	15,821.45	15,648.07	173.38	91.251		
16,500.00	6,981.49	5,990.00	5,988.29	156.31	143.36	-56.79	-433.12	6,136.47	15,920.08	15,746.61	173.47	91.773		
16,600.00	6,981.42	5,990.00	5,988.29	157.87	143.36	-56.79	-433.12	6,136.47	16,018.73	15,845.17	173.56	92.294		
16,700.00	6,981.35	5,990.00	5,988.29	159.44	143.36	-56.79	-433.12	6,136.47	16,117.39	15,943.74	173.65	92.815		
16,800.00	6,981.27	5,990.00	5,988.29	161.01	143.36	-56.79	-433.12	6,136.47	16,216.07	16,042.33	173.74	93.334		
16,900.00	6,981.20	5,990.00	5,988.29	162.58	143.36	-56.79	-433.12	6,136.47	16,314.77	16,140.93	173.83	93.853		
17,000.00	6,981.12	5,990.00	5,988.29	164.14	143.36	-56.79	-433.12	6,136.47	16,413.48	16,239.55	173.93	94.371		
17,100.00	6,981.05	5,990.00	5,988.29	165.71	143.36	-56.79	-433.12	6,136.47	16,512.21	16,338.19	174.02	94.888		
17,200.00	6,980.97	5,990.00	5,988.29	167.28	143.36	-56.79	-433.12	6,136.47	16,610.95	16,436.84	174.11	95.405		
17,300.00	6,980.90	5,990.00	5,988.29	168.85	143.36	-56.79	-433.12	6,136.47	16,709.71	16,535.50	174.20	95.920		
17,400.00	6,980.82	5,990.00	5,988.29	170.42	143.36	-56.79	-433.12	6,136.47	16,808.48	16,634.18	174.30	96.435		
17,500.00	6,980.75	5,990.00	5,988.29	172.00	143.36	-56.79	-433.12	6,136.47	16,907.26	16,732.87	174.39	96.949		
17,600.00	6,980.67	5,990.00	5,988.29	173.57	143.36	-56.79	-433.12	6,136.47	17,006.06	16,831.58	174.49	97.463		
17,700.00	6,980.60	5,990.00	5,988.29	175.14	143.36	-56.79	-433.12	6,136.47	17,104.88	16,930.30	174.58	97.975		
17,800.00	6,980.53	5,990.00	5,988.29	176.71	143.36	-56.79	-433.12	6,136.47	17,203.71	17,029.03	174.68	98.487		
17,900.00	6,980.45	5,990.00	5,988.29	178.29	143.36	-56.79	-433.12	6,136.47	17,302.55	17,127.77	174.78	98.998		
18,000.00	6,980.38	5,990.00	5,988.29	179.86	143.36	-56.79	-433.12	6,136.47	17,401.40	17,226.53	174.87	99.509		
18,100.00	6,980.30	5,990.00	5,988.29	181.44	143.36	-56.79	-433.12	6,136.47	17,500.27	17,325.30	174.97	100.018		
18,200.00	6,980.23	5,990.00	5,988.29	183.01	143.36	-56.79	-433.12	6,136.47	17,599.15	17,424.08	175.07	100.527		
18,300.00	6,980.15	5,990.00	5,988.29	184.59	143.36	-56.79	-433.12	6,136.47	17,698.05	17,522.88	175.17	101.035		
18,400.00	6,980.08	5,990.00	5,988.29	186.16	143.36	-56.79	-433.12	6,136.47	17,796.95	17,621.69	175.27	101.543		
18,500.00	6,980.00	5,990.00	5,988.29	187.74	143.36	-56.79	-433.12	6,136.47	17,895.87	17,720.50	175.37	102.049		
18,600.00	6,979.93	5,990.00	5,988.29	189.32	143.36	-56.79	-433.12	6,136.47	17,994.80	17,819.33	175.46	102.555		
18,700.00	6,979.85	5,990.00	5,988.29	190.90	143.36	-56.79	-433.12	6,136.47	18,093.74	17,918.18	175.57	103.060		
18,800.00	6,979.78	5,990.00	5,988.29	192.48	143.36	-56.79	-433.12	6,136.47	18,192.69	18,017.03	175.67	103.564		
18,900.00	6,979.71	5,990.00	5,988.29	194.05	143.36	-56.79	-433.12	6,136.47	18,291.66	18,115.89	175.77	104.068		
19,000.00	6,979.63	5,990.00	5,988.29	195.63	143.36	-56.79	-433.12	6,136.47	18,390.63	18,214.77	175.87	104.570		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit #95 - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		235-A027Ua_INC-ONLY				Rule Assigned:		Offset Well Error:		0.00 usft			
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
19,100.00	6,979.56	5,990.00	5,988.29	197.21	143.36	-56.79	-433.12	6,136.47	18,489.62	18,313.65	175.97	105.072	
19,200.00	6,979.48	5,990.00	5,988.29	198.79	143.36	-56.79	-433.12	6,136.47	18,588.62	18,412.55	176.07	105.574	
19,300.00	6,979.41	5,990.00	5,988.29	200.37	143.36	-56.79	-433.12	6,136.47	18,687.63	18,511.45	176.18	106.074	
19,400.00	6,979.33	5,990.00	5,988.29	201.95	143.36	-56.79	-433.12	6,136.47	18,786.65	18,610.37	176.28	106.574	
19,500.00	6,979.26	5,990.00	5,988.29	203.54	143.36	-56.79	-433.12	6,136.47	18,885.68	18,709.29	176.38	107.073	
19,600.00	6,979.18	5,990.00	5,988.29	205.12	143.36	-56.79	-433.12	6,136.47	18,984.71	18,808.23	176.49	107.571	
19,700.00	6,979.11	5,990.00	5,988.29	206.70	143.36	-56.79	-433.12	6,136.47	19,083.76	18,907.17	176.59	108.068	
19,800.00	6,979.03	5,990.00	5,988.29	208.28	143.36	-56.79	-433.12	6,136.47	19,182.82	19,006.13	176.69	108.565	
19,900.00	6,978.96	5,990.00	5,988.29	209.86	143.36	-56.79	-433.12	6,136.47	19,281.89	19,105.09	176.80	109.061	
20,000.00	6,978.89	5,990.00	5,988.29	211.45	143.36	-56.79	-433.12	6,136.47	19,380.97	19,204.07	176.90	109.556	
20,100.00	6,978.81	5,990.00	5,988.29	213.03	143.36	-56.79	-433.12	6,136.47	19,480.06	19,303.05	177.01	110.050	
20,200.00	6,978.74	5,990.00	5,988.29	214.61	143.36	-56.79	-433.12	6,136.47	19,579.16	19,402.04	177.12	110.544	
20,300.00	6,978.66	5,990.00	5,988.29	216.20	143.36	-56.79	-433.12	6,136.47	19,678.26	19,501.04	177.22	111.037	
20,400.00	6,978.59	5,990.00	5,988.29	217.78	143.36	-56.79	-433.12	6,136.47	19,777.38	19,600.05	177.33	111.529	
20,500.00	6,978.51	5,990.00	5,988.29	219.37	143.36	-56.79	-433.12	6,136.47	19,876.50	19,699.07	177.44	112.020	
20,600.00	6,978.44	5,990.00	5,988.29	220.95	143.36	-56.79	-433.12	6,136.47	19,975.63	19,798.09	177.54	112.511	
20,700.00	6,978.36	5,990.00	5,988.29	222.53	143.36	-56.79	-433.12	6,136.47	20,074.78	19,897.12	177.65	113.001	
20,800.00	6,978.29	5,990.00	5,988.29	224.12	143.36	-56.79	-433.12	6,136.47	20,173.93	19,996.17	177.76	113.490	
20,900.00	6,978.21	5,990.00	5,988.29	225.71	143.36	-56.79	-433.12	6,136.47	20,273.08	20,095.22	177.87	113.978	
21,000.00	6,978.14	5,990.00	5,988.29	227.29	143.36	-56.79	-433.12	6,136.47	20,372.25	20,194.27	177.98	114.466	
21,100.00	6,978.07	5,990.00	5,988.29	228.88	143.36	-56.79	-433.12	6,136.47	20,471.43	20,293.34	178.09	114.953	
21,200.00	6,977.99	5,990.00	5,988.29	230.46	143.36	-56.79	-433.12	6,136.47	20,570.61	20,392.41	178.19	115.439	
21,300.00	6,977.92	5,990.00	5,988.29	232.05	143.36	-56.79	-433.12	6,136.47	20,669.80	20,491.49	178.30	115.924	
21,400.00	6,977.84	5,990.00	5,988.29	233.64	143.36	-56.79	-433.12	6,136.47	20,769.00	20,590.58	178.41	116.409	
21,500.00	6,977.77	5,990.00	5,988.29	235.22	143.36	-56.79	-433.12	6,136.47	20,868.20	20,689.68	178.52	116.892	
21,600.00	6,977.69	5,990.00	5,988.29	236.81	143.36	-56.79	-433.12	6,136.47	20,967.42	20,788.78	178.64	117.376	
21,700.00	6,977.62	5,990.00	5,988.29	238.40	143.36	-56.79	-433.12	6,136.47	21,066.64	20,887.89	178.75	117.858	
21,800.00	6,977.54	5,990.00	5,988.29	239.99	143.36	-56.79	-433.12	6,136.47	21,165.87	20,987.01	178.86	118.339	
21,900.00	6,977.47	5,990.00	5,988.29	241.57	143.36	-56.79	-433.12	6,136.47	21,265.10	21,086.13	178.97	118.820	
22,000.00	6,977.39	5,990.00	5,988.29	243.16	143.36	-56.79	-433.12	6,136.47	21,364.34	21,185.26	179.08	119.300	
22,100.00	6,977.32	5,990.00	5,988.29	244.75	143.36	-56.79	-433.12	6,136.47	21,463.59	21,284.40	179.19	119.780	
22,200.00	6,977.25	5,990.00	5,988.29	246.34	143.36	-56.79	-433.12	6,136.47	21,562.85	21,383.55	179.30	120.258	
22,300.00	6,977.17	5,990.00	5,988.29	247.93	143.36	-56.79	-433.12	6,136.47	21,662.11	21,482.70	179.42	120.736	
22,400.00	6,977.10	5,990.00	5,988.29	249.52	143.36	-56.79	-433.12	6,136.47	21,761.38	21,581.85	179.53	121.213	
22,500.00	6,977.02	5,990.00	5,988.29	251.11	143.36	-56.79	-433.12	6,136.47	21,860.66	21,681.02	179.64	121.690	
22,529.62	6,977.00	5,990.00	5,988.29	251.58	143.36	-56.79	-433.12	6,136.47	21,890.06	21,710.39	179.68	121.830	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 358-APC_ISCWSA REV 2 MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-52.57	2,997.95	-3,917.40	4,933.01				
100.00	100.00	77.14	77.14	0.25	0.08	-52.57	2,997.87	-3,917.40	4,932.88	4,932.55	0.33	N/A	
200.00	200.00	185.80	185.80	0.61	0.20	-52.58	2,997.49	-3,917.41	4,932.67	4,931.86	0.81	6,083.044	
300.00	300.00	294.45	294.45	0.97	0.32	-52.58	2,996.79	-3,917.41	4,932.28	4,930.99	1.29	3,831.968	
400.00	400.00	375.33	375.32	1.33	0.43	-52.59	2,996.04	-3,917.49	4,931.84	4,930.08	1.75	2,814.556	
407.40	407.40	378.41	378.41	1.35	0.43	-52.59	2,996.00	-3,917.52	4,931.83	4,930.05	1.79	2,762.138	
500.00	500.00	419.00	418.98	1.68	0.52	-52.60	2,995.44	-3,918.32	4,932.40	4,930.20	2.20	2,238.874	
550.00	550.00	419.00	418.98	1.86	0.52	-52.60	2,995.44	-3,918.32	4,933.18	4,930.80	2.38	2,070.064	
600.00	600.00	437.85	437.81	2.04	0.57	-50.21	2,995.17	-3,919.02	4,934.05	4,931.44	2.60	1,895.921	
700.00	699.93	461.96	461.89	2.40	0.62	-50.21	2,994.83	-3,920.34	4,935.28	4,932.26	3.01	1,638.303	
800.00	799.68	480.00	479.88	2.77	0.67	-50.23	2,994.59	-3,921.61	4,935.84	4,932.43	3.41	1,447.670	
900.00	899.13	510.00	509.75	3.13	0.75	-50.28	2,994.28	-3,924.35	4,935.77	4,931.94	3.84	1,286.257	
1,000.00	998.15	523.16	522.83	3.49	0.78	-50.32	2,994.21	-3,925.80	4,935.09	4,930.86	4.23	1,166.368	
1,100.00	1,096.63	541.00	540.54	3.87	0.83	-50.38	2,994.23	-3,927.97	4,933.85	4,929.20	4.64	1,062.641	
1,130.50	1,126.54	541.00	540.54	3.99	0.83	-50.39	2,994.23	-3,927.97	4,933.38	4,928.62	4.76	1,036.975	
1,200.00	1,194.61	572.00	571.23	4.26	0.92	-50.47	2,994.53	-3,932.34	4,932.64	4,927.54	5.10	968.017	
1,238.22	1,232.05	572.00	571.23	4.42	0.92	-50.47	2,994.53	-3,932.34	4,932.49	4,927.25	5.24	941.394	
1,300.00	1,292.57	572.00	571.23	4.66	0.92	-50.47	2,994.53	-3,932.34	4,932.88	4,927.40	5.48	900.642	
1,400.00	1,390.52	602.00	600.79	5.07	1.01	-50.55	2,995.12	-3,937.37	4,934.85	4,928.91	5.94	830.843	
1,500.00	1,488.48	602.00	600.79	5.48	1.01	-50.55	2,995.12	-3,937.37	4,938.55	4,932.22	6.33	780.621	
1,600.00	1,586.43	633.00	631.19	5.90	1.11	-50.64	2,996.03	-3,943.38	4,943.78	4,936.98	6.80	727.225	
1,700.00	1,684.38	664.00	661.42	6.31	1.21	-50.73	2,997.13	-3,950.15	4,950.76	4,943.49	7.28	680.440	
1,800.00	1,782.34	676.64	673.70	6.73	1.26	-50.77	2,997.61	-3,953.12	4,959.23	4,951.53	7.70	643.991	
1,900.00	1,880.29	694.00	690.52	7.15	1.33	-50.83	2,998.26	-3,957.36	4,969.30	4,961.16	8.14	610.547	
2,000.00	1,978.25	725.00	720.44	7.58	1.47	-50.93	2,999.32	-3,965.41	4,980.74	4,972.12	8.62	577.505	
2,100.00	2,076.20	773.31	766.78	8.00	1.72	-51.09	3,000.80	-3,978.96	4,993.53	4,984.35	9.18	544.118	
2,200.00	2,174.15	818.00	809.43	8.43	1.97	-51.25	3,001.71	-3,992.29	5,007.42	4,997.69	9.73	514.782	
2,300.00	2,272.11	848.00	837.89	8.85	2.15	-51.36	3,002.20	-4,001.75	5,022.62	5,012.40	10.22	491.241	
2,400.00	2,370.06	864.98	853.91	9.28	2.26	-51.43	3,002.48	-4,007.39	5,039.35	5,028.68	10.67	472.406	
2,500.00	2,468.02	879.00	867.07	9.71	2.35	-51.48	3,002.73	-4,012.21	5,057.66	5,046.57	11.09	455.934	
2,600.00	2,565.97	910.00	895.96	10.14	2.57	-51.61	3,003.28	-4,023.43	5,077.49	5,065.89	11.60	437.832	
2,700.00	2,663.92	927.18	911.85	10.57	2.70	-51.68	3,003.53	-4,029.97	5,098.82	5,086.78	12.04	423.606	
2,800.00	2,761.88	940.00	923.64	11.00	2.80	-51.73	3,003.68	-4,035.00	5,121.66	5,109.21	12.45	411.409	
2,900.00	2,859.83	971.00	951.95	11.43	3.05	-51.87	3,003.96	-4,047.62	5,145.88	5,132.92	12.96	397.180	
3,000.00	2,957.79	1,000.00	978.17	11.86	3.29	-51.99	3,004.21	-4,060.01	5,171.61	5,158.16	13.45	384.391	
3,100.00	3,055.74	1,013.69	990.46	12.29	3.42	-52.06	3,004.34	-4,066.05	5,198.74	5,184.87	13.86	374.986	
3,200.00	3,153.69	1,031.00	1,005.93	12.72	3.57	-52.13	3,004.54	-4,073.81	5,227.29	5,213.00	14.29	365.850	
3,300.00	3,251.65	1,062.00	1,033.44	13.15	3.86	-52.28	3,004.89	-4,088.09	5,257.15	5,242.36	14.79	355.404	
3,400.00	3,349.60	1,091.00	1,058.95	13.59	4.15	-52.41	3,005.26	-4,101.87	5,288.36	5,273.08	15.28	346.034	
3,500.00	3,447.56	1,091.00	1,058.95	14.02	4.15	-52.41	3,005.26	-4,101.87	5,320.98	5,305.40	15.59	341.349	
3,600.00	3,545.51	1,122.00	1,085.90	14.45	4.46	-52.55	3,005.73	-4,117.18	5,354.88	5,338.80	16.08	332.914	
3,700.00	3,643.46	1,122.00	1,085.90	14.88	4.46	-52.55	3,005.73	-4,117.18	5,390.32	5,373.94	16.38	329.141	
3,800.00	3,741.42	1,152.00	1,111.56	15.32	4.79	-52.70	3,006.35	-4,132.71	5,427.01	5,410.15	16.86	321.870	
3,900.00	3,839.37	1,165.08	1,122.64	15.75	4.94	-52.76	3,006.69	-4,139.67	5,465.10	5,447.87	17.23	317.201	
4,000.00	3,937.33	1,182.00	1,136.86	16.18	5.13	-52.84	3,007.14	-4,148.82	5,504.48	5,486.86	17.62	312.470	
4,100.00	4,035.28	1,214.00	1,163.51	16.62	5.51	-53.00	3,007.97	-4,166.50	5,545.06	5,526.95	18.11	306.234	
4,200.00	4,133.23	1,244.00	1,188.29	17.05	5.87	-53.14	3,008.55	-4,183.40	5,586.66	5,568.08	18.58	300.654	
4,300.00	4,231.19	1,276.00	1,214.55	17.48	6.27	-53.31	3,008.98	-4,201.70	5,629.21	5,610.14	19.07	295.191	
4,400.00	4,329.14	1,351.60	1,276.17	17.92	7.21	-53.69	3,009.77	-4,245.47	5,672.53	5,652.65	19.88	285.368	
4,500.00	4,427.10	1,424.33	1,335.50	18.35	8.07	-54.05	3,010.57	-4,287.55	5,716.11	5,695.47	20.64	276.905	
4,600.00	4,525.05	1,448.51	1,355.13	18.78	8.38	-54.17	3,010.82	-4,301.67	5,760.48	5,739.42	21.06	273.509	
4,700.00	4,623.00	1,467.00	1,370.00	19.22	8.62	-54.26	3,011.00	-4,312.64	5,805.96	5,784.52	21.43	270.870	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		358-APC_ISCWSA REV 2 MWD						Rule Assigned:		Offset Well Error:		0.00 usft		
Reference	Offset	Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Distance	Minimum	Separation	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Ellipses (usft)	Separation (usft)	Factor		
4,800.00	4,720.96	1,515.19	1,408.61	19.65	9.25	-54.50	3,011.80	-4,341.47	5,852.34	5,830.31	22.03	265.705		
4,900.00	4,818.91	1,562.00	1,445.97	20.09	9.88	-54.73	3,012.73	-4,369.66	5,899.42	5,876.82	22.61	260.950		
5,000.00	4,916.87	1,594.00	1,471.43	20.52	10.30	-54.88	3,013.58	-4,389.02	5,947.28	5,924.21	23.06	257.856		
5,100.00	5,014.82	1,673.59	1,534.43	20.96	11.36	-55.27	3,015.16	-4,437.63	5,995.67	5,971.78	23.89	250.998		
5,200.00	5,112.77	1,722.00	1,572.61	21.39	12.01	-55.51	3,016.01	-4,467.38	6,044.58	6,020.11	24.47	247.044		
5,300.00	5,210.73	1,754.00	1,597.83	21.82	12.45	-55.66	3,016.93	-4,487.06	6,094.14	6,069.22	24.91	244.633		
5,400.00	5,308.68	1,786.00	1,622.83	22.26	12.90	-55.81	3,017.85	-4,507.01	6,144.61	6,119.25	25.36	242.306		
5,493.23	5,400.00	5,955.19	5,442.52	22.66	38.02	-68.39	2,940.81	-5,618.63	5,929.39	5,887.97	41.42	143.139		
5,500.00	5,406.64	5,961.65	5,448.98	22.69	38.03	-68.40	2,940.54	-5,618.64	5,928.80	5,887.35	41.46	143.014		
5,600.00	5,504.69	6,057.20	5,544.44	23.12	38.09	-68.57	2,936.49	-5,618.89	5,920.28	5,878.35	41.93	141.193		
5,700.00	5,602.91	6,153.00	5,640.16	23.55	38.16	-68.73	2,932.52	-5,619.13	5,912.18	5,869.77	42.41	139.418		
5,800.00	5,701.29	6,249.03	5,736.11	23.97	38.22	-68.89	2,928.63	-5,619.37	5,904.49	5,861.61	42.88	137.686		
5,900.00	5,799.82	6,345.28	5,832.28	24.39	38.29	-69.04	2,924.83	-5,619.60	5,897.21	5,853.85	43.36	135.998		
6,000.00	5,898.50	6,441.75	5,928.68	24.79	38.35	-69.18	2,921.12	-5,619.83	5,890.33	5,846.49	43.84	134.353		
6,100.00	5,997.31	6,538.42	6,025.29	25.20	38.42	-69.32	2,917.49	-5,620.05	5,883.84	5,839.52	44.32	132.749		
6,200.00	6,096.26	6,635.29	6,122.09	25.60	38.48	-69.45	2,913.94	-5,620.27	5,877.74	5,832.93	44.80	131.186		
6,300.00	6,195.33	6,732.34	6,219.08	25.99	38.55	-69.58	2,910.48	-5,620.48	5,872.01	5,826.73	45.29	129.663		
6,400.00	6,294.51	6,829.57	6,316.25	26.37	38.61	-69.70	2,907.12	-5,620.68	5,866.66	5,820.89	45.77	128.179		
6,498.19	6,392.00	6,925.20	6,411.82	26.75	38.68	-69.81	2,903.90	-5,620.88	5,861.75	5,815.51	46.24	126.759		
6,500.00	6,393.80	6,926.96	6,413.59	26.76	38.68	-68.61	2,903.84	-5,620.88	5,861.66	5,815.41	46.25	126.733		
6,550.00	6,443.29	6,975.50	6,462.09	26.95	38.71	-46.00	2,902.24	-5,620.98	5,857.20	5,810.70	46.50	125.972		
6,600.00	6,492.24	7,023.45	6,510.02	27.16	38.75	-35.43	2,900.68	-5,621.07	5,848.92	5,802.18	46.74	125.126		
6,650.00	6,540.33	7,070.53	6,557.07	27.38	38.78	-29.88	2,899.18	-5,621.17	5,836.89	5,789.90	46.99	124.206		
6,700.00	6,587.28	7,116.44	6,602.96	27.60	38.81	-26.68	2,897.73	-5,621.25	5,821.18	5,773.94	47.24	123.222		
6,750.00	6,632.80	7,160.91	6,647.41	27.84	38.84	-24.78	2,896.35	-5,621.34	5,801.89	5,754.40	47.49	122.180		
6,800.00	6,676.60	7,203.66	6,690.14	28.09	38.87	-23.70	2,895.04	-5,621.42	5,779.13	5,731.41	47.73	121.089		
6,850.00	6,718.42	7,244.43	6,730.89	28.34	38.90	-23.20	2,893.81	-5,621.49	5,753.06	5,705.10	47.96	119.958		
6,900.00	6,758.00	7,282.97	6,769.42	28.60	38.92	-23.15	2,892.66	-5,621.56	5,723.84	5,675.65	48.18	118.793		
6,950.00	6,795.09	7,319.04	6,805.47	28.87	38.95	-23.53	2,891.60	-5,621.63	5,691.63	5,643.24	48.40	117.603		
7,000.00	6,829.46	7,352.42	6,838.83	29.14	38.97	-24.33	2,890.63	-5,621.69	5,656.66	5,608.06	48.60	116.394		
7,050.00	6,860.91	7,382.90	6,869.30	29.43	38.99	-25.58	2,889.75	-5,621.74	5,619.12	5,570.34	48.79	115.173		
7,100.00	6,889.24	7,410.29	6,896.68	29.73	39.01	-27.39	2,888.97	-5,621.79	5,579.26	5,530.30	48.96	113.947		
7,150.00	6,914.27	7,434.42	6,920.80	30.05	39.03	-29.90	2,888.29	-5,621.83	5,537.32	5,488.20	49.12	112.720		
7,200.00	6,935.85	7,455.14	6,941.52	30.37	39.04	-33.38	2,887.71	-5,621.86	5,493.55	5,444.29	49.27	111.499		
7,250.00	6,953.84	7,472.33	6,958.69	30.71	39.05	-38.23	2,887.23	-5,621.89	5,448.24	5,398.84	49.40	110.289		
7,300.00	6,968.15	7,485.87	6,972.23	31.06	39.06	-45.11	2,886.86	-5,621.92	5,401.65	5,352.13	49.51	109.092		
7,350.00	6,978.67	7,495.67	6,982.03	31.42	39.07	-54.99	2,886.59	-5,621.93	5,354.07	5,304.45	49.61	107.915		
7,400.00	6,985.34	7,501.68	6,988.03	31.79	39.07	-69.01	2,886.42	-5,621.94	5,305.79	5,256.09	49.70	106.760		
7,450.00	6,988.13	7,503.85	6,990.21	32.17	39.07	-87.29	2,886.36	-5,621.95	5,257.11	5,207.34	49.77	105.629		
7,461.13	6,988.22	7,503.81	6,990.17	32.26	39.07	-91.73	2,886.36	-5,621.95	5,246.25	5,196.47	49.78	105.381		
7,500.00	6,988.19	7,503.35	6,989.70	32.56	39.07	-91.81	2,886.37	-5,621.95	5,208.27	5,158.44	49.83	104.519		
7,600.00	6,988.12	7,502.21	6,988.56	33.37	39.07	-92.10	2,886.41	-5,621.94	5,110.13	5,060.18	49.94	102.315		
7,700.00	6,988.05	7,501.15	6,987.51	34.21	39.07	-92.53	2,886.44	-5,621.94	5,011.43	4,961.38	50.05	100.133		
7,800.00	6,987.98	7,500.18	6,986.54	35.09	39.07	-93.22	2,886.46	-5,621.94	4,912.26	4,862.13	50.14	97.979		
7,900.00	6,987.91	7,499.30	6,985.66	35.99	39.07	-94.51	2,886.49	-5,621.94	4,812.73	4,762.53	50.21	95.858		
8,000.00	6,987.83	7,498.52	6,984.87	36.93	39.07	-97.71	2,886.51	-5,621.94	4,712.94	4,662.68	50.26	93.772		
8,100.00	6,987.76	7,497.82	6,984.17	37.88	39.07	-117.52	2,886.53	-5,621.94	4,612.99	4,562.70	50.29	91.726		
8,200.00	6,987.68	7,497.21	6,983.57	38.86	39.07	105.21	2,886.54	-5,621.94	4,513.00	4,462.70	50.30	89.723		
8,300.00	6,987.61	7,496.70	6,983.06	39.86	39.07	96.10	2,886.56	-5,621.93	4,413.09	4,362.81	50.28	87.764		
8,400.00	6,987.53	7,496.28	6,982.64	40.87	39.07	93.80	2,886.57	-5,621.93	4,313.39	4,263.15	50.24	85.851		
8,500.00	6,987.46	7,495.96	6,982.32	41.90	39.07	92.76	2,886.58	-5,621.93	4,214.05	4,163.88	50.18	83.985		
8,600.00	6,987.38	7,495.73	6,982.09	42.93	39.07	92.18	2,886.58	-5,621.93	4,115.22	4,065.13	50.08	82.165		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 358-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,700.00	6,987.31	7,495.60	6,981.96	43.98	39.07	91.81	2,886.59	-5,621.93	4,017.05	3,967.08	49.97	80.391	
8,800.00	6,987.23	7,495.56	6,981.92	45.03	39.07	91.55	2,886.59	-5,621.93	3,919.73	3,869.90	49.83	78.660	
8,872.16	6,987.18	7,495.59	6,981.95	45.79	39.07	91.42	2,886.59	-5,621.93	3,850.13	3,800.41	49.72	77.435	
8,900.00	6,987.16	7,495.62	6,981.97	46.08	39.07	91.42	2,886.59	-5,621.93	3,823.40	3,773.72	49.68	76.965	
9,000.00	6,987.09	7,495.69	6,982.05	47.16	39.07	91.42	2,886.58	-5,621.93	3,727.51	3,677.99	49.53	75.263	
9,100.00	6,987.01	7,495.77	6,982.13	48.27	39.07	91.43	2,886.58	-5,621.93	3,631.85	3,582.46	49.39	73.539	
9,200.00	6,986.94	7,495.85	6,982.21	49.40	39.07	91.43	2,886.58	-5,621.93	3,536.43	3,487.17	49.26	71.790	
9,300.00	6,986.86	7,495.93	6,982.29	50.56	39.07	91.44	2,886.58	-5,621.93	3,441.27	3,392.12	49.15	70.014	
9,400.00	6,986.79	7,496.01	6,982.37	51.75	39.07	91.44	2,886.58	-5,621.93	3,346.39	3,297.32	49.06	68.207	
9,500.00	6,986.71	7,496.09	6,982.45	52.95	39.07	91.44	2,886.57	-5,621.93	3,251.81	3,202.81	49.00	66.364	
9,600.00	6,986.64	7,496.17	6,982.52	54.18	39.07	91.45	2,886.57	-5,621.93	3,157.57	3,108.60	48.97	64.480	
9,700.00	6,986.56	7,496.25	6,982.60	55.42	39.07	91.45	2,886.57	-5,621.93	3,063.70	3,014.72	48.98	62.552	
9,800.00	6,986.49	7,496.33	6,982.68	56.69	39.07	91.46	2,886.57	-5,621.93	2,970.22	2,921.19	49.03	60.574	
9,900.00	6,986.41	7,496.40	6,982.76	57.97	39.07	91.46	2,886.57	-5,621.93	2,877.19	2,828.04	49.15	58.540	
10,000.00	6,986.34	7,496.48	6,982.84	59.26	39.07	91.47	2,886.56	-5,621.93	2,784.64	2,735.30	49.33	56.445	
10,100.00	6,986.27	7,496.56	6,982.92	60.57	39.07	91.47	2,886.56	-5,621.93	2,692.62	2,643.01	49.60	54.284	
10,200.00	6,986.19	7,496.64	6,983.00	61.90	39.07	91.47	2,886.56	-5,621.93	2,601.18	2,551.21	49.97	52.053	
10,300.00	6,986.12	7,496.72	6,983.08	63.23	39.07	91.48	2,886.56	-5,621.93	2,510.41	2,459.95	50.46	49.750	
10,400.00	6,986.04	7,496.80	6,983.16	64.58	39.07	91.48	2,886.55	-5,621.93	2,420.36	2,369.27	51.09	47.374	
10,500.00	6,985.97	7,496.88	6,983.23	65.94	39.07	91.49	2,886.55	-5,621.93	2,331.12	2,279.23	51.89	44.927	
10,600.00	6,985.89	7,496.96	6,983.31	67.32	39.07	91.49	2,886.55	-5,621.93	2,242.79	2,189.91	52.88	42.417	
10,700.00	6,985.82	7,497.03	6,983.39	68.70	39.07	91.50	2,886.55	-5,621.93	2,155.48	2,101.39	54.08	39.854	
10,800.00	6,985.74	7,497.11	6,983.47	70.09	39.07	91.50	2,886.55	-5,621.93	2,069.31	2,013.77	55.55	37.254	
10,900.00	6,985.67	7,497.19	6,983.55	71.49	39.07	91.50	2,886.54	-5,621.94	1,984.45	1,927.16	57.29	34.638	
11,000.00	6,985.59	7,497.27	6,983.63	72.90	39.07	91.51	2,886.54	-5,621.94	1,901.06	1,841.71	59.35	32.030	
11,100.00	6,985.52	7,497.35	6,983.71	74.31	39.07	91.51	2,886.54	-5,621.94	1,819.34	1,757.58	61.76	29.457	
11,200.00	6,985.45	7,497.43	6,983.78	75.74	39.07	91.52	2,886.54	-5,621.94	1,739.54	1,674.99	64.55	26.948	
11,300.00	6,985.37	7,497.51	6,983.86	77.17	39.07	91.52	2,886.54	-5,621.94	1,661.92	1,594.18	67.75	24.532	
11,400.00	6,985.30	7,497.59	6,983.94	78.61	39.07	91.52	2,886.53	-5,621.94	1,586.81	1,515.44	71.37	22.234	
11,500.00	6,985.22	7,497.66	6,984.02	80.05	39.07	91.53	2,886.53	-5,621.94	1,514.58	1,439.14	75.43	20.078	
11,600.00	6,985.15	7,497.74	6,984.10	81.50	39.07	91.53	2,886.53	-5,621.94	1,445.66	1,365.71	79.95	18.082	
11,700.00	6,985.07	7,497.82	6,984.18	82.96	39.07	91.54	2,886.53	-5,621.94	1,380.55	1,295.64	84.91	16.259	
11,800.00	6,985.00	7,497.90	6,984.26	84.42	39.07	91.54	2,886.52	-5,621.94	1,319.81	1,229.54	90.27	14.620	
11,900.00	6,984.92	7,497.98	6,984.34	85.89	39.07	91.55	2,886.52	-5,621.94	1,264.07	1,168.09	95.98	13.170	
12,000.00	6,984.85	7,498.06	6,984.41	87.36	39.07	91.55	2,886.52	-5,621.94	1,214.03	1,112.08	101.95	11.908	
12,100.00	6,984.77	7,498.14	6,984.49	88.83	39.07	91.55	2,886.52	-5,621.94	1,170.40	1,062.37	108.03	10.834	
12,200.00	6,984.70	7,498.22	6,984.57	90.31	39.07	91.56	2,886.52	-5,621.94	1,133.94	1,019.89	114.05	9.942	
12,300.00	6,984.63	7,498.29	6,984.65	91.80	39.07	91.56	2,886.51	-5,621.94	1,105.36	985.56	119.80	9.227	
12,400.00	6,984.55	7,498.37	6,984.73	93.29	39.07	91.57	2,886.51	-5,621.94	1,085.26	960.22	125.04	8.679	
12,500.00	6,984.48	7,498.45	6,984.81	94.78	39.07	91.57	2,886.51	-5,621.94	1,074.14	944.58	129.56	8.291	
12,570.09	6,984.42	7,498.51	6,984.86	95.83	39.07	91.57	2,886.51	-5,621.94	1,071.85	939.66	132.20	8.108 CC	
12,600.00	6,984.40	7,498.53	6,984.89	96.28	39.07	91.58	2,886.51	-5,621.94	1,072.27	939.10	133.17	8.052 ES	
12,700.00	6,984.33	7,498.61	6,984.96	97.78	39.07	91.58	2,886.50	-5,621.94	1,079.70	943.93	135.77	7.952 SF	
12,800.00	6,984.25	7,498.69	6,985.04	99.28	39.07	91.58	2,886.50	-5,621.94	1,096.23	958.91	137.32	7.983	
12,900.00	6,984.18	7,498.77	6,985.12	100.78	39.07	91.59	2,886.50	-5,621.94	1,121.48	983.60	137.88	8.134	
13,000.00	6,984.10	7,498.84	6,985.20	102.29	39.07	91.59	2,886.50	-5,621.94	1,154.86	1,017.30	137.56	8.396	
13,100.00	6,984.03	7,498.92	6,985.28	103.80	39.07	91.60	2,886.50	-5,621.94	1,195.69	1,059.19	136.50	8.759	
13,200.00	6,983.95	7,499.00	6,985.36	105.32	39.07	91.60	2,886.49	-5,621.94	1,243.25	1,108.36	134.89	9.217	
13,300.00	6,983.88	7,499.08	6,985.44	106.84	39.07	91.60	2,886.49	-5,621.94	1,296.78	1,163.92	132.86	9.760	
13,400.00	6,983.81	7,499.16	6,985.51	108.36	39.07	91.61	2,886.49	-5,621.94	1,355.59	1,225.01	130.58	10.382	
13,500.00	6,983.73	7,499.24	6,985.59	109.88	39.07	91.61	2,886.49	-5,621.94	1,419.02	1,290.88	128.13	11.074	
13,600.00	6,983.66	7,499.32	6,985.67	111.40	39.07	91.62	2,886.49	-5,621.94	1,486.47	1,360.84	125.63	11.832	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 358-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
13,700.00	6,983.58	7,499.39	6,985.75	112.93	39.07	91.62	2,886.48	-5,621.94	1,557.43	1,434.30	123.12	12.649	
13,800.00	6,983.51	7,499.47	6,985.83	114.46	39.07	91.63	2,886.48	-5,621.94	1,631.43	1,510.76	120.67	13.520	
13,900.00	6,983.43	7,499.55	6,985.91	115.99	39.07	91.63	2,886.48	-5,621.94	1,708.08	1,589.79	118.29	14.440	
14,000.00	6,983.36	7,499.63	6,985.98	117.52	39.07	91.63	2,886.48	-5,621.94	1,787.04	1,671.03	116.01	15.404	
14,100.00	6,983.28	7,499.71	6,986.06	119.06	39.07	91.64	2,886.47	-5,621.94	1,868.02	1,754.18	113.84	16.409	
14,200.00	6,983.21	7,499.79	6,986.14	120.59	39.07	91.64	2,886.47	-5,621.94	1,950.77	1,838.97	111.79	17.450	
14,300.00	6,983.13	7,499.86	6,986.22	122.13	39.07	91.65	2,886.47	-5,621.94	2,035.06	1,925.20	109.86	18.524	
14,400.00	6,983.06	7,499.94	6,986.30	123.67	39.07	91.65	2,886.47	-5,621.94	2,120.72	2,012.68	108.04	19.629	
14,500.00	6,982.99	7,500.02	6,986.38	125.21	39.07	91.65	2,886.47	-5,621.94	2,207.59	2,101.25	106.33	20.761	
14,600.00	6,982.91	7,500.10	6,986.46	126.75	39.07	91.66	2,886.46	-5,621.94	2,295.52	2,190.79	104.73	21.918	
14,700.00	6,982.84	7,500.18	6,986.53	128.30	39.07	91.66	2,886.46	-5,621.94	2,384.41	2,281.18	103.23	23.098	
14,800.00	6,982.76	7,500.26	6,986.61	129.85	39.07	91.67	2,886.46	-5,621.94	2,474.14	2,372.32	101.82	24.299	
14,900.00	6,982.69	7,500.34	6,986.69	131.39	39.07	91.67	2,886.46	-5,621.94	2,564.64	2,464.13	100.50	25.518	
15,000.00	6,982.61	7,500.41	6,986.77	132.94	39.07	91.68	2,886.46	-5,621.94	2,655.81	2,556.55	99.27	26.754	
15,100.00	6,982.54	7,500.49	6,986.85	134.49	39.07	91.68	2,886.45	-5,621.94	2,747.61	2,649.50	98.11	28.006	
15,200.00	6,982.46	7,500.57	6,986.93	136.04	39.07	91.68	2,886.45	-5,621.94	2,839.95	2,742.93	97.02	29.273	
15,300.00	6,982.39	7,500.65	6,987.00	137.60	39.07	91.69	2,886.45	-5,621.94	2,932.80	2,836.80	95.99	30.552	
15,400.00	6,982.31	7,500.73	6,987.08	139.15	39.07	91.69	2,886.45	-5,621.94	3,026.10	2,931.07	95.03	31.842	
15,500.00	6,982.24	7,500.81	6,987.16	140.70	39.07	91.70	2,886.44	-5,621.94	3,119.82	3,025.69	94.13	33.144	
15,600.00	6,982.17	7,500.88	6,987.24	142.26	39.07	91.70	2,886.44	-5,621.94	3,213.91	3,120.64	93.28	34.455	
15,700.00	6,982.09	7,500.96	6,987.32	143.82	39.07	91.71	2,886.44	-5,621.94	3,308.36	3,215.88	92.48	35.775	
15,800.00	6,982.02	7,501.04	6,987.40	145.38	39.07	91.71	2,886.44	-5,621.94	3,403.12	3,311.40	91.72	37.103	
15,900.00	6,981.94	7,501.12	6,987.47	146.94	39.07	91.71	2,886.44	-5,621.94	3,498.17	3,407.16	91.01	38.439	
16,000.00	6,981.87	7,501.20	6,987.55	148.50	39.07	91.72	2,886.43	-5,621.94	3,593.49	3,503.16	90.33	39.781	
16,100.00	6,981.79	7,501.28	6,987.63	150.06	39.07	91.72	2,886.43	-5,621.94	3,689.06	3,599.37	89.69	41.129	
16,200.00	6,981.72	7,501.35	6,987.71	151.62	39.07	91.73	2,886.43	-5,621.94	3,784.86	3,695.77	89.09	42.483	
16,300.00	6,981.64	7,501.43	6,987.79	153.18	39.07	91.73	2,886.43	-5,621.94	3,880.87	3,792.35	88.52	43.841	
16,400.00	6,981.57	7,501.51	6,987.87	154.74	39.07	91.73	2,886.43	-5,621.94	3,977.07	3,889.09	87.98	45.204	
16,500.00	6,981.49	7,501.59	6,987.94	156.31	39.07	91.74	2,886.42	-5,621.94	4,073.46	3,985.99	87.47	46.571	
16,600.00	6,981.42	7,501.67	6,988.02	157.87	39.07	91.74	2,886.42	-5,621.94	4,170.02	4,083.04	86.98	47.941	
16,700.00	6,981.35	7,501.74	6,988.10	159.44	39.07	91.75	2,886.42	-5,621.94	4,266.74	4,180.22	86.52	49.315	
16,800.00	6,981.27	7,501.82	6,988.18	161.01	39.07	91.75	2,886.42	-5,621.94	4,363.60	4,277.52	86.08	50.692	
16,900.00	6,981.20	7,501.90	6,988.26	162.58	39.07	91.76	2,886.41	-5,621.94	4,460.61	4,374.94	85.66	52.071	
17,000.00	6,981.12	7,501.98	6,988.33	164.14	39.07	91.76	2,886.41	-5,621.94	4,557.74	4,472.47	85.27	53.452	
17,100.00	6,981.05	7,502.06	6,988.41	165.71	39.07	91.76	2,886.41	-5,621.94	4,655.00	4,570.11	84.89	54.835	
17,200.00	6,980.97	7,502.14	6,988.49	167.28	39.07	91.77	2,886.41	-5,621.94	4,752.36	4,667.83	84.53	56.220	
17,300.00	6,980.90	7,502.21	6,988.57	168.85	39.07	91.77	2,886.41	-5,621.94	4,849.84	4,765.65	84.19	57.606	
17,400.00	6,980.82	7,502.29	6,988.65	170.42	39.07	91.78	2,886.40	-5,621.94	4,947.42	4,863.55	83.86	58.994	
17,500.00	6,980.75	7,502.37	6,988.73	172.00	39.07	91.78	2,886.40	-5,621.94	5,045.09	4,961.54	83.55	60.382	
17,600.00	6,980.67	7,502.45	6,988.80	173.57	39.07	91.78	2,886.40	-5,621.94	5,142.85	5,059.59	83.26	61.771	
17,700.00	6,980.60	7,502.53	6,988.88	175.14	39.07	91.79	2,886.40	-5,621.94	5,240.70	5,157.72	82.97	63.161	
17,800.00	6,980.53	7,502.60	6,988.96	176.71	39.07	91.79	2,886.40	-5,621.94	5,338.62	5,255.92	82.70	64.551	
17,900.00	6,980.45	7,502.68	6,989.04	178.29	39.07	91.80	2,886.39	-5,621.94	5,436.62	5,354.17	82.45	65.941	
18,000.00	6,980.38	7,502.76	6,989.12	179.86	39.07	91.80	2,886.39	-5,621.94	5,534.69	5,452.49	82.20	67.332	
18,100.00	6,980.30	7,502.84	6,989.19	181.44	39.07	91.81	2,886.39	-5,621.94	5,632.83	5,550.87	81.97	68.722	
18,200.00	6,980.23	7,502.92	6,989.27	183.01	39.07	91.81	2,886.39	-5,621.94	5,731.04	5,649.30	81.74	70.112	
18,300.00	6,980.15	7,503.00	6,989.35	184.59	39.07	91.81	2,886.38	-5,621.94	5,829.30	5,747.78	81.53	71.501	
18,400.00	6,980.08	7,503.07	6,989.43	186.16	39.07	91.82	2,886.38	-5,621.94	5,927.63	5,846.30	81.32	72.891	
18,500.00	6,980.00	7,503.15	6,989.51	187.74	39.07	91.82	2,886.38	-5,621.95	6,026.01	5,944.88	81.13	74.279	
18,600.00	6,979.93	7,503.23	6,989.58	189.32	39.07	91.83	2,886.38	-5,621.95	6,124.44	6,043.50	80.94	75.667	
18,700.00	6,979.85	7,503.31	6,989.66	190.90	39.07	91.83	2,886.38	-5,621.95	6,222.92	6,142.16	80.76	77.054	
18,800.00	6,979.78	7,503.39	6,989.74	192.48	39.07	91.83	2,886.37	-5,621.95	6,321.45	6,240.86	80.59	78.440	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 072B - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		358-APC_ISCWSA REV 2 MWD					Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
18,900.00	6,979.71	7,503.46	6,989.82	194.05	39.07	91.84	2,886.37	-5,621.95	6,420.02	6,339.59	80.43	79.825		
19,000.00	6,979.63	7,503.54	6,989.90	195.63	39.07	91.84	2,886.37	-5,621.95	6,518.64	6,438.37	80.27	81.208		
19,100.00	6,979.56	7,503.62	6,989.97	197.21	39.07	91.85	2,886.37	-5,621.95	6,617.30	6,537.18	80.12	82.591		
19,200.00	6,979.48	7,503.70	6,990.05	198.79	39.07	91.85	2,886.37	-5,621.95	6,716.00	6,636.02	79.98	83.972		
19,300.00	6,979.41	7,503.78	6,990.13	200.37	39.07	91.86	2,886.36	-5,621.95	6,814.73	6,734.89	79.84	85.352		
19,400.00	6,979.33	7,503.85	6,990.21	201.95	39.07	91.86	2,886.36	-5,621.95	6,913.51	6,833.79	79.71	86.730		
19,500.00	6,979.26	7,503.93	6,990.29	203.54	39.07	91.86	2,886.36	-5,621.95	7,012.32	6,932.73	79.59	88.107		
19,600.00	6,979.18	7,504.01	6,990.36	205.12	39.07	91.87	2,886.36	-5,621.95	7,111.16	7,031.69	79.47	89.483		
19,700.00	6,979.11	7,504.09	6,990.44	206.70	39.07	91.87	2,886.35	-5,621.95	7,210.03	7,130.67	79.36	90.856		
19,800.00	6,979.03	7,504.17	6,990.52	208.28	39.07	91.88	2,886.35	-5,621.95	7,308.93	7,229.69	79.25	92.228		
19,900.00	6,978.96	7,504.24	6,990.60	209.86	39.07	91.88	2,886.35	-5,621.95	7,407.87	7,328.72	79.15	93.598		
20,000.00	6,978.89	7,504.32	6,990.68	211.45	39.07	91.88	2,886.35	-5,621.95	7,506.83	7,427.78	79.05	94.966		
20,100.00	6,978.81	7,504.40	6,990.75	213.03	39.07	91.89	2,886.35	-5,621.95	7,605.82	7,526.86	78.95	96.332		
20,200.00	6,978.74	7,504.48	6,990.83	214.61	39.07	91.89	2,886.34	-5,621.95	7,704.83	7,625.97	78.86	97.697		
20,300.00	6,978.66	7,504.56	6,990.91	216.20	39.07	91.90	2,886.34	-5,621.95	7,803.87	7,725.09	78.78	99.059		
20,400.00	6,978.59	7,504.63	6,990.99	217.78	39.07	91.90	2,886.34	-5,621.95	7,902.94	7,824.24	78.70	100.419		
20,500.00	6,978.51	7,504.71	6,991.07	219.37	39.07	91.91	2,886.34	-5,621.95	8,002.02	7,923.40	78.62	101.777		
20,600.00	6,978.44	7,504.79	6,991.14	220.95	39.07	91.91	2,886.34	-5,621.95	8,101.13	8,022.58	78.55	103.133		
20,700.00	6,978.36	7,504.87	6,991.22	222.53	39.07	91.91	2,886.33	-5,621.95	8,200.27	8,121.78	78.48	104.487		
20,800.00	6,978.29	7,504.95	6,991.30	224.12	39.07	91.92	2,886.33	-5,621.95	8,299.42	8,221.00	78.42	105.838		
20,900.00	6,978.21	7,505.02	6,991.38	225.71	39.07	91.92	2,886.33	-5,621.95	8,398.59	8,320.24	78.35	107.187		
21,000.00	6,978.14	7,505.10	6,991.45	227.29	39.07	91.93	2,886.33	-5,621.95	8,497.78	8,419.49	78.30	108.534		
21,100.00	6,978.07	7,505.18	6,991.53	228.88	39.07	91.93	2,886.32	-5,621.95	8,596.99	8,518.75	78.24	109.878		
21,200.00	6,977.99	7,505.26	6,991.61	230.46	39.07	91.93	2,886.32	-5,621.95	8,696.22	8,618.03	78.19	111.220		
21,300.00	6,977.92	7,505.33	6,991.69	232.05	39.08	91.94	2,886.32	-5,621.95	8,795.47	8,717.33	78.14	112.560		
21,400.00	6,977.84	7,505.41	6,991.77	233.64	39.08	91.94	2,886.32	-5,621.95	8,894.73	8,816.64	78.09	113.897		
21,500.00	6,977.77	7,505.49	6,991.84	235.22	39.08	91.95	2,886.32	-5,621.95	8,994.01	8,915.96	78.05	115.232		
21,600.00	6,977.69	7,505.57	6,991.92	236.81	39.08	91.95	2,886.31	-5,621.95	9,093.30	9,015.29	78.01	116.564		
21,700.00	6,977.62	7,505.65	6,992.00	238.40	39.08	91.96	2,886.31	-5,621.95	9,192.62	9,114.64	77.97	117.893		
21,800.00	6,977.54	7,505.72	6,992.08	239.99	39.08	91.96	2,886.31	-5,621.95	9,291.94	9,214.00	77.94	119.220		
21,900.00	6,977.47	7,505.80	6,992.15	241.57	39.08	91.96	2,886.31	-5,621.95	9,391.28	9,313.37	77.91	120.544		
22,000.00	6,977.39	7,505.88	6,992.23	243.16	39.08	91.97	2,886.31	-5,621.95	9,490.63	9,412.76	77.88	121.865		
22,100.00	6,977.32	7,505.96	6,992.31	244.75	39.08	91.97	2,886.30	-5,621.95	9,590.00	9,512.15	77.85	123.184		
22,200.00	6,977.25	7,506.03	6,992.39	246.34	39.08	91.98	2,886.30	-5,621.95	9,689.38	9,611.55	77.83	124.500		
22,300.00	6,977.17	7,506.11	6,992.47	247.93	39.08	91.98	2,886.30	-5,621.95	9,788.77	9,710.97	77.80	125.814		
22,400.00	6,977.10	7,506.19	6,992.54	249.52	39.08	91.98	2,886.30	-5,621.95	9,888.18	9,810.39	77.78	127.124		
22,500.00	6,977.02	7,506.27	6,992.62	251.11	39.08	91.99	2,886.29	-5,621.95	9,987.59	9,909.83	77.77	128.432		
22,529.62	6,977.00	7,506.29	6,992.64	251.58	39.08	91.99	2,886.29	-5,621.95	10,017.04	9,939.28	77.76	128.819		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC													Offset Site Error:	0.00 usft	
Survey Program:		248-A027Ua_INC-ONLY						Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-85.02	1,227.19	-14,071.75	14,125.22						
100.00	100.00	61.00	61.00	0.25	1.13	-85.02	1,227.19	-14,071.75	14,125.16	14,123.79	1.38	N/A			
200.00	200.00	161.00	161.00	0.61	2.98	-85.02	1,227.19	-14,071.75	14,125.16	14,121.58	3.59	3,939.391			
300.00	300.00	261.00	261.00	0.97	4.85	-85.02	1,227.19	-14,071.75	14,125.16	14,119.35	5.82	2,428.933			
400.00	400.00	361.00	361.00	1.33	6.87	-85.02	1,227.19	-14,071.75	14,125.16	14,116.97	8.20	1,723.126			
500.00	500.00	464.59	464.58	1.68	8.97	-85.02	1,227.35	-14,071.75	14,125.18	14,114.53	10.65	1,326.059			
550.00	550.00	511.04	511.00	1.86	9.92	-85.02	1,227.19	-14,071.75	14,125.16	14,113.38	11.79	1,198.322			
600.00	600.00	561.03	561.00	2.04	11.14	-82.63	1,227.19	-14,071.75	14,125.11	14,111.93	13.18	1,071.636			
700.00	699.93	663.98	663.94	2.40	13.64	-82.65	1,227.86	-14,071.75	14,124.72	14,108.68	16.04	880.648			
800.00	799.68	775.23	775.17	2.77	16.34	-82.71	1,227.05	-14,071.75	14,123.77	14,104.67	19.10	739.481			
900.00	899.13	860.25	860.13	3.13	18.65	-82.77	1,227.19	-14,071.75	14,122.44	14,100.67	21.77	648.664			
1,000.00	998.15	962.22	962.08	3.49	21.38	-82.86	1,228.47	-14,071.75	14,120.79	14,095.92	24.87	567.691			
1,100.00	1,096.63	1,072.17	1,072.00	3.87	24.33	-82.98	1,227.66	-14,071.75	14,118.56	14,090.36	28.20	500.643			
1,130.50	1,126.54	1,105.48	1,105.31	3.99	25.22	-83.03	1,227.20	-14,071.75	14,117.78	14,088.57	29.21	483.289			
1,200.00	1,194.61	1,155.90	1,155.61	4.26	26.54	-83.07	1,227.19	-14,071.75	14,116.04	14,085.23	30.81	458.224			
1,300.00	1,292.57	1,253.85	1,253.57	4.66	29.11	-83.15	1,227.19	-14,071.75	14,113.57	14,079.80	33.77	417.910			
1,400.00	1,390.52	1,351.81	1,351.52	5.07	31.68	-83.23	1,227.19	-14,071.75	14,111.13	14,074.39	36.74	384.045			
1,500.00	1,488.48	1,456.60	1,456.28	5.48	34.42	-83.30	1,228.78	-14,071.75	14,108.85	14,068.95	39.90	353.615			
1,600.00	1,586.43	1,561.38	1,561.03	5.90	37.17	-83.39	1,227.79	-14,071.75	14,106.40	14,063.34	43.06	327.619			
1,700.00	1,684.38	1,645.87	1,645.38	6.31	39.25	-83.46	1,227.19	-14,071.75	14,103.99	14,058.43	45.56	309.570			
1,800.00	1,782.34	1,743.82	1,743.34	6.73	41.52	-83.54	1,227.19	-14,071.75	14,101.67	14,053.42	48.25	292.283			
1,900.00	1,880.29	1,841.78	1,841.29	7.15	43.79	-83.62	1,227.19	-14,071.75	14,099.37	14,048.44	50.94	276.810			
2,000.00	1,978.25	1,944.45	1,943.93	7.58	46.16	-83.70	1,228.62	-14,071.75	14,097.21	14,043.47	53.73	262.349			
2,100.00	2,076.20	2,047.59	2,047.06	8.00	48.55	-83.79	1,227.85	-14,071.75	14,094.92	14,038.37	56.55	249.263			
2,200.00	2,174.15	2,135.76	2,135.15	8.43	50.53	-83.86	1,227.19	-14,071.75	14,092.66	14,033.71	58.95	239.068			
2,300.00	2,272.11	2,233.71	2,233.11	8.85	52.60	-83.94	1,227.19	-14,071.75	14,090.48	14,029.03	61.44	229.323			
2,400.00	2,370.06	2,331.84	2,331.23	9.28	54.67	-84.02	1,228.17	-14,071.75	14,088.38	14,024.44	63.94	220.325			
2,500.00	2,468.02	2,433.33	2,432.71	9.71	56.82	-84.10	1,227.95	-14,071.75	14,086.24	14,019.73	66.52	211.775			
2,600.00	2,565.97	2,534.67	2,534.04	10.14	58.96	-84.19	1,227.32	-14,071.75	14,084.11	14,015.03	69.08	203.869			
2,700.00	2,663.92	2,625.60	2,624.92	10.57	60.73	-84.26	1,227.19	-14,071.75	14,082.03	14,010.74	71.29	197.532			
2,800.00	2,761.88	2,723.55	2,722.88	11.00	62.61	-84.34	1,227.19	-14,071.75	14,079.99	14,006.39	73.60	191.300			
2,900.00	2,859.83	2,822.28	2,821.59	11.43	64.51	-84.42	1,228.25	-14,071.75	14,078.04	14,002.11	75.93	185.411			
3,000.00	2,957.79	2,923.05	2,922.36	11.86	66.45	-84.50	1,227.98	-14,071.75	14,076.04	13,997.75	78.30	179.781			
3,100.00	3,055.74	3,023.68	3,022.98	12.29	68.38	-84.59	1,227.34	-14,071.75	14,074.05	13,993.39	80.66	174.486			
3,200.00	3,153.69	3,115.41	3,114.69	12.72	69.95	-84.66	1,227.19	-14,071.75	14,072.12	13,989.46	82.66	170.240			
3,300.00	3,251.65	3,213.36	3,212.65	13.15	71.58	-84.74	1,227.19	-14,071.75	14,070.22	13,985.50	84.72	166.080			
3,400.00	3,349.60	3,311.32	3,310.60	13.59	73.21	-84.82	1,227.19	-14,071.75	14,068.35	13,981.57	86.78	162.117			
3,500.00	3,447.56	3,409.66	3,408.94	14.02	74.84	-84.90	1,227.90	-14,071.75	14,066.55	13,977.70	88.85	158.327			
3,600.00	3,545.51	3,508.48	3,507.76	14.45	76.48	-84.98	1,227.78	-14,071.75	14,064.73	13,973.81	90.92	154.694			
3,700.00	3,643.46	3,607.25	3,606.53	14.88	78.12	-85.06	1,227.53	-14,071.75	14,062.93	13,969.94	92.99	151.225			
3,800.00	3,741.42	3,703.15	3,702.42	15.32	79.73	-85.14	1,227.19	-14,071.75	14,061.16	13,966.13	95.03	147.968			
3,900.00	3,839.37	3,801.10	3,800.37	15.75	81.46	-85.22	1,227.19	-14,071.75	14,059.44	13,962.24	97.20	144.643			
4,000.00	3,937.33	3,899.78	3,899.05	16.18	83.22	-85.30	1,227.29	-14,071.75	14,057.74	13,958.36	99.39	141.446			
4,100.00	4,035.28	3,997.02	3,996.28	16.62	85.27	-85.38	1,227.19	-14,071.75	14,056.07	13,954.20	101.87	137.978			
4,200.00	4,133.23	4,094.98	4,094.23	17.05	87.79	-85.46	1,227.19	-14,071.75	14,054.43	13,949.61	104.82	134.078			
4,300.00	4,231.19	4,194.75	4,194.00	17.48	90.35	-85.54	1,227.56	-14,071.75	14,052.83	13,945.01	107.82	130.335			
4,400.00	4,329.14	4,291.02	4,290.14	17.92	92.97	-85.62	1,227.19	-14,071.75	14,051.24	13,940.36	110.87	126.733			
4,500.00	4,427.10	4,395.38	4,394.47	18.35	96.33	-85.70	1,227.74	-14,071.75	14,049.70	13,935.04	114.67	122.525			
4,600.00	4,525.05	4,487.08	4,486.05	18.78	99.36	-85.78	1,227.19	-14,071.75	14,048.16	13,930.03	118.13	118.923			
4,700.00	4,623.00	4,585.17	4,584.00	19.22	102.68	-85.86	1,227.19	-14,071.75	14,046.66	13,924.78	121.88	115.249			
4,800.00	4,720.96	4,694.99	4,693.77	19.65	106.48	-85.95	1,226.93	-14,071.75	14,045.19	13,919.07	126.12	111.364			
4,900.00	4,818.91	4,788.31	4,786.96	20.09	109.84	-86.03	1,227.54	-14,071.75	14,043.76	13,913.85	129.92	108.098			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC											Offset Site Error: 0.00 usft			
Survey Program: Reference		248-A027Ua_INC-ONLY Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,916.87	4,881.52	4,880.03	20.52	113.29	-86.10	1,227.98	-14,071.75	14,042.36	13,908.57	133.79	104.955		
5,100.00	5,014.82	4,977.46	4,975.82	20.96	116.92	-86.18	1,227.19	-14,071.75	14,040.96	13,903.10	137.86	101.851		
5,200.00	5,112.77	5,080.88	5,079.18	21.39	120.90	-86.26	1,227.99	-14,071.75	14,039.63	13,897.35	142.28	98.678		
5,300.00	5,210.73	5,173.65	5,171.73	21.82	124.49	-86.34	1,227.19	-14,071.75	14,038.28	13,891.98	146.30	95.953		
5,400.00	5,308.68	5,271.79	5,269.68	22.26	128.25	-86.42	1,227.19	-14,071.75	14,036.99	13,886.49	150.50	93.269		
5,493.23	5,400.00	5,367.55	5,365.40	22.66	131.79	-86.50	1,227.86	-14,071.75	14,035.82	13,881.37	154.44	90.879		
5,500.00	5,406.64	5,374.88	5,372.72	22.69	132.06	-86.51	1,227.74	-14,071.75	14,035.73	13,880.99	154.75	90.702		
5,600.00	5,504.69	5,468.62	5,466.30	23.12	135.47	-86.57	1,227.94	-14,071.75	14,034.52	13,875.94	158.58	88.502		
5,700.00	5,602.91	5,566.35	5,563.91	23.55	139.00	-86.65	1,227.19	-14,071.75	14,033.38	13,870.84	162.54	86.340		
5,800.00	5,701.29	5,665.40	5,662.92	23.97	142.58	-86.71	1,228.68	-14,071.75	14,032.35	13,865.80	166.54	84.257		
5,900.00	5,799.82	5,768.21	5,765.68	24.39	146.31	-86.78	1,227.37	-14,071.75	14,031.34	13,860.66	170.68	82.208		
6,000.00	5,898.50	5,862.23	5,859.50	24.79	149.82	-86.84	1,227.19	-14,071.75	14,030.43	13,855.82	174.61	80.354		
6,100.00	5,997.31	5,963.28	5,960.49	25.20	153.62	-86.89	1,228.32	-14,071.75	14,029.59	13,850.79	178.80	78.464		
6,200.00	6,096.26	6,060.31	6,057.26	25.60	157.30	-86.95	1,227.19	-14,071.75	14,028.79	13,845.90	182.89	76.708		
6,300.00	6,195.33	6,160.29	6,157.19	25.99	161.18	-86.99	1,228.56	-14,071.75	14,028.08	13,840.92	187.16	74.952		
6,400.00	6,294.51	6,258.86	6,255.51	26.37	165.00	-87.05	1,227.19	-14,071.75	14,027.40	13,836.04	191.36	73.303		
6,498.19	6,392.00	6,359.07	6,355.68	26.75	168.79	-87.09	1,227.49	-14,071.75	14,026.80	13,831.27	195.53	71.739		
6,500.00	6,393.80	6,360.98	6,357.58	26.76	168.86	-85.89	1,227.45	-14,071.75	14,026.79	13,831.18	195.60	71.710		
6,550.00	6,443.29	6,407.80	6,404.29	26.95	170.59	-63.25	1,227.19	-14,071.75	14,024.63	13,827.10	197.53	70.999		
6,600.00	6,492.24	6,456.75	6,453.24	27.16	172.39	-52.74	1,227.19	-14,071.75	14,019.02	13,819.49	199.54	70.257		
6,650.00	6,540.33	6,505.79	6,502.24	27.38	174.19	-47.32	1,228.20	-14,071.75	14,010.01	13,808.46	201.56	69.509		
6,700.00	6,587.28	6,553.77	6,550.20	27.60	175.96	-44.35	1,227.49	-14,071.75	13,997.63	13,794.09	203.54	68.770		
6,750.00	6,632.80	6,597.53	6,593.80	27.84	177.57	-42.75	1,227.19	-14,071.75	13,981.98	13,776.59	205.38	68.078		
6,800.00	6,676.60	6,641.36	6,637.60	28.09	179.18	-42.06	1,228.07	-14,071.75	13,963.15	13,755.92	207.23	67.380		
6,850.00	6,718.42	6,683.83	6,680.06	28.34	180.75	-42.04	1,227.77	-14,071.75	13,941.27	13,732.24	209.03	66.694		
6,900.00	6,758.00	6,722.90	6,719.00	28.60	182.15	-42.57	1,227.19	-14,071.75	13,916.47	13,705.79	210.68	66.055		
6,950.00	6,795.09	6,759.99	6,756.09	28.87	183.39	-43.61	1,227.19	-14,071.75	13,888.92	13,676.76	212.16	65.464		
7,000.00	6,829.46	6,794.36	6,790.46	29.14	184.54	-45.14	1,227.19	-14,071.75	13,858.79	13,645.24	213.55	64.897		
7,050.00	6,860.91	6,825.81	6,821.91	29.43	185.59	-47.20	1,227.19	-14,071.75	13,826.27	13,611.43	214.84	64.355		
7,100.00	6,889.24	6,854.14	6,850.24	29.73	186.54	-49.81	1,227.19	-14,071.75	13,791.56	13,575.53	216.03	63.840		
7,150.00	6,914.27	6,879.07	6,875.12	30.05	187.37	-53.03	1,229.06	-14,071.75	13,754.88	13,537.77	217.10	63.356		
7,200.00	6,935.85	6,900.31	6,896.35	30.37	188.08	-56.96	1,229.00	-14,071.75	13,716.46	13,498.41	218.05	62.904		
7,250.00	6,953.84	6,917.88	6,913.92	30.71	188.66	-61.65	1,228.90	-14,071.75	13,676.55	13,457.67	218.88	62.485		
7,300.00	6,968.15	6,931.72	6,927.75	31.06	189.13	-67.17	1,228.78	-14,071.75	13,635.39	13,415.82	219.57	62.100		
7,350.00	6,978.67	6,941.76	6,937.78	31.42	189.46	-73.51	1,228.68	-14,071.75	13,593.23	13,373.09	220.14	61.748		
7,400.00	6,985.34	6,947.99	6,944.01	31.79	189.67	-80.61	1,228.61	-14,071.75	13,550.34	13,329.77	220.58	61.432		
7,450.00	6,988.13	6,950.41	6,946.43	32.17	189.75	-88.29	1,228.58	-14,071.75	13,506.99	13,286.10	220.88	61.150		
7,461.13	6,988.22	6,950.43	6,946.46	32.26	189.75	-90.05	1,228.58	-14,071.75	13,497.30	13,276.36	220.93	61.092		
7,500.00	6,988.19	6,950.19	6,946.21	32.56	189.74	-90.05	1,228.58	-14,071.75	13,463.33	13,242.23	221.10	60.894		
7,600.00	6,988.12	6,949.60	6,945.62	33.37	189.72	-90.05	1,228.59	-14,071.75	13,374.91	13,153.40	221.51	60.380		
7,700.00	6,988.05	6,949.04	6,945.07	34.21	189.70	-90.05	1,228.60	-14,071.75	13,285.06	13,063.14	221.92	59.863		
7,800.00	6,987.98	6,948.53	6,944.56	35.09	189.69	-90.05	1,228.60	-14,071.75	13,193.87	12,971.55	222.32	59.347		
7,900.00	6,987.91	6,948.07	6,944.09	35.99	189.67	-90.05	1,228.61	-14,071.75	13,101.41	12,878.71	222.70	58.830		
8,000.00	6,987.83	6,947.64	6,943.66	36.93	189.66	-90.05	1,228.61	-14,071.75	13,007.78	12,784.72	223.06	58.315		
8,100.00	6,987.76	6,947.25	6,943.28	37.88	189.64	-90.05	1,228.62	-14,071.75	12,913.07	12,689.67	223.40	57.803		
8,200.00	6,987.68	6,946.90	6,942.93	38.86	189.63	-90.06	1,228.62	-14,071.75	12,817.36	12,593.64	223.71	57.294		
8,300.00	6,987.61	6,946.60	6,942.62	39.86	189.62	-90.06	1,228.62	-14,071.75	12,720.75	12,496.75	224.00	56.789		
8,400.00	6,987.53	6,946.33	6,942.35	40.87	189.61	-90.07	1,228.63	-14,071.75	12,623.34	12,399.08	224.26	56.289		
8,500.00	6,987.46	6,946.09	6,942.12	41.90	189.61	-90.08	1,228.63	-14,071.75	12,525.24	12,300.75	224.49	55.795		
8,600.00	6,987.38	6,945.90	6,941.92	42.93	189.60	-90.09	1,228.63	-14,071.75	12,426.54	12,201.86	224.68	55.308		
8,700.00	6,987.31	6,945.74	6,941.77	43.98	189.59	-90.11	1,228.63	-14,071.75	12,327.36	12,102.52	224.84	54.828		
8,800.00	6,987.23	6,945.62	6,941.65	45.03	189.59	-90.16	1,228.64	-14,071.75	12,227.80	12,002.84	224.96	54.356		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC												Offset Site Error:	0.00 usft	
Survey Program:		248-A027Ua_INC-ONLY				Rule Assigned:							Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
8,872.16	6,987.18	6,945.56	6,941.59	45.79	189.59	-90.22	1,228.64	-14,071.75	12,155.79	11,930.77	225.02	54.021		
8,900.00	6,987.16	6,945.54	6,941.57	46.08	189.59	-90.22	1,228.64	-14,071.75	12,127.99	11,902.95	225.04	53.892		
9,000.00	6,987.09	6,945.47	6,941.49	47.16	189.58	-90.22	1,228.64	-14,071.75	12,028.12	11,803.01	225.12	53.431		
9,100.00	6,987.01	6,945.39	6,941.42	48.27	189.58	-90.21	1,228.64	-14,071.75	11,928.26	11,703.07	225.19	52.969		
9,200.00	6,986.94	6,945.32	6,941.35	49.40	189.58	-90.20	1,228.64	-14,071.75	11,828.40	11,603.13	225.27	52.507		
9,300.00	6,986.86	6,945.25	6,941.27	50.56	189.58	-90.20	1,228.64	-14,071.75	11,728.54	11,503.19	225.35	52.046		
9,400.00	6,986.79	6,945.17	6,941.20	51.75	189.57	-90.19	1,228.64	-14,071.75	11,628.69	11,403.25	225.43	51.584		
9,500.00	6,986.71	6,945.10	6,941.13	52.95	189.57	-90.18	1,228.64	-14,071.75	11,528.83	11,303.32	225.52	51.122		
9,600.00	6,986.64	6,945.03	6,941.05	54.18	189.57	-90.18	1,228.64	-14,071.75	11,428.98	11,203.38	225.60	50.660		
9,700.00	6,986.56	6,944.96	6,940.98	55.42	189.57	-90.17	1,228.64	-14,071.75	11,329.14	11,103.44	225.69	50.197		
9,800.00	6,986.49	6,944.88	6,940.91	56.69	189.56	-90.16	1,228.64	-14,071.75	11,229.29	11,003.51	225.78	49.735		
9,900.00	6,986.41	6,944.81	6,940.83	57.97	189.56	-90.16	1,228.64	-14,071.75	11,129.45	10,903.57	225.87	49.273		
10,000.00	6,986.34	6,944.74	6,940.76	59.26	189.56	-90.15	1,228.65	-14,071.75	11,029.61	10,803.64	225.97	48.811		
10,100.00	6,986.27	6,944.66	6,940.69	60.57	189.56	-90.14	1,228.65	-14,071.75	10,929.77	10,703.71	226.06	48.348		
10,200.00	6,986.19	6,944.59	6,940.62	61.90	189.55	-90.14	1,228.65	-14,071.75	10,829.94	10,603.78	226.16	47.886		
10,300.00	6,986.12	6,944.52	6,940.54	63.23	189.55	-90.13	1,228.65	-14,071.75	10,730.11	10,503.85	226.26	47.423		
10,400.00	6,986.04	6,944.44	6,940.47	64.58	189.55	-90.12	1,228.65	-14,071.75	10,630.28	10,403.91	226.37	46.961		
10,500.00	6,985.97	6,944.37	6,940.40	65.94	189.55	-90.12	1,228.65	-14,071.75	10,530.46	10,303.99	226.47	46.498		
10,600.00	6,985.89	6,944.30	6,940.32	67.32	189.55	-90.11	1,228.65	-14,071.75	10,430.64	10,204.06	226.58	46.035		
10,700.00	6,985.82	6,944.22	6,940.25	68.70	189.54	-90.10	1,228.65	-14,071.75	10,330.82	10,104.13	226.69	45.573		
10,800.00	6,985.74	6,944.15	6,940.18	70.09	189.54	-90.10	1,228.65	-14,071.75	10,231.01	10,004.20	226.80	45.110		
10,900.00	6,985.67	6,944.08	6,940.10	71.49	189.54	-90.09	1,228.65	-14,071.75	10,131.20	9,904.28	226.92	44.647		
11,000.00	6,985.59	6,944.00	6,940.03	72.90	189.54	-90.08	1,228.65	-14,071.75	10,031.39	9,804.36	227.03	44.185		
11,100.00	6,985.52	6,943.93	6,939.96	74.31	189.53	-90.08	1,228.65	-14,071.75	9,931.59	9,704.43	227.15	43.722		
11,200.00	6,985.45	6,943.86	6,939.88	75.74	189.53	-90.07	1,228.66	-14,071.75	9,831.79	9,604.51	227.28	43.259		
11,300.00	6,985.37	6,943.79	6,939.81	77.17	189.53	-90.06	1,228.66	-14,071.75	9,732.00	9,504.59	227.40	42.796		
11,400.00	6,985.30	6,943.71	6,939.74	78.61	189.53	-90.06	1,228.66	-14,071.75	9,632.21	9,404.67	227.53	42.334		
11,500.00	6,985.22	6,943.64	6,939.67	80.05	189.52	-90.05	1,228.66	-14,071.75	9,532.42	9,304.76	227.66	41.871		
11,600.00	6,985.15	6,943.57	6,939.59	81.50	189.52	-90.04	1,228.66	-14,071.75	9,432.64	9,204.84	227.80	41.408		
11,700.00	6,985.07	6,943.49	6,939.52	82.96	189.52	-90.04	1,228.66	-14,071.75	9,332.86	9,104.93	227.93	40.945		
11,800.00	6,985.00	6,943.42	6,939.45	84.42	189.52	-90.03	1,228.66	-14,071.75	9,233.09	9,005.02	228.08	40.483		
11,900.00	6,984.92	6,943.35	6,939.37	85.89	189.51	-90.02	1,228.66	-14,071.75	9,133.33	8,905.11	228.22	40.020		
12,000.00	6,984.85	6,943.27	6,939.30	87.36	189.51	-90.02	1,228.66	-14,071.75	9,033.57	8,805.20	228.37	39.557		
12,100.00	6,984.77	6,943.20	6,939.23	88.83	189.51	-90.01	1,228.66	-14,071.75	8,933.81	8,705.29	228.52	39.095		
12,200.00	6,984.70	6,943.13	6,939.16	90.31	189.51	-90.00	1,228.66	-14,071.75	8,834.06	8,605.39	228.67	38.632		
12,300.00	6,984.63	6,943.06	6,939.08	91.80	189.50	-90.00	1,228.66	-14,071.75	8,734.32	8,505.49	228.83	38.170		
12,400.00	6,984.55	6,942.98	6,939.01	93.29	189.50	-89.99	1,228.67	-14,071.75	8,634.58	8,405.59	228.99	37.707		
12,500.00	6,984.48	6,942.91	6,938.94	94.78	189.50	-89.98	1,228.67	-14,071.75	8,534.84	8,305.69	229.16	37.245		
12,600.00	6,984.40	6,942.84	6,938.86	96.28	189.50	-89.98	1,228.67	-14,071.75	8,435.12	8,205.79	229.32	36.782		
12,700.00	6,984.33	6,942.76	6,938.79	97.78	189.49	-89.97	1,228.67	-14,071.75	8,335.40	8,105.90	229.50	36.320		
12,800.00	6,984.25	6,942.69	6,938.72	99.28	189.49	-89.96	1,228.67	-14,071.75	8,235.69	8,006.01	229.67	35.858		
12,900.00	6,984.18	6,942.62	6,938.64	100.78	189.49	-89.96	1,228.67	-14,071.75	8,135.98	7,906.12	229.86	35.396		
13,000.00	6,984.10	6,942.55	6,938.57	102.29	189.49	-89.95	1,228.67	-14,071.75	8,036.28	7,806.24	230.04	34.934		
13,100.00	6,984.03	6,942.47	6,938.50	103.80	189.48	-89.94	1,228.67	-14,071.75	7,936.59	7,706.36	230.23	34.472		
13,200.00	6,983.95	6,942.40	6,938.43	105.32	189.48	-89.94	1,228.67	-14,071.75	7,836.91	7,606.48	230.43	34.010		
13,300.00	6,983.88	6,942.33	6,938.35	106.84	189.48	-89.93	1,228.67	-14,071.75	7,737.23	7,506.60	230.63	33.548		
13,400.00	6,983.81	6,942.25	6,938.28	108.36	189.48	-89.92	1,228.67	-14,071.75	7,637.57	7,406.73	230.84	33.086		
13,500.00	6,983.73	6,942.18	6,938.21	109.88	189.47	-89.92	1,228.67	-14,071.75	7,537.91	7,306.86	231.05	32.625		
13,600.00	6,983.66	6,942.11	6,938.14	111.40	189.47	-89.91	1,228.68	-14,071.75	7,438.26	7,207.00	231.26	32.163		
13,700.00	6,983.58	6,942.04	6,938.06	112.93	189.47	-89.90	1,228.68	-14,071.75	7,338.62	7,107.14	231.49	31.702		
13,800.00	6,983.51	6,941.96	6,937.99	114.46	189.47	-89.90	1,228.68	-14,071.75	7,238.99	7,007.28	231.72	31.241		
13,900.00	6,983.43	6,941.89	6,937.92	115.99	189.46	-89.89	1,228.68	-14,071.75	7,139.38	6,907.43	231.95	30.780		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		248-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft
Reference	Offset	Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Distance			Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,000.00	6,983.36	6,941.82	6,937.84	117.52	189.46	-89.88	1,228.68	-14,071.75	7,039.77	6,807.58	232.19	30.319	
14,100.00	6,983.28	6,941.74	6,937.77	119.06	189.46	-89.88	1,228.68	-14,071.75	6,940.17	6,707.73	232.44	29.858	
14,200.00	6,983.21	6,941.67	6,937.70	120.59	189.46	-89.87	1,228.68	-14,071.75	6,840.59	6,607.89	232.70	29.397	
14,300.00	6,983.13	6,941.60	6,937.63	122.13	189.46	-89.86	1,228.68	-14,071.75	6,741.02	6,508.06	232.96	28.936	
14,400.00	6,983.06	6,941.53	6,937.55	123.67	189.45	-89.86	1,228.68	-14,071.75	6,641.46	6,408.23	233.23	28.476	
14,500.00	6,982.99	6,941.45	6,937.48	125.21	189.45	-89.85	1,228.68	-14,071.75	6,541.91	6,308.40	233.51	28.016	
14,600.00	6,982.91	6,941.38	6,937.41	126.75	189.45	-89.84	1,228.68	-14,071.75	6,442.38	6,208.58	233.80	27.556	
14,700.00	6,982.84	6,941.31	6,937.33	128.30	189.45	-89.84	1,228.68	-14,071.75	6,342.86	6,108.77	234.09	27.096	
14,800.00	6,982.76	6,941.23	6,937.26	129.85	189.44	-89.83	1,228.68	-14,071.75	6,243.36	6,008.96	234.40	26.636	
14,900.00	6,982.69	6,941.16	6,937.19	131.39	189.44	-89.82	1,228.69	-14,071.75	6,143.88	5,909.16	234.71	26.176	
15,000.00	6,982.61	6,941.09	6,937.12	132.94	189.44	-89.82	1,228.69	-14,071.75	6,044.41	5,809.37	235.04	25.717	
15,100.00	6,982.54	6,941.02	6,937.04	134.49	189.44	-89.81	1,228.69	-14,071.75	5,944.96	5,709.58	235.37	25.258	
15,200.00	6,982.46	6,940.94	6,936.97	136.04	189.43	-89.80	1,228.69	-14,071.75	5,845.53	5,609.81	235.72	24.799	
15,300.00	6,982.39	6,940.87	6,936.90	137.60	189.43	-89.80	1,228.69	-14,071.75	5,746.11	5,510.03	236.08	24.340	
15,400.00	6,982.31	6,940.80	6,936.83	139.15	189.43	-89.79	1,228.69	-14,071.75	5,646.72	5,410.27	236.45	23.881	
15,500.00	6,982.24	6,940.73	6,936.75	140.70	189.43	-89.78	1,228.69	-14,071.75	5,547.35	5,310.52	236.84	23.423	
15,600.00	6,982.17	6,940.65	6,936.68	142.26	189.42	-89.78	1,228.69	-14,071.75	5,448.01	5,210.77	237.23	22.965	
15,700.00	6,982.09	6,940.58	6,936.61	143.82	189.42	-89.77	1,228.69	-14,071.75	5,348.68	5,111.04	237.65	22.507	
15,800.00	6,982.02	6,940.51	6,936.54	145.38	189.42	-89.76	1,228.69	-14,071.75	5,249.39	5,011.31	238.08	22.049	
15,900.00	6,981.94	6,940.44	6,936.46	146.94	189.42	-89.76	1,228.69	-14,071.75	5,150.12	4,911.60	238.52	21.592	
16,000.00	6,981.87	6,940.36	6,936.39	148.50	189.41	-89.75	1,228.69	-14,071.75	5,050.88	4,811.89	238.99	21.135	
16,100.00	6,981.79	6,940.29	6,936.32	150.06	189.41	-89.74	1,228.69	-14,071.75	4,951.67	4,712.20	239.47	20.678	
16,200.00	6,981.72	6,940.22	6,936.25	151.62	189.41	-89.74	1,228.70	-14,071.75	4,852.49	4,612.52	239.97	20.221	
16,300.00	6,981.64	6,940.14	6,936.17	153.18	189.41	-89.73	1,228.70	-14,071.75	4,753.35	4,512.86	240.49	19.765	
16,400.00	6,981.57	6,940.07	6,936.10	154.74	189.40	-89.72	1,228.70	-14,071.75	4,654.24	4,413.21	241.04	19.309	
16,500.00	6,981.49	6,940.00	6,936.03	156.31	189.40	-89.72	1,228.70	-14,071.75	4,555.18	4,313.57	241.61	18.854	
16,600.00	6,981.42	6,939.93	6,935.96	157.87	189.40	-89.71	1,228.70	-14,071.75	4,456.15	4,213.95	242.20	18.399	
16,700.00	6,981.35	6,939.85	6,935.88	159.44	189.40	-89.70	1,228.70	-14,071.75	4,357.17	4,114.35	242.82	17.944	
16,800.00	6,981.27	6,939.78	6,935.81	161.01	189.39	-89.70	1,228.70	-14,071.75	4,258.24	4,014.77	243.47	17.490	
16,900.00	6,981.20	6,939.71	6,935.74	162.58	189.39	-89.69	1,228.70	-14,071.75	4,159.36	3,915.20	244.16	17.036	
17,000.00	6,981.12	6,939.64	6,935.67	164.14	189.39	-89.68	1,228.70	-14,071.75	4,060.53	3,815.66	244.87	16.582	
17,100.00	6,981.05	6,939.56	6,935.59	165.71	189.39	-89.68	1,228.70	-14,071.75	3,961.76	3,716.14	245.62	16.129	
17,200.00	6,980.97	6,939.49	6,935.52	167.28	189.38	-89.67	1,228.70	-14,071.75	3,863.06	3,616.64	246.42	15.677	
17,300.00	6,980.90	6,939.42	6,935.45	168.85	189.38	-89.66	1,228.70	-14,071.75	3,764.42	3,517.17	247.25	15.225	
17,400.00	6,980.82	6,939.35	6,935.38	170.42	189.38	-89.66	1,228.70	-14,071.75	3,665.86	3,417.73	248.13	14.774	
17,500.00	6,980.75	6,939.27	6,935.30	172.00	189.38	-89.65	1,228.71	-14,071.75	3,567.37	3,318.31	249.06	14.323	
17,600.00	6,980.67	6,939.20	6,935.23	173.57	189.38	-89.64	1,228.71	-14,071.75	3,468.98	3,218.93	250.05	13.873	
17,700.00	6,980.60	6,939.13	6,935.16	175.14	189.37	-89.64	1,228.71	-14,071.75	3,370.68	3,119.59	251.09	13.424	
17,800.00	6,980.53	6,939.06	6,935.09	176.71	189.37	-89.63	1,228.71	-14,071.75	3,272.48	3,020.28	252.19	12.976	
17,900.00	6,980.45	6,938.98	6,935.01	178.29	189.37	-89.62	1,228.71	-14,071.75	3,174.39	2,921.02	253.37	12.529	
18,000.00	6,980.38	6,938.91	6,934.94	179.86	189.37	-89.62	1,228.71	-14,071.75	3,076.43	2,821.81	254.62	12.082	
18,100.00	6,980.30	6,938.84	6,934.87	181.44	189.36	-89.61	1,228.71	-14,071.75	2,978.60	2,722.64	255.96	11.637	
18,200.00	6,980.23	6,938.77	6,934.80	183.01	189.36	-89.60	1,228.71	-14,071.75	2,880.92	2,623.53	257.39	11.193	
18,300.00	6,980.15	6,938.69	6,934.72	184.59	189.36	-89.60	1,228.71	-14,071.75	2,783.41	2,524.49	258.92	10.750	
18,400.00	6,980.08	6,938.62	6,934.65	186.16	189.36	-89.59	1,228.71	-14,071.75	2,686.08	2,425.51	260.57	10.309	
18,500.00	6,980.00	6,938.55	6,934.58	187.74	189.35	-89.58	1,228.71	-14,071.75	2,588.95	2,326.62	262.34	9.869	
18,600.00	6,979.93	6,938.48	6,934.51	189.32	189.35	-89.58	1,228.71	-14,071.75	2,492.05	2,227.81	264.24	9.431	
18,700.00	6,979.85	6,938.41	6,934.43	190.90	189.35	-89.57	1,228.71	-14,071.75	2,395.41	2,129.10	266.31	8.995	
18,800.00	6,979.78	6,938.33	6,934.36	192.48	189.35	-89.56	1,228.72	-14,071.75	2,299.05	2,030.51	268.54	8.561	
18,900.00	6,979.71	6,938.26	6,934.29	194.05	189.34	-89.56	1,228.72	-14,071.75	2,203.02	1,932.04	270.98	8.130	
19,000.00	6,979.63	6,938.19	6,934.22	195.63	189.34	-89.55	1,228.72	-14,071.75	2,107.35	1,833.72	273.63	7.702	
19,100.00	6,979.56	6,938.12	6,934.14	197.21	189.34	-89.54	1,228.72	-14,071.75	2,012.11	1,735.58	276.53	7.276	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - (O) Rosa Unit 148 COM - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 248-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre	Distance	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
19,200.00	6,979.48	6,938.04	6,934.07	198.79	189.34	-89.54	1,228.72	-14,071.75	1,917.35	1,637.64	279.71	6.855	
19,300.00	6,979.41	6,937.97	6,934.00	200.37	189.33	-89.53	1,228.72	-14,071.75	1,823.15	1,539.95	283.21	6.438	
19,400.00	6,979.33	6,937.90	6,933.93	201.95	189.33	-89.52	1,228.72	-14,071.75	1,729.61	1,442.54	287.07	6.025	
19,500.00	6,979.26	6,937.83	6,933.86	203.54	189.33	-89.52	1,228.72	-14,071.75	1,636.82	1,345.47	291.35	5.618	
19,600.00	6,979.18	6,937.75	6,933.78	205.12	189.33	-89.51	1,228.72	-14,071.75	1,544.94	1,248.84	296.11	5.218	
19,700.00	6,979.11	6,937.68	6,933.71	206.70	189.32	-89.51	1,228.72	-14,071.75	1,454.13	1,152.72	301.41	4.824	
19,800.00	6,979.03	6,937.61	6,933.64	208.28	189.32	-89.50	1,228.72	-14,071.75	1,364.60	1,057.26	307.34	4.440	
19,900.00	6,978.96	6,937.54	6,933.57	209.86	189.32	-89.49	1,228.72	-14,071.75	1,276.63	962.65	313.99	4.066	
20,000.00	6,978.89	6,937.46	6,933.49	211.45	189.32	-89.49	1,228.72	-14,071.75	1,190.57	869.12	321.45	3.704	
20,100.00	6,978.81	6,937.39	6,933.42	213.03	189.31	-89.48	1,228.73	-14,071.75	1,106.84	777.02	329.82	3.356	
20,200.00	6,978.74	6,937.32	6,933.35	214.61	189.31	-89.47	1,228.73	-14,071.75	1,026.04	686.85	339.19	3.025	
20,300.00	6,978.66	6,937.25	6,933.28	216.20	189.31	-89.47	1,228.73	-14,071.75	948.89	599.30	349.60	2.714	
20,400.00	6,978.59	6,937.18	6,933.21	217.78	189.31	-89.46	1,228.73	-14,071.75	876.39	515.38	361.01	2.428	
20,500.00	6,978.51	6,937.10	6,933.13	219.37	189.31	-89.45	1,228.73	-14,071.75	809.75	436.55	373.21	2.170	
20,600.00	6,978.44	6,937.03	6,933.06	220.95	189.30	-89.45	1,228.73	-14,071.75	750.57	364.85	385.72	1.946	
20,700.00	6,978.36	6,936.96	6,932.99	222.53	189.30	-89.44	1,228.73	-14,071.75	700.72	303.06	397.66	1.762	
20,800.00	6,978.29	6,936.89	6,932.92	224.12	189.30	-89.43	1,228.73	-14,071.75	662.31	254.61	407.70	1.624	
20,900.00	6,978.21	6,936.81	6,932.84	225.71	189.30	-89.43	1,228.73	-14,071.75	637.42	223.19	414.23	1.539	
21,000.00	6,978.14	6,936.74	6,932.77	227.29	189.29	-89.42	1,228.73	-14,071.75	627.66	211.83	415.83	1.509 ES, SF	
21,011.74	6,978.13	6,936.73	6,932.76	227.48	189.29	-89.42	1,228.73	-14,071.75	627.55	211.90	415.65	1.510 CC	
21,100.00	6,978.07	6,936.67	6,932.70	228.88	189.29	-89.41	1,228.73	-14,071.75	633.73	221.82	411.91	1.539	
21,200.00	6,977.99	6,936.60	6,932.63	230.46	189.29	-89.41	1,228.73	-14,071.75	655.18	252.12	403.06	1.626	
21,300.00	6,977.92	6,936.53	6,932.56	232.05	189.29	-89.40	1,228.73	-14,071.75	690.59	299.84	390.75	1.767	
21,400.00	6,977.84	6,936.45	6,932.48	233.64	189.28	-89.39	1,228.73	-14,071.75	737.95	361.26	376.69	1.959	
21,500.00	6,977.77	6,936.38	6,932.41	235.22	189.28	-89.39	1,228.74	-14,071.75	795.12	432.84	362.28	2.195	
21,600.00	6,977.69	6,936.31	6,932.34	236.81	189.28	-89.38	1,228.74	-14,071.75	860.15	511.70	348.46	2.468	
21,700.00	6,977.62	6,936.24	6,932.27	238.40	189.28	-89.37	1,228.74	-14,071.75	931.41	595.70	335.70	2.774	
21,800.00	6,977.54	6,936.17	6,932.20	239.99	189.27	-89.37	1,228.74	-14,071.75	1,007.56	683.35	324.21	3.108	
21,900.00	6,977.47	6,936.09	6,932.12	241.57	189.27	-89.36	1,228.74	-14,071.75	1,087.58	773.59	313.98	3.464	
22,000.00	6,977.39	6,936.02	6,932.05	243.16	189.27	-89.35	1,228.74	-14,071.75	1,170.67	865.72	304.95	3.839	
22,100.00	6,977.32	6,935.95	6,931.98	244.75	189.27	-89.35	1,228.74	-14,071.75	1,256.23	959.24	296.99	4.230	
22,200.00	6,977.25	6,935.88	6,931.91	246.34	189.26	-89.34	1,228.74	-14,071.75	1,343.79	1,053.80	289.99	4.634	
22,300.00	6,977.17	6,935.81	6,931.84	247.93	189.26	-89.33	1,228.74	-14,071.75	1,432.98	1,149.17	283.81	5.049	
22,400.00	6,977.10	6,935.73	6,931.76	249.52	189.26	-89.33	1,228.74	-14,071.75	1,523.51	1,245.15	278.36	5.473	
22,500.00	6,977.02	6,935.66	6,931.69	251.11	189.26	-89.32	1,228.74	-14,071.75	1,615.16	1,341.62	273.53	5.905	
22,529.62	6,977.00	6,935.64	6,931.67	251.58	189.26	-89.32	1,228.74	-14,071.75	1,642.48	1,370.27	272.21	6.034	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #672H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	28.90	17.48	9.65	19.96				
100.00	100.00	100.00	100.00	0.25	0.25	28.90	17.48	9.65	19.96	19.46	0.50	39.774	
200.00	200.00	200.00	200.00	0.61	0.61	28.90	17.48	9.65	19.96	18.74	1.22	16.378	
300.00	300.00	300.00	300.00	0.97	0.97	28.90	17.48	9.65	19.96	18.03	1.94	10.312	
400.00	400.00	400.00	400.00	1.33	1.33	28.90	17.48	9.65	19.96	17.31	2.65	7.525	
500.00	500.00	500.00	500.00	1.68	1.68	28.90	17.48	9.65	19.96	16.59	3.37	5.924 CC, ES	
550.00	550.00	549.67	549.67	1.86	1.86	28.51	17.90	9.72	20.37	16.64	3.73	5.466	
600.00	600.00	599.32	599.30	2.04	2.04	30.38	19.17	9.95	21.23	17.15	4.08	5.199	
700.00	699.93	698.57	698.41	2.40	2.40	30.75	24.25	10.84	23.16	18.37	4.79	4.833	
800.00	799.68	797.75	797.21	2.77	2.76	32.60	32.70	12.33	25.40	19.90	5.50	4.619	
900.00	899.13	896.85	895.58	3.13	3.12	35.51	44.50	14.41	27.99	21.78	6.20	4.511	
1,000.00	998.15	995.86	993.39	3.49	3.49	39.10	59.63	17.08	31.01	24.10	6.91	4.485	
1,100.00	1,096.63	1,094.96	1,090.70	3.87	3.87	42.53	78.12	19.94	34.30	26.66	7.64	4.490	
1,130.50	1,126.54	1,125.18	1,120.24	3.99	3.99	43.42	84.42	20.76	35.31	27.44	7.87	4.488	
1,200.00	1,194.61	1,194.01	1,187.27	4.26	4.27	44.37	99.94	22.53	38.18	29.80	8.38	4.556	
1,300.00	1,292.57	1,292.82	1,282.82	4.66	4.69	42.74	125.02	24.83	44.34	35.22	9.12	4.863	
1,400.00	1,390.52	1,391.17	1,377.01	5.07	5.12	38.96	153.22	26.84	53.05	43.22	9.84	5.393	
1,500.00	1,488.48	1,488.83	1,469.54	5.48	5.58	34.40	184.40	28.56	64.63	54.10	10.54	6.133	
1,600.00	1,586.43	1,587.64	1,562.52	5.90	6.06	30.40	217.79	30.13	78.14	66.86	11.28	6.925	
1,700.00	1,684.38	1,686.60	1,655.64	6.31	6.55	27.57	251.25	31.71	91.93	79.88	12.05	7.630	
1,800.00	1,782.34	1,785.56	1,748.76	6.73	7.05	25.48	284.70	33.29	105.88	93.06	12.82	8.259	
1,900.00	1,880.29	1,884.51	1,841.88	7.15	7.56	23.88	318.15	34.86	119.94	106.34	13.60	8.821	
2,000.00	1,978.25	1,983.47	1,935.00	7.58	8.07	22.62	351.60	36.44	134.06	119.68	14.38	9.323	
2,100.00	2,076.20	2,082.43	2,028.12	8.00	8.59	21.60	385.05	38.02	148.24	133.08	15.17	9.774	
2,200.00	2,174.15	2,181.39	2,121.24	8.43	9.11	20.75	418.50	39.60	162.46	146.50	15.96	10.181	
2,300.00	2,272.11	2,280.35	2,214.36	8.85	9.63	20.04	451.95	41.17	176.71	159.96	16.75	10.550	
2,400.00	2,370.06	2,379.31	2,307.48	9.28	10.16	19.44	485.40	42.75	190.98	173.43	17.54	10.886	
2,500.00	2,468.02	2,478.26	2,400.60	9.71	10.69	18.92	518.86	44.33	205.26	186.92	18.34	11.192	
2,600.00	2,565.97	2,577.22	2,493.72	10.14	11.22	18.47	552.31	45.91	219.56	200.42	19.14	11.472	
2,700.00	2,663.92	2,676.18	2,586.84	10.57	11.75	18.08	585.76	47.48	233.88	213.94	19.94	11.730	
2,800.00	2,761.88	2,775.14	2,679.96	11.00	12.29	17.73	619.21	49.06	248.20	227.46	20.74	11.968	
2,900.00	2,859.83	2,874.10	2,773.08	11.43	12.82	17.41	652.66	50.64	262.53	240.99	21.54	12.188	
3,000.00	2,957.79	2,973.06	2,866.20	11.86	13.36	17.13	686.11	52.22	276.87	254.52	22.34	12.391	
3,100.00	3,055.74	3,072.01	2,959.32	12.29	13.90	16.88	719.56	53.79	291.21	268.06	23.15	12.581	
3,200.00	3,153.69	3,170.97	3,052.44	12.72	14.44	16.65	753.01	55.37	305.56	281.61	23.95	12.757	
3,300.00	3,251.65	3,269.93	3,145.56	13.15	14.98	16.45	786.47	56.95	319.91	295.15	24.76	12.922	
3,400.00	3,349.60	3,368.89	3,238.68	13.59	15.52	16.26	819.92	58.53	334.27	308.70	25.56	13.077	
3,500.00	3,447.56	3,467.85	3,331.80	14.02	16.06	16.08	853.37	60.10	348.63	322.26	26.37	13.221	
3,600.00	3,545.51	3,566.81	3,424.92	14.45	16.60	15.92	886.82	61.68	362.99	335.81	27.18	13.357	
3,700.00	3,643.46	3,665.76	3,518.04	14.88	17.14	15.77	920.27	63.26	377.35	349.37	27.98	13.485	
3,800.00	3,741.42	3,764.72	3,611.16	15.32	17.68	15.63	953.72	64.84	391.72	362.93	28.79	13.606	
3,900.00	3,839.37	3,863.68	3,704.28	15.75	18.22	15.51	987.17	66.41	406.09	376.49	29.60	13.720	
4,000.00	3,937.33	3,962.64	3,797.39	16.18	18.77	15.39	1,020.62	67.99	420.46	390.06	30.41	13.828	
4,100.00	4,035.28	4,061.60	3,890.51	16.62	19.31	15.28	1,054.08	69.57	434.84	403.62	31.22	13.930	
4,200.00	4,133.23	4,160.56	3,983.63	17.05	19.86	15.17	1,087.53	71.15	449.21	417.19	32.02	14.027	
4,300.00	4,231.19	4,259.51	4,076.75	17.48	20.40	15.07	1,120.98	72.73	463.59	430.75	32.83	14.119	
4,400.00	4,329.14	4,358.47	4,169.87	17.92	20.94	14.98	1,154.43	74.30	477.96	444.32	33.64	14.207	
4,500.00	4,427.10	4,457.43	4,262.99	18.35	21.49	14.90	1,187.88	75.88	492.34	457.89	34.45	14.290	
4,600.00	4,525.05	4,556.39	4,356.11	18.78	22.03	14.81	1,221.33	77.46	506.72	471.46	35.26	14.370	
4,700.00	4,623.00	4,655.35	4,449.23	19.22	22.58	14.74	1,254.78	79.04	521.10	485.03	36.07	14.445	
4,800.00	4,720.96	4,754.30	4,542.35	19.65	23.12	14.66	1,288.23	80.61	535.48	498.60	36.88	14.518	
4,900.00	4,818.91	4,853.26	4,635.47	20.09	23.67	14.60	1,321.69	82.19	549.87	512.17	37.69	14.587	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #672H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						Rule Assigned:				Offset Well Error:	0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
5,000.00	4,916.87	4,952.22	4,728.59	20.52	24.21	14.53	1,355.14	83.77	564.25	525.74	38.51	14.654		
5,100.00	5,014.82	5,051.18	4,821.71	20.96	24.76	14.47	1,388.59	85.35	578.63	539.31	39.32	14.717		
5,200.00	5,112.77	5,150.14	4,914.83	21.39	25.31	14.41	1,422.04	86.92	593.02	552.89	40.13	14.778		
5,300.00	5,210.73	5,249.10	5,007.95	21.82	25.85	14.35	1,455.49	88.50	607.40	566.46	40.94	14.837		
5,400.00	5,308.68	5,348.05	5,101.07	22.26	26.40	14.30	1,488.94	90.08	621.79	580.03	41.75	14.893		
5,493.23	5,400.00	5,440.31	5,187.88	22.66	26.91	14.25	1,520.13	91.55	635.20	592.69	42.51	14.943		
5,500.00	5,406.64	5,447.01	5,194.19	22.69	26.94	14.25	1,522.39	91.66	636.17	593.61	42.56	14.947		
5,600.00	5,504.69	5,545.90	5,287.24	23.12	27.49	14.21	1,555.82	93.23	651.03	607.66	43.37	15.010		
5,700.00	5,602.91	5,644.66	5,380.17	23.55	28.04	14.15	1,589.20	94.81	666.73	622.55	44.18	15.092		
5,800.00	5,701.29	5,753.62	5,482.93	23.97	28.63	14.08	1,625.40	96.51	682.68	637.60	45.08	15.144		
5,900.00	5,799.82	5,865.84	5,589.45	24.39	29.23	14.02	1,660.67	98.18	697.60	651.61	45.99	15.168		
6,000.00	5,898.50	5,978.57	5,697.13	24.79	29.81	13.96	1,694.00	99.75	711.44	664.56	46.88	15.175		
6,100.00	5,997.31	6,091.76	5,805.89	25.20	30.37	13.92	1,725.33	101.23	724.20	676.44	47.75	15.166		
6,200.00	6,096.26	6,205.38	5,915.66	25.60	30.92	13.89	1,754.61	102.61	735.85	687.25	48.60	15.141		
6,300.00	6,195.33	6,319.40	6,026.37	25.99	31.44	13.86	1,781.80	103.89	746.39	696.97	49.42	15.102		
6,400.00	6,294.51	6,433.77	6,137.96	26.37	31.95	13.85	1,806.86	105.07	755.82	705.60	50.22	15.050		
6,498.19	6,392.00	6,546.37	6,248.29	26.75	32.43	13.84	1,829.35	106.13	763.98	713.00	50.98	14.985		
6,500.00	6,393.80	6,548.46	6,250.33	26.76	32.44	15.03	1,829.75	106.15	764.12	713.13	51.00	14.984		
6,550.00	6,443.29	6,605.90	6,306.78	26.95	32.68	37.70	1,840.37	106.65	767.13	715.74	51.39	14.928		
6,600.00	6,492.24	6,663.10	6,363.10	27.16	32.91	48.86	1,850.38	107.12	768.52	716.72	51.80	14.837		
6,650.00	6,540.33	6,719.63	6,418.85	27.38	33.14	55.52	1,859.72	107.56	768.39	716.16	52.23	14.712		
6,700.00	6,587.28	6,750.00	6,448.76	27.60	33.26	59.73	1,864.97	107.37	767.59	714.91	52.68	14.570		
6,750.00	6,632.80	6,782.01	6,480.05	27.84	33.40	62.83	1,871.52	106.01	767.11	713.96	53.15	14.433		
6,780.90	6,660.09	6,800.00	6,497.51	27.99	33.48	64.35	1,875.67	104.73	767.00	713.56	53.44	14.352		
6,800.00	6,676.60	6,812.59	6,509.67	28.09	33.54	65.24	1,878.77	103.61	767.01	713.38	53.63	14.302		
6,850.00	6,718.42	6,850.00	6,545.40	28.34	33.72	67.42	1,888.90	99.22	767.39	713.23	54.16	14.169		
6,900.00	6,758.00	6,874.08	6,568.07	28.60	33.84	68.97	1,896.15	95.55	768.20	713.52	54.68	14.049		
6,950.00	6,795.09	6,900.00	6,592.13	28.87	33.97	70.36	1,904.58	90.88	769.64	714.40	55.24	13.933		
7,000.00	6,829.46	6,936.12	6,624.99	29.14	34.17	71.92	1,917.38	83.11	771.69	715.77	55.91	13.802		
7,050.00	6,860.91	6,967.40	6,652.76	29.43	34.35	73.20	1,929.43	75.23	774.46	717.84	56.62	13.679		
7,100.00	6,889.24	7,000.00	6,680.94	29.73	34.54	74.44	1,942.90	65.90	778.01	720.62	57.39	13.557		
7,150.00	6,914.27	7,030.66	6,706.66	30.05	34.73	75.50	1,956.38	56.10	782.39	724.17	58.22	13.439		
7,200.00	6,935.85	7,062.71	6,732.69	30.37	34.93	76.52	1,971.30	44.82	787.65	728.54	59.11	13.324		
7,250.00	6,953.84	7,100.00	6,761.76	30.71	35.17	77.67	1,989.66	30.41	793.87	733.80	60.07	13.216		
7,300.00	6,968.15	7,127.94	6,782.65	31.06	35.36	78.34	2,004.09	18.72	801.03	740.00	61.02	13.126		
7,350.00	6,978.67	7,161.27	6,806.47	31.42	35.59	79.13	2,022.00	3.84	809.20	747.16	62.05	13.041		
7,400.00	6,985.34	7,195.18	6,829.45	31.79	35.82	79.85	2,040.98	-12.34	818.41	755.34	63.07	12.977		
7,450.00	6,988.13	7,229.80	6,851.53	32.17	36.07	80.49	2,061.06	-29.87	828.65	764.58	64.07	12.933		
7,461.13	6,988.22	7,237.61	6,856.31	32.26	36.13	80.63	2,065.69	-33.97	831.07	766.78	64.29	12.927		
7,500.00	6,988.19	7,265.90	6,872.99	32.56	36.34	81.85	2,082.72	-49.20	840.23	775.19	65.04	12.918		
7,600.00	6,988.12	7,347.45	6,915.27	33.37	36.96	84.92	2,133.93	-96.44	868.76	801.90	66.87	12.993		
7,700.00	6,988.05	7,441.73	6,952.69	34.21	37.71	87.58	2,196.18	-156.41	902.60	834.05	68.55	13.167		
7,800.00	6,987.98	7,547.06	6,979.04	35.09	38.59	89.39	2,268.00	-228.64	939.66	869.47	70.19	13.387		
7,900.00	6,987.91	7,658.74	6,988.40	35.99	39.56	90.01	2,344.65	-309.12	978.51	906.59	71.92	13.606		
8,000.00	6,987.83	7,749.89	6,988.34	36.93	40.37	90.01	2,406.82	-375.79	1,019.62	945.82	73.80	13.816		
8,100.00	6,987.76	7,839.56	6,988.28	37.88	41.19	90.01	2,467.97	-441.36	1,063.89	988.17	75.72	14.051		
8,200.00	6,987.68	7,927.62	6,988.21	38.86	42.04	90.01	2,528.02	-505.76	1,111.26	1,033.61	77.65	14.311		
8,300.00	6,987.61	8,013.97	6,988.15	39.86	42.89	90.01	2,586.92	-568.92	1,161.68	1,082.08	79.59	14.595		
8,400.00	6,987.53	8,098.52	6,988.10	40.87	43.74	90.00	2,644.58	-630.75	1,215.08	1,133.54	81.54	14.902		
8,500.00	6,987.46	8,405.83	6,987.87	41.90	46.91	90.00	2,836.90	-869.80	1,268.84	1,185.50	83.34	15.224		
8,600.00	6,987.38	9,227.14	6,987.25	42.93	54.29	90.00	3,066.15	-1,646.81	1,283.40	1,207.02	76.38	16.804		
8,700.00	6,987.31	9,326.87	6,987.18	43.98	55.06	90.00	3,066.98	-1,746.53	1,276.00	1,197.41	78.60	16.235		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #672H - OH - Prelim 5											Offset Site Error: 0.00 usft		
Survey Program: Reference		0-MWD+HRGM+MS Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance			Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,800.00	6,987.23	9,426.78	6,987.10	45.03	55.87	89.99	3,067.82	-1,846.44	1,272.09	1,191.21	80.88	15.728	
8,862.09	6,987.19	9,488.87	6,987.06	45.68	56.39	89.99	3,068.34	-1,908.52	1,271.42	1,189.09	82.33	15.443	
8,872.16	6,987.18	9,498.94	6,987.05	45.79	56.47	89.99	3,068.43	-1,918.59	1,271.44	1,188.87	82.56	15.399	
8,900.00	6,987.16	9,526.78	6,987.03	46.08	56.71	89.99	3,068.66	-1,946.43	1,271.53	1,188.31	83.23	15.278	
9,000.00	6,987.09	9,626.78	6,986.96	47.16	57.58	89.99	3,069.50	-2,046.43	1,271.88	1,186.26	85.63	14.854	
9,100.00	6,987.01	9,726.78	6,986.88	48.27	58.49	89.99	3,070.34	-2,146.42	1,272.24	1,184.16	88.08	14.444	
9,200.00	6,986.94	9,826.78	6,986.81	49.40	59.42	89.99	3,071.18	-2,246.42	1,272.59	1,182.01	90.58	14.049	
9,300.00	6,986.86	9,926.78	6,986.74	50.56	60.38	89.99	3,072.02	-2,346.41	1,272.94	1,179.81	93.12	13.669	
9,400.00	6,986.79	10,026.78	6,986.66	51.75	61.37	89.99	3,072.86	-2,446.41	1,273.29	1,177.58	95.71	13.304	
9,500.00	6,986.71	10,126.77	6,986.59	52.95	62.39	89.99	3,073.70	-2,546.41	1,273.64	1,175.31	98.33	12.953	
9,600.00	6,986.64	10,226.77	6,986.51	54.18	63.42	89.99	3,074.54	-2,646.40	1,273.99	1,173.01	100.98	12.616	
9,700.00	6,986.56	10,326.77	6,986.44	55.42	64.49	89.99	3,075.37	-2,746.40	1,274.34	1,170.68	103.67	12.292	
9,800.00	6,986.49	10,426.77	6,986.37	56.69	65.57	89.99	3,076.21	-2,846.39	1,274.70	1,168.31	106.38	11.982	
9,900.00	6,986.41	10,526.77	6,986.29	57.97	66.68	89.99	3,077.05	-2,946.39	1,275.05	1,165.92	109.13	11.684	
10,000.00	6,986.34	10,626.77	6,986.22	59.26	67.81	89.99	3,077.89	-3,046.39	1,275.40	1,163.51	111.89	11.398	
10,100.00	6,986.27	10,726.77	6,986.15	60.57	68.95	89.99	3,078.73	-3,146.38	1,275.75	1,161.07	114.68	11.124	
10,200.00	6,986.19	10,826.77	6,986.07	61.90	70.12	89.99	3,079.57	-3,246.38	1,276.10	1,158.61	117.49	10.861	
10,300.00	6,986.12	10,926.77	6,986.00	63.23	71.30	89.99	3,080.41	-3,346.37	1,276.45	1,156.13	120.32	10.608	
10,400.00	6,986.04	11,026.77	6,985.93	64.58	72.50	89.99	3,081.25	-3,446.37	1,276.80	1,153.63	123.17	10.366	
10,500.00	6,985.97	11,126.77	6,985.85	65.94	73.71	89.99	3,082.09	-3,546.36	1,277.16	1,151.12	126.04	10.133	
10,600.00	6,985.89	11,226.77	6,985.78	67.32	74.94	89.99	3,082.93	-3,646.36	1,277.51	1,148.58	128.92	9.909	
10,700.00	6,985.82	11,326.77	6,985.70	68.70	76.18	89.99	3,083.77	-3,746.36	1,277.86	1,146.04	131.82	9.694	
10,800.00	6,985.74	11,426.77	6,985.63	70.09	77.44	89.99	3,084.60	-3,846.35	1,278.21	1,143.48	134.73	9.487	
10,900.00	6,985.67	11,526.77	6,985.56	71.49	78.71	89.99	3,085.44	-3,946.35	1,278.56	1,140.90	137.66	9.288	
11,000.00	6,985.59	11,626.77	6,985.48	72.90	79.99	89.99	3,086.28	-4,046.34	1,278.91	1,138.32	140.60	9.096	
11,100.00	6,985.52	11,726.76	6,985.41	74.31	81.29	89.99	3,087.12	-4,146.34	1,279.26	1,135.72	143.54	8.912	
11,200.00	6,985.45	11,826.76	6,985.34	75.74	82.59	89.99	3,087.96	-4,246.34	1,279.62	1,133.11	146.51	8.734	
11,300.00	6,985.37	11,926.76	6,985.26	77.17	83.91	90.00	3,088.80	-4,346.33	1,279.97	1,130.49	149.48	8.563	
11,400.00	6,985.30	12,026.76	6,985.19	78.61	85.24	90.00	3,089.64	-4,446.33	1,280.32	1,127.86	152.46	8.398	
11,500.00	6,985.22	12,126.76	6,985.12	80.05	86.57	90.00	3,090.48	-4,546.32	1,280.67	1,125.22	155.44	8.239	
11,600.00	6,985.15	12,226.76	6,985.04	81.50	87.92	90.00	3,091.32	-4,646.32	1,281.02	1,122.58	158.44	8.085	
11,700.00	6,985.07	12,326.76	6,984.97	82.96	89.27	90.00	3,092.16	-4,746.31	1,281.37	1,119.92	161.45	7.937	
11,800.00	6,985.00	12,426.76	6,984.90	84.42	90.63	90.00	3,093.00	-4,846.31	1,281.72	1,117.26	164.46	7.793	
11,900.00	6,984.92	12,526.76	6,984.82	85.89	92.00	90.00	3,093.83	-4,946.31	1,282.07	1,114.59	167.48	7.655	
12,000.00	6,984.85	12,626.76	6,984.75	87.36	93.38	90.00	3,094.67	-5,046.30	1,282.43	1,111.92	170.51	7.521	
12,100.00	6,984.77	12,726.76	6,984.67	88.83	94.77	90.00	3,095.51	-5,146.30	1,282.78	1,109.23	173.55	7.392	
12,200.00	6,984.70	12,826.76	6,984.60	90.31	96.16	90.00	3,096.35	-5,246.29	1,283.13	1,106.54	176.59	7.266	
12,300.00	6,984.63	12,926.76	6,984.53	91.80	97.56	90.00	3,097.19	-5,346.29	1,283.48	1,103.85	179.63	7.145	
12,400.00	6,984.55	13,026.76	6,984.45	93.29	98.96	90.00	3,098.03	-5,446.29	1,283.83	1,101.15	182.68	7.028	
12,500.00	6,984.48	13,126.76	6,984.38	94.78	100.37	90.00	3,098.87	-5,546.28	1,284.18	1,098.44	185.74	6.914	
12,600.00	6,984.40	13,226.76	6,984.31	96.28	101.79	90.00	3,099.71	-5,646.28	1,284.53	1,095.73	188.80	6.804	
12,700.00	6,984.33	13,326.76	6,984.23	97.78	103.22	90.00	3,100.55	-5,746.27	1,284.89	1,093.02	191.87	6.697	
12,800.00	6,984.25	13,426.75	6,984.16	99.28	104.64	90.00	3,101.39	-5,846.27	1,285.24	1,090.30	194.94	6.593	
12,900.00	6,984.18	13,526.75	6,984.09	100.78	106.08	90.00	3,102.23	-5,946.26	1,285.59	1,087.57	198.02	6.492	
13,000.00	6,984.10	13,626.75	6,984.01	102.29	107.52	90.00	3,103.06	-6,046.26	1,285.94	1,084.84	201.10	6.395	
13,100.00	6,984.03	13,726.75	6,983.94	103.80	108.96	90.00	3,103.90	-6,146.26	1,286.29	1,082.11	204.18	6.300	
13,200.00	6,983.95	13,826.75	6,983.87	105.32	110.41	90.00	3,104.74	-6,246.25	1,286.64	1,079.37	207.27	6.208	
13,300.00	6,983.88	13,926.75	6,983.79	106.84	111.86	90.00	3,105.58	-6,346.25	1,286.99	1,076.63	210.36	6.118	
13,400.00	6,983.81	14,026.75	6,983.72	108.36	113.31	90.00	3,106.42	-6,446.24	1,287.35	1,073.89	213.46	6.031	
13,500.00	6,983.73	14,126.75	6,983.64	109.88	114.77	90.00	3,107.26	-6,546.24	1,287.70	1,071.14	216.56	5.946	
13,600.00	6,983.66	14,226.75	6,983.57	111.40	116.24	90.00	3,108.10	-6,646.24	1,288.05	1,068.39	219.66	5.864	
13,700.00	6,983.58	14,326.75	6,983.50	112.93	117.71	90.00	3,108.94	-6,746.23	1,288.40	1,065.64	222.76	5.784	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #672H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS					Rule Assigned:				Offset Well Error:	0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,800.00	6,983.51	14,426.75	6,983.42	114.46	119.18	90.00	3,109.78	-6,846.23	1,288.75	1,062.88	225.87	5.706		
13,900.00	6,983.43	14,526.75	6,983.35	115.99	120.65	90.00	3,110.62	-6,946.22	1,289.10	1,060.12	228.98	5.630		
14,000.00	6,983.36	14,626.75	6,983.28	117.52	122.13	90.00	3,111.46	-7,046.22	1,289.45	1,057.36	232.09	5.556		
14,100.00	6,983.28	14,726.75	6,983.20	119.06	123.61	90.00	3,112.29	-7,146.22	1,289.81	1,054.60	235.21	5.484		
14,200.00	6,983.21	14,826.75	6,983.13	120.59	125.10	90.00	3,113.13	-7,246.21	1,290.16	1,051.83	238.33	5.413		
14,300.00	6,983.13	14,926.75	6,983.06	122.13	126.59	90.00	3,113.97	-7,346.21	1,290.51	1,049.06	241.45	5.345		
14,400.00	6,983.06	15,026.74	6,982.98	123.67	128.08	90.00	3,114.81	-7,446.20	1,290.86	1,046.29	244.57	5.278		
14,500.00	6,982.99	15,126.74	6,982.91	125.21	129.57	90.00	3,115.65	-7,546.20	1,291.21	1,043.52	247.69	5.213		
14,600.00	6,982.91	15,226.74	6,982.84	126.75	131.07	90.00	3,116.49	-7,646.19	1,291.56	1,040.74	250.82	5.149		
14,700.00	6,982.84	15,326.74	6,982.76	128.30	132.56	90.00	3,117.33	-7,746.19	1,291.91	1,037.96	253.95	5.087		
14,800.00	6,982.76	15,426.74	6,982.69	129.85	134.07	90.00	3,118.17	-7,846.19	1,292.27	1,035.18	257.08	5.027		
14,900.00	6,982.69	15,526.74	6,982.61	131.39	135.57	90.00	3,119.01	-7,946.18	1,292.62	1,032.40	260.21	4.967		
15,000.00	6,982.61	15,626.74	6,982.54	132.94	137.07	90.00	3,119.85	-8,046.18	1,292.97	1,029.62	263.35	4.910		
15,100.00	6,982.54	15,726.74	6,982.47	134.49	138.58	90.00	3,120.69	-8,146.17	1,293.32	1,026.83	266.49	4.853		
15,200.00	6,982.46	15,826.74	6,982.39	136.04	140.09	90.00	3,121.53	-8,246.17	1,293.67	1,024.05	269.62	4.798		
15,300.00	6,982.39	15,926.74	6,982.32	137.60	141.61	90.00	3,122.36	-8,346.17	1,294.02	1,021.26	272.76	4.744		
15,400.00	6,982.31	16,026.74	6,982.25	139.15	143.12	90.00	3,123.20	-8,446.16	1,294.37	1,018.47	275.91	4.691		
15,500.00	6,982.24	16,126.74	6,982.17	140.70	144.64	90.00	3,124.04	-8,546.16	1,294.73	1,015.68	279.05	4.640		
15,600.00	6,982.17	16,226.74	6,982.10	142.26	146.15	90.00	3,124.88	-8,646.15	1,295.08	1,012.88	282.19	4.589		
15,700.00	6,982.09	16,326.74	6,982.03	143.82	147.67	90.00	3,125.72	-8,746.15	1,295.43	1,010.09	285.34	4.540		
15,800.00	6,982.02	16,426.74	6,981.95	145.38	149.20	90.00	3,126.56	-8,846.14	1,295.78	1,007.29	288.49	4.492		
15,900.00	6,981.94	16,526.74	6,981.88	146.94	150.72	90.00	3,127.40	-8,946.14	1,296.13	1,004.49	291.64	4.444		
16,000.00	6,981.87	16,626.73	6,981.80	148.50	152.25	90.00	3,128.24	-9,046.14	1,296.48	1,001.70	294.79	4.398		
16,100.00	6,981.79	16,726.73	6,981.73	150.06	153.77	90.00	3,129.08	-9,146.13	1,296.83	998.90	297.94	4.353		
16,200.00	6,981.72	16,826.73	6,981.66	151.62	155.30	90.00	3,129.92	-9,246.13	1,297.19	996.10	301.09	4.308		
16,300.00	6,981.64	16,926.73	6,981.58	153.18	156.83	90.00	3,130.76	-9,346.12	1,297.54	993.29	304.24	4.265		
16,400.00	6,981.57	17,026.73	6,981.51	154.74	158.36	90.00	3,131.59	-9,446.12	1,297.89	990.49	307.40	4.222		
16,500.00	6,981.49	17,126.73	6,981.44	156.31	159.90	90.00	3,132.43	-9,546.12	1,298.24	987.68	310.55	4.180		
16,600.00	6,981.42	17,226.73	6,981.36	157.87	161.43	90.00	3,133.27	-9,646.11	1,298.59	984.88	313.71	4.139		
16,700.00	6,981.35	17,326.73	6,981.29	159.44	162.97	90.00	3,134.11	-9,746.11	1,298.94	982.07	316.87	4.099		
16,800.00	6,981.27	17,426.73	6,981.22	161.01	164.50	90.00	3,134.95	-9,846.10	1,299.29	979.26	320.03	4.060		
16,900.00	6,981.20	17,526.73	6,981.14	162.58	166.04	90.00	3,135.79	-9,946.10	1,299.65	976.46	323.19	4.021		
17,000.00	6,981.12	17,626.73	6,981.07	164.14	167.58	90.00	3,136.63	-10,046.09	1,300.00	973.65	326.35	3.983		
17,100.00	6,981.05	17,726.73	6,981.00	165.71	169.12	90.00	3,137.47	-10,146.09	1,300.35	970.84	329.51	3.946		
17,200.00	6,980.97	17,826.73	6,980.92	167.28	170.67	90.00	3,138.31	-10,246.09	1,300.70	968.02	332.68	3.910		
17,300.00	6,980.90	17,926.73	6,980.85	168.85	172.21	90.00	3,139.15	-10,346.08	1,301.05	965.21	335.84	3.874		
17,400.00	6,980.82	18,026.73	6,980.77	170.42	173.75	90.00	3,139.99	-10,446.08	1,301.40	962.40	339.00	3.839		
17,500.00	6,980.75	18,126.73	6,980.70	172.00	175.30	90.00	3,140.82	-10,546.07	1,301.75	959.58	342.17	3.804		
17,600.00	6,980.67	18,226.72	6,980.63	173.57	176.85	90.00	3,141.66	-10,646.07	1,302.10	956.77	345.34	3.771		
17,700.00	6,980.60	18,326.72	6,980.55	175.14	178.39	90.00	3,142.50	-10,746.07	1,302.46	953.95	348.50	3.737		
17,800.00	6,980.53	18,426.72	6,980.48	176.71	179.94	90.00	3,143.34	-10,846.06	1,302.81	951.14	351.67	3.705		
17,900.00	6,980.45	18,526.72	6,980.41	178.29	181.49	90.00	3,144.18	-10,946.06	1,303.16	948.32	354.84	3.673		
18,000.00	6,980.38	18,626.72	6,980.33	179.86	183.04	90.00	3,145.02	-11,046.05	1,303.51	945.50	358.01	3.641		
18,100.00	6,980.30	18,726.72	6,980.26	181.44	184.59	90.00	3,145.86	-11,146.05	1,303.86	942.68	361.18	3.610		
18,200.00	6,980.23	18,826.72	6,980.19	183.01	186.15	90.00	3,146.70	-11,246.04	1,304.21	939.86	364.35	3.580		
18,300.00	6,980.15	18,926.72	6,980.11	184.59	187.70	90.00	3,147.54	-11,346.04	1,304.56	937.04	367.52	3.550		
18,400.00	6,980.08	19,026.72	6,980.04	186.16	189.25	90.00	3,148.38	-11,446.04	1,304.92	934.22	370.69	3.520		
18,500.00	6,980.00	19,126.72	6,979.97	187.74	190.81	90.00	3,149.22	-11,546.03	1,305.27	931.40	373.87	3.491		
18,600.00	6,979.93	19,226.72	6,979.89	189.32	192.36	90.00	3,150.05	-11,646.03	1,305.62	928.58	377.04	3.463		
18,700.00	6,979.85	19,326.72	6,979.82	190.90	193.92	90.00	3,150.89	-11,746.02	1,305.97	925.76	380.21	3.435		
18,800.00	6,979.78	19,426.72	6,979.74	192.48	195.48	90.00	3,151.73	-11,846.02	1,306.32	922.93	383.39	3.407		
18,900.00	6,979.71	19,526.72	6,979.67	194.05	197.04	90.00	3,152.57	-11,946.02	1,306.67	920.11	386.56	3.380		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #672H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS							Rule Assigned:						Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
19,000.00	6,979.63	19,626.72	6,979.60	195.63	198.60	90.00	3,153.41	-12,046.01	1,307.02	917.29	389.74	3.354	
19,100.00	6,979.56	19,726.72	6,979.52	197.21	200.16	90.00	3,154.25	-12,146.01	1,307.38	914.46	392.91	3.327	
19,200.00	6,979.48	19,826.72	6,979.45	198.79	201.72	90.00	3,155.09	-12,246.00	1,307.73	911.64	396.09	3.302	
19,300.00	6,979.41	19,926.71	6,979.38	200.37	203.28	90.00	3,155.93	-12,346.00	1,308.08	908.81	399.27	3.276	
19,400.00	6,979.33	20,026.71	6,979.30	201.95	204.84	90.00	3,156.77	-12,445.99	1,308.43	905.98	402.45	3.251	
19,500.00	6,979.26	20,126.71	6,979.23	203.54	206.40	90.00	3,157.61	-12,545.99	1,308.78	903.16	405.62	3.227	
19,600.00	6,979.18	20,226.71	6,979.16	205.12	207.97	90.00	3,158.45	-12,645.99	1,309.13	900.33	408.80	3.202	
19,700.00	6,979.11	20,326.71	6,979.08	206.70	209.53	90.00	3,159.28	-12,745.98	1,309.48	897.50	411.98	3.179	
19,800.00	6,979.03	20,426.71	6,979.01	208.28	211.09	90.00	3,160.12	-12,845.98	1,309.84	894.67	415.16	3.155	
19,900.00	6,978.96	20,526.71	6,978.93	209.86	212.66	90.00	3,160.96	-12,945.97	1,310.19	891.85	418.34	3.132	
20,000.00	6,978.89	20,626.71	6,978.86	211.45	214.22	90.00	3,161.80	-13,045.97	1,310.54	889.02	421.52	3.109	
20,100.00	6,978.81	20,726.71	6,978.79	213.03	215.79	90.00	3,162.64	-13,145.97	1,310.89	886.19	424.70	3.087	
20,200.00	6,978.74	20,826.71	6,978.71	214.61	217.36	90.00	3,163.48	-13,245.96	1,311.24	883.36	427.88	3.064	
20,300.00	6,978.66	20,926.71	6,978.64	216.20	218.92	90.00	3,164.32	-13,345.96	1,311.59	880.53	431.07	3.043	
20,400.00	6,978.59	21,026.71	6,978.57	217.78	220.49	90.00	3,165.16	-13,445.95	1,311.94	877.70	434.25	3.021	
20,500.00	6,978.51	21,126.71	6,978.49	219.37	222.06	90.00	3,166.00	-13,545.95	1,312.30	874.87	437.43	3.000	
20,600.00	6,978.44	21,226.71	6,978.42	220.95	223.63	90.00	3,166.84	-13,645.94	1,312.65	872.03	440.61	2.979	
20,700.00	6,978.36	21,326.71	6,978.35	222.53	225.20	90.00	3,167.68	-13,745.94	1,313.00	869.20	443.80	2.959	
20,800.00	6,978.29	21,426.71	6,978.27	224.12	226.77	90.00	3,168.51	-13,845.94	1,313.35	866.37	446.98	2.938	
20,900.00	6,978.21	21,526.70	6,978.20	225.71	228.34	90.00	3,169.35	-13,945.93	1,313.70	863.54	450.16	2.918	
21,000.00	6,978.14	21,626.70	6,978.13	227.29	229.91	90.00	3,170.19	-14,045.93	1,314.05	860.70	453.35	2.899	
21,100.00	6,978.07	21,726.70	6,978.05	228.88	231.48	90.00	3,171.03	-14,145.92	1,314.40	857.87	456.53	2.879	
21,200.00	6,977.99	21,826.70	6,977.98	230.46	233.05	90.00	3,171.87	-14,245.92	1,314.76	855.04	459.72	2.860	
21,300.00	6,977.92	21,926.70	6,977.90	232.05	234.63	90.00	3,172.71	-14,345.92	1,315.11	852.20	462.90	2.841	
21,400.00	6,977.84	22,026.70	6,977.83	233.64	236.20	90.00	3,173.55	-14,445.91	1,315.46	849.37	466.09	2.822	
21,500.00	6,977.77	22,126.70	6,977.76	235.22	237.77	90.00	3,174.39	-14,545.91	1,315.81	846.53	469.28	2.804	
21,600.00	6,977.69	22,226.70	6,977.68	236.81	239.34	90.00	3,175.23	-14,645.90	1,316.16	843.70	472.46	2.786	
21,700.00	6,977.62	22,326.70	6,977.61	238.40	240.92	90.00	3,176.07	-14,745.90	1,316.51	840.86	475.65	2.768	
21,800.00	6,977.54	22,426.70	6,977.54	239.99	242.49	90.00	3,176.91	-14,845.89	1,316.86	838.03	478.84	2.750	
21,900.00	6,977.47	22,526.70	6,977.46	241.57	244.07	90.00	3,177.75	-14,945.89	1,317.22	835.19	482.02	2.733	
22,000.00	6,977.39	22,626.70	6,977.39	243.16	245.64	90.00	3,178.58	-15,045.89	1,317.57	832.36	485.21	2.715	
22,100.00	6,977.32	22,726.70	6,977.32	244.75	247.22	90.00	3,179.42	-15,145.88	1,317.92	829.52	488.40	2.698	
22,200.00	6,977.25	22,826.70	6,977.24	246.34	248.79	90.00	3,180.26	-15,245.88	1,318.27	826.68	491.59	2.682	
22,300.00	6,977.17	22,926.70	6,977.17	247.93	250.37	90.00	3,181.10	-15,345.87	1,318.62	823.85	494.78	2.665	
22,400.00	6,977.10	23,026.70	6,977.10	249.52	251.95	90.00	3,181.94	-15,445.87	1,318.97	821.01	497.96	2.649	
22,500.00	6,977.02	23,126.69	6,977.02	251.11	253.52	90.00	3,182.78	-15,545.87	1,319.32	818.17	501.15	2.633	
22,529.62	6,977.00	23,156.15	6,977.00	251.58	254.06	90.00	3,183.03	-15,575.32	1,319.43	817.33	502.10	2.628 SF	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.37	-17.48	-9.94	20.10				
100.00	100.00	100.00	100.00	0.25	0.25	-150.37	-17.48	-9.94	20.10	19.60	0.50	40.059	
200.00	200.00	200.00	200.00	0.61	0.61	-150.37	-17.48	-9.94	20.10	18.89	1.22	16.495	
300.00	300.00	300.00	300.00	0.97	0.97	-150.37	-17.48	-9.94	20.10	18.17	1.94	10.386	
400.00	400.00	400.00	400.00	1.33	1.33	-150.37	-17.48	-9.94	20.10	17.45	2.65	7.579	
500.00	500.00	500.00	500.00	1.68	1.68	-150.37	-17.48	-9.94	20.10	16.73	3.37	5.966	
550.00	550.00	550.00	550.00	1.86	1.86	-150.37	-17.48	-9.94	20.10	16.38	3.73	5.393 CC, ES	
600.00	600.00	600.00	600.00	2.04	2.04	-148.63	-17.48	-9.94	20.48	16.39	4.09	5.010	
700.00	699.93	700.57	700.55	2.40	2.40	-150.47	-15.74	-10.25	22.10	17.30	4.80	4.600	
800.00	799.68	801.20	801.04	2.77	2.77	-151.08	-10.52	-11.17	23.98	18.46	5.52	4.344	
900.00	899.13	901.88	901.33	3.13	3.13	-150.70	-1.83	-12.70	26.09	19.85	6.24	4.184	
1,000.00	998.15	1,002.62	1,001.29	3.49	3.50	-149.57	10.34	-14.84	28.44	21.48	6.96	4.089	
1,100.00	1,096.63	1,103.39	1,100.81	3.87	3.87	-147.87	25.97	-17.60	31.04	23.36	7.68	4.041	
1,130.50	1,126.54	1,134.14	1,131.05	3.99	3.99	-147.27	31.42	-18.56	31.89	23.98	7.91	4.033	
1,200.00	1,194.61	1,204.21	1,199.74	4.26	4.26	-144.98	45.04	-20.96	33.23	24.80	8.42	3.944	
1,300.00	1,292.57	1,304.96	1,297.87	4.66	4.66	-138.31	67.51	-24.92	33.22	24.01	9.20	3.609	
1,400.00	1,390.52	1,405.38	1,394.82	5.07	5.09	-126.49	93.28	-29.47	31.80	21.74	10.06	3.162	
1,486.13	1,474.89	1,491.43	1,477.12	5.42	5.47	-111.00	118.01	-33.83	30.94	20.09	10.86	2.850	
1,500.00	1,488.48	1,505.25	1,490.26	5.48	5.53	-108.05	122.21	-34.57	30.98	19.99	10.99	2.820 SF	
1,600.00	1,586.43	1,604.53	1,584.52	5.90	5.99	-87.13	152.89	-39.98	33.66	21.81	11.86	2.839	
1,700.00	1,684.38	1,703.79	1,678.77	6.31	6.45	-71.01	183.59	-45.39	40.00	27.39	12.61	3.173	
1,800.00	1,782.34	1,803.06	1,773.01	6.73	6.93	-59.88	214.28	-50.80	48.58	35.27	13.32	3.648	
1,900.00	1,880.29	1,902.32	1,867.25	7.15	7.42	-52.27	244.98	-56.22	58.43	44.40	14.04	4.162	
2,000.00	1,978.25	2,001.58	1,961.50	7.58	7.91	-46.92	275.67	-61.63	69.01	54.23	14.77	4.671	
2,100.00	2,076.20	2,100.85	2,055.74	8.00	8.40	-43.00	306.37	-67.04	80.02	64.50	15.52	5.155	
2,200.00	2,174.15	2,200.11	2,149.98	8.43	8.90	-40.04	337.06	-72.45	91.31	75.03	16.28	5.607	
2,300.00	2,272.11	2,299.37	2,244.23	8.85	9.40	-37.74	367.75	-77.87	102.79	85.74	17.05	6.027	
2,400.00	2,370.06	2,398.64	2,338.47	9.28	9.91	-35.90	398.45	-83.28	114.40	96.57	17.83	6.416	
2,500.00	2,468.02	2,497.90	2,432.71	9.71	10.42	-34.40	429.14	-88.69	126.11	107.50	18.61	6.776	
2,600.00	2,565.97	2,597.16	2,526.96	10.14	10.93	-33.16	459.84	-94.10	137.89	118.49	19.40	7.108	
2,700.00	2,663.92	2,696.43	2,621.20	10.57	11.44	-32.11	490.53	-99.51	149.72	129.53	20.19	7.416	
2,800.00	2,761.88	2,795.69	2,715.44	11.00	11.95	-31.21	521.23	-104.93	161.59	140.61	20.98	7.703	
2,900.00	2,859.83	2,894.95	2,809.68	11.43	12.46	-30.44	551.92	-110.34	173.50	151.72	21.77	7.969	
3,000.00	2,957.79	2,994.22	2,903.93	11.86	12.98	-29.77	582.62	-115.75	185.43	162.86	22.57	8.216	
3,100.00	3,055.74	3,093.48	2,998.17	12.29	13.49	-29.18	613.31	-121.16	197.38	174.02	23.37	8.447	
3,200.00	3,153.69	3,192.74	3,092.41	12.72	14.01	-28.65	644.00	-126.58	209.36	185.19	24.16	8.664	
3,300.00	3,251.65	3,292.01	3,186.66	13.15	14.53	-28.19	674.70	-131.99	221.35	196.38	24.97	8.866	
3,400.00	3,349.60	3,391.27	3,280.90	13.59	15.05	-27.77	705.39	-137.40	233.35	207.58	25.77	9.056	
3,500.00	3,447.56	3,490.53	3,375.14	14.02	15.57	-27.39	736.09	-142.81	245.36	218.80	26.57	9.235	
3,600.00	3,545.51	3,589.80	3,469.39	14.45	16.09	-27.05	766.78	-148.22	257.39	230.02	27.37	9.404	
3,700.00	3,643.46	3,689.06	3,563.63	14.88	16.61	-26.73	797.48	-153.64	269.42	241.24	28.17	9.562	
3,800.00	3,741.42	3,788.32	3,657.87	15.32	17.13	-26.45	828.17	-159.05	281.46	252.48	28.98	9.712	
3,900.00	3,839.37	3,887.59	3,752.12	15.75	17.65	-26.19	858.87	-164.46	293.50	263.72	29.78	9.854	
4,000.00	3,937.33	3,986.85	3,846.36	16.18	18.17	-25.95	889.56	-169.87	305.55	274.96	30.59	9.989	
4,100.00	4,035.28	4,086.11	3,940.60	16.62	18.70	-25.72	920.25	-175.29	317.61	286.21	31.40	10.116	
4,200.00	4,133.23	4,185.38	4,034.85	17.05	19.22	-25.52	950.95	-180.70	329.67	297.47	32.20	10.238	
4,300.00	4,231.19	4,284.64	4,129.09	17.48	19.74	-25.32	981.64	-186.11	341.73	308.72	33.01	10.353	
4,400.00	4,329.14	4,383.90	4,223.33	17.92	20.27	-25.14	1,012.34	-191.52	353.80	319.98	33.82	10.463	
4,500.00	4,427.10	4,483.17	4,317.58	18.35	20.79	-24.98	1,043.03	-196.93	365.87	331.25	34.62	10.567	
4,600.00	4,525.05	4,582.43	4,411.82	18.78	21.31	-24.82	1,073.73	-202.35	377.94	342.51	35.43	10.667	
4,700.00	4,623.00	4,681.69	4,506.06	19.22	21.84	-24.67	1,104.42	-207.76	390.02	353.78	36.24	10.762	
4,800.00	4,720.96	4,780.96	4,600.31	19.65	22.36	-24.54	1,135.12	-213.17	402.10	365.05	37.05	10.854	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4,900.00	4,818.91	4,880.22	4,694.55	20.09	22.89	-24.41	1,165.81	-218.58	414.18	376.32	37.86	10.941	
5,000.00	4,916.87	4,979.48	4,788.79	20.52	23.41	-24.28	1,196.50	-224.00	426.26	387.60	38.66	11.025	
5,100.00	5,014.82	5,078.75	4,883.03	20.96	23.94	-24.17	1,227.20	-229.41	438.34	398.87	39.47	11.105	
5,200.00	5,112.77	5,178.01	4,977.28	21.39	24.46	-24.06	1,257.89	-234.82	450.43	410.15	40.28	11.182	
5,300.00	5,210.73	5,277.27	5,071.52	21.82	24.99	-23.95	1,288.59	-240.23	462.52	421.43	41.09	11.256	
5,400.00	5,308.68	5,376.54	5,165.76	22.26	25.51	-23.85	1,319.28	-245.64	474.61	432.70	41.90	11.327	
5,493.23	5,400.00	5,469.08	5,253.62	22.66	26.00	-23.77	1,347.90	-250.69	485.88	443.22	42.66	11.390	
5,500.00	5,406.64	5,475.80	5,260.01	22.69	26.04	-23.76	1,349.98	-251.06	486.70	443.99	42.71	11.395	
5,600.00	5,504.69	5,575.01	5,354.20	23.12	26.56	-23.68	1,380.65	-256.47	499.24	455.72	43.52	11.472	
5,700.00	5,602.91	5,678.88	5,452.90	23.55	27.11	-23.56	1,412.52	-262.09	512.34	467.97	44.37	11.547	
5,800.00	5,701.29	5,787.57	5,556.73	23.97	27.67	-23.45	1,444.17	-267.67	524.64	479.39	45.26	11.592	
5,900.00	5,799.82	5,896.64	5,661.51	24.39	28.21	-23.37	1,473.98	-272.92	535.93	489.80	46.13	11.619	
6,000.00	5,898.50	6,006.05	5,767.18	24.79	28.74	-23.31	1,501.90	-277.85	546.19	499.22	46.98	11.627	
6,100.00	5,997.31	6,115.77	5,873.68	25.20	29.25	-23.27	1,527.90	-282.43	555.42	507.62	47.81	11.618	
6,200.00	6,096.26	6,225.77	5,980.93	25.60	29.75	-23.25	1,551.95	-286.67	563.61	515.00	48.62	11.593	
6,300.00	6,195.33	6,336.02	6,088.88	25.99	30.23	-23.25	1,574.01	-290.56	570.76	521.36	49.40	11.553	
6,400.00	6,294.51	6,446.48	6,197.45	26.37	30.69	-23.27	1,594.06	-294.09	576.85	526.68	50.17	11.498	
6,498.19	6,392.00	6,555.12	6,304.58	26.75	31.12	-23.30	1,611.76	-297.22	581.81	530.91	50.90	11.431	
6,500.00	6,393.80	6,557.13	6,306.57	26.76	31.13	-22.10	1,612.07	-297.27	581.89	530.98	50.91	11.429	
6,550.00	6,443.29	6,612.52	6,361.33	26.95	31.35	0.75	1,620.30	-298.72	582.21	530.94	51.27	11.356	
6,600.00	6,492.24	6,665.22	6,413.50	27.16	31.55	12.05	1,627.68	-300.00	578.91	527.31	51.60	11.219	
6,650.00	6,540.33	6,700.00	6,447.82	27.38	31.68	18.72	1,633.27	-299.95	572.99	521.06	51.93	11.035	
6,700.00	6,587.28	6,739.14	6,486.12	27.60	31.85	23.72	1,641.14	-298.26	565.11	512.91	52.21	10.825	
6,750.00	6,632.80	6,773.64	6,519.47	27.84	32.00	27.91	1,649.42	-295.37	555.58	503.14	52.44	10.594	
6,800.00	6,676.60	6,800.00	6,544.65	28.09	32.13	31.48	1,656.59	-292.27	544.79	492.19	52.60	10.357	
6,850.00	6,718.42	6,835.55	6,578.09	28.34	32.30	35.53	1,667.37	-286.89	533.05	480.28	52.78	10.100	
6,900.00	6,758.00	6,862.46	6,602.95	28.60	32.43	39.16	1,676.38	-281.90	521.00	468.12	52.88	9.852	
6,950.00	6,795.09	6,886.50	6,624.79	28.87	32.55	42.65	1,685.02	-276.78	509.15	456.19	52.96	9.614	
7,000.00	6,829.46	6,900.00	6,636.89	29.14	32.62	45.22	1,690.12	-273.64	498.15	445.27	52.88	9.420	
7,050.00	6,860.91	6,925.98	6,659.82	29.43	32.76	48.91	1,700.40	-267.06	488.32	435.21	53.10	9.196	
7,100.00	6,889.24	6,950.00	6,680.57	29.73	32.89	52.42	1,710.47	-260.35	480.58	427.12	53.46	8.990	
7,150.00	6,914.27	6,950.00	6,680.57	30.05	32.89	53.15	1,710.47	-260.35	475.03	421.74	53.28	8.915	
7,200.00	6,935.85	6,964.84	6,693.16	30.37	32.97	55.28	1,716.94	-255.91	472.33	418.58	53.75	8.787	
7,218.10	6,942.78	6,968.00	6,695.82	30.49	32.99	55.73	1,718.34	-254.94	472.12	418.22	53.90	8.759	
7,250.00	6,953.84	6,972.82	6,699.86	30.71	33.02	56.36	1,720.50	-253.43	472.78	418.57	54.22	8.720	
7,300.00	6,968.15	6,978.52	6,704.61	31.06	33.05	56.87	1,723.08	-251.62	476.51	421.69	54.83	8.691	
7,350.00	6,978.67	6,982.06	6,707.55	31.42	33.07	56.83	1,724.69	-250.48	483.55	427.98	55.57	8.702	
7,400.00	6,985.34	6,983.54	6,708.77	31.79	33.08	56.23	1,725.37	-250.00	493.79	437.37	56.42	8.752	
7,450.00	6,988.13	6,983.04	6,708.36	32.17	33.07	55.11	1,725.14	-250.16	507.00	449.67	57.33	8.843	
7,461.13	6,988.22	6,982.68	6,708.06	32.26	33.07	54.80	1,724.98	-250.28	510.32	452.78	57.54	8.869	
7,500.00	6,988.19	6,981.16	6,708.80	32.56	33.06	54.46	1,724.28	-250.77	523.64	465.38	58.25	8.989	
7,600.00	6,988.12	6,976.69	6,703.09	33.37	33.04	53.30	1,722.25	-252.20	570.40	510.55	59.85	9.531	
7,700.00	6,988.05	6,971.47	6,698.73	34.21	33.01	51.72	1,719.89	-253.85	631.74	570.72	61.03	10.352	
7,800.00	6,987.98	6,965.61	6,693.81	35.09	32.98	49.67	1,717.28	-255.67	703.76	641.93	61.84	11.381	
7,900.00	6,987.91	6,950.00	6,680.57	35.99	32.89	45.96	1,710.47	-260.35	783.52	721.48	62.04	12.629	
8,000.00	6,987.83	6,950.00	6,680.57	36.93	32.89	43.67	1,710.47	-260.35	868.49	805.82	62.67	13.859	
8,100.00	6,987.76	6,950.00	6,680.57	37.88	32.89	40.77	1,710.47	-260.35	957.43	894.29	63.14	15.163	
8,200.00	6,987.68	6,950.00	6,680.57	38.86	32.89	37.16	1,710.47	-260.35	1,049.26	985.74	63.52	16.519	
8,300.00	6,987.61	6,929.91	6,663.24	39.86	32.78	30.03	1,702.01	-266.00	1,142.75	1,079.44	63.32	18.048	
8,400.00	6,987.53	6,922.07	6,656.40	40.87	32.74	23.58	1,698.82	-268.09	1,237.82	1,174.39	63.43	19.515	
8,500.00	6,987.46	6,900.00	6,636.89	41.90	32.62	14.73	1,690.12	-273.64	1,334.06	1,270.86	63.21	21.106	
8,600.00	6,987.38	6,900.00	6,636.89	42.93	32.62	7.42	1,690.12	-273.64	1,430.64	1,367.15	63.48	22.536	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error:	0.00 usft		
Survey Program:		0-MWD+HRGM+MS					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
8,700.00	6,987.31	6,900.00	6,636.89	43.98	32.62	-0.71	1,690.12	-273.64	1,527.75	1,464.02	63.73	23.973				
8,800.00	6,987.23	6,900.00	6,636.89	45.03	32.62	-9.37	1,690.12	-273.64	1,625.21	1,561.25	63.95	25.412				
8,872.16	6,987.18	6,900.00	6,636.89	45.79	32.62	-15.71	1,690.12	-273.64	1,695.64	1,631.54	64.11	26.450				
8,900.00	6,987.16	6,882.74	6,621.40	46.08	32.53	-16.02	1,683.63	-277.62	1,722.59	1,658.73	63.86	26.974				
9,000.00	6,987.09	6,875.44	6,614.79	47.16	32.50	-16.12	1,680.98	-279.21	1,820.20	1,756.26	63.94	28.468				
9,100.00	6,987.01	6,868.63	6,608.59	48.27	32.46	-16.21	1,678.55	-280.64	1,917.97	1,853.96	64.01	29.964				
9,200.00	6,986.94	6,850.00	6,591.49	49.40	32.37	-16.41	1,672.12	-284.30	2,016.01	1,952.12	63.89	31.555				
9,300.00	6,986.86	6,850.00	6,591.49	50.56	32.37	-16.41	1,672.12	-284.30	2,113.98	2,049.94	64.04	33.009				
9,400.00	6,986.79	6,850.00	6,591.49	51.75	32.37	-16.41	1,672.12	-284.30	2,212.13	2,147.95	64.18	34.466				
9,500.00	6,986.71	6,850.00	6,591.49	52.95	32.37	-16.41	1,672.12	-284.30	2,310.45	2,246.14	64.31	35.928				
9,600.00	6,986.64	6,850.00	6,591.49	54.18	32.37	-16.41	1,672.12	-284.30	2,408.90	2,344.47	64.42	37.392				
9,700.00	6,986.56	6,850.00	6,591.49	55.42	32.37	-16.41	1,672.12	-284.30	2,507.47	2,442.94	64.53	38.859				
9,800.00	6,986.49	6,850.00	6,591.49	56.69	32.37	-16.41	1,672.12	-284.30	2,606.15	2,541.52	64.62	40.327				
9,900.00	6,986.41	6,827.35	6,570.43	57.97	32.26	-16.56	1,664.77	-288.25	2,704.55	2,640.10	64.45	41.966				
10,000.00	6,986.34	6,823.41	6,566.74	59.26	32.24	-16.57	1,663.55	-288.88	2,803.28	2,738.79	64.49	43.468				
10,100.00	6,986.27	6,819.68	6,563.24	60.57	32.22	-16.59	1,662.40	-289.46	2,902.07	2,837.54	64.53	44.970				
10,200.00	6,986.19	6,800.00	6,544.65	61.90	32.13	-16.62	1,656.59	-292.27	3,001.11	2,936.71	64.40	46.601				
10,300.00	6,986.12	6,800.00	6,544.65	63.23	32.13	-16.62	1,656.59	-292.27	3,099.95	3,035.47	64.48	48.075				
10,400.00	6,986.04	6,800.00	6,544.65	64.58	32.13	-16.62	1,656.59	-292.27	3,198.86	3,134.31	64.56	49.550				
10,500.00	6,985.97	6,800.00	6,544.65	65.94	32.13	-16.62	1,656.59	-292.27	3,297.84	3,233.21	64.63	51.024				
10,600.00	6,985.89	6,800.00	6,544.65	67.32	32.13	-16.62	1,656.59	-292.27	3,396.88	3,332.18	64.70	52.499				
10,700.00	6,985.82	6,800.00	6,544.65	68.70	32.13	-16.62	1,656.59	-292.27	3,495.97	3,431.20	64.77	53.974				
10,800.00	6,985.74	6,800.00	6,544.65	70.09	32.13	-16.62	1,656.59	-292.27	3,595.12	3,530.28	64.84	55.449				
10,900.00	6,985.67	6,800.00	6,544.65	71.49	32.13	-16.62	1,656.59	-292.27	3,694.31	3,629.41	64.90	56.923				
11,000.00	6,985.59	6,800.00	6,544.65	72.90	32.13	-16.62	1,656.59	-292.27	3,793.54	3,728.58	64.96	58.397				
11,100.00	6,985.52	6,800.00	6,544.65	74.31	32.13	-16.62	1,656.59	-292.27	3,892.81	3,827.79	65.02	59.869				
11,200.00	6,985.45	6,800.00	6,544.65	75.74	32.13	-16.62	1,656.59	-292.27	3,992.12	3,927.04	65.08	61.341				
11,300.00	6,985.37	6,800.00	6,544.65	77.17	32.13	-16.62	1,656.59	-292.27	4,091.46	4,026.32	65.14	62.812				
11,400.00	6,985.30	6,800.00	6,544.65	78.61	32.13	-16.62	1,656.59	-292.27	4,190.83	4,125.64	65.19	64.282				
11,500.00	6,985.22	6,800.00	6,544.65	80.05	32.13	-16.62	1,656.59	-292.27	4,290.23	4,224.98	65.25	65.750				
11,600.00	6,985.15	6,800.00	6,544.65	81.50	32.13	-16.62	1,656.59	-292.27	4,389.66	4,324.36	65.31	67.217				
11,700.00	6,985.07	6,778.56	6,524.20	82.96	32.03	-16.60	1,650.71	-294.85	4,488.81	4,423.63	65.18	68.869				
11,800.00	6,985.00	6,776.78	6,522.49	84.42	32.02	-16.59	1,650.24	-295.04	4,588.24	4,523.02	65.22	70.350				
11,900.00	6,984.92	6,775.06	6,520.84	85.89	32.01	-16.59	1,649.79	-295.22	4,687.69	4,622.42	65.26	71.830				
12,000.00	6,984.85	6,773.41	6,519.25	87.36	32.00	-16.58	1,649.36	-295.39	4,787.15	4,721.85	65.30	73.307				
12,100.00	6,984.77	6,771.81	6,517.72	88.83	32.00	-16.58	1,648.95	-295.56	4,886.64	4,821.29	65.34	74.783				
12,200.00	6,984.70	6,750.00	6,496.66	90.31	31.90	-16.48	1,643.61	-297.50	4,986.41	4,921.18	65.23	76.445				
12,300.00	6,984.63	6,750.00	6,496.66	91.80	31.90	-16.48	1,643.61	-297.50	5,085.89	5,020.60	65.28	77.904				
12,400.00	6,984.55	6,750.00	6,496.66	93.29	31.90	-16.48	1,643.61	-297.50	5,185.39	5,120.05	65.34	79.361				
12,500.00	6,984.48	6,750.00	6,496.66	94.78	31.90	-16.48	1,643.61	-297.50	5,284.91	5,219.51	65.39	80.817				
12,600.00	6,984.40	6,750.00	6,496.66	96.28	31.90	-16.48	1,643.61	-297.50	5,384.44	5,318.99	65.45	82.270				
12,700.00	6,984.33	6,750.00	6,496.66	97.78	31.90	-16.48	1,643.61	-297.50	5,484.00	5,418.49	65.50	83.721				
12,800.00	6,984.25	6,750.00	6,496.66	99.28	31.90	-16.48	1,643.61	-297.50	5,583.57	5,518.01	65.56	85.170				
12,900.00	6,984.18	6,750.00	6,496.66	100.78	31.90	-16.48	1,643.61	-297.50	5,683.15	5,617.54	65.61	86.617				
13,000.00	6,984.10	6,750.00	6,496.66	102.29	31.90	-16.48	1,643.61	-297.50	5,782.75	5,717.08	65.67	88.061				
13,100.00	6,984.03	6,750.00	6,496.66	103.80	31.90	-16.48	1,643.61	-297.50	5,882.36	5,816.64	65.72	89.503				
13,200.00	6,983.95	6,750.00	6,496.66	105.32	31.90	-16.48	1,643.61	-297.50	5,981.99	5,916.21	65.78	90.943				
13,300.00	6,983.88	6,750.00	6,496.66	106.84	31.90	-16.48	1,643.61	-297.50	6,081.63	6,015.79	65.83	92.381				
13,400.00	6,983.81	6,750.00	6,496.66	108.36	31.90	-16.48	1,643.61	-297.50	6,181.28	6,115.39	65.89	93.815				
13,500.00	6,983.73	6,750.00	6,496.66	109.88	31.90	-16.48	1,643.61	-297.50	6,280.94	6,214.99	65.94	95.248				
13,600.00	6,983.66	6,750.00	6,496.66	111.40	31.90	-16.48	1,643.61	-297.50	6,380.61	6,314.61	66.00	96.678				
13,700.00	6,983.58	6,750.00	6,496.66	112.93	31.90	-16.48	1,643.61	-297.50	6,480.29	6,414.23	66.05	98.105				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS					Rule Assigned:				Offset Well Error:	0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,800.00	6,983.51	6,750.00	6,496.66	114.46	31.90	-16.48	1,643.61	-297.50	6,579.98	6,513.87	66.11	99.529		
13,900.00	6,983.43	6,750.00	6,496.66	115.99	31.90	-16.48	1,643.61	-297.50	6,679.68	6,613.51	66.17	100.951		
14,000.00	6,983.36	6,750.00	6,496.66	117.52	31.90	-16.48	1,643.61	-297.50	6,779.39	6,713.17	66.22	102.370		
14,100.00	6,983.28	6,750.00	6,496.66	119.06	31.90	-16.48	1,643.61	-297.50	6,879.11	6,812.83	66.28	103.786		
14,200.00	6,983.21	6,750.00	6,496.66	120.59	31.90	-16.48	1,643.61	-297.50	6,978.83	6,912.49	66.34	105.200		
14,300.00	6,983.13	6,750.00	6,496.66	122.13	31.90	-16.48	1,643.61	-297.50	7,078.57	7,012.17	66.40	106.610		
14,400.00	6,983.06	6,750.00	6,496.66	123.67	31.90	-16.48	1,643.61	-297.50	7,178.31	7,111.85	66.45	108.018		
14,500.00	6,982.99	6,750.00	6,496.66	125.21	31.90	-16.48	1,643.61	-297.50	7,278.06	7,211.54	66.51	109.422		
14,600.00	6,982.91	6,750.00	6,496.66	126.75	31.90	-16.48	1,643.61	-297.50	7,377.81	7,311.24	66.57	110.824		
14,700.00	6,982.84	6,750.00	6,496.66	128.30	31.90	-16.48	1,643.61	-297.50	7,477.57	7,410.94	66.63	112.223		
14,800.00	6,982.76	6,750.00	6,496.66	129.85	31.90	-16.48	1,643.61	-297.50	7,577.34	7,510.65	66.69	113.618		
14,900.00	6,982.69	6,750.00	6,496.66	131.39	31.90	-16.48	1,643.61	-297.50	7,677.11	7,610.36	66.75	115.011		
15,000.00	6,982.61	6,750.00	6,496.66	132.94	31.90	-16.48	1,643.61	-297.50	7,776.89	7,710.08	66.81	116.400		
15,100.00	6,982.54	6,750.00	6,496.66	134.49	31.90	-16.48	1,643.61	-297.50	7,876.68	7,809.81	66.87	117.787		
15,200.00	6,982.46	6,750.00	6,496.66	136.04	31.90	-16.48	1,643.61	-297.50	7,976.47	7,909.54	66.93	119.170		
15,300.00	6,982.39	6,750.00	6,496.66	137.60	31.90	-16.48	1,643.61	-297.50	8,076.26	8,009.27	67.00	120.550		
15,400.00	6,982.31	6,750.00	6,496.66	139.15	31.90	-16.48	1,643.61	-297.50	8,176.07	8,109.01	67.06	121.926		
15,500.00	6,982.24	6,750.00	6,496.66	140.70	31.90	-16.48	1,643.61	-297.50	8,275.87	8,208.75	67.12	123.300		
15,600.00	6,982.17	6,750.00	6,496.66	142.26	31.90	-16.48	1,643.61	-297.50	8,375.68	8,308.50	67.18	124.670		
15,700.00	6,982.09	6,750.00	6,496.66	143.82	31.90	-16.48	1,643.61	-297.50	8,475.50	8,408.25	67.25	126.037		
15,800.00	6,982.02	6,750.00	6,496.66	145.38	31.90	-16.48	1,643.61	-297.50	8,575.31	8,508.00	67.31	127.401		
15,900.00	6,981.94	6,750.00	6,496.66	146.94	31.90	-16.48	1,643.61	-297.50	8,675.14	8,607.76	67.37	128.761		
16,000.00	6,981.87	6,750.00	6,496.66	148.50	31.90	-16.48	1,643.61	-297.50	8,774.96	8,707.53	67.44	130.118		
16,100.00	6,981.79	6,750.00	6,496.66	150.06	31.90	-16.48	1,643.61	-297.50	8,874.80	8,807.29	67.50	131.471		
16,200.00	6,981.72	6,750.00	6,496.66	151.62	31.90	-16.48	1,643.61	-297.50	8,974.63	8,907.06	67.57	132.821		
16,300.00	6,981.64	6,750.00	6,496.66	153.18	31.90	-16.48	1,643.61	-297.50	9,074.47	9,006.83	67.64	134.168		
16,400.00	6,981.57	6,750.00	6,496.66	154.74	31.90	-16.48	1,643.61	-297.50	9,174.31	9,106.61	67.70	135.511		
16,500.00	6,981.49	6,750.00	6,496.66	156.31	31.90	-16.48	1,643.61	-297.50	9,274.16	9,206.39	67.77	136.850		
16,600.00	6,981.42	6,750.00	6,496.66	157.87	31.90	-16.48	1,643.61	-297.50	9,374.00	9,306.17	67.84	138.186		
16,700.00	6,981.35	6,750.00	6,496.66	159.44	31.90	-16.48	1,643.61	-297.50	9,473.86	9,405.95	67.90	139.519		
16,800.00	6,981.27	6,750.00	6,496.66	161.01	31.90	-16.48	1,643.61	-297.50	9,573.71	9,505.74	67.97	140.848		
16,900.00	6,981.20	6,750.00	6,496.66	162.58	31.90	-16.48	1,643.61	-297.50	9,673.57	9,605.53	68.04	142.173		
17,000.00	6,981.12	6,750.00	6,496.66	164.14	31.90	-16.48	1,643.61	-297.50	9,773.43	9,705.32	68.11	143.495		
17,100.00	6,981.05	6,750.00	6,496.66	165.71	31.90	-16.48	1,643.61	-297.50	9,873.29	9,805.11	68.18	144.814		
17,200.00	6,980.97	6,750.00	6,496.66	167.28	31.90	-16.48	1,643.61	-297.50	9,973.16	9,904.91	68.25	146.128		
17,300.00	6,980.90	6,750.00	6,496.66	168.85	31.90	-16.48	1,643.61	-297.50	10,073.03	10,004.71	68.32	147.439		
17,400.00	6,980.82	6,750.00	6,496.66	170.42	31.90	-16.48	1,643.61	-297.50	10,172.90	10,104.51	68.39	148.747		
17,500.00	6,980.75	6,750.00	6,496.66	172.00	31.90	-16.48	1,643.61	-297.50	10,272.78	10,204.31	68.46	150.051		
17,600.00	6,980.67	6,750.00	6,496.66	173.57	31.90	-16.48	1,643.61	-297.50	10,372.65	10,304.12	68.53	151.351		
17,700.00	6,980.60	6,750.00	6,496.66	175.14	31.90	-16.48	1,643.61	-297.50	10,472.53	10,403.92	68.61	152.647		
17,800.00	6,980.53	6,726.67	6,473.96	176.71	31.80	-16.32	1,638.46	-298.99	10,572.09	10,503.54	68.54	154.243		
17,900.00	6,980.45	6,726.28	6,473.58	178.29	31.80	-16.32	1,638.37	-299.01	10,671.96	10,603.34	68.61	155.539		
18,000.00	6,980.38	6,725.89	6,473.20	179.86	31.79	-16.31	1,638.29	-299.02	10,771.83	10,703.15	68.68	156.830		
18,100.00	6,980.30	6,725.51	6,472.82	181.44	31.79	-16.31	1,638.22	-299.04	10,871.71	10,802.95	68.76	158.119		
18,200.00	6,980.23	6,725.14	6,472.46	183.01	31.79	-16.31	1,638.14	-299.06	10,971.59	10,902.76	68.83	159.403		
18,300.00	6,980.15	6,724.77	6,472.10	184.59	31.79	-16.30	1,638.06	-299.08	11,071.47	11,002.57	68.90	160.684		
18,400.00	6,980.08	6,724.40	6,471.74	186.16	31.79	-16.30	1,637.99	-299.10	11,171.35	11,102.38	68.98	161.960		
18,500.00	6,980.00	6,724.05	6,471.40	187.74	31.79	-16.30	1,637.91	-299.12	11,271.24	11,202.19	69.05	163.233		
18,600.00	6,979.93	6,723.70	6,471.05	189.32	31.79	-16.30	1,637.84	-299.13	11,371.12	11,302.00	69.12	164.503		
18,700.00	6,979.85	6,723.35	6,470.72	190.90	31.78	-16.29	1,637.77	-299.15	11,471.01	11,401.81	69.20	165.768		
18,800.00	6,979.78	6,700.00	6,447.82	192.48	31.68	-16.08	1,633.27	-299.95	11,571.22	11,502.07	69.15	167.340		
18,900.00	6,979.71	6,700.00	6,447.82	194.05	31.68	-16.08	1,633.27	-299.95	11,671.10	11,601.87	69.23	168.594		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #690H - OH - Prelim 5													Offset Site Error:	0.00 usft	
Survey Program:		0-MWD+HRGM+MS					Rule Assigned:							Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
19,000.00	6,979.63	6,700.00	6,447.82	195.63	31.68	-16.08	1,633.27	-299.95	11,770.99	11,701.68	69.30	169.845			
19,100.00	6,979.56	6,700.00	6,447.82	197.21	31.68	-16.08	1,633.27	-299.95	11,870.87	11,801.49	69.38	171.091			
19,200.00	6,979.48	6,700.00	6,447.82	198.79	31.68	-16.08	1,633.27	-299.95	11,970.76	11,901.30	69.46	172.334			
19,300.00	6,979.41	6,700.00	6,447.82	200.37	31.68	-16.08	1,633.27	-299.95	12,070.65	12,001.11	69.54	173.573			
19,400.00	6,979.33	6,700.00	6,447.82	201.95	31.68	-16.08	1,633.27	-299.95	12,170.54	12,100.92	69.62	174.809			
19,500.00	6,979.26	6,700.00	6,447.82	203.54	31.68	-16.08	1,633.27	-299.95	12,270.44	12,200.73	69.70	176.040			
19,600.00	6,979.18	6,700.00	6,447.82	205.12	31.68	-16.08	1,633.27	-299.95	12,370.33	12,300.55	69.78	177.267			
19,700.00	6,979.11	6,700.00	6,447.82	206.70	31.68	-16.08	1,633.27	-299.95	12,470.23	12,400.37	69.86	178.491			
19,800.00	6,979.03	6,700.00	6,447.82	208.28	31.68	-16.08	1,633.27	-299.95	12,570.13	12,500.18	69.95	179.711			
19,900.00	6,978.96	6,700.00	6,447.82	209.86	31.68	-16.08	1,633.27	-299.95	12,670.03	12,600.00	70.03	180.926			
20,000.00	6,978.89	6,700.00	6,447.82	211.45	31.68	-16.08	1,633.27	-299.95	12,769.93	12,699.82	70.11	182.138			
20,100.00	6,978.81	6,700.00	6,447.82	213.03	31.68	-16.08	1,633.27	-299.95	12,869.84	12,799.64	70.19	183.346			
20,200.00	6,978.74	6,700.00	6,447.82	214.61	31.68	-16.08	1,633.27	-299.95	12,969.74	12,899.46	70.28	184.551			
20,300.00	6,978.66	6,700.00	6,447.82	216.20	31.68	-16.08	1,633.27	-299.95	13,069.65	12,999.29	70.36	185.751			
20,400.00	6,978.59	6,700.00	6,447.82	217.78	31.68	-16.08	1,633.27	-299.95	13,169.56	13,099.11	70.45	186.947			
20,500.00	6,978.51	6,700.00	6,447.82	219.37	31.68	-16.08	1,633.27	-299.95	13,269.47	13,198.94	70.53	188.139			
20,600.00	6,978.44	6,700.00	6,447.82	220.95	31.68	-16.08	1,633.27	-299.95	13,369.38	13,298.76	70.61	189.328			
20,700.00	6,978.36	6,700.00	6,447.82	222.53	31.68	-16.08	1,633.27	-299.95	13,469.29	13,398.59	70.70	190.513			
20,800.00	6,978.29	6,700.00	6,447.82	224.12	31.68	-16.08	1,633.27	-299.95	13,569.20	13,498.42	70.79	191.693			
20,900.00	6,978.21	6,700.00	6,447.82	225.71	31.68	-16.08	1,633.27	-299.95	13,669.12	13,598.24	70.87	192.870			
21,000.00	6,978.14	6,700.00	6,447.82	227.29	31.68	-16.08	1,633.27	-299.95	13,769.03	13,698.07	70.96	194.043			
21,100.00	6,978.07	6,700.00	6,447.82	228.88	31.68	-16.08	1,633.27	-299.95	13,868.95	13,797.90	71.05	195.212			
21,200.00	6,977.99	6,700.00	6,447.82	230.46	31.68	-16.08	1,633.27	-299.95	13,968.87	13,897.73	71.13	196.377			
21,300.00	6,977.92	6,700.00	6,447.82	232.05	31.68	-16.08	1,633.27	-299.95	14,068.79	13,997.57	71.22	197.538			
21,400.00	6,977.84	6,700.00	6,447.82	233.64	31.68	-16.08	1,633.27	-299.95	14,168.71	14,097.40	71.31	198.695			
21,500.00	6,977.77	6,700.00	6,447.82	235.22	31.68	-16.08	1,633.27	-299.95	14,268.63	14,197.23	71.40	199.848			
21,600.00	6,977.69	6,700.00	6,447.82	236.81	31.68	-16.08	1,633.27	-299.95	14,368.55	14,297.07	71.49	200.998			
21,700.00	6,977.62	6,700.00	6,447.82	238.40	31.68	-16.08	1,633.27	-299.95	14,468.48	14,396.90	71.58	202.143			
21,800.00	6,977.54	6,700.00	6,447.82	239.99	31.68	-16.08	1,633.27	-299.95	14,568.40	14,496.74	71.66	203.285			
21,900.00	6,977.47	6,700.00	6,447.82	241.57	31.68	-16.08	1,633.27	-299.95	14,668.33	14,596.57	71.75	204.423			
22,000.00	6,977.39	6,700.00	6,447.82	243.16	31.68	-16.08	1,633.27	-299.95	14,768.25	14,696.41	71.85	205.556			
22,100.00	6,977.32	6,700.00	6,447.82	244.75	31.68	-16.08	1,633.27	-299.95	14,868.18	14,796.25	71.94	206.686			
22,200.00	6,977.25	6,700.00	6,447.82	246.34	31.68	-16.08	1,633.27	-299.95	14,968.11	14,896.08	72.03	207.812			
22,300.00	6,977.17	6,700.00	6,447.82	247.93	31.68	-16.08	1,633.27	-299.95	15,068.04	14,995.92	72.12	208.934			
22,400.00	6,977.10	6,700.00	6,447.82	249.52	31.68	-16.08	1,633.27	-299.95	15,167.97	15,095.76	72.21	210.053			
22,500.00	6,977.02	6,700.00	6,447.82	251.11	31.68	-16.08	1,633.27	-299.95	15,267.90	15,195.60	72.30	211.167			
22,529.62	6,977.00	6,700.00	6,447.82	251.58	31.68	-16.08	1,633.27	-299.95	15,297.50	15,225.17	72.33	211.496			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.73	-34.95	-19.59	40.06				
100.00	100.00	100.00	100.00	0.25	0.25	-150.73	-34.95	-19.59	40.06	39.56	0.50	79.832	
200.00	200.00	200.00	200.00	0.61	0.61	-150.73	-34.95	-19.59	40.06	38.85	1.22	32.872	
300.00	300.00	300.00	300.00	0.97	0.97	-150.73	-34.95	-19.59	40.06	38.13	1.94	20.697	
400.00	400.00	400.00	400.00	1.33	1.33	-150.73	-34.95	-19.59	40.06	37.41	2.65	15.103	
500.00	500.00	500.00	500.00	1.68	1.68	-150.73	-34.95	-19.59	40.06	36.69	3.37	11.890	
550.00	550.00	550.00	550.00	1.86	1.86	-150.73	-34.95	-19.59	40.06	36.34	3.73	10.747 CC, ES	
600.00	600.00	600.00	600.00	2.04	2.04	-148.67	-34.95	-19.59	40.44	36.35	4.09	9.895	
700.00	699.93	699.93	699.93	2.40	2.40	-151.03	-34.95	-19.59	43.46	38.65	4.80	9.045	
800.00	799.68	801.18	801.15	2.77	2.76	-153.91	-33.18	-19.78	48.14	42.62	5.53	8.713	
900.00	899.13	902.61	902.44	3.13	3.13	-156.01	-27.83	-20.38	53.00	46.75	6.24	8.487	
1,000.00	998.15	1,004.22	1,003.65	3.49	3.50	-157.50	-18.91	-21.38	57.96	51.00	6.96	8.326	
1,100.00	1,096.63	1,106.02	1,104.67	3.87	3.87	-158.53	-6.40	-22.78	63.00	55.32	7.68	8.204	
1,130.50	1,126.54	1,137.11	1,135.41	3.99	3.98	-158.77	-1.88	-23.29	64.55	56.65	7.90	8.172	
1,200.00	1,194.61	1,206.88	1,204.32	4.26	4.24	-159.13	9.01	-24.51	67.76	59.35	8.41	8.059	
1,300.00	1,292.57	1,306.77	1,302.96	4.66	4.61	-159.57	24.67	-26.26	72.32	63.17	9.15	7.907	
1,400.00	1,390.52	1,406.66	1,401.60	5.07	5.00	-159.96	40.33	-28.02	76.88	66.99	9.89	7.773	
1,500.00	1,488.48	1,506.56	1,500.25	5.48	5.38	-160.31	55.99	-29.77	81.45	70.81	10.64	7.656	
1,600.00	1,586.43	1,606.45	1,598.89	5.90	5.77	-160.62	71.65	-31.52	86.02	74.63	11.39	7.552	
1,700.00	1,684.38	1,706.35	1,697.53	6.31	6.16	-160.90	87.31	-33.28	90.60	78.45	12.14	7.460	
1,800.00	1,782.34	1,806.24	1,796.18	6.73	6.55	-161.15	102.97	-35.03	95.17	82.27	12.90	7.378	
1,900.00	1,880.29	1,906.14	1,894.82	7.15	6.95	-161.38	118.63	-36.79	99.75	86.09	13.66	7.304	
2,000.00	1,978.25	2,006.03	1,993.47	7.58	7.34	-161.59	134.29	-38.54	104.32	89.91	14.41	7.238	
2,100.00	2,076.20	2,105.93	2,092.11	8.00	7.74	-161.78	149.95	-40.29	108.90	93.73	15.17	7.178	
2,200.00	2,174.15	2,205.82	2,190.75	8.43	8.14	-161.95	165.61	-42.05	113.48	97.55	15.93	7.123	
2,300.00	2,272.11	2,305.72	2,289.40	8.85	8.54	-162.12	181.27	-43.80	118.07	101.37	16.69	7.073	
2,400.00	2,370.06	2,405.61	2,388.04	9.28	8.93	-162.27	196.93	-45.55	122.65	105.19	17.45	7.027	
2,500.00	2,468.02	2,505.50	2,486.69	9.71	9.33	-162.40	212.59	-47.31	127.23	109.02	18.22	6.985	
2,600.00	2,565.97	2,605.40	2,585.33	10.14	9.73	-162.53	228.25	-49.06	131.82	112.84	18.98	6.945	
2,700.00	2,663.92	2,705.29	2,683.97	10.57	10.14	-162.65	243.91	-50.82	136.40	116.66	19.74	6.909	
2,800.00	2,761.88	2,805.19	2,782.62	11.00	10.54	-162.77	259.57	-52.57	140.98	120.48	20.50	6.876	
2,900.00	2,859.83	2,905.08	2,881.26	11.43	10.94	-162.87	275.23	-54.32	145.57	124.30	21.27	6.845	
3,000.00	2,957.79	3,004.98	2,979.90	11.86	11.34	-162.97	290.89	-56.08	150.16	128.12	22.03	6.815	
3,100.00	3,055.74	3,104.87	3,078.55	12.29	11.74	-163.07	306.55	-57.83	154.74	131.95	22.80	6.788	
3,200.00	3,153.69	3,204.77	3,177.19	12.72	12.14	-163.15	322.21	-59.58	159.33	135.77	23.56	6.763	
3,300.00	3,251.65	3,304.66	3,275.84	13.15	12.55	-163.24	337.87	-61.34	163.92	139.59	24.32	6.739	
3,400.00	3,349.60	3,404.55	3,374.48	13.59	12.95	-163.32	353.53	-63.09	168.50	143.41	25.09	6.716	
3,500.00	3,447.56	3,504.45	3,473.12	14.02	13.35	-163.39	369.19	-64.85	173.09	147.24	25.85	6.695	
3,600.00	3,545.51	3,604.34	3,571.77	14.45	13.76	-163.46	384.85	-66.60	177.68	151.06	26.62	6.675	
3,700.00	3,643.46	3,704.24	3,670.41	14.88	14.16	-163.53	400.51	-68.35	182.27	154.88	27.38	6.656	
3,800.00	3,741.42	3,804.13	3,769.05	15.32	14.56	-163.59	416.17	-70.11	186.86	158.71	28.15	6.638	
3,900.00	3,839.37	3,904.03	3,867.70	15.75	14.97	-163.65	431.83	-71.86	191.44	162.53	28.92	6.621	
4,000.00	3,937.33	4,003.92	3,966.34	16.18	15.37	-163.71	447.49	-73.61	196.03	166.35	29.68	6.605	
4,100.00	4,035.28	4,103.82	4,064.99	16.62	15.78	-163.77	463.15	-75.37	200.62	170.18	30.45	6.589	
4,200.00	4,133.23	4,203.71	4,163.63	17.05	16.18	-163.82	478.81	-77.12	205.21	174.00	31.21	6.575	
4,300.00	4,231.19	4,303.60	4,262.27	17.48	16.58	-163.87	494.47	-78.88	209.80	177.82	31.98	6.561	
4,400.00	4,329.14	4,403.50	4,360.92	17.92	16.99	-163.92	510.13	-80.63	214.39	181.65	32.74	6.547	
4,500.00	4,427.10	4,503.39	4,459.56	18.35	17.39	-163.96	525.79	-82.38	218.98	185.47	33.51	6.535	
4,600.00	4,525.05	4,603.29	4,558.20	18.78	17.80	-164.01	541.45	-84.14	223.57	189.29	34.28	6.523	
4,700.00	4,623.00	4,703.18	4,656.85	19.22	18.20	-164.05	557.11	-85.89	228.16	193.12	35.04	6.511	
4,800.00	4,720.96	4,803.08	4,755.49	19.65	18.61	-164.09	572.77	-87.64	232.75	196.94	35.81	6.500	
4,900.00	4,818.91	4,902.97	4,854.14	20.09	19.01	-164.13	588.43	-89.40	237.34	200.77	36.58	6.489	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Rule Assigned:												Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	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	4,916.87	5,002.87	4,952.78	20.52	19.42	-164.17	604.09	-91.15	241.93	204.59	37.34	6.479	
5,100.00	5,014.82	5,102.76	5,051.42	20.96	19.82	-164.20	619.75	-92.91	246.52	208.41	38.11	6.469	
5,200.00	5,112.77	5,202.65	5,150.07	21.39	20.23	-164.24	635.41	-94.66	251.11	212.24	38.87	6.460	
5,300.00	5,210.73	5,302.55	5,248.71	21.82	20.63	-164.27	651.07	-96.41	255.70	216.06	39.64	6.450	
5,400.00	5,308.68	5,402.44	5,347.35	22.26	21.04	-164.31	666.73	-98.17	260.29	219.89	40.41	6.442	
5,493.23	5,400.00	5,493.91	5,437.70	22.66	21.41	-164.34	680.94	-99.76	264.70	223.58	41.12	6.438 SF	
5,500.00	5,406.64	5,500.00	5,443.72	22.69	21.43	-164.35	681.86	-99.86	265.05	223.89	41.16	6.439	
5,600.00	5,504.69	5,596.02	5,538.77	23.12	21.81	-164.47	695.39	-101.38	270.69	228.79	41.90	6.460	
5,700.00	5,602.91	5,691.51	5,633.50	23.55	22.18	-164.65	707.28	-102.71	277.05	234.43	42.62	6.501	
5,800.00	5,701.29	5,786.84	5,728.27	23.97	22.55	-164.88	717.58	-103.86	284.15	240.83	43.32	6.560	
5,900.00	5,799.82	5,882.00	5,823.02	24.39	22.90	-165.16	726.29	-104.84	291.98	247.98	44.00	6.636	
6,000.00	5,898.50	5,976.97	5,917.71	24.79	23.24	-165.49	733.43	-105.64	300.54	255.88	44.66	6.729	
6,100.00	5,997.31	6,071.72	6,012.30	25.20	23.58	-165.84	739.00	-106.26	309.84	264.53	45.31	6.838	
6,200.00	6,096.26	6,166.25	6,106.74	25.60	23.91	-166.23	743.01	-106.71	319.87	273.93	45.94	6.963	
6,300.00	6,195.33	6,260.54	6,200.99	25.99	24.22	-166.65	745.46	-106.98	330.63	284.09	46.55	7.103	
6,400.00	6,294.51	6,354.56	6,295.01	26.37	24.52	-167.08	746.37	-107.09	342.13	295.01	47.13	7.260	
6,498.19	6,392.00	6,471.42	6,411.77	26.75	24.89	-168.02	747.29	-104.28	352.70	304.61	48.09	7.335	
6,500.00	6,393.80	6,474.21	6,414.55	26.76	24.90	-166.86	747.41	-104.04	352.80	304.69	48.11	7.333	
6,550.00	6,443.29	6,549.62	6,488.95	26.95	25.16	-146.27	752.95	-93.37	354.41	305.78	48.63	7.288	
6,600.00	6,492.24	6,619.99	6,556.65	27.16	25.41	-139.40	762.07	-76.61	354.57	305.61	48.96	7.242	
6,610.50	6,502.42	6,633.88	6,569.74	27.20	25.46	-138.87	764.31	-72.54	354.56	305.54	49.02	7.233	
6,650.00	6,540.33	6,682.93	6,615.09	27.38	25.64	-138.48	773.35	-56.23	354.89	305.63	49.26	7.205	
6,700.00	6,587.28	6,737.26	6,663.48	27.60	25.85	-140.04	785.39	-34.69	357.30	307.66	49.64	7.198	
6,750.00	6,632.80	6,782.83	6,702.33	27.84	26.02	-142.34	797.05	-13.94	363.64	313.51	50.13	7.254	
6,800.00	6,676.60	6,820.16	6,732.81	28.09	26.16	-144.48	807.63	4.82	375.31	324.69	50.63	7.413	
6,850.00	6,718.42	6,850.09	6,756.30	28.34	26.28	-145.99	816.75	20.95	393.07	342.00	51.07	7.697	
6,900.00	6,758.00	6,873.53	6,774.08	28.60	26.37	-146.65	824.28	34.24	417.00	365.65	51.35	8.121	
6,950.00	6,795.09	6,891.36	6,787.23	28.87	26.44	-146.35	830.22	44.73	446.66	395.19	51.47	8.678	
7,000.00	6,829.46	6,904.38	6,796.60	29.14	26.50	-144.93	834.68	52.58	481.28	429.83	51.45	9.355	
7,050.00	6,860.91	6,913.25	6,802.89	29.43	26.53	-142.19	837.77	58.03	519.97	468.64	51.33	10.130	
7,100.00	6,889.24	6,918.52	6,806.58	29.73	26.55	-137.75	839.63	61.30	561.87	510.70	51.17	10.981	
7,150.00	6,914.27	6,920.66	6,808.07	30.05	26.56	-131.10	840.39	62.63	606.16	555.17	50.99	11.888	
7,200.00	6,935.85	6,920.03	6,807.63	30.37	26.56	-121.55	840.16	62.24	652.16	601.35	50.82	12.834	
7,250.00	6,953.84	6,916.93	6,805.47	30.71	26.55	-108.65	839.07	60.31	699.27	648.60	50.66	13.802	
7,300.00	6,968.15	6,911.62	6,801.74	31.06	26.53	-93.06	837.20	57.02	746.97	696.43	50.54	14.781	
7,350.00	6,978.67	6,900.00	6,793.47	31.42	26.48	-76.43	833.17	49.92	794.84	744.51	50.33	15.793	
7,400.00	6,985.34	6,900.00	6,793.47	31.79	26.48	-63.66	833.17	49.92	842.49	792.02	50.47	16.693	
7,450.00	6,988.13	6,884.10	6,781.91	32.17	26.41	-52.54	827.78	40.42	889.57	839.27	50.29	17.688	
7,461.13	6,988.22	6,881.43	6,779.95	32.26	26.40	-50.57	826.89	38.85	899.95	849.67	50.28	17.898	
7,500.00	6,988.19	6,872.03	6,772.96	32.56	26.37	-51.45	823.79	33.38	936.10	885.85	50.25	18.629	
7,600.00	6,988.12	6,850.00	6,756.24	33.37	26.28	-53.53	816.72	20.91	1,028.76	978.56	50.20	20.494	
7,700.00	6,988.05	6,825.52	6,737.08	34.21	26.18	-55.16	809.22	7.64	1,120.95	1,070.88	50.07	22.386	
7,800.00	6,987.98	6,800.00	6,716.50	35.09	26.08	-56.47	801.81	-5.50	1,212.68	1,162.72	49.96	24.273	
7,900.00	6,987.91	6,782.83	6,702.32	35.99	26.02	-58.00	797.05	-13.94	1,303.91	1,253.92	49.99	26.084	
8,000.00	6,987.83	6,763.10	6,685.71	36.93	25.94	-59.23	791.83	-23.22	1,394.68	1,344.72	49.95	27.919	
8,100.00	6,987.76	6,750.00	6,674.51	37.88	25.89	-60.67	788.51	-29.13	1,484.99	1,434.97	50.02	29.690	
8,200.00	6,987.68	6,726.95	6,654.47	38.86	25.81	-61.48	782.95	-39.05	1,574.78	1,524.85	49.93	31.540	
8,300.00	6,987.61	6,700.00	6,630.52	39.86	25.71	-62.01	776.91	-49.85	1,664.18	1,614.39	49.79	33.426	
8,400.00	6,987.53	6,700.00	6,630.52	40.87	25.71	-63.77	776.91	-49.85	1,752.96	1,702.93	50.03	35.040	
8,500.00	6,987.46	6,680.74	6,613.10	41.90	25.63	-64.50	772.91	-57.02	1,841.26	1,791.27	50.00	36.827	
8,600.00	6,987.38	6,667.31	6,600.81	42.93	25.59	-65.43	770.28	-61.75	1,929.06	1,879.02	50.04	38.549	
8,700.00	6,987.31	6,650.00	6,584.80	43.98	25.52	-66.12	767.09	-67.52	2,016.33	1,966.30	50.04	40.297	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS				Reference				Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
8,800.00	6,987.23	6,650.00	6,584.80	45.03	25.52	-67.49	767.09	-67.52	2,103.05	2,052.82	50.23	41.865	
8,872.16	6,987.18	6,650.00	6,584.80	45.79	25.52	-68.42	767.09	-67.52	2,165.36	2,114.99	50.37	42.991	
8,900.00	6,987.16	6,632.22	6,568.18	46.08	25.46	-67.68	764.03	-73.04	2,189.20	2,138.98	50.22	43.589	
9,000.00	6,987.09	6,622.21	6,558.75	47.16	25.42	-67.26	762.42	-75.98	2,275.97	2,225.67	50.30	45.248	
9,100.00	6,987.01	6,600.00	6,537.64	48.27	25.34	-66.33	759.10	-82.03	2,363.78	2,313.54	50.25	47.044	
9,200.00	6,986.94	6,600.00	6,537.64	49.40	25.34	-66.33	759.10	-82.03	2,452.23	2,401.82	50.41	48.641	
9,300.00	6,986.86	6,600.00	6,537.64	50.56	25.34	-66.33	759.10	-82.03	2,541.53	2,490.96	50.57	50.256	
9,400.00	6,986.79	6,600.00	6,537.64	51.75	25.34	-66.33	759.10	-82.03	2,631.61	2,580.89	50.72	51.887	
9,500.00	6,986.71	6,600.00	6,537.64	52.95	25.34	-66.33	759.10	-82.03	2,722.37	2,671.52	50.85	53.532	
9,600.00	6,986.64	6,576.54	6,515.10	54.18	25.26	-65.36	756.00	-87.72	2,813.39	2,762.60	50.79	55.394	
9,700.00	6,986.56	6,570.71	6,509.46	55.42	25.24	-65.11	755.29	-89.03	2,905.15	2,854.28	50.87	57.109	
9,800.00	6,986.49	6,550.00	6,489.32	56.69	25.16	-64.25	752.99	-93.29	2,997.54	2,946.71	50.83	58.971	
9,900.00	6,986.41	6,550.00	6,489.32	57.97	25.16	-64.25	752.99	-93.29	3,090.14	3,039.19	50.95	60.649	
10,000.00	6,986.34	6,550.00	6,489.32	59.26	25.16	-64.25	752.99	-93.29	3,183.18	3,132.12	51.07	62.335	
10,100.00	6,986.27	6,550.00	6,489.32	60.57	25.16	-64.25	752.99	-93.29	3,276.64	3,225.46	51.17	64.029	
10,200.00	6,986.19	6,550.00	6,489.32	61.90	25.16	-64.25	752.99	-93.29	3,370.47	3,319.19	51.28	65.728	
10,300.00	6,986.12	6,550.00	6,489.32	63.23	25.16	-64.25	752.99	-93.29	3,464.64	3,413.26	51.38	67.434	
10,400.00	6,986.04	6,550.00	6,489.32	64.58	25.16	-64.25	752.99	-93.29	3,559.14	3,507.66	51.47	69.144	
10,500.00	6,985.97	6,550.00	6,489.32	65.94	25.16	-64.25	752.99	-93.29	3,653.92	3,602.36	51.57	70.858	
10,600.00	6,985.89	6,550.00	6,489.32	67.32	25.16	-64.25	752.99	-93.29	3,748.98	3,697.32	51.66	72.575	
10,700.00	6,985.82	6,528.58	6,468.35	68.70	25.09	-63.36	750.96	-97.11	3,843.98	3,792.36	51.62	74.473	
10,800.00	6,985.74	6,525.52	6,465.34	70.09	25.08	-63.24	750.70	-97.61	3,939.42	3,887.74	51.68	76.221	
10,900.00	6,985.67	6,522.60	6,462.47	71.49	25.07	-63.11	750.46	-98.07	4,035.08	3,983.32	51.75	77.968	
11,000.00	6,985.59	6,500.00	6,440.15	72.90	24.99	-62.18	748.81	-101.25	4,131.19	4,079.48	51.71	79.890	
11,100.00	6,985.52	6,500.00	6,440.15	74.31	24.99	-62.18	748.81	-101.25	4,227.16	4,175.36	51.79	81.615	
11,200.00	6,985.45	6,500.00	6,440.15	75.74	24.99	-62.18	748.81	-101.25	4,323.30	4,271.43	51.88	83.340	
11,300.00	6,985.37	6,500.00	6,440.15	77.17	24.99	-62.18	748.81	-101.25	4,419.62	4,367.67	51.96	85.066	
11,400.00	6,985.30	6,500.00	6,440.15	78.61	24.99	-62.18	748.81	-101.25	4,516.10	4,464.07	52.03	86.792	
11,500.00	6,985.22	6,500.00	6,440.15	80.05	24.99	-62.18	748.81	-101.25	4,612.73	4,560.62	52.11	88.518	
11,600.00	6,985.15	6,500.00	6,440.15	81.50	24.99	-62.18	748.81	-101.25	4,709.50	4,657.31	52.19	90.244	
11,700.00	6,985.07	6,500.00	6,440.15	82.96	24.99	-62.18	748.81	-101.25	4,806.40	4,754.14	52.26	91.969	
11,800.00	6,985.00	6,500.00	6,440.15	84.42	24.99	-62.18	748.81	-101.25	4,903.43	4,851.09	52.34	93.693	
11,900.00	6,984.92	6,500.00	6,440.15	85.89	24.99	-62.18	748.81	-101.25	5,000.57	4,948.16	52.41	95.416	
12,000.00	6,984.85	6,500.00	6,440.15	87.36	24.99	-62.18	748.81	-101.25	5,097.83	5,045.34	52.48	97.137	
12,100.00	6,984.77	6,500.00	6,440.15	88.83	24.99	-62.18	748.81	-101.25	5,195.18	5,142.63	52.55	98.857	
12,200.00	6,984.70	6,500.00	6,440.15	90.31	24.99	-62.18	748.81	-101.25	5,292.64	5,240.02	52.62	100.576	
12,300.00	6,984.63	6,500.00	6,440.15	91.80	24.99	-62.18	748.81	-101.25	5,390.19	5,337.50	52.69	102.292	
12,400.00	6,984.55	6,500.00	6,440.15	93.29	24.99	-62.18	748.81	-101.25	5,487.83	5,435.06	52.76	104.006	
12,500.00	6,984.48	6,500.00	6,440.15	94.78	24.99	-62.18	748.81	-101.25	5,585.55	5,532.71	52.83	105.717	
12,600.00	6,984.40	6,500.00	6,440.15	96.28	24.99	-62.18	748.81	-101.25	5,683.35	5,630.45	52.90	107.426	
12,700.00	6,984.33	6,500.00	6,440.15	97.78	24.99	-62.18	748.81	-101.25	5,781.23	5,728.25	52.97	109.133	
12,800.00	6,984.25	6,500.00	6,440.15	99.28	24.99	-62.18	748.81	-101.25	5,879.17	5,826.13	53.04	110.836	
12,900.00	6,984.18	6,500.00	6,440.15	100.78	24.99	-62.18	748.81	-101.25	5,977.19	5,924.08	53.11	112.537	
13,000.00	6,984.10	6,500.00	6,440.15	102.29	24.99	-62.18	748.81	-101.25	6,075.27	6,022.09	53.18	114.234	
13,100.00	6,984.03	6,500.00	6,440.15	103.80	24.99	-62.18	748.81	-101.25	6,173.41	6,120.16	53.25	115.929	
13,200.00	6,983.95	6,500.00	6,440.15	105.32	24.99	-62.18	748.81	-101.25	6,271.61	6,218.29	53.32	117.620	
13,300.00	6,983.88	6,500.00	6,440.15	106.84	24.99	-62.18	748.81	-101.25	6,369.87	6,316.48	53.39	119.307	
13,400.00	6,983.81	6,500.00	6,440.15	108.36	24.99	-62.18	748.81	-101.25	6,468.18	6,414.72	53.46	120.991	
13,500.00	6,983.73	6,477.35	6,417.68	109.88	24.91	-61.25	747.55	-103.74	6,566.19	6,512.74	53.44	122.861	
13,600.00	6,983.66	6,476.30	6,416.64	111.40	24.91	-61.21	747.50	-103.84	6,664.56	6,611.05	53.51	124.547	
13,700.00	6,983.58	6,475.29	6,415.62	112.93	24.91	-61.17	747.46	-103.94	6,762.99	6,709.41	53.58	126.229	
13,800.00	6,983.51	6,474.30	6,414.64	114.46	24.90	-61.13	747.41	-104.03	6,861.45	6,807.81	53.64	127.906	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error:	0.00 usft	
Survey Program:		0-MWD+HRGM+MS					Rule Assigned:							Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)				
13,900.00	6,983.43	6,473.34	6,413.69	115.99	24.90	-61.09	747.37	-104.11	6,959.96	6,906.25	53.71	129.579			
14,000.00	6,983.36	6,450.00	6,390.43	117.52	24.82	-60.13	746.57	-105.83	7,058.86	7,005.16	53.70	131.448			
14,100.00	6,983.28	6,450.00	6,390.43	119.06	24.82	-60.13	746.57	-105.83	7,157.42	7,103.65	53.77	133.105			
14,200.00	6,983.21	6,450.00	6,390.43	120.59	24.82	-60.13	746.57	-105.83	7,256.02	7,202.18	53.84	134.758			
14,300.00	6,983.13	6,450.00	6,390.43	122.13	24.82	-60.13	746.57	-105.83	7,354.66	7,300.74	53.92	136.406			
14,400.00	6,983.06	6,450.00	6,390.43	123.67	24.82	-60.13	746.57	-105.83	7,453.34	7,399.35	53.99	138.050			
14,500.00	6,982.99	6,450.00	6,390.43	125.21	24.82	-60.13	746.57	-105.83	7,552.05	7,497.98	54.06	139.689			
14,600.00	6,982.91	6,450.00	6,390.43	126.75	24.82	-60.13	746.57	-105.83	7,650.79	7,596.65	54.14	141.324			
14,700.00	6,982.84	6,450.00	6,390.43	128.30	24.82	-60.13	746.57	-105.83	7,749.57	7,695.36	54.21	142.954			
14,800.00	6,982.76	6,450.00	6,390.43	129.85	24.82	-60.13	746.57	-105.83	7,848.37	7,794.09	54.28	144.580			
14,900.00	6,982.69	6,450.00	6,390.43	131.39	24.82	-60.13	746.57	-105.83	7,947.21	7,892.85	54.36	146.200			
15,000.00	6,982.61	6,450.00	6,390.43	132.94	24.82	-60.13	746.57	-105.83	8,046.07	7,991.64	54.43	147.816			
15,100.00	6,982.54	6,450.00	6,390.43	134.49	24.82	-60.13	746.57	-105.83	8,144.97	8,090.46	54.51	149.427			
15,200.00	6,982.46	6,450.00	6,390.43	136.04	24.82	-60.13	746.57	-105.83	8,243.89	8,189.30	54.58	151.034			
15,300.00	6,982.39	6,450.00	6,390.43	137.60	24.82	-60.13	746.57	-105.83	8,342.83	8,288.17	54.66	152.635			
15,400.00	6,982.31	6,450.00	6,390.43	139.15	24.82	-60.13	746.57	-105.83	8,441.80	8,387.07	54.73	154.231			
15,500.00	6,982.24	6,450.00	6,390.43	140.70	24.82	-60.13	746.57	-105.83	8,540.80	8,485.99	54.81	155.822			
15,600.00	6,982.17	6,450.00	6,390.43	142.26	24.82	-60.13	746.57	-105.83	8,639.82	8,584.93	54.89	157.408			
15,700.00	6,982.09	6,450.00	6,390.43	143.82	24.82	-60.13	746.57	-105.83	8,738.86	8,683.89	54.97	158.989			
15,800.00	6,982.02	6,450.00	6,390.43	145.38	24.82	-60.13	746.57	-105.83	8,837.92	8,782.88	55.04	160.565			
15,900.00	6,981.94	6,450.00	6,390.43	146.94	24.82	-60.13	746.57	-105.83	8,937.00	8,881.88	55.12	162.136			
16,000.00	6,981.87	6,450.00	6,390.43	148.50	24.82	-60.13	746.57	-105.83	9,036.10	8,980.90	55.20	163.701			
16,100.00	6,981.79	6,450.00	6,390.43	150.06	24.82	-60.13	746.57	-105.83	9,135.23	9,079.95	55.28	165.261			
16,200.00	6,981.72	6,450.00	6,390.43	151.62	24.82	-60.13	746.57	-105.83	9,234.37	9,179.01	55.36	166.816			
16,300.00	6,981.64	6,450.00	6,390.43	153.18	24.82	-60.13	746.57	-105.83	9,333.53	9,278.09	55.44	168.365			
16,400.00	6,981.57	6,450.00	6,390.43	154.74	24.82	-60.13	746.57	-105.83	9,432.70	9,377.19	55.52	169.909			
16,500.00	6,981.49	6,450.00	6,390.43	156.31	24.82	-60.13	746.57	-105.83	9,531.90	9,476.30	55.60	171.448			
16,600.00	6,981.42	6,450.00	6,390.43	157.87	24.82	-60.13	746.57	-105.83	9,631.11	9,575.43	55.68	172.981			
16,700.00	6,981.35	6,450.00	6,390.43	159.44	24.82	-60.13	746.57	-105.83	9,730.34	9,674.58	55.76	174.508			
16,800.00	6,981.27	6,450.00	6,390.43	161.01	24.82	-60.13	746.57	-105.83	9,829.58	9,773.74	55.84	176.031			
16,900.00	6,981.20	6,450.00	6,390.43	162.58	24.82	-60.13	746.57	-105.83	9,928.84	9,872.92	55.92	177.547			
17,000.00	6,981.12	6,450.00	6,390.43	164.14	24.82	-60.13	746.57	-105.83	10,028.11	9,972.11	56.00	179.058			
17,100.00	6,981.05	6,450.00	6,390.43	165.71	24.82	-60.13	746.57	-105.83	10,127.40	10,071.31	56.09	180.564			
17,200.00	6,980.97	6,450.00	6,390.43	167.28	24.82	-60.13	746.57	-105.83	10,226.70	10,170.53	56.17	182.064			
17,300.00	6,980.90	6,450.00	6,390.43	168.85	24.82	-60.13	746.57	-105.83	10,326.01	10,269.76	56.25	183.558			
17,400.00	6,980.82	6,450.00	6,390.43	170.42	24.82	-60.13	746.57	-105.83	10,425.34	10,369.00	56.34	185.047			
17,500.00	6,980.75	6,450.00	6,390.43	172.00	24.82	-60.13	746.57	-105.83	10,524.68	10,468.26	56.42	186.530			
17,600.00	6,980.67	6,450.00	6,390.43	173.57	24.82	-60.13	746.57	-105.83	10,624.04	10,567.53	56.51	188.008			
17,700.00	6,980.60	6,450.00	6,390.43	175.14	24.82	-60.13	746.57	-105.83	10,723.40	10,666.81	56.59	189.480			
17,800.00	6,980.53	6,450.00	6,390.43	176.71	24.82	-60.13	746.57	-105.83	10,822.78	10,766.10	56.68	190.946			
17,900.00	6,980.45	6,450.00	6,390.43	178.29	24.82	-60.13	746.57	-105.83	10,922.16	10,865.40	56.77	192.406			
18,000.00	6,980.38	6,450.00	6,390.43	179.86	24.82	-60.13	746.57	-105.83	11,021.56	10,964.71	56.85	193.861			
18,100.00	6,980.30	6,450.00	6,390.43	181.44	24.82	-60.13	746.57	-105.83	11,120.97	11,064.03	56.94	195.310			
18,200.00	6,980.23	6,450.00	6,390.43	183.01	24.82	-60.13	746.57	-105.83	11,220.39	11,163.37	57.03	196.754			
18,300.00	6,980.15	6,450.00	6,390.43	184.59	24.82	-60.13	746.57	-105.83	11,319.82	11,262.71	57.12	198.192			
18,400.00	6,980.08	6,450.00	6,390.43	186.16	24.82	-60.13	746.57	-105.83	11,419.26	11,362.06	57.20	199.624			
18,500.00	6,980.00	6,450.00	6,390.43	187.74	24.82	-60.13	746.57	-105.83	11,518.71	11,461.42	57.29	201.050			
18,600.00	6,979.93	6,450.00	6,390.43	189.32	24.82	-60.13	746.57	-105.83	11,618.17	11,560.79	57.38	202.471			
18,700.00	6,979.85	6,450.00	6,390.43	190.90	24.82	-60.13	746.57	-105.83	11,717.64	11,660.17	57.47	203.886			
18,800.00	6,979.78	6,450.00	6,390.43	192.48	24.82	-60.13	746.57	-105.83	11,817.12	11,759.56	57.56	205.295			
18,900.00	6,979.71	6,450.00	6,390.43	194.05	24.82	-60.13	746.57	-105.83	11,916.61	11,858.96	57.65	206.698			
19,000.00	6,979.63	6,450.00	6,390.43	195.63	24.82	-60.13	746.57	-105.83	12,016.10	11,958.36	57.74	208.096			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #692H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS					Rule Assigned:				Offset Well Error:	0.00 usft		
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,100.00	6,979.56	6,450.00	6,390.43	197.21	24.82	-60.13	746.57	-105.83	12,115.61	12,057.77	57.83	209.488		
19,200.00	6,979.48	6,450.00	6,390.43	198.79	24.82	-60.13	746.57	-105.83	12,215.12	12,157.19	57.93	210.874		
19,300.00	6,979.41	6,450.00	6,390.43	200.37	24.82	-60.13	746.57	-105.83	12,314.64	12,256.62	58.02	212.255		
19,400.00	6,979.33	6,450.00	6,390.43	201.95	24.82	-60.13	746.57	-105.83	12,414.16	12,356.05	58.11	213.629		
19,500.00	6,979.26	6,450.00	6,390.43	203.54	24.82	-60.13	746.57	-105.83	12,513.70	12,455.49	58.20	214.998		
19,600.00	6,979.18	6,450.00	6,390.43	205.12	24.82	-60.13	746.57	-105.83	12,613.24	12,554.94	58.30	216.362		
19,700.00	6,979.11	6,450.00	6,390.43	206.70	24.82	-60.13	746.57	-105.83	12,712.79	12,654.40	58.39	217.719		
19,800.00	6,979.03	6,450.00	6,390.43	208.28	24.82	-60.13	746.57	-105.83	12,812.35	12,753.86	58.48	219.071		
19,900.00	6,978.96	6,450.00	6,390.43	209.86	24.82	-60.13	746.57	-105.83	12,911.91	12,853.33	58.58	220.417		
20,000.00	6,978.89	6,450.00	6,390.43	211.45	24.82	-60.13	746.57	-105.83	13,011.48	12,952.80	58.67	221.758		
20,100.00	6,978.81	6,450.00	6,390.43	213.03	24.82	-60.13	746.57	-105.83	13,111.05	13,052.28	58.77	223.093		
20,200.00	6,978.74	6,450.00	6,390.43	214.61	24.82	-60.13	746.57	-105.83	13,210.64	13,151.77	58.87	224.422		
20,300.00	6,978.66	6,450.00	6,390.43	216.20	24.82	-60.13	746.57	-105.83	13,310.23	13,251.26	58.96	225.745		
20,400.00	6,978.59	6,450.00	6,390.43	217.78	24.82	-60.13	746.57	-105.83	13,409.82	13,350.76	59.06	227.063		
20,500.00	6,978.51	6,450.00	6,390.43	219.37	24.82	-60.13	746.57	-105.83	13,509.42	13,450.27	59.15	228.375		
20,600.00	6,978.44	6,450.00	6,390.43	220.95	24.82	-60.13	746.57	-105.83	13,609.03	13,549.78	59.25	229.681		
20,700.00	6,978.36	6,450.00	6,390.43	222.53	24.82	-60.13	746.57	-105.83	13,708.64	13,649.29	59.35	230.982		
20,800.00	6,978.29	6,450.00	6,390.43	224.12	24.82	-60.13	746.57	-105.83	13,808.26	13,748.81	59.45	232.277		
20,900.00	6,978.21	6,450.00	6,390.43	225.71	24.82	-60.13	746.57	-105.83	13,907.88	13,848.34	59.55	233.567		
21,000.00	6,978.14	6,450.00	6,390.43	227.29	24.82	-60.13	746.57	-105.83	14,007.51	13,947.87	59.64	234.850		
21,100.00	6,978.07	6,450.00	6,390.43	228.88	24.82	-60.13	746.57	-105.83	14,107.15	14,047.40	59.74	236.129		
21,200.00	6,977.99	6,450.00	6,390.43	230.46	24.82	-60.13	746.57	-105.83	14,206.79	14,146.94	59.84	237.401		
21,300.00	6,977.92	6,450.00	6,390.43	232.05	24.82	-60.13	746.57	-105.83	14,306.43	14,246.49	59.94	238.668		
21,400.00	6,977.84	6,450.00	6,390.43	233.64	24.82	-60.13	746.57	-105.83	14,406.08	14,346.04	60.04	239.930		
21,500.00	6,977.77	6,450.00	6,390.43	235.22	24.82	-60.13	746.57	-105.83	14,505.73	14,445.59	60.14	241.186		
21,600.00	6,977.69	6,450.00	6,390.43	236.81	24.82	-60.13	746.57	-105.83	14,605.39	14,545.15	60.24	242.436		
21,700.00	6,977.62	6,450.00	6,390.43	238.40	24.82	-60.13	746.57	-105.83	14,705.06	14,644.71	60.35	243.681		
21,800.00	6,977.54	6,450.00	6,390.43	239.99	24.82	-60.13	746.57	-105.83	14,804.73	14,744.28	60.45	244.920		
21,900.00	6,977.47	6,450.00	6,390.43	241.57	24.82	-60.13	746.57	-105.83	14,904.40	14,843.85	60.55	246.154		
22,000.00	6,977.39	6,450.00	6,390.43	243.16	24.82	-60.13	746.57	-105.83	15,004.07	14,943.42	60.65	247.382		
22,100.00	6,977.32	6,450.00	6,390.43	244.75	24.82	-60.13	746.57	-105.83	15,103.76	15,043.00	60.75	248.605		
22,200.00	6,977.25	6,450.00	6,390.43	246.34	24.82	-60.13	746.57	-105.83	15,203.44	15,142.58	60.86	249.823		
22,300.00	6,977.17	6,450.00	6,390.43	247.93	24.82	-60.13	746.57	-105.83	15,303.13	15,242.17	60.96	251.035		
22,400.00	6,977.10	6,450.00	6,390.43	249.52	24.82	-60.13	746.57	-105.83	15,402.82	15,341.76	61.06	252.241		
22,500.00	6,977.02	6,450.00	6,390.43	251.11	24.82	-60.13	746.57	-105.83	15,502.52	15,441.35	61.17	253.442		
22,529.62	6,977.00	6,450.00	6,390.43	251.58	24.82	-60.13	746.57	-105.83	15,532.05	15,470.85	61.20	253.797		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.86	-52.43	-29.23	60.03				
100.00	100.00	100.00	100.00	0.25	0.25	-150.86	-52.43	-29.23	60.03	59.52	0.50	119.605	
200.00	200.00	200.00	200.00	0.61	0.61	-150.86	-52.43	-29.23	60.03	58.81	1.22	49.249	
300.00	300.00	300.00	300.00	0.97	0.97	-150.86	-52.43	-29.23	60.03	58.09	1.94	31.009	
400.00	400.00	400.00	400.00	1.33	1.33	-150.86	-52.43	-29.23	60.03	57.37	2.65	22.628	
500.00	500.00	500.00	500.00	1.68	1.68	-150.86	-52.43	-29.23	60.03	56.66	3.37	17.814	
550.00	550.00	550.00	550.00	1.86	1.86	-150.86	-52.43	-29.23	60.03	56.30	3.73	16.101	CC, ES
600.00	600.00	600.00	600.00	2.04	2.04	-148.68	-52.43	-29.23	60.40	56.31	4.09	14.779	
700.00	699.93	699.93	699.93	2.40	2.40	-150.29	-52.43	-29.23	63.41	58.60	4.80	13.197	
800.00	799.68	801.66	801.64	2.77	2.77	-152.27	-50.65	-29.57	68.11	62.59	5.53	12.323	
900.00	899.13	902.44	902.30	3.13	3.13	-153.82	-45.87	-30.48	73.50	67.25	6.25	11.763	
1,000.00	998.15	1,002.05	1,001.77	3.49	3.49	-155.98	-40.76	-31.45	81.78	74.81	6.97	11.731	
1,100.00	1,096.63	1,101.28	1,100.87	3.87	3.84	-158.53	-35.66	-32.42	93.38	85.68	7.70	12.133	
1,130.50	1,126.54	1,131.46	1,131.01	3.99	3.95	-159.32	-34.11	-32.71	97.59	89.67	7.92	12.322	
1,200.00	1,194.61	1,200.17	1,199.62	4.26	4.20	-161.02	-30.58	-33.38	107.61	99.19	8.42	12.777	
1,300.00	1,292.57	1,299.03	1,298.35	4.66	4.55	-162.98	-25.50	-34.35	122.15	113.00	9.15	13.357	
1,400.00	1,390.52	1,397.89	1,397.07	5.07	4.91	-164.51	-20.42	-35.31	136.80	126.93	9.87	13.860	
1,500.00	1,488.48	1,496.75	1,495.80	5.48	5.27	-165.75	-15.34	-36.28	151.53	140.93	10.60	14.299	
1,600.00	1,586.43	1,595.61	1,594.53	5.90	5.62	-166.77	-10.26	-37.24	166.32	154.99	11.33	14.685	
1,700.00	1,684.38	1,694.48	1,693.25	6.31	5.98	-167.63	-5.18	-38.21	181.15	169.09	12.06	15.026	
1,800.00	1,782.34	1,793.34	1,791.98	6.73	6.34	-168.35	-0.10	-39.17	196.01	183.22	12.79	15.330	
1,900.00	1,880.29	1,892.20	1,890.70	7.15	6.70	-168.97	4.98	-40.14	210.90	197.38	13.52	15.602	
2,000.00	1,978.25	1,991.06	1,989.43	7.58	7.05	-169.51	10.06	-41.10	225.81	211.56	14.25	15.846	
2,100.00	2,076.20	2,089.92	2,088.16	8.00	7.41	-169.98	15.14	-42.07	240.74	225.75	14.98	16.068	
2,200.00	2,174.15	2,188.78	2,186.88	8.43	7.77	-170.40	20.22	-43.03	255.68	239.96	15.72	16.269	
2,300.00	2,272.11	2,287.64	2,285.61	8.85	8.13	-170.77	25.30	-44.00	270.63	254.18	16.45	16.452	
2,400.00	2,370.06	2,386.50	2,384.33	9.28	8.49	-171.11	30.38	-44.96	285.60	268.41	17.18	16.620	
2,500.00	2,468.02	2,485.37	2,483.06	9.71	8.84	-171.41	35.46	-45.92	300.57	282.65	17.92	16.774	
2,600.00	2,565.97	2,584.23	2,581.79	10.14	9.20	-171.68	40.53	-46.89	315.55	296.89	18.65	16.916	
2,700.00	2,663.92	2,683.09	2,680.51	10.57	9.56	-171.92	45.61	-47.85	330.53	311.14	19.39	17.048	
2,800.00	2,761.88	2,781.95	2,779.24	11.00	9.92	-172.15	50.69	-48.82	345.52	325.40	20.12	17.170	
2,900.00	2,859.83	2,880.81	2,877.96	11.43	10.28	-172.35	55.77	-49.78	360.52	339.66	20.86	17.283	
3,000.00	2,957.79	2,979.67	2,976.69	11.86	10.64	-172.54	60.85	-50.75	375.52	353.92	21.60	17.388	
3,100.00	3,055.74	3,078.53	3,075.42	12.29	10.99	-172.72	65.93	-51.71	390.52	368.19	22.33	17.487	
3,200.00	3,153.69	3,177.40	3,174.14	12.72	11.35	-172.88	71.01	-52.68	405.53	382.46	23.07	17.580	
3,300.00	3,251.65	3,276.26	3,272.87	13.15	11.71	-173.03	76.09	-53.64	420.54	396.73	23.80	17.666	
3,400.00	3,349.60	3,375.12	3,371.59	13.59	12.07	-173.17	81.17	-54.61	435.55	411.01	24.54	17.748	
3,500.00	3,447.56	3,473.98	3,470.32	14.02	12.43	-173.30	86.25	-55.57	450.57	425.29	25.28	17.824	
3,600.00	3,545.51	3,572.84	3,569.05	14.45	12.79	-173.43	91.33	-56.54	465.58	439.57	26.01	17.897	
3,700.00	3,643.46	3,671.70	3,667.77	14.88	13.14	-173.54	96.41	-57.50	480.60	453.85	26.75	17.965	
3,800.00	3,741.42	3,770.56	3,766.50	15.32	13.50	-173.65	101.49	-58.47	495.62	468.13	27.49	18.030	
3,900.00	3,839.37	3,869.42	3,865.22	15.75	13.86	-173.75	106.57	-59.43	510.65	482.42	28.23	18.091	
4,000.00	3,937.33	3,968.29	3,963.95	16.18	14.22	-173.85	111.65	-60.40	525.67	496.71	28.96	18.149	
4,100.00	4,035.28	4,067.15	4,062.68	16.62	14.58	-173.94	116.73	-61.36	540.70	510.99	29.70	18.205	
4,200.00	4,133.23	4,166.01	4,161.40	17.05	14.94	-174.02	121.81	-62.33	555.72	525.28	30.44	18.257	
4,300.00	4,231.19	4,264.87	4,260.13	17.48	15.30	-174.10	126.89	-63.29	570.75	539.57	31.18	18.307	
4,400.00	4,329.14	4,363.73	4,358.85	17.92	15.65	-174.18	131.97	-64.26	585.78	553.86	31.91	18.355	
4,500.00	4,427.10	4,462.59	4,457.58	18.35	16.01	-174.25	137.04	-65.22	600.81	568.16	32.65	18.401	
4,600.00	4,525.05	4,561.45	4,556.30	18.78	16.37	-174.32	142.12	-66.19	615.84	582.45	33.39	18.444	
4,700.00	4,623.00	4,660.31	4,655.03	19.22	16.73	-174.39	147.20	-67.15	630.87	596.74	34.13	18.486	
4,800.00	4,720.96	4,759.18	4,753.76	19.65	17.09	-174.45	152.28	-68.12	645.90	611.04	34.87	18.526	
4,900.00	4,818.91	4,858.04	4,852.48	20.09	17.45	-174.51	157.36	-69.08	660.94	625.33	35.60	18.564	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS					Rule Assigned:			Offset Well Error:		0.00 usft		
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,916.87	4,956.90	4,951.21	20.52	17.81	-174.57	162.44	-70.04	675.97	639.63	36.34	18.601		
5,100.00	5,014.82	5,055.76	5,049.93	20.96	18.17	-174.63	167.52	-71.01	691.00	653.92	37.08	18.636		
5,200.00	5,112.77	5,154.62	5,148.66	21.39	18.52	-174.68	172.60	-71.97	706.04	668.22	37.82	18.670		
5,300.00	5,210.73	5,253.48	5,247.39	21.82	18.88	-174.73	177.68	-72.94	721.07	682.52	38.56	18.702		
5,400.00	5,308.68	5,351.44	5,345.21	22.26	19.24	-174.78	182.70	-73.89	736.12	696.83	39.29	18.736		
5,493.23	5,400.00	5,438.06	5,431.74	22.66	19.55	-174.83	186.73	-74.66	750.59	710.65	39.94	18.793		
5,500.00	5,406.64	5,444.35	5,438.02	22.69	19.57	-174.83	186.99	-74.71	751.67	711.68	39.99	18.798		
5,600.00	5,504.69	5,537.11	5,530.70	23.12	19.91	-174.90	190.54	-75.38	767.51	726.82	40.68	18.866		
5,700.00	5,602.91	5,629.75	5,623.31	23.55	20.24	-174.97	193.34	-75.91	783.26	741.89	41.37	18.933		
5,800.00	5,701.29	5,722.29	5,715.82	23.97	20.57	-175.05	195.41	-76.31	798.94	756.89	42.05	18.998		
5,900.00	5,799.82	5,814.73	5,808.25	24.39	20.90	-175.13	196.74	-76.56	814.54	771.81	42.73	19.062		
6,000.00	5,898.50	5,907.06	5,900.58	24.79	21.23	-175.22	197.34	-76.67	830.06	786.65	43.40	19.124		
6,100.00	5,997.31	6,003.80	5,997.31	25.20	21.57	-175.31	197.37	-76.68	845.31	801.20	44.11	19.164		
6,200.00	6,096.26	6,102.74	6,096.26	25.60	21.92	-175.39	197.37	-76.68	859.74	814.91	44.83	19.178		
6,300.00	6,195.33	6,201.81	6,195.33	25.99	22.27	-175.47	197.37	-76.68	873.32	827.77	45.55	19.173		
6,400.00	6,294.51	6,300.99	6,294.51	26.37	22.62	-175.54	197.37	-76.68	886.03	839.76	46.27	19.149		
6,498.19	6,392.00	6,417.76	6,411.19	26.75	23.04	-175.44	198.11	-79.34	897.24	850.12	47.12	19.040		
6,500.00	6,393.80	6,420.42	6,413.84	26.76	23.05	-174.21	198.17	-79.58	897.41	850.27	47.14	19.035		
6,550.00	6,443.29	6,493.34	6,485.85	26.95	23.31	-150.57	201.15	-90.40	902.30	854.63	47.67	18.929		
6,600.00	6,492.24	6,565.06	6,554.97	27.16	23.57	-138.70	206.20	-108.71	907.63	859.46	48.17	18.842		
6,650.00	6,540.33	6,635.26	6,620.14	27.38	23.82	-131.59	213.10	-133.78	913.44	864.78	48.66	18.771		
6,700.00	6,587.28	6,703.69	6,680.54	27.60	24.08	-126.59	221.62	-164.72	919.78	870.62	49.15	18.713		
6,750.00	6,632.80	6,770.19	6,735.61	27.84	24.34	-122.64	231.51	-200.62	926.66	877.01	49.65	18.666		
6,800.00	6,676.60	6,834.69	6,785.03	28.09	24.60	-119.28	242.51	-240.54	934.11	883.96	50.15	18.625		
6,850.00	6,718.42	6,897.17	6,828.67	28.34	24.87	-116.27	254.37	-283.60	942.16	891.48	50.68	18.591		
6,900.00	6,758.00	6,957.65	6,866.55	28.60	25.14	-113.48	266.88	-329.03	950.80	899.58	51.23	18.561		
6,950.00	6,795.09	7,016.22	6,898.81	28.87	25.42	-110.84	279.86	-376.13	960.02	908.23	51.79	18.536		
7,000.00	6,829.46	7,072.96	6,925.66	29.14	25.71	-108.31	293.13	-424.31	969.80	917.43	52.37	18.518		
7,050.00	6,860.91	7,128.00	6,947.35	29.43	26.00	-105.87	306.56	-473.06	980.09	927.13	52.96	18.505		
7,100.00	6,889.24	7,181.47	6,964.17	29.73	26.29	-103.51	320.03	-521.97	990.84	937.28	53.56	18.500		
7,150.00	6,914.27	7,233.48	6,976.39	30.05	26.60	-101.22	333.45	-570.70	1,001.98	947.83	54.16	18.502		
7,200.00	6,935.85	7,284.17	6,984.29	30.37	26.90	-99.00	346.74	-618.96	1,013.45	958.70	54.75	18.511		
7,250.00	6,953.84	7,333.66	6,988.14	30.71	27.21	-96.85	359.84	-666.51	1,025.15	969.82	55.33	18.528		
7,300.00	6,968.15	7,381.32	6,988.60	31.06	27.51	-94.82	372.50	-712.46	1,037.01	981.11	55.90	18.552		
7,350.00	6,978.67	7,428.66	6,988.57	31.42	27.83	-93.02	385.07	-758.10	1,048.95	992.46	56.49	18.568		
7,400.00	6,985.34	7,476.76	6,988.54	31.79	28.17	-91.49	397.84	-804.47	1,060.78	1,003.66	57.12	18.571		
7,450.00	6,988.13	7,525.30	6,988.50	32.17	28.53	-90.24	410.73	-851.27	1,072.36	1,014.57	57.79	18.555		
7,461.13	6,988.22	7,536.14	6,988.50	32.26	28.61	-90.01	413.61	-861.72	1,074.89	1,016.94	57.95	18.548		
7,500.00	6,988.19	7,574.05	6,988.47	32.56	28.90	-90.01	423.68	-898.27	1,083.45	1,024.94	58.51	18.519		
7,600.00	6,988.12	7,668.44	6,988.40	33.37	29.67	-90.01	448.73	-989.27	1,103.10	1,043.13	59.97	18.393		
7,700.00	6,988.05	7,739.33	6,988.35	34.21	30.29	-90.01	466.48	-1,057.91	1,120.85	1,059.67	61.17	18.322		
7,800.00	6,987.98	7,800.00	6,988.31	35.09	30.84	-90.01	480.32	-1,116.97	1,137.65	1,075.42	62.23	18.282		
7,900.00	6,987.91	7,880.59	6,988.25	35.99	31.60	-90.01	496.76	-1,195.87	1,153.32	1,089.62	63.70	18.106		
8,000.00	6,987.83	7,950.98	6,988.20	36.93	32.29	-90.01	509.30	-1,265.13	1,168.03	1,103.01	65.02	17.964		
8,100.00	6,987.76	8,021.23	6,988.15	37.88	33.00	-90.01	520.12	-1,334.54	1,181.72	1,115.35	66.37	17.805		
8,200.00	6,987.68	8,100.00	6,988.09	38.86	33.82	-90.01	530.21	-1,412.66	1,194.42	1,126.48	67.94	17.581		
8,300.00	6,987.61	8,161.34	6,988.04	39.86	34.47	-90.02	536.59	-1,473.66	1,205.99	1,136.85	69.14	17.442		
8,400.00	6,987.53	8,231.23	6,987.99	40.87	35.23	-90.02	542.26	-1,543.32	1,216.56	1,146.01	70.55	17.243		
8,500.00	6,987.46	8,300.00	6,987.94	41.90	35.98	-90.02	546.18	-1,611.98	1,226.09	1,154.14	71.94	17.042		
8,600.00	6,987.38	8,370.72	6,987.88	42.93	36.78	-90.02	548.49	-1,682.66	1,234.56	1,161.16	73.40	16.819		
8,700.00	6,987.31	8,450.75	6,987.82	43.98	37.69	-90.02	549.20	-1,762.68	1,241.84	1,166.70	75.14	16.528		
8,800.00	6,987.23	8,550.65	6,987.74	45.03	38.85	-90.02	549.64	-1,862.59	1,246.15	1,168.66	77.49	16.082		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,872.16	6,987.18	8,622.80	6,987.68	45.79	39.71	-90.02	549.96	-1,934.73	1,247.09	1,167.88	79.22	15.743	
8,900.00	6,987.16	8,650.65	6,987.66	46.08	40.05	-90.02	550.08	-1,962.58	1,247.11	1,167.21	79.89	15.610	
9,000.00	6,987.09	8,750.65	6,987.58	47.16	41.27	-90.02	550.52	-2,062.58	1,247.16	1,164.80	82.35	15.144	
9,100.00	6,987.01	8,850.65	6,987.51	48.27	42.51	-90.02	550.96	-2,162.57	1,247.20	1,162.34	84.87	14.696	
9,200.00	6,986.94	8,950.65	6,987.43	49.40	43.79	-90.02	551.40	-2,262.57	1,247.25	1,159.83	87.43	14.266	
9,300.00	6,986.86	9,050.65	6,987.35	50.56	45.08	-90.02	551.83	-2,362.57	1,247.30	1,157.28	90.03	13.855	
9,400.00	6,986.79	9,150.65	6,987.27	51.75	46.39	-90.02	552.27	-2,462.57	1,247.35	1,154.69	92.66	13.461	
9,500.00	6,986.71	9,250.65	6,987.19	52.95	47.72	-90.02	552.71	-2,562.57	1,247.40	1,152.06	95.34	13.084	
9,600.00	6,986.64	9,350.65	6,987.11	54.18	49.06	-90.02	553.15	-2,662.57	1,247.45	1,149.41	98.04	12.724	
9,700.00	6,986.56	9,450.65	6,987.04	55.42	50.42	-90.02	553.59	-2,762.57	1,247.50	1,146.72	100.78	12.379	
9,800.00	6,986.49	9,550.65	6,986.96	56.69	51.80	-90.02	554.03	-2,862.57	1,247.55	1,144.01	103.54	12.049	
9,900.00	6,986.41	9,650.65	6,986.88	57.97	53.18	-90.02	554.47	-2,962.57	1,247.59	1,141.27	106.33	11.734	
10,000.00	6,986.34	9,750.65	6,986.80	59.26	54.58	-90.02	554.91	-3,062.57	1,247.64	1,138.51	109.14	11.432	
10,100.00	6,986.27	9,850.65	6,986.72	60.57	55.99	-90.02	555.35	-3,162.56	1,247.69	1,135.72	111.97	11.143	
10,200.00	6,986.19	9,950.65	6,986.64	61.90	57.41	-90.02	555.79	-3,262.56	1,247.74	1,132.92	114.82	10.867	
10,300.00	6,986.12	10,050.65	6,986.57	63.23	58.84	-90.02	556.22	-3,362.56	1,247.79	1,130.10	117.69	10.602	
10,400.00	6,986.04	10,150.65	6,986.49	64.58	60.28	-90.02	556.66	-3,462.56	1,247.84	1,127.26	120.58	10.349	
10,500.00	6,985.97	10,250.65	6,986.41	65.94	61.73	-90.02	557.10	-3,562.56	1,247.89	1,124.41	123.48	10.106	
10,600.00	6,985.89	10,350.65	6,986.33	67.32	63.18	-90.02	557.54	-3,662.56	1,247.93	1,121.54	126.40	9.873	
10,700.00	6,985.82	10,450.65	6,986.25	68.70	64.65	-90.02	557.98	-3,762.56	1,247.98	1,118.65	129.33	9.650	
10,800.00	6,985.74	10,550.65	6,986.18	70.09	66.11	-90.02	558.42	-3,862.56	1,248.03	1,115.76	132.27	9.435	
10,900.00	6,985.67	10,650.65	6,986.10	71.49	67.59	-90.02	558.86	-3,962.56	1,248.08	1,112.85	135.23	9.229	
11,000.00	6,985.59	10,750.65	6,986.02	72.90	69.07	-90.02	559.30	-4,062.56	1,248.13	1,109.93	138.20	9.031	
11,100.00	6,985.52	10,850.65	6,985.94	74.31	70.55	-90.02	559.74	-4,162.55	1,248.18	1,107.00	141.18	8.841	
11,200.00	6,985.45	10,950.65	6,985.86	75.74	72.04	-90.02	560.18	-4,262.55	1,248.23	1,104.06	144.16	8.658	
11,300.00	6,985.37	11,050.65	6,985.78	77.17	73.54	-90.02	560.61	-4,362.55	1,248.28	1,101.11	147.16	8.482	
11,400.00	6,985.30	11,150.65	6,985.71	78.61	75.04	-90.02	561.05	-4,462.55	1,248.32	1,098.16	150.17	8.313	
11,500.00	6,985.22	11,250.65	6,985.63	80.05	76.54	-90.02	561.49	-4,562.55	1,248.37	1,095.19	153.18	8.150	
11,600.00	6,985.15	11,350.65	6,985.55	81.50	78.05	-90.02	561.93	-4,662.55	1,248.42	1,092.22	156.20	7.992	
11,700.00	6,985.07	11,450.64	6,985.47	82.96	79.56	-90.02	562.37	-4,762.55	1,248.47	1,089.24	159.23	7.840	
11,800.00	6,985.00	11,550.64	6,985.39	84.42	81.08	-90.02	562.81	-4,862.55	1,248.52	1,086.25	162.27	7.694	
11,900.00	6,984.92	11,650.64	6,985.31	85.89	82.60	-90.02	563.25	-4,962.55	1,248.57	1,083.25	165.31	7.553	
12,000.00	6,984.85	11,750.64	6,985.24	87.36	84.12	-90.02	563.69	-5,062.55	1,248.62	1,080.25	168.36	7.416	
12,100.00	6,984.77	11,850.64	6,985.16	88.83	85.65	-90.02	564.13	-5,162.54	1,248.67	1,077.25	171.42	7.284	
12,200.00	6,984.70	11,950.64	6,985.08	90.31	87.17	-90.02	564.57	-5,262.54	1,248.71	1,074.24	174.48	7.157	
12,300.00	6,984.63	12,050.64	6,985.00	91.80	88.70	-90.02	565.00	-5,362.54	1,248.76	1,071.22	177.54	7.034	
12,400.00	6,984.55	12,150.64	6,984.92	93.29	90.24	-90.02	565.44	-5,462.54	1,248.81	1,068.20	180.61	6.914	
12,500.00	6,984.48	12,250.64	6,984.84	94.78	91.77	-90.02	565.88	-5,562.54	1,248.86	1,065.17	183.69	6.799	
12,600.00	6,984.40	12,350.64	6,984.77	96.28	93.31	-90.02	566.32	-5,662.54	1,248.91	1,062.14	186.77	6.687	
12,700.00	6,984.33	12,450.64	6,984.69	97.78	94.85	-90.02	566.76	-5,762.54	1,248.96	1,059.10	189.85	6.579	
12,800.00	6,984.25	12,550.64	6,984.61	99.28	96.39	-90.02	567.20	-5,862.54	1,249.01	1,056.06	192.94	6.473	
12,900.00	6,984.18	12,650.64	6,984.53	100.78	97.94	-90.02	567.64	-5,962.54	1,249.05	1,053.02	196.03	6.372	
13,000.00	6,984.10	12,750.64	6,984.45	102.29	99.48	-90.02	568.08	-6,062.54	1,249.10	1,049.97	199.13	6.273	
13,100.00	6,984.03	12,850.64	6,984.37	103.80	101.03	-90.02	568.52	-6,162.53	1,249.15	1,046.92	202.23	6.177	
13,200.00	6,983.95	12,950.64	6,984.30	105.32	102.58	-90.02	568.96	-6,262.53	1,249.20	1,043.87	205.33	6.084	
13,300.00	6,983.88	13,050.64	6,984.22	106.84	104.13	-90.02	569.40	-6,362.53	1,249.25	1,040.81	208.44	5.993	
13,400.00	6,983.81	13,150.64	6,984.14	108.36	105.69	-90.02	569.83	-6,462.53	1,249.30	1,037.75	211.55	5.906	
13,500.00	6,983.73	13,250.64	6,984.06	109.88	107.24	-90.02	570.27	-6,562.53	1,249.35	1,034.69	214.66	5.820	
13,600.00	6,983.66	13,350.64	6,983.98	111.40	108.80	-90.01	570.71	-6,662.53	1,249.40	1,031.62	217.77	5.737	
13,700.00	6,983.58	13,450.64	6,983.90	112.93	110.35	-90.01	571.15	-6,762.53	1,249.44	1,028.55	220.89	5.656	
13,800.00	6,983.51	13,550.64	6,983.83	114.46	111.91	-90.01	571.59	-6,862.53	1,249.49	1,025.48	224.01	5.578	
13,900.00	6,983.43	13,650.64	6,983.75	115.99	113.47	-90.01	572.03	-6,962.53	1,249.54	1,022.41	227.13	5.501	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,000.00	6,983.36	13,750.64	6,983.67	117.52	115.03	-90.01	572.47	-7,062.53	1,249.59	1,019.33	230.26	5.427	
14,100.00	6,983.28	13,850.64	6,983.59	119.06	116.59	-90.01	572.91	-7,162.52	1,249.64	1,016.25	233.39	5.354	
14,200.00	6,983.21	13,950.64	6,983.51	120.59	118.16	-90.01	573.35	-7,262.52	1,249.69	1,013.17	236.52	5.284	
14,300.00	6,983.13	14,050.64	6,983.43	122.13	119.72	-90.01	573.79	-7,362.52	1,249.74	1,010.09	239.65	5.215	
14,400.00	6,983.06	14,150.64	6,983.36	123.67	121.29	-90.01	574.22	-7,462.52	1,249.79	1,007.01	242.78	5.148	
14,500.00	6,982.99	14,250.64	6,983.28	125.21	122.85	-90.01	574.66	-7,562.52	1,249.83	1,003.92	245.92	5.082	
14,600.00	6,982.91	14,350.64	6,983.20	126.75	124.42	-90.01	575.10	-7,662.52	1,249.88	1,000.83	249.05	5.019	
14,700.00	6,982.84	14,450.64	6,983.12	128.30	125.99	-90.01	575.54	-7,762.52	1,249.93	997.74	252.19	4.956	
14,800.00	6,982.76	14,550.64	6,983.04	129.85	127.56	-90.01	575.98	-7,862.52	1,249.98	994.65	255.33	4.895	
14,900.00	6,982.69	14,650.64	6,982.97	131.39	129.13	-90.01	576.42	-7,962.52	1,250.03	991.55	258.48	4.836	
15,000.00	6,982.61	14,750.64	6,982.89	132.94	130.70	-90.01	576.86	-8,062.52	1,250.08	988.46	261.62	4.778	
15,100.00	6,982.54	14,850.64	6,982.81	134.49	132.27	-90.01	577.30	-8,162.51	1,250.13	985.36	264.76	4.722	
15,200.00	6,982.46	14,950.64	6,982.73	136.04	133.85	-90.01	577.74	-8,262.51	1,250.18	982.26	267.91	4.666	
15,300.00	6,982.39	15,050.64	6,982.65	137.60	135.42	-90.01	578.18	-8,362.51	1,250.22	979.16	271.06	4.612	
15,400.00	6,982.31	15,150.64	6,982.57	139.15	136.99	-90.01	578.61	-8,462.51	1,250.27	976.06	274.21	4.560	
15,500.00	6,982.24	15,250.64	6,982.50	140.70	138.57	-90.01	579.05	-8,562.51	1,250.32	972.96	277.36	4.508	
15,600.00	6,982.17	15,350.64	6,982.42	142.26	140.14	-90.01	579.49	-8,662.51	1,250.37	969.85	280.51	4.457	
15,700.00	6,982.09	15,450.64	6,982.34	143.82	141.72	-90.01	579.93	-8,762.51	1,250.42	966.75	283.67	4.408	
15,800.00	6,982.02	15,550.64	6,982.26	145.38	143.30	-90.01	580.37	-8,862.51	1,250.47	963.64	286.82	4.360	
15,900.00	6,981.94	15,650.64	6,982.18	146.94	144.87	-90.01	580.81	-8,962.51	1,250.52	960.54	289.98	4.312	
16,000.00	6,981.87	15,750.64	6,982.10	148.50	146.45	-90.01	581.25	-9,062.51	1,250.56	957.43	293.14	4.266	
16,100.00	6,981.79	15,850.64	6,982.03	150.06	148.03	-90.01	581.69	-9,162.50	1,250.61	954.32	296.30	4.221	
16,200.00	6,981.72	15,950.64	6,981.95	151.62	149.61	-90.01	582.13	-9,262.50	1,250.66	951.21	299.46	4.176	
16,300.00	6,981.64	16,050.64	6,981.87	153.18	151.19	-90.01	582.57	-9,362.50	1,250.71	948.09	302.62	4.133	
16,400.00	6,981.57	16,150.64	6,981.79	154.74	152.77	-90.01	583.00	-9,462.50	1,250.76	944.98	305.78	4.090	
16,500.00	6,981.49	16,250.64	6,981.71	156.31	154.35	-90.01	583.44	-9,562.50	1,250.81	941.87	308.94	4.049	
16,600.00	6,981.42	16,350.64	6,981.63	157.87	155.93	-90.01	583.88	-9,662.50	1,250.86	938.75	312.10	4.008	
16,700.00	6,981.35	16,450.64	6,981.56	159.44	157.51	-90.01	584.32	-9,762.50	1,250.91	935.64	315.27	3.968	
16,800.00	6,981.27	16,550.64	6,981.48	161.01	159.09	-90.01	584.76	-9,862.50	1,250.95	932.52	318.43	3.928	
16,900.00	6,981.20	16,650.64	6,981.40	162.58	160.68	-90.01	585.20	-9,962.50	1,251.00	929.40	321.60	3.890	
17,000.00	6,981.12	16,750.64	6,981.32	164.14	162.26	-90.01	585.64	-10,062.50	1,251.05	926.28	324.77	3.852	
17,100.00	6,981.05	16,850.64	6,981.24	165.71	163.84	-90.01	586.08	-10,162.49	1,251.10	923.16	327.94	3.815	
17,200.00	6,980.97	16,950.64	6,981.16	167.28	165.43	-90.01	586.52	-10,262.49	1,251.15	920.04	331.10	3.779	
17,300.00	6,980.90	17,050.64	6,981.09	168.85	167.01	-90.01	586.96	-10,362.49	1,251.20	916.92	334.27	3.743	
17,400.00	6,980.82	17,150.64	6,981.01	170.42	168.60	-90.01	587.39	-10,462.49	1,251.25	913.80	337.44	3.708	
17,500.00	6,980.75	17,250.64	6,980.93	172.00	170.18	-90.01	587.83	-10,562.49	1,251.30	910.68	340.62	3.674	
17,600.00	6,980.67	17,350.64	6,980.85	173.57	171.77	-90.01	588.27	-10,662.49	1,251.34	907.56	343.79	3.640	
17,700.00	6,980.60	17,450.64	6,980.77	175.14	173.35	-90.01	588.71	-10,762.49	1,251.39	904.43	346.96	3.607	
17,800.00	6,980.53	17,550.64	6,980.69	176.71	174.94	-90.01	589.15	-10,862.49	1,251.44	901.31	350.13	3.574	
17,900.00	6,980.45	17,650.64	6,980.62	178.29	176.52	-90.01	589.59	-10,962.49	1,251.49	898.18	353.31	3.542	
18,000.00	6,980.38	17,750.64	6,980.54	179.86	178.11	-90.01	590.03	-11,062.49	1,251.54	895.06	356.48	3.511	
18,100.00	6,980.30	17,850.64	6,980.46	181.44	179.70	-90.01	590.47	-11,162.48	1,251.59	891.93	359.66	3.480	
18,200.00	6,980.23	17,950.64	6,980.38	183.01	181.28	-90.01	590.91	-11,262.48	1,251.64	888.80	362.83	3.450	
18,300.00	6,980.15	18,050.64	6,980.30	184.59	182.87	-90.01	591.35	-11,362.48	1,251.68	885.68	366.01	3.420	
18,400.00	6,980.08	18,150.64	6,980.23	186.16	184.46	-90.01	591.78	-11,462.48	1,251.73	882.55	369.18	3.391	
18,500.00	6,980.00	18,250.64	6,980.15	187.74	186.05	-90.01	592.22	-11,562.48	1,251.78	879.42	372.36	3.362	
18,600.00	6,979.93	18,350.64	6,980.07	189.32	187.64	-90.01	592.66	-11,662.48	1,251.83	876.29	375.54	3.333	
18,700.00	6,979.85	18,450.64	6,979.99	190.90	189.22	-90.01	593.10	-11,762.48	1,251.88	873.16	378.72	3.306	
18,800.00	6,979.78	18,550.64	6,979.91	192.48	190.81	-90.01	593.54	-11,862.48	1,251.93	870.03	381.90	3.278	
18,900.00	6,979.71	18,650.64	6,979.83	194.05	192.40	-90.01	593.98	-11,962.48	1,251.98	866.90	385.08	3.251	
19,000.00	6,979.63	18,750.64	6,979.76	195.63	193.99	-90.01	594.42	-12,062.48	1,252.03	863.77	388.26	3.225	
19,100.00	6,979.56	18,850.64	6,979.68	197.21	195.58	-90.01	594.86	-12,162.47	1,252.07	860.64	391.44	3.199	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #694H - OH - Prelim 5											Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	
19,200.00	6,979.48	18,950.64	6,979.60	198.79	197.17	-90.01	595.30	-12,262.47	1,252.12	857.51	3.173
19,300.00	6,979.41	19,050.64	6,979.52	200.37	198.76	-90.01	595.74	-12,362.47	1,252.17	854.37	3.148
19,400.00	6,979.33	19,150.64	6,979.44	201.95	200.35	-90.00	596.18	-12,462.47	1,252.22	851.24	3.123
19,500.00	6,979.26	19,250.64	6,979.36	203.54	201.94	-90.00	596.61	-12,562.47	1,252.27	848.11	3.098
19,600.00	6,979.18	19,350.64	6,979.29	205.12	203.53	-90.00	597.05	-12,662.47	1,252.32	844.97	3.074
19,700.00	6,979.11	19,450.64	6,979.21	206.70	205.13	-90.00	597.49	-12,762.47	1,252.37	841.84	3.051
19,800.00	6,979.03	19,550.64	6,979.13	208.28	206.72	-90.00	597.93	-12,862.47	1,252.42	838.71	3.027
19,900.00	6,978.96	19,650.64	6,979.05	209.86	208.31	-90.00	598.37	-12,962.47	1,252.46	835.57	3.004
20,000.00	6,978.89	19,750.64	6,978.97	211.45	209.90	-90.00	598.81	-13,062.47	1,252.51	832.44	2.982
20,100.00	6,978.81	19,850.64	6,978.89	213.03	211.49	-90.00	599.25	-13,162.46	1,252.56	829.30	2.959
20,200.00	6,978.74	19,950.64	6,978.82	214.61	213.08	-90.00	599.69	-13,262.46	1,252.61	826.16	2.937
20,300.00	6,978.66	20,050.64	6,978.74	216.20	214.68	-90.00	600.13	-13,362.46	1,252.66	823.03	2.916
20,400.00	6,978.59	20,150.64	6,978.66	217.78	216.27	-90.00	600.57	-13,462.46	1,252.71	819.89	2.894
20,500.00	6,978.51	20,250.64	6,978.58	219.37	217.86	-90.00	601.00	-13,562.46	1,252.76	816.75	2.873
20,600.00	6,978.44	20,350.64	6,978.50	220.95	219.45	-90.00	601.44	-13,662.46	1,252.80	813.62	2.853
20,700.00	6,978.36	20,450.64	6,978.42	222.53	221.05	-90.00	601.88	-13,762.46	1,252.85	810.48	2.832
20,800.00	6,978.29	20,550.64	6,978.35	224.12	222.64	-90.00	602.32	-13,862.46	1,252.90	807.34	2.812
20,900.00	6,978.21	20,650.64	6,978.27	225.71	224.23	-90.00	602.76	-13,962.46	1,252.95	804.20	2.792
21,000.00	6,978.14	20,750.64	6,978.19	227.29	225.83	-90.00	603.20	-14,062.46	1,253.00	801.06	2.773
21,100.00	6,978.07	20,850.64	6,978.11	228.88	227.42	-90.00	603.64	-14,162.45	1,253.05	797.92	2.753
21,200.00	6,977.99	20,950.64	6,978.03	230.46	229.01	-90.00	604.08	-14,262.45	1,253.10	794.78	2.734
21,300.00	6,977.92	21,050.64	6,977.95	232.05	230.61	-90.00	604.52	-14,362.45	1,253.15	791.64	2.715
21,400.00	6,977.84	21,150.64	6,977.88	233.64	232.20	-90.00	604.96	-14,462.45	1,253.19	788.50	2.697
21,500.00	6,977.77	21,250.64	6,977.80	235.22	233.80	-90.00	605.39	-14,562.45	1,253.24	785.36	2.679
21,600.00	6,977.69	21,350.64	6,977.72	236.81	235.39	-90.00	605.83	-14,662.45	1,253.29	782.22	2.661
21,700.00	6,977.62	21,450.64	6,977.64	238.40	236.98	-90.00	606.27	-14,762.45	1,253.34	779.08	2.643
21,800.00	6,977.54	21,550.64	6,977.56	239.99	238.58	-90.00	606.71	-14,862.45	1,253.39	775.94	2.625
21,900.00	6,977.47	21,650.64	6,977.48	241.57	240.17	-90.00	607.15	-14,962.45	1,253.44	772.80	2.608
22,000.00	6,977.39	21,750.64	6,977.41	243.16	241.77	-90.00	607.59	-15,062.45	1,253.49	769.66	2.591
22,100.00	6,977.32	21,850.64	6,977.33	244.75	243.36	-90.00	608.03	-15,162.44	1,253.54	766.52	2.574
22,200.00	6,977.25	21,950.64	6,977.25	246.34	244.96	-90.00	608.47	-15,262.44	1,253.58	763.37	2.557
22,300.00	6,977.17	22,050.64	6,977.17	247.93	246.55	-90.00	608.91	-15,362.44	1,253.63	760.23	2.541
22,400.00	6,977.10	22,150.64	6,977.09	249.52	248.15	-90.00	609.35	-15,462.44	1,253.68	757.09	2.525
22,500.00	6,977.02	22,250.64	6,977.02	251.11	249.74	-90.00	609.78	-15,562.44	1,253.73	753.95	2.509
22,501.33	6,977.02	22,251.98	6,977.01	251.13	249.77	-90.00	609.79	-15,563.77	1,253.73	753.91	2.508
22,529.62	6,977.00	22,269.73	6,977.00	251.58	250.05	-90.00	609.87	-15,581.52	1,253.79	753.49	2.506 SF

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-150.73	-69.90	-39.17	80.13				
100.00	100.00	100.00	100.00	0.25	0.25	-150.73	-69.90	-39.17	80.13	79.63	0.50	159.663	
200.00	200.00	200.00	200.00	0.61	0.61	-150.73	-69.90	-39.17	80.13	78.91	1.22	65.744	
300.00	300.00	300.00	300.00	0.97	0.97	-150.73	-69.90	-39.17	80.13	78.19	1.94	41.394	
400.00	400.00	400.00	400.00	1.33	1.33	-150.73	-69.90	-39.17	80.13	77.48	2.65	30.207	
500.00	500.00	500.00	500.00	1.68	1.68	-150.73	-69.90	-39.17	80.13	76.76	3.37	23.780	
550.00	550.00	550.00	550.00	1.86	1.86	-150.73	-69.90	-39.17	80.13	76.40	3.73	21.493 CC, ES	
600.00	600.00	600.00	600.00	2.04	2.04	-148.51	-69.90	-39.17	80.50	76.41	4.09	19.698	
700.00	699.93	699.93	699.93	2.40	2.40	-149.73	-69.90	-39.17	83.50	78.69	4.80	17.379	
800.00	799.68	801.41	801.39	2.77	2.76	-151.01	-68.35	-40.07	88.61	83.08	5.53	16.032	
900.00	899.13	901.12	901.04	3.13	3.12	-152.23	-65.33	-41.81	95.86	89.62	6.25	15.348	
1,000.00	998.15	1,000.51	1,000.37	3.49	3.48	-154.09	-62.33	-43.54	106.28	99.31	6.97	15.254 SF	
1,100.00	1,096.63	1,099.46	1,099.26	3.87	3.83	-156.27	-59.34	-45.27	119.96	112.27	7.69	15.599	
1,130.50	1,126.54	1,129.54	1,129.32	3.99	3.94	-156.96	-58.43	-45.79	124.80	116.89	7.91	15.771	
1,200.00	1,194.61	1,198.01	1,197.74	4.26	4.18	-158.48	-56.36	-46.99	136.23	127.81	8.41	16.191	
1,300.00	1,292.57	1,296.52	1,296.20	4.66	4.54	-160.26	-53.38	-48.71	152.80	143.67	9.13	16.729	
1,400.00	1,390.52	1,395.04	1,394.66	5.07	4.89	-161.70	-50.41	-50.43	169.50	159.64	9.86	17.195	
1,500.00	1,488.48	1,493.56	1,493.11	5.48	5.24	-162.87	-47.43	-52.15	186.27	175.69	10.58	17.604	
1,600.00	1,586.43	1,592.07	1,591.57	5.90	5.60	-163.86	-44.45	-53.87	203.12	191.81	11.31	17.963	
1,700.00	1,684.38	1,690.59	1,690.03	6.31	5.95	-164.69	-41.47	-55.58	220.01	207.97	12.03	18.281	
1,800.00	1,782.34	1,789.11	1,788.48	6.73	6.31	-165.40	-38.50	-57.30	236.94	224.17	12.76	18.565	
1,900.00	1,880.29	1,887.62	1,886.94	7.15	6.66	-166.02	-35.52	-59.02	253.90	240.40	13.49	18.819	
2,000.00	1,978.25	1,986.14	1,985.40	7.58	7.02	-166.56	-32.54	-60.74	270.88	256.66	14.22	19.048	
2,100.00	2,076.20	2,084.66	2,083.85	8.00	7.37	-167.04	-29.56	-62.46	287.89	272.94	14.95	19.255	
2,200.00	2,174.15	2,183.17	2,182.31	8.43	7.72	-167.46	-26.59	-64.18	304.91	289.23	15.68	19.443	
2,300.00	2,272.11	2,281.69	2,280.77	8.85	8.08	-167.84	-23.61	-65.90	321.95	305.54	16.41	19.615	
2,400.00	2,370.06	2,380.21	2,379.22	9.28	8.43	-168.18	-20.63	-67.62	339.00	321.85	17.15	19.772	
2,500.00	2,468.02	2,478.72	2,477.68	9.71	8.79	-168.49	-17.65	-69.34	356.06	338.18	17.88	19.917	
2,600.00	2,565.97	2,577.24	2,576.14	10.14	9.14	-168.77	-14.68	-71.06	373.13	354.52	18.61	20.051	
2,700.00	2,663.92	2,675.76	2,674.59	10.57	9.50	-169.02	-11.70	-72.78	390.21	370.87	19.34	20.174	
2,800.00	2,761.88	2,774.27	2,773.05	11.00	9.85	-169.26	-8.72	-74.49	407.29	387.22	20.07	20.289	
2,900.00	2,859.83	2,872.79	2,871.51	11.43	10.21	-169.47	-5.74	-76.21	424.38	403.58	20.81	20.395	
3,000.00	2,957.79	2,971.31	2,969.96	11.86	10.56	-169.67	-2.76	-77.93	441.48	419.94	21.54	20.495	
3,100.00	3,055.74	3,069.82	3,068.42	12.29	10.92	-169.86	0.21	-79.65	458.58	436.31	22.27	20.587	
3,200.00	3,153.69	3,168.34	3,166.88	12.72	11.27	-170.03	3.19	-81.37	475.69	452.68	23.01	20.674	
3,300.00	3,251.65	3,266.86	3,265.33	13.15	11.63	-170.19	6.17	-83.09	492.79	469.05	23.74	20.756	
3,400.00	3,349.60	3,365.37	3,363.79	13.59	11.98	-170.33	9.15	-84.81	509.91	485.43	24.48	20.833	
3,500.00	3,447.56	3,463.89	3,462.25	14.02	12.34	-170.47	12.12	-86.53	527.02	501.81	25.21	20.905	
3,600.00	3,545.51	3,562.41	3,560.70	14.45	12.69	-170.60	15.10	-88.25	544.14	518.20	25.94	20.973	
3,700.00	3,643.46	3,660.92	3,659.16	14.88	13.05	-170.72	18.08	-89.97	561.26	534.58	26.68	21.038	
3,800.00	3,741.42	3,759.44	3,757.62	15.32	13.40	-170.84	21.06	-91.69	578.38	550.97	27.41	21.098	
3,900.00	3,839.37	3,857.96	3,856.07	15.75	13.75	-170.95	24.03	-93.40	595.51	567.36	28.15	21.156	
4,000.00	3,937.33	3,956.47	3,954.53	16.18	14.11	-171.05	27.01	-95.12	612.64	583.75	28.88	21.211	
4,100.00	4,035.28	4,054.99	4,052.99	16.62	14.46	-171.14	29.99	-96.84	629.77	600.15	29.62	21.263	
4,200.00	4,133.23	4,153.51	4,151.44	17.05	14.82	-171.24	32.97	-98.56	646.90	616.54	30.35	21.313	
4,300.00	4,231.19	4,252.02	4,249.90	17.48	15.17	-171.32	35.94	-100.28	664.03	632.94	31.09	21.360	
4,400.00	4,329.14	4,350.54	4,348.36	17.92	15.53	-171.41	38.92	-102.00	681.16	649.34	31.82	21.405	
4,500.00	4,427.10	4,449.06	4,446.81	18.35	15.88	-171.48	41.90	-103.72	698.30	665.74	32.56	21.448	
4,600.00	4,525.05	4,547.57	4,545.27	18.78	16.24	-171.56	44.88	-105.44	715.43	682.14	33.29	21.489	
4,700.00	4,623.00	4,646.09	4,643.73	19.22	16.59	-171.63	47.85	-107.16	732.57	698.54	34.03	21.528	
4,800.00	4,720.96	4,744.61	4,742.18	19.65	16.95	-171.70	50.83	-108.88	749.71	714.94	34.76	21.566	
4,900.00	4,818.91	4,843.12	4,840.64	20.09	17.30	-171.76	53.81	-110.60	766.85	731.35	35.50	21.602	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HRGM+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,916.87	4,941.64	4,939.10	20.52	17.66	-171.82	56.79	-112.31	783.99	747.75	36.23	21.636	
5,100.00	5,014.82	5,040.16	5,037.55	20.96	18.01	-171.88	59.76	-114.03	801.13	764.16	36.97	21.669	
5,200.00	5,112.77	5,138.67	5,136.01	21.39	18.37	-171.94	62.74	-115.75	818.27	780.56	37.71	21.701	
5,300.00	5,210.73	5,237.19	5,234.47	21.82	18.72	-171.99	65.72	-117.47	835.41	796.97	38.44	21.732	
5,400.00	5,308.68	5,335.71	5,332.92	22.26	19.08	-172.05	68.70	-119.19	852.56	813.38	39.18	21.761	
5,493.23	5,400.00	5,426.11	5,423.27	22.66	19.40	-172.09	71.41	-120.76	868.56	828.70	39.85	21.793	
5,500.00	5,406.64	5,432.39	5,429.55	22.69	19.43	-172.10	71.59	-120.86	869.73	829.83	39.90	21.797	
5,600.00	5,504.69	5,525.10	5,522.23	23.12	19.76	-172.17	73.86	-122.17	886.92	846.33	40.60	21.847	
5,700.00	5,602.91	5,617.73	5,614.83	23.55	20.09	-172.27	75.48	-123.10	903.92	862.63	41.29	21.893	
5,800.00	5,701.29	5,710.28	5,707.37	23.97	20.42	-172.38	76.45	-123.67	920.71	878.74	41.97	21.936	
5,900.00	5,799.82	5,802.82	5,799.92	24.39	20.75	-172.51	76.77	-123.85	937.31	894.65	42.65	21.975	
6,000.00	5,898.50	5,901.40	5,898.50	24.79	21.10	-172.64	76.77	-123.85	953.38	910.01	43.38	21.980	
6,100.00	5,997.31	6,000.22	5,997.31	25.20	21.45	-172.77	76.77	-123.85	968.60	924.51	44.10	21.965	
6,200.00	6,096.26	6,099.17	6,096.26	25.60	21.81	-172.89	76.77	-123.85	982.97	938.16	44.82	21.933	
6,300.00	6,195.33	6,198.23	6,195.33	25.99	22.16	-172.99	76.77	-123.85	996.49	950.95	45.54	21.883	
6,400.00	6,294.51	6,297.42	6,294.51	26.37	22.51	-173.09	76.77	-123.85	1,009.15	962.89	46.25	21.817	
6,498.19	6,392.00	6,424.28	6,421.24	26.75	22.95	-173.40	77.49	-120.15	1,020.17	973.02	47.15	21.639	
6,500.00	6,393.80	6,427.39	6,424.33	26.76	22.96	-172.21	77.56	-119.81	1,020.32	973.15	47.17	21.633	
6,550.00	6,443.29	6,510.39	6,505.94	26.95	23.23	-150.13	80.38	-105.31	1,024.60	976.92	47.68	21.489	
6,600.00	6,492.24	6,585.46	6,577.55	27.16	23.47	-140.64	84.65	-83.32	1,029.29	981.16	48.12	21.389	
6,650.00	6,540.33	6,649.87	6,636.53	27.38	23.66	-136.31	89.58	-57.96	1,035.14	986.63	48.51	21.337	
6,700.00	6,587.28	6,702.85	6,682.88	27.60	23.83	-134.10	94.47	-32.81	1,042.96	994.09	48.87	21.342	
6,750.00	6,632.80	6,744.99	6,718.13	27.84	23.97	-132.69	98.87	-10.16	1,053.42	1,004.23	49.19	21.416	
6,800.00	6,676.60	6,777.52	6,744.25	28.09	24.08	-131.45	102.57	8.86	1,067.00	1,017.53	49.46	21.572	
6,850.00	6,718.42	6,801.86	6,763.13	28.34	24.16	-130.04	105.50	23.94	1,083.96	1,034.28	49.68	21.818	
6,900.00	6,758.00	6,819.36	6,776.33	28.60	24.22	-128.28	107.69	35.21	1,104.38	1,054.54	49.84	22.157	
6,950.00	6,795.09	6,831.16	6,785.06	28.87	24.26	-126.08	109.21	43.01	1,128.16	1,078.22	49.94	22.588	
7,000.00	6,829.46	6,838.23	6,790.22	29.14	24.29	-123.34	110.13	47.76	1,155.08	1,105.09	49.99	23.107	
7,050.00	6,860.91	6,841.35	6,792.47	29.43	24.30	-120.03	110.54	49.88	1,184.85	1,134.87	49.99	23.704	
7,100.00	6,889.24	6,841.15	6,792.33	29.73	24.30	-116.10	110.51	49.74	1,217.11	1,167.17	49.94	24.370	
7,150.00	6,914.27	6,838.12	6,790.13	30.05	24.29	-111.55	110.11	47.69	1,251.48	1,201.61	49.87	25.095	
7,200.00	6,935.85	6,832.68	6,786.17	30.37	24.27	-106.39	109.40	44.03	1,287.56	1,237.78	49.78	25.867	
7,250.00	6,953.84	6,825.14	6,780.62	30.71	24.24	-100.70	108.43	39.01	1,324.95	1,275.28	49.67	26.675	
7,300.00	6,968.15	6,815.77	6,773.65	31.06	24.21	-94.63	107.23	32.87	1,363.29	1,313.73	49.56	27.509	
7,350.00	6,978.67	6,800.00	6,761.71	31.42	24.16	-88.10	105.27	22.76	1,402.20	1,352.81	49.40	28.387	
7,400.00	6,985.34	6,800.00	6,761.71	31.79	24.16	-82.47	105.27	22.76	1,441.36	1,391.96	49.41	29.174	
7,450.00	6,988.13	6,778.68	6,745.16	32.17	24.08	-76.07	102.70	9.56	1,480.38	1,431.16	49.23	30.072	
7,461.13	6,988.22	6,775.47	6,742.63	32.26	24.07	-74.78	102.33	7.62	1,489.03	1,439.83	49.21	30.262	
7,500.00	6,988.19	6,764.35	6,733.79	32.56	24.04	-74.59	101.04	1.00	1,519.18	1,470.05	49.13	30.920	
7,600.00	6,988.12	6,737.47	6,711.95	33.37	23.95	-74.17	98.05	-14.37	1,596.49	1,547.53	48.97	32.604	
7,700.00	6,988.05	6,712.93	6,691.45	34.21	23.87	-73.88	95.48	-27.60	1,673.47	1,624.65	48.83	34.273	
7,800.00	6,987.98	6,700.00	6,680.44	35.09	23.82	-74.04	94.18	-34.26	1,750.19	1,701.39	48.81	35.861	
7,900.00	6,987.91	6,670.17	6,654.53	35.99	23.73	-73.58	91.36	-48.78	1,826.50	1,777.88	48.63	37.562	
8,000.00	6,987.83	6,650.00	6,636.64	36.93	23.66	-73.49	89.59	-57.91	1,902.55	1,854.01	48.55	39.191	
8,100.00	6,987.76	6,634.60	6,622.78	37.88	23.62	-73.59	88.31	-64.50	1,978.28	1,929.77	48.51	40.779	
8,200.00	6,987.68	6,619.10	6,608.68	38.86	23.57	-73.68	87.08	-70.81	2,053.68	2,005.20	48.48	42.362	
8,300.00	6,987.61	6,600.00	6,591.08	39.86	23.51	-73.66	85.66	-78.11	2,128.73	2,080.31	48.42	43.966	
8,400.00	6,987.53	6,600.00	6,591.08	40.87	23.51	-74.28	85.66	-78.11	2,203.41	2,154.88	48.52	45.409	
8,500.00	6,987.46	6,580.04	6,572.47	41.90	23.45	-74.23	84.29	-85.18	2,277.61	2,229.15	48.46	46.999	
8,600.00	6,987.38	6,569.10	6,562.18	42.93	23.41	-74.47	83.58	-88.81	2,351.41	2,302.94	48.47	48.508	
8,700.00	6,987.31	6,550.00	6,544.06	43.98	23.36	-74.44	82.43	-94.74	2,424.80	2,376.38	48.42	50.074	
8,800.00	6,987.23	6,550.00	6,544.06	45.03	23.36	-75.00	82.43	-94.74	2,497.59	2,449.06	48.53	51.467	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM+MS												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,872.16	6,987.18	6,550.00	6,544.06	45.79	23.36	-75.39	82.43	-94.74	2,549.85	2,501.25	48.60	52.466	
8,900.00	6,987.16	6,550.00	6,544.06	46.08	23.36	-75.39	82.43	-94.74	2,570.04	2,521.41	48.63	52.852	
9,000.00	6,987.09	6,550.00	6,544.06	47.16	23.36	-75.39	82.43	-94.74	2,643.70	2,594.97	48.73	54.253	
9,100.00	6,987.01	6,526.11	6,521.15	48.27	23.28	-74.69	81.14	-101.39	2,718.66	2,670.00	48.65	55.876	
9,200.00	6,986.94	6,519.42	6,514.69	49.40	23.26	-74.49	80.80	-103.10	2,795.29	2,746.58	48.71	57.387	
9,300.00	6,986.86	6,500.00	6,495.84	50.56	23.20	-73.91	79.91	-107.69	2,873.43	2,824.76	48.67	59.033	
9,400.00	6,986.79	6,500.00	6,495.84	51.75	23.20	-73.91	79.91	-107.69	2,952.64	2,903.86	48.78	60.532	
9,500.00	6,986.71	6,500.00	6,495.84	52.95	23.20	-73.91	79.91	-107.69	3,033.08	2,984.20	48.88	62.053	
9,600.00	6,986.64	6,500.00	6,495.84	54.18	23.20	-73.91	79.91	-107.69	3,114.65	3,065.67	48.98	63.595	
9,700.00	6,986.56	6,500.00	6,495.84	55.42	23.20	-73.91	79.91	-107.69	3,197.27	3,148.20	49.07	65.155	
9,800.00	6,986.49	6,500.00	6,495.84	56.69	23.20	-73.91	79.91	-107.69	3,280.86	3,231.69	49.16	66.733	
9,900.00	6,986.41	6,500.00	6,495.84	57.97	23.20	-73.91	79.91	-107.69	3,365.34	3,316.08	49.25	68.326	
10,000.00	6,986.34	6,500.00	6,495.84	59.26	23.20	-73.91	79.91	-107.69	3,450.65	3,401.31	49.34	69.934	
10,100.00	6,986.27	6,476.34	6,472.70	60.57	23.12	-73.21	78.97	-112.52	3,536.31	3,487.02	49.29	71.744	
10,200.00	6,986.19	6,472.89	6,469.31	61.90	23.11	-73.10	78.85	-113.15	3,622.98	3,573.62	49.36	73.403	
10,300.00	6,986.12	6,450.00	6,446.74	63.23	23.04	-72.42	78.12	-116.89	3,710.58	3,661.27	49.31	75.244	
10,400.00	6,986.04	6,450.00	6,446.74	64.58	23.04	-72.42	78.12	-116.89	3,798.43	3,749.03	49.40	76.891	
10,500.00	6,985.97	6,450.00	6,446.74	65.94	23.04	-72.42	78.12	-116.89	3,886.86	3,837.38	49.48	78.547	
10,600.00	6,985.89	6,450.00	6,446.74	67.32	23.04	-72.42	78.12	-116.89	3,975.84	3,926.27	49.57	80.211	
10,700.00	6,985.82	6,450.00	6,446.74	68.70	23.04	-72.42	78.12	-116.89	4,065.34	4,015.69	49.65	81.883	
10,800.00	6,985.74	6,450.00	6,446.74	70.09	23.04	-72.42	78.12	-116.89	4,155.31	4,105.58	49.73	83.562	
10,900.00	6,985.67	6,450.00	6,446.74	71.49	23.04	-72.42	78.12	-116.89	4,245.73	4,195.92	49.81	85.246	
11,000.00	6,985.59	6,450.00	6,446.74	72.90	23.04	-72.42	78.12	-116.89	4,336.57	4,286.69	49.88	86.936	
11,100.00	6,985.52	6,450.00	6,446.74	74.31	23.04	-72.42	78.12	-116.89	4,427.81	4,377.85	49.96	88.631	
11,200.00	6,985.45	6,450.00	6,446.74	75.74	23.04	-72.42	78.12	-116.89	4,519.42	4,469.38	50.03	90.329	
11,300.00	6,985.37	6,450.00	6,446.74	77.17	23.04	-72.42	78.12	-116.89	4,611.37	4,561.27	50.11	92.032	
11,400.00	6,985.30	6,450.00	6,446.74	78.61	23.04	-72.42	78.12	-116.89	4,703.66	4,653.48	50.18	93.737	
11,500.00	6,985.22	6,450.00	6,446.74	80.05	23.04	-72.42	78.12	-116.89	4,796.25	4,746.00	50.25	95.445	
11,600.00	6,985.15	6,450.00	6,446.74	81.50	23.04	-72.42	78.12	-116.89	4,889.14	4,838.81	50.32	97.155	
11,700.00	6,985.07	6,450.00	6,446.74	82.96	23.04	-72.42	78.12	-116.89	4,982.30	4,931.90	50.39	98.867	
11,800.00	6,985.00	6,450.00	6,446.74	84.42	23.04	-72.42	78.12	-116.89	5,075.72	5,025.25	50.46	100.580	
11,900.00	6,984.92	6,450.00	6,446.74	85.89	23.04	-72.42	78.12	-116.89	5,169.39	5,118.85	50.53	102.295	
12,000.00	6,984.85	6,450.00	6,446.74	87.36	23.04	-72.42	78.12	-116.89	5,263.29	5,212.68	50.60	104.010	
12,100.00	6,984.77	6,450.00	6,446.74	88.83	23.04	-72.42	78.12	-116.89	5,357.41	5,306.73	50.67	105.725	
12,200.00	6,984.70	6,450.00	6,446.74	90.31	23.04	-72.42	78.12	-116.89	5,451.74	5,401.00	50.74	107.440	
12,300.00	6,984.63	6,450.00	6,446.74	91.80	23.04	-72.42	78.12	-116.89	5,546.27	5,495.46	50.81	109.155	
12,400.00	6,984.55	6,427.28	6,424.22	93.29	22.96	-71.74	77.55	-119.82	5,640.58	5,589.80	50.79	111.061	
12,500.00	6,984.48	6,426.02	6,422.97	94.78	22.96	-71.71	77.53	-119.96	5,735.44	5,684.58	50.85	112.785	
12,600.00	6,984.40	6,424.81	6,421.76	96.28	22.95	-71.67	77.50	-120.09	5,830.46	5,779.54	50.92	114.508	
12,700.00	6,984.33	6,423.63	6,420.59	97.78	22.95	-71.63	77.48	-120.21	5,925.64	5,874.66	50.98	116.229	
12,800.00	6,984.25	6,422.50	6,419.46	99.28	22.94	-71.60	77.45	-120.33	6,020.98	5,969.93	51.05	117.949	
12,900.00	6,984.18	6,400.00	6,397.06	100.78	22.87	-70.93	77.07	-122.28	6,116.82	6,065.79	51.03	119.866	
13,000.00	6,984.10	6,400.00	6,397.06	102.29	22.87	-70.93	77.07	-122.28	6,212.41	6,161.31	51.10	121.572	
13,100.00	6,984.03	6,400.00	6,397.06	103.80	22.87	-70.93	77.07	-122.28	6,308.13	6,256.96	51.17	123.275	
13,200.00	6,983.95	6,400.00	6,397.06	105.32	22.87	-70.93	77.07	-122.28	6,403.99	6,352.75	51.24	124.977	
13,300.00	6,983.88	6,400.00	6,397.06	106.84	22.87	-70.93	77.07	-122.28	6,499.97	6,448.66	51.31	126.676	
13,400.00	6,983.81	6,400.00	6,397.06	108.36	22.87	-70.93	77.07	-122.28	6,596.07	6,544.69	51.38	128.372	
13,500.00	6,983.73	6,400.00	6,397.06	109.88	22.87	-70.93	77.07	-122.28	6,692.29	6,640.84	51.45	130.065	
13,600.00	6,983.66	6,400.00	6,397.06	111.40	22.87	-70.93	77.07	-122.28	6,788.62	6,737.09	51.52	131.756	
13,700.00	6,983.58	6,400.00	6,397.06	112.93	22.87	-70.93	77.07	-122.28	6,885.05	6,833.45	51.60	133.444	
13,800.00	6,983.51	6,400.00	6,397.06	114.46	22.87	-70.93	77.07	-122.28	6,981.58	6,929.91	51.67	135.128	
13,900.00	6,983.43	6,400.00	6,397.06	115.99	22.87	-70.93	77.07	-122.28	7,078.20	7,026.46	51.74	136.809	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error:	0.00 usft		
Survey Program:		0-MWD+HRGM+MS					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
14,000.00	6,983.36	6,400.00	6,397.06	117.52	22.87	-70.93	77.07	-122.28	7,174.92	7,123.11	51.81	138.487				
14,100.00	6,983.28	6,400.00	6,397.06	119.06	22.87	-70.93	77.07	-122.28	7,271.73	7,219.85	51.88	140.161				
14,200.00	6,983.21	6,400.00	6,397.06	120.59	22.87	-70.93	77.07	-122.28	7,368.62	7,316.67	51.95	141.832				
14,300.00	6,983.13	6,400.00	6,397.06	122.13	22.87	-70.93	77.07	-122.28	7,465.60	7,413.57	52.03	143.498				
14,400.00	6,983.06	6,400.00	6,397.06	123.67	22.87	-70.93	77.07	-122.28	7,562.65	7,510.55	52.10	145.161				
14,500.00	6,982.99	6,400.00	6,397.06	125.21	22.87	-70.93	77.07	-122.28	7,659.78	7,607.61	52.17	146.820				
14,600.00	6,982.91	6,400.00	6,397.06	126.75	22.87	-70.93	77.07	-122.28	7,756.98	7,704.74	52.24	148.474				
14,700.00	6,982.84	6,400.00	6,397.06	128.30	22.87	-70.93	77.07	-122.28	7,854.26	7,801.94	52.32	150.124				
14,800.00	6,982.76	6,400.00	6,397.06	129.85	22.87	-70.93	77.07	-122.28	7,951.60	7,899.20	52.39	151.770				
14,900.00	6,982.69	6,400.00	6,397.06	131.39	22.87	-70.93	77.07	-122.28	8,049.00	7,996.54	52.47	153.412				
15,000.00	6,982.61	6,400.00	6,397.06	132.94	22.87	-70.93	77.07	-122.28	8,146.47	8,093.93	52.54	155.049				
15,100.00	6,982.54	6,400.00	6,397.06	134.49	22.87	-70.93	77.07	-122.28	8,244.00	8,191.38	52.62	156.682				
15,200.00	6,982.46	6,400.00	6,397.06	136.04	22.87	-70.93	77.07	-122.28	8,341.59	8,288.90	52.69	158.310				
15,300.00	6,982.39	6,400.00	6,397.06	137.60	22.87	-70.93	77.07	-122.28	8,439.23	8,386.46	52.77	159.933				
15,400.00	6,982.31	6,400.00	6,397.06	139.15	22.87	-70.93	77.07	-122.28	8,536.93	8,484.09	52.84	161.552				
15,500.00	6,982.24	6,400.00	6,397.06	140.70	22.87	-70.93	77.07	-122.28	8,634.68	8,581.76	52.92	163.165				
15,600.00	6,982.17	6,400.00	6,397.06	142.26	22.87	-70.93	77.07	-122.28	8,732.48	8,679.49	53.00	164.774				
15,700.00	6,982.09	6,400.00	6,397.06	143.82	22.87	-70.93	77.07	-122.28	8,830.34	8,777.26	53.07	166.378				
15,800.00	6,982.02	6,400.00	6,397.06	145.38	22.87	-70.93	77.07	-122.28	8,928.23	8,875.08	53.15	167.977				
15,900.00	6,981.94	6,400.00	6,397.06	146.94	22.87	-70.93	77.07	-122.28	9,026.18	8,972.95	53.23	169.571				
16,000.00	6,981.87	6,400.00	6,397.06	148.50	22.87	-70.93	77.07	-122.28	9,124.17	9,070.86	53.31	171.159				
16,100.00	6,981.79	6,400.00	6,397.06	150.06	22.87	-70.93	77.07	-122.28	9,222.20	9,168.82	53.39	172.743				
16,200.00	6,981.72	6,400.00	6,397.06	151.62	22.87	-70.93	77.07	-122.28	9,320.28	9,266.81	53.47	174.321				
16,300.00	6,981.64	6,400.00	6,397.06	153.18	22.87	-70.93	77.07	-122.28	9,418.39	9,364.85	53.55	175.894				
16,400.00	6,981.57	6,400.00	6,397.06	154.74	22.87	-70.93	77.07	-122.28	9,516.55	9,462.92	53.63	177.462				
16,500.00	6,981.49	6,400.00	6,397.06	156.31	22.87	-70.93	77.07	-122.28	9,614.74	9,561.03	53.71	179.024				
16,600.00	6,981.42	6,400.00	6,397.06	157.87	22.87	-70.93	77.07	-122.28	9,712.97	9,659.18	53.79	180.581				
16,700.00	6,981.35	6,400.00	6,397.06	159.44	22.87	-70.93	77.07	-122.28	9,811.23	9,757.37	53.87	182.132				
16,800.00	6,981.27	6,400.00	6,397.06	161.01	22.87	-70.93	77.07	-122.28	9,909.53	9,855.58	53.95	183.678				
16,900.00	6,981.20	6,400.00	6,397.06	162.58	22.87	-70.93	77.07	-122.28	10,007.87	9,953.83	54.03	185.219				
17,000.00	6,981.12	6,400.00	6,397.06	164.14	22.87	-70.93	77.07	-122.28	10,106.23	10,052.12	54.12	186.754				
17,100.00	6,981.05	6,400.00	6,397.06	165.71	22.87	-70.93	77.07	-122.28	10,204.63	10,150.43	54.20	188.283				
17,200.00	6,980.97	6,400.00	6,397.06	167.28	22.87	-70.93	77.07	-122.28	10,303.06	10,248.78	54.28	189.807				
17,300.00	6,980.90	6,400.00	6,397.06	168.85	22.87	-70.93	77.07	-122.28	10,401.52	10,347.15	54.37	191.326				
17,400.00	6,980.82	6,400.00	6,397.06	170.42	22.87	-70.93	77.07	-122.28	10,500.01	10,445.56	54.45	192.838				
17,500.00	6,980.75	6,400.00	6,397.06	172.00	22.87	-70.93	77.07	-122.28	10,598.52	10,543.99	54.53	194.345				
17,600.00	6,980.67	6,400.00	6,397.06	173.57	22.87	-70.93	77.07	-122.28	10,697.07	10,642.45	54.62	195.846				
17,700.00	6,980.60	6,400.00	6,397.06	175.14	22.87	-70.93	77.07	-122.28	10,795.64	10,740.93	54.71	197.342				
17,800.00	6,980.53	6,400.00	6,397.06	176.71	22.87	-70.93	77.07	-122.28	10,894.23	10,839.44	54.79	198.832				
17,900.00	6,980.45	6,400.00	6,397.06	178.29	22.87	-70.93	77.07	-122.28	10,992.86	10,937.98	54.88	200.316				
18,000.00	6,980.38	6,400.00	6,397.06	179.86	22.87	-70.93	77.07	-122.28	11,091.50	11,036.54	54.96	201.794				
18,100.00	6,980.30	6,400.00	6,397.06	181.44	22.87	-70.93	77.07	-122.28	11,190.17	11,135.12	55.05	203.267				
18,200.00	6,980.23	6,400.00	6,397.06	183.01	22.87	-70.93	77.07	-122.28	11,288.87	11,233.73	55.14	204.734				
18,300.00	6,980.15	6,400.00	6,397.06	184.59	22.87	-70.93	77.07	-122.28	11,387.58	11,332.36	55.23	206.195				
18,400.00	6,980.08	6,400.00	6,397.06	186.16	22.87	-70.93	77.07	-122.28	11,486.32	11,431.01	55.32	207.650				
18,500.00	6,980.00	6,400.00	6,397.06	187.74	22.87	-70.93	77.07	-122.28	11,585.08	11,529.68	55.40	209.099				
18,600.00	6,979.93	6,400.00	6,397.06	189.32	22.87	-70.93	77.07	-122.28	11,683.87	11,628.37	55.49	210.543				
18,700.00	6,979.85	6,400.00	6,397.06	190.90	22.87	-70.93	77.07	-122.28	11,782.67	11,727.08	55.58	211.980				
18,800.00	6,979.78	6,400.00	6,397.06	192.48	22.87	-70.93	77.07	-122.28	11,881.49	11,825.82	55.67	213.412				
18,900.00	6,979.71	6,400.00	6,397.06	194.05	22.87	-70.93	77.07	-122.28	11,980.33	11,924.57	55.76	214.838				
19,000.00	6,979.63	6,400.00	6,397.06	195.63	22.87	-70.93	77.07	-122.28	12,079.19	12,023.34	55.86	216.258				
19,100.00	6,979.56	6,400.00	6,397.06	197.21	22.87	-70.93	77.07	-122.28	12,178.07	12,122.13	55.95	217.672				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 34 - Rosa Unit #696H - OH - Prelim 5													Offset Site Error:	0.00 usft		
Survey Program:		0-MWD+HRGM+MS					Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
19,200.00	6,979.48	6,400.00	6,397.06	198.79	22.87	-70.93	77.07	-122.28	12,276.97	12,220.93	56.04	219.081				
19,300.00	6,979.41	6,400.00	6,397.06	200.37	22.87	-70.93	77.07	-122.28	12,375.89	12,319.76	56.13	220.483				
19,400.00	6,979.33	6,400.00	6,397.06	201.95	22.87	-70.93	77.07	-122.28	12,474.82	12,418.60	56.22	221.880				
19,500.00	6,979.26	6,400.00	6,397.06	203.54	22.87	-70.93	77.07	-122.28	12,573.77	12,517.45	56.32	223.271				
19,600.00	6,979.18	6,400.00	6,397.06	205.12	22.87	-70.93	77.07	-122.28	12,672.74	12,616.33	56.41	224.656				
19,700.00	6,979.11	6,400.00	6,397.06	206.70	22.87	-70.93	77.07	-122.28	12,771.72	12,715.21	56.50	226.035				
19,800.00	6,979.03	6,400.00	6,397.06	208.28	22.87	-70.93	77.07	-122.28	12,870.72	12,814.12	56.60	227.408				
19,900.00	6,978.96	6,400.00	6,397.06	209.86	22.87	-70.93	77.07	-122.28	12,969.73	12,913.04	56.69	228.775				
20,000.00	6,978.89	6,400.00	6,397.06	211.45	22.87	-70.93	77.07	-122.28	13,068.76	13,011.97	56.79	230.136				
20,100.00	6,978.81	6,400.00	6,397.06	213.03	22.87	-70.93	77.07	-122.28	13,167.80	13,110.92	56.88	231.492				
20,200.00	6,978.74	6,400.00	6,397.06	214.61	22.87	-70.93	77.07	-122.28	13,266.86	13,209.88	56.98	232.842				
20,300.00	6,978.66	6,400.00	6,397.06	216.20	22.87	-70.93	77.07	-122.28	13,365.93	13,308.85	57.07	234.185				
20,400.00	6,978.59	6,400.00	6,397.06	217.78	22.87	-70.93	77.07	-122.28	13,465.01	13,407.84	57.17	235.523				
20,500.00	6,978.51	6,400.00	6,397.06	219.37	22.87	-70.93	77.07	-122.28	13,564.11	13,506.85	57.27	236.856				
20,600.00	6,978.44	6,400.00	6,397.06	220.95	22.87	-70.93	77.07	-122.28	13,663.22	13,605.86	57.36	238.182				
20,700.00	6,978.36	6,400.00	6,397.06	222.53	22.87	-70.93	77.07	-122.28	13,762.35	13,704.89	57.46	239.502				
20,800.00	6,978.29	6,400.00	6,397.06	224.12	22.87	-70.93	77.07	-122.28	13,861.49	13,803.93	57.56	240.817				
20,900.00	6,978.21	6,400.00	6,397.06	225.71	22.87	-70.93	77.07	-122.28	13,960.64	13,902.98	57.66	242.126				
21,000.00	6,978.14	6,400.00	6,397.06	227.29	22.87	-70.93	77.07	-122.28	14,059.80	14,002.04	57.76	243.429				
21,100.00	6,978.07	6,400.00	6,397.06	228.88	22.87	-70.93	77.07	-122.28	14,158.97	14,101.11	57.86	244.726				
21,200.00	6,977.99	6,400.00	6,397.06	230.46	22.87	-70.93	77.07	-122.28	14,258.16	14,200.20	57.96	246.018				
21,300.00	6,977.92	6,400.00	6,397.06	232.05	22.87	-70.93	77.07	-122.28	14,357.35	14,299.30	58.06	247.304				
21,400.00	6,977.84	6,400.00	6,397.06	233.64	22.87	-70.93	77.07	-122.28	14,456.56	14,398.40	58.16	248.584				
21,500.00	6,977.77	6,400.00	6,397.06	235.22	22.87	-70.93	77.07	-122.28	14,555.78	14,497.52	58.26	249.858				
21,600.00	6,977.69	6,400.00	6,397.06	236.81	22.87	-70.93	77.07	-122.28	14,655.01	14,596.65	58.36	251.126				
21,700.00	6,977.62	6,400.00	6,397.06	238.40	22.87	-70.93	77.07	-122.28	14,754.24	14,695.79	58.46	252.389				
21,800.00	6,977.54	6,400.00	6,397.06	239.99	22.87	-70.93	77.07	-122.28	14,853.49	14,794.93	58.56	253.646				
21,900.00	6,977.47	6,400.00	6,397.06	241.57	22.87	-70.93	77.07	-122.28	14,952.75	14,894.09	58.66	254.898				
22,000.00	6,977.39	6,400.00	6,397.06	243.16	22.87	-70.93	77.07	-122.28	15,052.02	14,993.26	58.76	256.144				
22,100.00	6,977.32	6,400.00	6,397.06	244.75	22.87	-70.93	77.07	-122.28	15,151.30	15,092.43	58.87	257.384				
22,200.00	6,977.25	6,400.00	6,397.06	246.34	22.87	-70.93	77.07	-122.28	15,250.59	15,191.62	58.97	258.618				
22,300.00	6,977.17	6,400.00	6,397.06	247.93	22.87	-70.93	77.07	-122.28	15,349.89	15,290.81	59.07	259.847				
22,400.00	6,977.10	6,400.00	6,397.06	249.52	22.87	-70.93	77.07	-122.28	15,449.19	15,390.02	59.18	261.070				
22,500.00	6,977.02	6,400.00	6,397.06	251.11	22.87	-70.93	77.07	-122.28	15,548.51	15,489.23	59.28	262.288				
22,529.62	6,977.00	6,400.00	6,397.06	251.58	22.87	-70.93	77.07	-122.28	15,577.92	15,518.61	59.31	262.647				

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6347+30 @ 6377.00usft (H&P 530)

Coordinates are relative to: Rosa Unit #674H

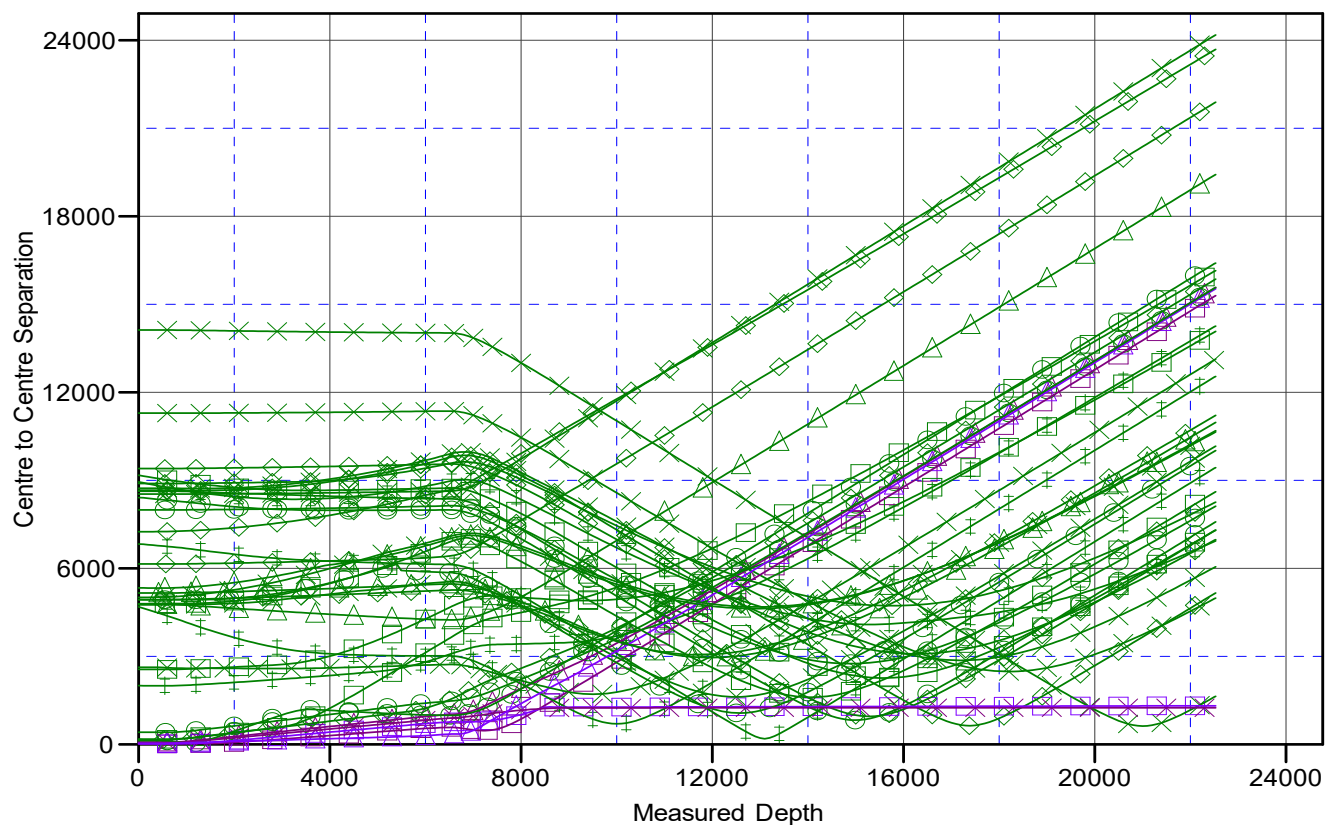
Offset Depths are relative to Offset Datum

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

Central Meridian is -107.833334

Grid Convergence at Surface is: 0.27°

Ladder Plot



LEGEND

(C) Rosa Unit #95, OH, OH-INC V0	(C) Rosa Unit #171B, OH, OH-SVY V0	(C) Rosa Unit #46, OH, OH-INC V0
(C) Rosa Unit #149B, OH, OH-INC V0	(C) Rosa Unit 148 COM, OH, OH-INC V0	Rosa Unit #694H, OH, Prelim 5 V0
(C) Rosa Unit #108, OH, OH-SVY V0	(C) Rosa Unit #336, OH, OH-INC V0	Rosa Unit #692H, OH, Prelim 5 V0
(C) Rosa Unit #164C, OH, OH-SVY V0	(C) Rosa Unit #041C, OH, OH-SVY V0	(C) Rosa Unit #149A, OH, OH-INC V0
(C) Rosa Unit #149C, OH, OH-SVY V0	(C) Rosa Unit #164B, OH, OH-SVY V0	(C) Rosa Unit #171A, OH, OH-SVY V0
(C) Rosa Unit #149, OH, OH-INC V0	(C) Rosa Unit #164, OH, OH-SVY V0	(C) Rosa Unit #107, OH, OH-INC V0
Rosa Unit #696H, OH, Prelim 5 V0	(C) Rosa Unit #164A, OH, OH-INC V0	(C) Rosa Unit #171C, OH, OH-SVY V0
(C) Rosa Unit #080A, OH, OH-INC V0	(C) Rosa Unit #041B, OH, OH-SVY V0	(C) Rosa Unit #171, OH, OH-INC V0
(C) Carson #1, OH, OH-INC V0	(C) Rosa Unit #336A, OH, OH-INC V0	(C) Rosa Unit #053, OH, OH-INC V0
Rosa Unit #690H, OH, Prelim 5 V0	Rosa Unit #672H, OH, Prelim 5 V0	(C) Rosa Unit #80B, OH, OH-SVY V0
(C) Rosa Unit #072C, OH, OH-SVY V0	(C) Rosa Unit #072B, OH, OH-SVY V0	(C) Rosa Unit #226, OH, OH-INC V0
(C) Rosa Unit #226A, OH, OH-SVY V0	(C) Rosa Unit #650A, OH, OH-SVY V0	(C) Rosa Unit #226A, OH, OH-SVY V0

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #674H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Reference Site:	Rosa Unit 34	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Prelim 5	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6347+30 @ 6377.00usft (H&P 530)

Offset Depths are relative to Offset Datum

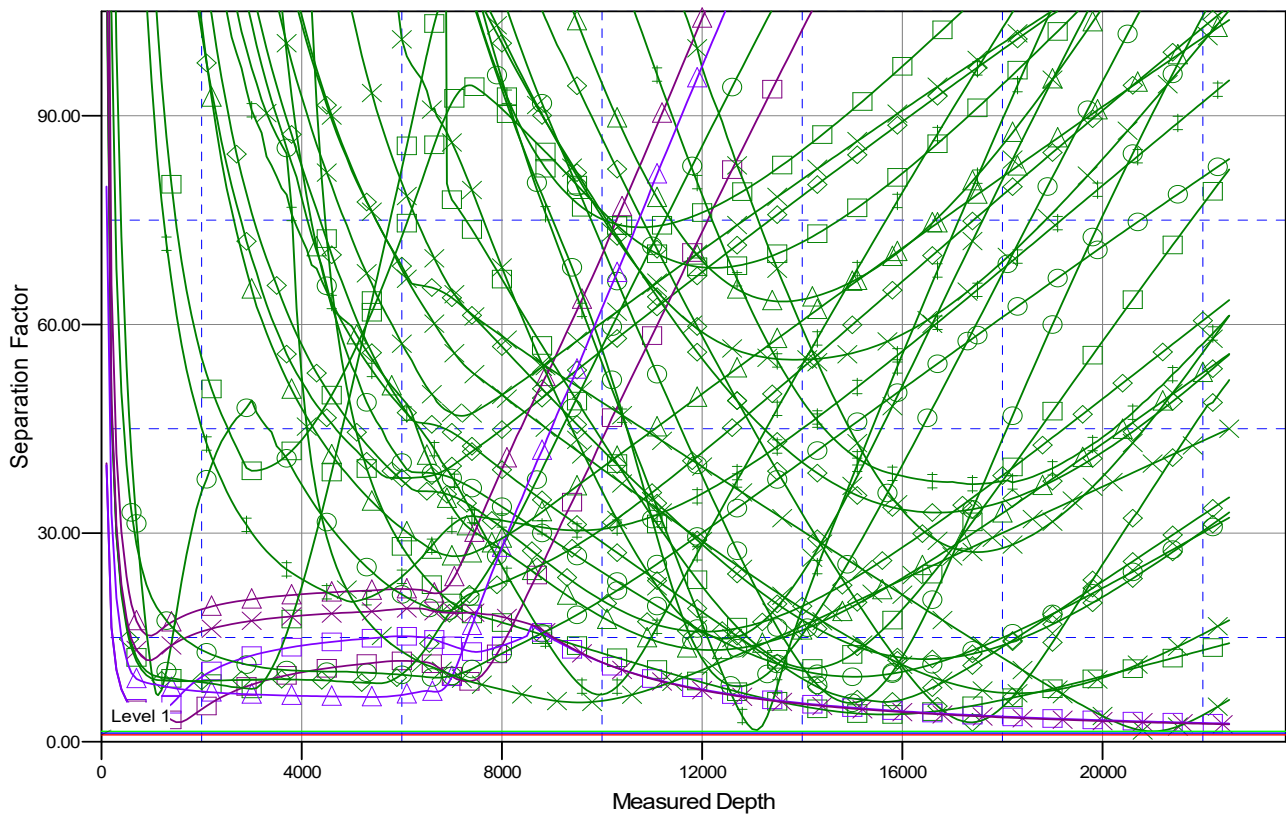
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit #674H

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

Grid Convergence at Surface is: 0.27°

Separation Factor Plot



LEGEND

(C) Rosa Unit #95, OH, OH-INC V0	(C) Rosa Unit #171B, OH, OH-SVY V0	(C) Rosa Unit #46, OH, OH-INC V0
(C) Rosa Unit #148B, OH, OH-INC V0	(C) Rosa Unit 148 COM, OH, OH-INC V0	Rosa Unit #694H, OH, Prelim 5 V0
(C) Rosa Unit #108, OH, OH-SVY V0	(C) Rosa Unit #336, OH, OH-INC V0	Rosa Unit #692H, OH, Prelim 5 V0
(C) Rosa Unit #164C, OH, OH-SVY V0	(C) Rosa Unit #641C, OH, OH-SVY V0	(C) Rosa Unit #149A, OH, OH-INC V0
(C) Rosa Unit #148C, OH, OH-SVY V0	(C) Rosa Unit #168B, OH, OH-SVY V0	(C) Rosa Unit #171A, OH, OH-SVY V0
(C) Rosa Unit #149, OH, OH-INC V0	(C) Rosa Unit #164, OH, OH-SVY V0	(C) Rosa Unit #107, OH, OH-INC V0
Rosa Unit #696H, OH, Prelim 5 V0	(C) Rosa Unit #164A, OH, OH-INC V0	(C) Rosa Unit #171C, OH, OH-SVY V0
(C) Rosa Unit #080A, OH, OH-INC V0	(C) Rosa Unit #041B, OH, OH-SVY V0	(C) Rosa Unit #171, OH, OH-INC V0
(C) Carson #1, OH, OH-INC V0	(C) Rosa Unit #336A, OH, OH-INC V0	(C) Rosa Unit #053, OH, OH-INC V0
Rosa Unit #690H, OH, Prelim 5 V0	Rosa Unit #672H, OH, Prelim 5 V0	(C) Rosa Unit #80B, OH, OH-SVY V0
(C) Rosa Unit #072C, OH, OH-SVY V0	(C) Rosa Unit #072B, OH, OH-SVY V0	(C) Rosa Unit #225, OH, OH-INC V0
(C) Rosa Unit #226A, OH, OH-SVY V0	(C) Rosa Unit #850A, OH, OH-SVY V0	(C) Rosa Unit #228A, OH, OH-SVY 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 Unit 34

Rosa Unit #674H

OH

Plan: Prelim 5

Standard Planning Report

22 November, 2024

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #674H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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

Site	Rosa Unit 34				
Site Position:		Northing:	2,154,213.35 usft	Latitude:	36.919164
From:	Lat/Long	Easting:	2,854,601.45 usft	Longitude:	-107.383447
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Rosa Unit #674H					
Well Position	+N/-S	0.00 usft	Northing:	2,154,244.01 usft	Latitude:	36.919248
	+E/-W	0.00 usft	Easting:	2,854,618.56 usft	Longitude:	-107.383388
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	6,347.00 usft
Grid Convergence:		0.27 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/16/2024	8.40	63.46	49,423.23468625

Design	Prelim 5				
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	270.28	

Plan Survey Tool Program	Date	11/22/2024			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	22,529.49 Prelim 5 (OH)	MWD+HRGM+MS		
			MWD + HRGM + Multi-Station		

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	
550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,130.50	11.61	357.62	1,126.54	58.56	-2.44	2.00	2.00	0.00	357.62	
5,493.23	11.61	357.62	5,400.00	935.80	-38.98	0.00	0.00	0.00	0.00	
6,498.19	6.59	357.62	6,392.00	1,094.51	-45.59	0.50	-0.50	0.00	-180.00	
7,461.13	90.04	298.50	6,988.22	1,449.91	-576.27	9.00	8.67	-6.14	-59.28	
8,872.16	90.04	270.28	6,987.18	1,797.04	-1,929.26	2.00	0.00	-2.00	-89.98	
22,529.62	90.04	270.28	6,977.00	1,863.65	-15,586.55	0.00	0.00	0.00	0.00	RU #674 PBHL

SDT

Planning Report

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Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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
550.00	0.00	0.00	550.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
600.00	1.00	357.62	600.00	0.44	-0.02	0.02	2.00	2.00	0.00
700.00	3.00	357.62	699.93	3.92	-0.16	0.18	2.00	2.00	0.00
800.00	5.00	357.62	799.68	10.89	-0.45	0.51	2.00	2.00	0.00
900.00	7.00	357.62	899.13	21.34	-0.89	0.99	2.00	2.00	0.00
1,000.00	9.00	357.62	998.15	35.24	-1.47	1.64	2.00	2.00	0.00
1,100.00	11.00	357.62	1,096.63	52.59	-2.19	2.45	2.00	2.00	0.00
1,130.50	11.61	357.62	1,126.54	58.56	-2.44	2.73	2.00	2.00	0.00
Start 4362.73 hold at 1130.50 MD									
1,200.00	11.61	357.62	1,194.61	72.54	-3.02	3.38	0.00	0.00	0.00
1,300.00	11.61	357.62	1,292.57	92.64	-3.86	4.31	0.00	0.00	0.00
1,400.00	11.61	357.62	1,390.52	112.75	-4.70	5.25	0.00	0.00	0.00
1,500.00	11.61	357.62	1,488.48	132.86	-5.53	6.18	0.00	0.00	0.00
1,600.00	11.61	357.62	1,586.43	152.97	-6.37	7.12	0.00	0.00	0.00
1,700.00	11.61	357.62	1,684.38	173.07	-7.21	8.05	0.00	0.00	0.00
1,800.00	11.61	357.62	1,782.34	193.18	-8.05	8.99	0.00	0.00	0.00
1,900.00	11.61	357.62	1,880.29	213.29	-8.88	9.93	0.00	0.00	0.00
2,000.00	11.61	357.62	1,978.25	233.40	-9.72	10.86	0.00	0.00	0.00
2,100.00	11.61	357.62	2,076.20	253.50	-10.56	11.80	0.00	0.00	0.00
2,200.00	11.61	357.62	2,174.15	273.61	-11.40	12.73	0.00	0.00	0.00
2,300.00	11.61	357.62	2,272.11	293.72	-12.23	13.67	0.00	0.00	0.00
2,400.00	11.61	357.62	2,370.06	313.83	-13.07	14.60	0.00	0.00	0.00
2,470.38	11.61	357.62	2,439.00	327.98	-13.66	15.26	0.00	0.00	0.00
Ojo Alamo									
2,500.00	11.61	357.62	2,468.02	333.93	-13.91	15.54	0.00	0.00	0.00
2,592.88	11.61	357.62	2,559.00	352.61	-14.69	16.41	0.00	0.00	0.00
Kirtland									
2,600.00	11.61	357.62	2,565.97	354.04	-14.75	16.48	0.00	0.00	0.00
2,700.00	11.61	357.62	2,663.92	374.15	-15.58	17.41	0.00	0.00	0.00
2,800.00	11.61	357.62	2,761.88	394.26	-16.42	18.35	0.00	0.00	0.00
2,898.13	11.61	357.62	2,858.00	413.99	-17.24	19.27	0.00	0.00	0.00
Fruitland									
2,900.00	11.61	357.62	2,859.83	414.36	-17.26	19.28	0.00	0.00	0.00
3,000.00	11.61	357.62	2,957.79	434.47	-18.10	20.22	0.00	0.00	0.00
3,044.12	11.61	357.62	3,001.00	443.34	-18.47	20.63	0.00	0.00	0.00
Top of Coals									
3,100.00	11.61	357.62	3,055.74	454.58	-18.93	21.15	0.00	0.00	0.00
3,200.00	11.61	357.62	3,153.69	474.69	-19.77	22.09	0.00	0.00	0.00
3,213.58	11.61	357.62	3,167.00	477.42	-19.88	22.22	0.00	0.00	0.00
Base of Coals									
3,300.00	11.61	357.62	3,251.65	494.79	-20.61	23.03	0.00	0.00	0.00
3,400.00	11.61	357.62	3,349.60	514.90	-21.45	23.96	0.00	0.00	0.00
3,418.78	11.61	357.62	3,368.00	518.68	-21.60	24.14	0.00	0.00	0.00
Pictured Cliffs									
3,500.00	11.61	357.62	3,447.56	535.01	-22.28	24.90	0.00	0.00	0.00
3,523.93	11.61	357.62	3,471.00	539.82	-22.48	25.12	0.00	0.00	0.00

SDT

Planning Report

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Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)
Lewis									
3,600.00	11.61	357.62	3,545.51	555.12	-23.12	25.83	0.00	0.00	0.00
3,700.00	11.61	357.62	3,643.46	575.22	-23.96	26.77	0.00	0.00	0.00
3,800.00	11.61	357.62	3,741.42	595.33	-24.80	27.70	0.00	0.00	0.00
3,900.00	11.61	357.62	3,839.37	615.44	-25.63	28.64	0.00	0.00	0.00
4,000.00	11.61	357.62	3,937.33	635.55	-26.47	29.58	0.00	0.00	0.00
4,100.00	11.61	357.62	4,035.28	655.65	-27.31	30.51	0.00	0.00	0.00
4,200.00	11.61	357.62	4,133.23	675.76	-28.15	31.45	0.00	0.00	0.00
4,300.00	11.61	357.62	4,231.19	695.87	-28.98	32.38	0.00	0.00	0.00
4,400.00	11.61	357.62	4,329.14	715.98	-29.82	33.32	0.00	0.00	0.00
4,500.00	11.61	357.62	4,427.10	736.08	-30.66	34.25	0.00	0.00	0.00
4,600.00	11.61	357.62	4,525.05	756.19	-31.50	35.19	0.00	0.00	0.00
4,700.00	11.61	357.62	4,623.00	776.30	-32.33	36.13	0.00	0.00	0.00
4,726.54	11.61	357.62	4,649.00	781.63	-32.56	36.37	0.00	0.00	0.00
Chacra									
4,800.00	11.61	357.62	4,720.96	796.41	-33.17	37.06	0.00	0.00	0.00
4,900.00	11.61	357.62	4,818.91	816.51	-34.01	38.00	0.00	0.00	0.00
5,000.00	11.61	357.62	4,916.87	836.62	-34.85	38.93	0.00	0.00	0.00
5,100.00	11.61	357.62	5,014.82	856.73	-35.68	39.87	0.00	0.00	0.00
5,198.19	11.61	357.62	5,111.00	876.47	-36.51	40.79	0.00	0.00	0.00
Upper Cliff House									
5,200.00	11.61	357.62	5,112.77	876.84	-36.52	40.80	0.00	0.00	0.00
5,300.00	11.61	357.62	5,210.73	896.94	-37.36	41.74	0.00	0.00	0.00
5,400.00	11.61	357.62	5,308.68	917.05	-38.20	42.68	0.00	0.00	0.00
5,493.23	11.61	357.62	5,400.00	935.80	-38.98	43.55	0.00	0.00	0.00
Start DLS 0.50 TFO -180.00									
5,500.00	11.58	357.62	5,406.64	937.16	-39.03	43.61	0.50	-0.50	0.00
5,519.76	11.48	357.62	5,426.00	941.10	-39.20	43.80	0.50	-0.50	0.00
Cliff House									
5,555.46	11.30	357.62	5,461.00	948.14	-39.49	44.12	0.50	-0.50	0.00
Menefee									
5,600.00	11.08	357.62	5,504.69	956.78	-39.85	44.53	0.50	-0.50	0.00
5,700.00	10.58	357.62	5,602.91	975.54	-40.63	45.40	0.50	-0.50	0.00
5,732.64	10.41	357.62	5,635.00	981.48	-40.88	45.67	0.50	-0.50	0.00
Point Lookout									
5,800.00	10.08	357.62	5,701.29	993.45	-41.38	46.23	0.50	-0.50	0.00
5,900.00	9.58	357.62	5,799.82	1,010.51	-42.09	47.03	0.50	-0.50	0.00
6,000.00	9.08	357.62	5,898.50	1,026.70	-42.76	47.78	0.50	-0.50	0.00
6,100.00	8.58	357.62	5,997.31	1,042.03	-43.40	48.49	0.50	-0.50	0.00
6,200.00	8.08	357.62	6,096.26	1,056.49	-44.00	49.17	0.50	-0.50	0.00
6,300.00	7.58	357.62	6,195.33	1,070.10	-44.57	49.80	0.50	-0.50	0.00
6,343.04	7.36	357.62	6,238.00	1,075.69	-44.80	50.06	0.50	-0.50	0.00
Mancos									
6,400.00	7.08	357.62	6,294.51	1,082.84	-45.10	50.39	0.50	-0.50	0.00
6,498.19	6.59	357.62	6,392.00	1,094.51	-45.59	50.93	0.50	-0.50	0.00
Start DLS 9.00 TFO -59.28									
6,500.00	6.67	356.41	6,393.80	1,094.72	-45.60	50.95	9.00	4.68	-66.61
6,550.00	9.82	333.42	6,443.29	1,101.43	-47.69	53.07	9.00	6.30	-45.97
6,600.00	13.74	322.41	6,492.24	1,109.95	-53.22	58.64	9.00	7.84	-22.02
6,650.00	17.93	316.34	6,540.33	1,120.23	-62.16	67.63	9.00	8.38	-12.15
6,700.00	22.24	312.53	6,587.28	1,132.20	-74.45	79.98	9.00	8.62	-7.62
6,750.00	26.60	309.91	6,632.80	1,145.78	-90.02	95.61	9.00	8.74	-5.23
6,800.00	31.01	307.99	6,676.60	1,160.90	-108.76	114.44	9.00	8.81	-3.84

SDT Planning Report

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Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)	
6,850.00	35.43	306.51	6,718.42	1,177.46	-130.58	136.33	9.00	8.85	-2.97	
6,900.00	39.88	305.31	6,758.00	1,195.36	-155.32	161.16	9.00	8.88	-2.38	
6,950.00	44.33	304.33	6,795.09	1,214.48	-182.84	188.77	9.00	8.90	-1.98	
6,981.39	47.12	303.78	6,817.00	1,227.07	-201.46	207.45	9.00	8.91	-1.73	
Black Top										
7,000.00	48.78	303.48	6,829.46	1,234.72	-212.96	218.99	9.00	8.92	-1.61	
7,050.00	53.25	302.75	6,860.91	1,255.94	-245.51	251.65	9.00	8.93	-1.47	
7,100.00	57.72	302.09	6,889.24	1,278.01	-280.28	286.53	9.00	8.94	-1.31	
7,150.00	62.19	301.50	6,914.27	1,300.81	-317.06	323.41	9.00	8.94	-1.19	
7,200.00	66.66	300.95	6,935.85	1,324.18	-355.62	362.09	9.00	8.95	-1.09	
7,250.00	71.13	300.44	6,953.84	1,347.99	-395.72	402.30	9.00	8.95	-1.02	
7,300.00	75.61	299.96	6,968.15	1,372.08	-437.12	443.82	9.00	8.95	-0.97	
7,350.00	80.09	299.50	6,978.67	1,396.31	-479.55	486.37	9.00	8.95	-0.93	
7,400.00	84.57	299.04	6,985.34	1,420.53	-522.77	529.70	9.00	8.96	-0.90	
7,450.00	89.04	298.60	6,988.13	1,444.59	-566.50	573.55	9.00	8.96	-0.89	
7,461.13	90.04	298.50	6,988.22	1,449.91	-576.27	583.35	9.00	8.96	-0.89	
Start DLS 2.00 TFO -89.98										
7,500.00	90.04	297.72	6,988.19	1,468.22	-610.56	617.72	2.00	0.00	-2.00	
7,600.00	90.04	295.72	6,988.12	1,513.19	-699.87	707.26	2.00	0.00	-2.00	
7,700.00	90.04	293.72	6,988.05	1,555.01	-790.70	798.29	2.00	0.00	-2.00	
7,800.00	90.04	291.72	6,987.98	1,593.63	-882.94	890.71	2.00	0.00	-2.00	
7,900.00	90.04	289.72	6,987.91	1,629.02	-976.46	984.41	2.00	0.00	-2.00	
8,000.00	90.04	287.72	6,987.83	1,661.11	-1,071.16	1,079.27	2.00	0.00	-2.00	
8,100.00	90.04	285.72	6,987.76	1,689.89	-1,166.93	1,175.18	2.00	0.00	-2.00	
8,200.00	90.04	283.72	6,987.68	1,715.30	-1,263.64	1,272.01	2.00	0.00	-2.00	
8,300.00	90.04	281.72	6,987.61	1,737.32	-1,361.18	1,369.66	2.00	0.00	-2.00	
8,400.00	90.04	279.72	6,987.53	1,755.92	-1,459.43	1,467.99	2.00	0.00	-2.00	
8,500.00	90.04	277.72	6,987.46	1,771.09	-1,558.27	1,566.91	2.00	0.00	-2.00	
8,600.00	90.04	275.72	6,987.38	1,782.79	-1,657.58	1,666.27	2.00	0.00	-2.00	
8,700.00	90.04	273.72	6,987.31	1,791.03	-1,757.23	1,765.96	2.00	0.00	-2.00	
8,800.00	90.04	271.72	6,987.23	1,795.78	-1,857.11	1,865.87	2.00	0.00	-2.00	
8,872.16	90.04	270.28	6,987.18	1,797.04	-1,929.26	1,938.02	2.00	0.00	-2.00	
Start 13657.46 hold at 8872.16 MD										
8,900.00	90.04	270.28	6,987.16	1,797.17	-1,957.10	1,965.86	0.00	0.00	0.00	
9,000.00	90.04	270.28	6,987.09	1,797.66	-2,057.10	2,065.86	0.00	0.00	0.00	
9,100.00	90.04	270.28	6,987.01	1,798.15	-2,157.10	2,165.86	0.00	0.00	0.00	
9,200.00	90.04	270.28	6,986.94	1,798.64	-2,257.10	2,265.86	0.00	0.00	0.00	
9,300.00	90.04	270.28	6,986.86	1,799.12	-2,357.10	2,365.86	0.00	0.00	0.00	
9,400.00	90.04	270.28	6,986.79	1,799.61	-2,457.10	2,465.86	0.00	0.00	0.00	
9,500.00	90.04	270.28	6,986.71	1,800.10	-2,557.09	2,565.86	0.00	0.00	0.00	
9,600.00	90.04	270.28	6,986.64	1,800.59	-2,657.09	2,665.86	0.00	0.00	0.00	
9,700.00	90.04	270.28	6,986.56	1,801.07	-2,757.09	2,765.86	0.00	0.00	0.00	
9,800.00	90.04	270.28	6,986.49	1,801.56	-2,857.09	2,865.86	0.00	0.00	0.00	
9,900.00	90.04	270.28	6,986.41	1,802.05	-2,957.09	2,965.86	0.00	0.00	0.00	
10,000.00	90.04	270.28	6,986.34	1,802.54	-3,057.09	3,065.86	0.00	0.00	0.00	
10,100.00	90.04	270.28	6,986.27	1,803.03	-3,157.09	3,165.86	0.00	0.00	0.00	
10,200.00	90.04	270.28	6,986.19	1,803.51	-3,257.09	3,265.86	0.00	0.00	0.00	
10,300.00	90.04	270.28	6,986.12	1,804.00	-3,357.08	3,365.86	0.00	0.00	0.00	
10,400.00	90.04	270.28	6,986.04	1,804.49	-3,457.08	3,465.86	0.00	0.00	0.00	
10,500.00	90.04	270.28	6,985.97	1,804.98	-3,557.08	3,565.86	0.00	0.00	0.00	
10,600.00	90.04	270.28	6,985.89	1,805.46	-3,657.08	3,665.86	0.00	0.00	0.00	
10,700.00	90.04	270.28	6,985.82	1,805.95	-3,757.08	3,765.86	0.00	0.00	0.00	
10,800.00	90.04	270.28	6,985.74	1,806.44	-3,857.08	3,865.86	0.00	0.00	0.00	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #674H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)
10,900.00	90.04	270.28	6,985.67	1,806.93	-3,957.08	3,965.86	0.00	0.00	0.00
11,000.00	90.04	270.28	6,985.59	1,807.42	-4,057.08	4,065.86	0.00	0.00	0.00
11,100.00	90.04	270.28	6,985.52	1,807.90	-4,157.07	4,165.86	0.00	0.00	0.00
11,200.00	90.04	270.28	6,985.45	1,808.39	-4,257.07	4,265.86	0.00	0.00	0.00
11,300.00	90.04	270.28	6,985.37	1,808.88	-4,357.07	4,365.86	0.00	0.00	0.00
11,400.00	90.04	270.28	6,985.30	1,809.37	-4,457.07	4,465.86	0.00	0.00	0.00
11,500.00	90.04	270.28	6,985.22	1,809.85	-4,557.07	4,565.86	0.00	0.00	0.00
11,600.00	90.04	270.28	6,985.15	1,810.34	-4,657.07	4,665.86	0.00	0.00	0.00
11,700.00	90.04	270.28	6,985.07	1,810.83	-4,757.07	4,765.86	0.00	0.00	0.00
11,800.00	90.04	270.28	6,985.00	1,811.32	-4,857.07	4,865.86	0.00	0.00	0.00
11,900.00	90.04	270.28	6,984.92	1,811.80	-4,957.06	4,965.86	0.00	0.00	0.00
12,000.00	90.04	270.28	6,984.85	1,812.29	-5,057.06	5,065.86	0.00	0.00	0.00
12,100.00	90.04	270.28	6,984.77	1,812.78	-5,157.06	5,165.86	0.00	0.00	0.00
12,200.00	90.04	270.28	6,984.70	1,813.27	-5,257.06	5,265.86	0.00	0.00	0.00
12,300.00	90.04	270.28	6,984.63	1,813.76	-5,357.06	5,365.86	0.00	0.00	0.00
12,400.00	90.04	270.28	6,984.55	1,814.24	-5,457.06	5,465.86	0.00	0.00	0.00
12,500.00	90.04	270.28	6,984.48	1,814.73	-5,557.06	5,565.86	0.00	0.00	0.00
12,600.00	90.04	270.28	6,984.40	1,815.22	-5,657.06	5,665.86	0.00	0.00	0.00
12,700.00	90.04	270.28	6,984.33	1,815.71	-5,757.05	5,765.86	0.00	0.00	0.00
12,800.00	90.04	270.28	6,984.25	1,816.19	-5,857.05	5,865.86	0.00	0.00	0.00
12,900.00	90.04	270.28	6,984.18	1,816.68	-5,957.05	5,965.86	0.00	0.00	0.00
13,000.00	90.04	270.28	6,984.10	1,817.17	-6,057.05	6,065.86	0.00	0.00	0.00
13,100.00	90.04	270.28	6,984.03	1,817.66	-6,157.05	6,165.86	0.00	0.00	0.00
13,200.00	90.04	270.28	6,983.95	1,818.14	-6,257.05	6,265.86	0.00	0.00	0.00
13,300.00	90.04	270.28	6,983.88	1,818.63	-6,357.05	6,365.86	0.00	0.00	0.00
13,400.00	90.04	270.28	6,983.81	1,819.12	-6,457.05	6,465.86	0.00	0.00	0.00
13,500.00	90.04	270.28	6,983.73	1,819.61	-6,557.05	6,565.86	0.00	0.00	0.00
13,600.00	90.04	270.28	6,983.66	1,820.10	-6,657.04	6,665.86	0.00	0.00	0.00
13,700.00	90.04	270.28	6,983.58	1,820.58	-6,757.04	6,765.86	0.00	0.00	0.00
13,800.00	90.04	270.28	6,983.51	1,821.07	-6,857.04	6,865.86	0.00	0.00	0.00
13,900.00	90.04	270.28	6,983.43	1,821.56	-6,957.04	6,965.86	0.00	0.00	0.00
14,000.00	90.04	270.28	6,983.36	1,822.05	-7,057.04	7,065.86	0.00	0.00	0.00
14,100.00	90.04	270.28	6,983.28	1,822.53	-7,157.04	7,165.86	0.00	0.00	0.00
14,200.00	90.04	270.28	6,983.21	1,823.02	-7,257.04	7,265.86	0.00	0.00	0.00
14,300.00	90.04	270.28	6,983.13	1,823.51	-7,357.04	7,365.86	0.00	0.00	0.00
14,400.00	90.04	270.28	6,983.06	1,824.00	-7,457.03	7,465.86	0.00	0.00	0.00
14,500.00	90.04	270.28	6,982.99	1,824.49	-7,557.03	7,565.86	0.00	0.00	0.00
14,600.00	90.04	270.28	6,982.91	1,824.97	-7,657.03	7,665.86	0.00	0.00	0.00
14,700.00	90.04	270.28	6,982.84	1,825.46	-7,757.03	7,765.86	0.00	0.00	0.00
14,800.00	90.04	270.28	6,982.76	1,825.95	-7,857.03	7,865.86	0.00	0.00	0.00
14,900.00	90.04	270.28	6,982.69	1,826.44	-7,957.03	7,965.86	0.00	0.00	0.00
15,000.00	90.04	270.28	6,982.61	1,826.92	-8,057.03	8,065.86	0.00	0.00	0.00
15,100.00	90.04	270.28	6,982.54	1,827.41	-8,157.03	8,165.86	0.00	0.00	0.00
15,200.00	90.04	270.28	6,982.46	1,827.90	-8,257.02	8,265.86	0.00	0.00	0.00
15,300.00	90.04	270.28	6,982.39	1,828.39	-8,357.02	8,365.86	0.00	0.00	0.00
15,400.00	90.04	270.28	6,982.31	1,828.87	-8,457.02	8,465.86	0.00	0.00	0.00
15,500.00	90.04	270.28	6,982.24	1,829.36	-8,557.02	8,565.86	0.00	0.00	0.00
15,600.00	90.04	270.28	6,982.17	1,829.85	-8,657.02	8,665.86	0.00	0.00	0.00
15,700.00	90.04	270.28	6,982.09	1,830.34	-8,757.02	8,765.86	0.00	0.00	0.00
15,800.00	90.04	270.28	6,982.02	1,830.83	-8,857.02	8,865.86	0.00	0.00	0.00
15,900.00	90.04	270.28	6,981.94	1,831.31	-8,957.02	8,965.86	0.00	0.00	0.00
16,000.00	90.04	270.28	6,981.87	1,831.80	-9,057.01	9,065.86	0.00	0.00	0.00
16,100.00	90.04	270.28	6,981.79	1,832.29	-9,157.01	9,165.86	0.00	0.00	0.00
16,200.00	90.04	270.28	6,981.72	1,832.78	-9,257.01	9,265.86	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #674H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,300.00	90.04	270.28	6,981.64	1,833.26	-9,357.01	9,365.86	0.00	0.00	0.00
16,400.00	90.04	270.28	6,981.57	1,833.75	-9,457.01	9,465.86	0.00	0.00	0.00
16,500.00	90.04	270.28	6,981.49	1,834.24	-9,557.01	9,565.86	0.00	0.00	0.00
16,600.00	90.04	270.28	6,981.42	1,834.73	-9,657.01	9,665.86	0.00	0.00	0.00
16,700.00	90.04	270.28	6,981.35	1,835.22	-9,757.01	9,765.86	0.00	0.00	0.00
16,800.00	90.04	270.28	6,981.27	1,835.70	-9,857.01	9,865.86	0.00	0.00	0.00
16,900.00	90.04	270.28	6,981.20	1,836.19	-9,957.00	9,965.86	0.00	0.00	0.00
17,000.00	90.04	270.28	6,981.12	1,836.68	-10,057.00	10,065.86	0.00	0.00	0.00
17,100.00	90.04	270.28	6,981.05	1,837.17	-10,157.00	10,165.86	0.00	0.00	0.00
17,200.00	90.04	270.28	6,980.97	1,837.65	-10,257.00	10,265.86	0.00	0.00	0.00
17,300.00	90.04	270.28	6,980.90	1,838.14	-10,357.00	10,365.86	0.00	0.00	0.00
17,400.00	90.04	270.28	6,980.82	1,838.63	-10,457.00	10,465.86	0.00	0.00	0.00
17,500.00	90.04	270.28	6,980.75	1,839.12	-10,557.00	10,565.86	0.00	0.00	0.00
17,600.00	90.04	270.28	6,980.67	1,839.60	-10,657.00	10,665.86	0.00	0.00	0.00
17,700.00	90.04	270.28	6,980.60	1,840.09	-10,756.99	10,765.86	0.00	0.00	0.00
17,800.00	90.04	270.28	6,980.53	1,840.58	-10,856.99	10,865.86	0.00	0.00	0.00
17,900.00	90.04	270.28	6,980.45	1,841.07	-10,956.99	10,965.86	0.00	0.00	0.00
18,000.00	90.04	270.28	6,980.38	1,841.56	-11,056.99	11,065.86	0.00	0.00	0.00
18,100.00	90.04	270.28	6,980.30	1,842.04	-11,156.99	11,165.86	0.00	0.00	0.00
18,200.00	90.04	270.28	6,980.23	1,842.53	-11,256.99	11,265.86	0.00	0.00	0.00
18,300.00	90.04	270.28	6,980.15	1,843.02	-11,356.99	11,365.86	0.00	0.00	0.00
18,400.00	90.04	270.28	6,980.08	1,843.51	-11,456.99	11,465.86	0.00	0.00	0.00
18,500.00	90.04	270.28	6,980.00	1,843.99	-11,556.98	11,565.86	0.00	0.00	0.00
18,600.00	90.04	270.28	6,979.93	1,844.48	-11,656.98	11,665.86	0.00	0.00	0.00
18,700.00	90.04	270.28	6,979.85	1,844.97	-11,756.98	11,765.86	0.00	0.00	0.00
18,800.00	90.04	270.28	6,979.78	1,845.46	-11,856.98	11,865.86	0.00	0.00	0.00
18,900.00	90.04	270.28	6,979.71	1,845.94	-11,956.98	11,965.86	0.00	0.00	0.00
19,000.00	90.04	270.28	6,979.63	1,846.43	-12,056.98	12,065.86	0.00	0.00	0.00
19,100.00	90.04	270.28	6,979.56	1,846.92	-12,156.98	12,165.86	0.00	0.00	0.00
19,200.00	90.04	270.28	6,979.48	1,847.41	-12,256.98	12,265.86	0.00	0.00	0.00
19,300.00	90.04	270.28	6,979.41	1,847.90	-12,356.97	12,365.86	0.00	0.00	0.00
19,400.00	90.04	270.28	6,979.33	1,848.38	-12,456.97	12,465.86	0.00	0.00	0.00
19,500.00	90.04	270.28	6,979.26	1,848.87	-12,556.97	12,565.86	0.00	0.00	0.00
19,600.00	90.04	270.28	6,979.18	1,849.36	-12,656.97	12,665.86	0.00	0.00	0.00
19,700.00	90.04	270.28	6,979.11	1,849.85	-12,756.97	12,765.86	0.00	0.00	0.00
19,800.00	90.04	270.28	6,979.03	1,850.33	-12,856.97	12,865.86	0.00	0.00	0.00
19,900.00	90.04	270.28	6,978.96	1,850.82	-12,956.97	12,965.86	0.00	0.00	0.00
20,000.00	90.04	270.28	6,978.89	1,851.31	-13,056.97	13,065.86	0.00	0.00	0.00
20,100.00	90.04	270.28	6,978.81	1,851.80	-13,156.97	13,165.86	0.00	0.00	0.00
20,200.00	90.04	270.28	6,978.74	1,852.29	-13,256.96	13,265.86	0.00	0.00	0.00
20,300.00	90.04	270.28	6,978.66	1,852.77	-13,356.96	13,365.86	0.00	0.00	0.00
20,400.00	90.04	270.28	6,978.59	1,853.26	-13,456.96	13,465.86	0.00	0.00	0.00
20,500.00	90.04	270.28	6,978.51	1,853.75	-13,556.96	13,565.86	0.00	0.00	0.00
20,600.00	90.04	270.28	6,978.44	1,854.24	-13,656.96	13,665.86	0.00	0.00	0.00
20,700.00	90.04	270.28	6,978.36	1,854.72	-13,756.96	13,765.86	0.00	0.00	0.00
20,800.00	90.04	270.28	6,978.29	1,855.21	-13,856.96	13,865.86	0.00	0.00	0.00
20,900.00	90.04	270.28	6,978.21	1,855.70	-13,956.96	13,965.86	0.00	0.00	0.00
21,000.00	90.04	270.28	6,978.14	1,856.19	-14,056.95	14,065.86	0.00	0.00	0.00
21,100.00	90.04	270.28	6,978.07	1,856.67	-14,156.95	14,165.86	0.00	0.00	0.00
21,200.00	90.04	270.28	6,977.99	1,857.16	-14,256.95	14,265.86	0.00	0.00	0.00
21,300.00	90.04	270.28	6,977.92	1,857.65	-14,356.95	14,365.86	0.00	0.00	0.00
21,400.00	90.04	270.28	6,977.84	1,858.14	-14,456.95	14,465.86	0.00	0.00	0.00
21,500.00	90.04	270.28	6,977.77	1,858.63	-14,556.95	14,565.86	0.00	0.00	0.00
21,600.00	90.04	270.28	6,977.69	1,859.11	-14,656.95	14,665.86	0.00	0.00	0.00

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #674H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

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)
21,700.00	90.04	270.28	6,977.62	1,859.60	-14,756.95	14,765.86	0.00	0.00	0.00
21,800.00	90.04	270.28	6,977.54	1,860.09	-14,856.94	14,865.86	0.00	0.00	0.00
21,900.00	90.04	270.28	6,977.47	1,860.58	-14,956.94	14,965.86	0.00	0.00	0.00
22,000.00	90.04	270.28	6,977.39	1,861.06	-15,056.94	15,065.86	0.00	0.00	0.00
22,100.00	90.04	270.28	6,977.32	1,861.55	-15,156.94	15,165.86	0.00	0.00	0.00
22,200.00	90.04	270.28	6,977.25	1,862.04	-15,256.94	15,265.86	0.00	0.00	0.00
22,300.00	90.04	270.28	6,977.17	1,862.53	-15,356.94	15,365.86	0.00	0.00	0.00
22,400.00	90.04	270.28	6,977.10	1,863.01	-15,456.94	15,465.86	0.00	0.00	0.00
22,500.00	90.04	270.28	6,977.02	1,863.50	-15,556.94	15,565.86	0.00	0.00	0.00
22,529.62	90.04	270.28	6,977.00	1,863.65	-15,586.55	15,595.47	0.00	0.00	0.00
TD at 22529.61									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
RU #674 SHL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,154,244.01	2,854,618.56	36.919248	-107.383388
RU #674 KOP - plan hits target center - Point	0.00	0.00	6,392.00	1,094.51	-45.59	2,155,338.29	2,854,567.81	36.922254	-107.383544
RU #674 PBHL - plan hits target center - Point	0.00	0.00	6,977.00	1,863.65	-15,586.55	2,156,034.11	2,839,023.39	36.924355	-107.436712
RU #674 IP - plan hits target center - Point	0.00	0.00	6,987.18	1,797.04	-1,929.26	2,156,031.93	2,852,680.84	36.924184	-107.389988
RU #674 POE - plan hits target center - Point	0.00	0.00	6,988.22	1,449.91	-576.27	2,155,691.18	2,854,035.45	36.923231	-107.385360

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit #674H
Company:	Logos Operating LLC	TVD Reference:	6347+30 @ 6377.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6347+30 @ 6377.00usft (H&P 530)
Site:	Rosa Unit 34	North Reference:	True
Well:	Rosa Unit #674H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 5		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,470.38	2,439.00	Ojo Alamo				
2,592.88	2,559.00	Kirtland				
2,898.13	2,858.00	Fruitland				
3,044.12	3,001.00	Top of Coals				
3,213.58	3,167.00	Base of Coals				
3,418.78	3,368.00	Pictured Cliffs				
3,523.93	3,471.00	Lewis				
4,726.54	4,649.00	Chacra				
5,198.19	5,111.00	Upper Cliff House				
5,519.76	5,426.00	Cliff House				
5,555.46	5,461.00	Menefee				
5,732.64	5,635.00	Point Lookout				
6,343.04	6,238.00	Mancos				
6,981.39	6,817.00	Black Top				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
550.00	550.00	0.00	0.00	Start Build 2.00	
1,130.50	1,126.54	58.56	-2.44	Start 4362.73 hold at 1130.50 MD	
5,493.23	5,400.00	935.80	-38.98	Start DLS 0.50 TFO -180.00	
6,498.19	6,392.00	1,094.51	-45.59	Start DLS 9.00 TFO -59.28	
7,461.13	6,988.22	1,449.91	-576.27	Start DLS 2.00 TFO -89.98	
8,872.16	6,987.18	1,797.04	-1,929.26	Start 13657.46 hold at 8872.16 MD	
22,529.62	6,977.00	1,863.65	-15,586.55	TD at 22529.61	

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

General Information
Phone: (505) 629-6116

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

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

CONDITIONS

Action 471321

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 471321
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
etta trujillo	Cement is required to circulate on both surface and intermediate1 strings of casing.	6/5/2025
etta trujillo	If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing.	6/5/2025
ward.rikala	Notify the OCD 24 hours prior to casing & cement.	7/15/2025
ward.rikala	File As Drilled C-102 and a directional Survey with C-104 completion packet.	7/15/2025
ward.rikala	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string.	7/15/2025
ward.rikala	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.	7/15/2025