

Form 3160-5
(June 2019)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.5. Lease Serial No.
NMSF078768
6. If Indian, Allottee or Tribe Name**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

LOGOS OPERATING, LLC

3a. Address 2010 AFTON PLACE
FARMINGTON, NM 874013b. Phone No. (include area code)
(505) 278-87204. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC 36 T31N R05W NWNW (D) 550 FNL 475 FWL7. If Unit of CA/Agreement, Name and/or No.
NMNM78407E8. Well Name and No.
ROSA UNIT 836H9. API Well No.
30-039-3142210. Field and Pool or Exploratory Area
BASIN MANCOS11. Country or Parish, State
RIO ARRIBA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION				
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off	
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity	
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other	
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon		
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal		

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

LOGOS Operating request a change in plans for the following:

Original surface location from 537' FNL & 483' FWL to new **surface location 550' FNL & 475' FWL**Original TD @ 17,045' MD 7,148' TVD to new **TD @ 17,057' MD 7,163' TVD**

Geology tops have been updated per changes.

Original KOP @ 6,479' MD 6,461' TVD to new **KOP @ 6,493' MD 6,475' TVD**Original Landing point @ 7,530' MD 7,148' TVD to new **Landing point @ 7,542' MD 7,161' TVD**Original 9.625" Intermediate casing @ 6,431' to new **Intermediate casing @ 6,484' MD**Original 5.5" Production casing @ 17,045' MD to new **Production 5.5" casing @ 17,057' MD**

The 5.5" production cementing bbls and sacks have been updated per casing depth change.

Attached: New C102, Operation and Directional Drill plans.

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

Etta Trujillo

Title Regulatory Specialist

Signature *Etta Trujillo*

Date 9/08/2023

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

Office

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

(Instructions on page 2)

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 36 / NWNW /	County or Parish/State:
Well Number: 836H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF78768	Unit or CA Name: ROSA UNIT	Unit or CA Number: NMNM78407E
US Well Number: 3003931422	Well Status: Approved Application for Permit to Drill	Operator: LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2750329

Type of Submission: Notice of Intent

Type of Action: Drilling Operations

Date Sundry Submitted: 09/08/2023

Time Sundry Submitted: 02:20

Date proposed operation will begin: 09/08/2023

Procedure Description: LOGOS Operating request a change in plans for the following: Original surface location from 537' FNL & 483' FWL to new surface location 550' FNL & 475' FWL Original TD @ 17,045' MD 7,148' TVD to new TD @ 17,057' MD 7,163' TVD Geology tops have been updated per changes. Original KOP @ 6,479' MD 6,461' TVD to new KOP @ 6,493' MD 6,475' TVD Original Landing point @ 7,530' MD 7,148' TVD to new Landing point @ 7,542' MD 7,161' TVD Original 9.625" Intermediate casing @ 6,431' to new Intermediate casing @ 6,484' MD Original 5.5" Production casing @ 17,045' MD to new Production 5.5" casing @ 17,057' MD The 5.5" production cementing bbls and sacks have been updated per casing depth change. Attached: New C102, Operation and Directional Drill plans.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

3160_5_Rosa_Unit_836H_Plan_3_Change_in_Plan_20230907_20230908141929.pdf

Well Name: ROSA UNIT

Well Location: T31N / R5W / SEC 36 /
NWNW /

County or Parish/State:

Well Number: 836H

Type of Well: CONVENTIONAL GAS
WELL

Allottee or Tribe Name:

Lease Number: NMSF78768

Unit or CA Name: ROSA UNIT

Unit or CA Number:
NMNM78407E

US Well Number: 3003931422

Well Status: Approved Application for
Permit to DrillOperator: LOGOS OPERATING
LLC**Operator**

I certify that the foregoing is true and correct. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: ETTA TRUJILLO

Signed on: SEP 08, 2023 02:20 PM

Name: LOGOS OPERATING LLC

Title: Regulatory Specialist

Street Address: 2010 AFTON PLACE

City: Farmington

State: NM

Phone: (505) 324-4154

Email address: ETRUJILLO@LOGOSRESOURCESLLC.COM

Field

Representative Name:

Street Address:

City:

State:

Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: KENNETH G RENNICK

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5055647742

BLM POC Email Address: krennick@blm.gov

Disposition: Approved

Disposition Date: 09/08/2023

Signature: Kenneth Rennick

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

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-039-31422		2 Pool Code 97232	3 Pool Name BASIN MANCOS
4 Property Code 320608	5 Property Name ROSA UNIT		6 Well Number 836H
7 OGRID No. 289408	8 Operator Name LOGOS OPERATING, LLC		9 Elevation 6563'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	36	31N	5W		550	NORTH	475	WEST	RIO ARriba

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	31	31N	4W		526	NORTH	153	EAST	RIO ARriba

12 Dedicated Acres 627.31	N/2 - Section 36, T31N, R5W N/2 - Section 31, T31N, R4W	13 Joint or Infill	14 Consolidation Code	15 Order No. R-13457
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SURFACE LOCATION (A) 550' FNL 475' FWL SECTION 36, T31N, R5W LAT 36.861851°N LONG -107.320351°W DATUM: NAD1927 LAT 36.861857°N LONG -107.320952°W DATUM: NAD1983	FIRST TAKE POINT (B) 505' FNL 655' FWL SECTION 36, T31N, R5W LAT 36.861974°N LONG -107.319734°W DATUM: NAD1927 LAT 36.861980°N LONG -107.320335°W DATUM: NAD1983	FIRST PERFORATION (C) 524' FNL 330' FEL SECTION 31, T31N, R4W LAT 36.861910°N LONG -107.287815°W DATUM: NAD1927 LAT 36.861917°N LONG -107.288415°W DATUM: NAD1983	LAST TAKE POINT (D) 526' FNL 153' FEL SECTION 31, T31N, R4W LAT 36.861909°N LONG -107.287210°W DATUM: NAD1927 LAT 36.861915°N LONG -107.287810°W DATUM: NAD1983
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17 OPERATOR CERTIFICATION
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

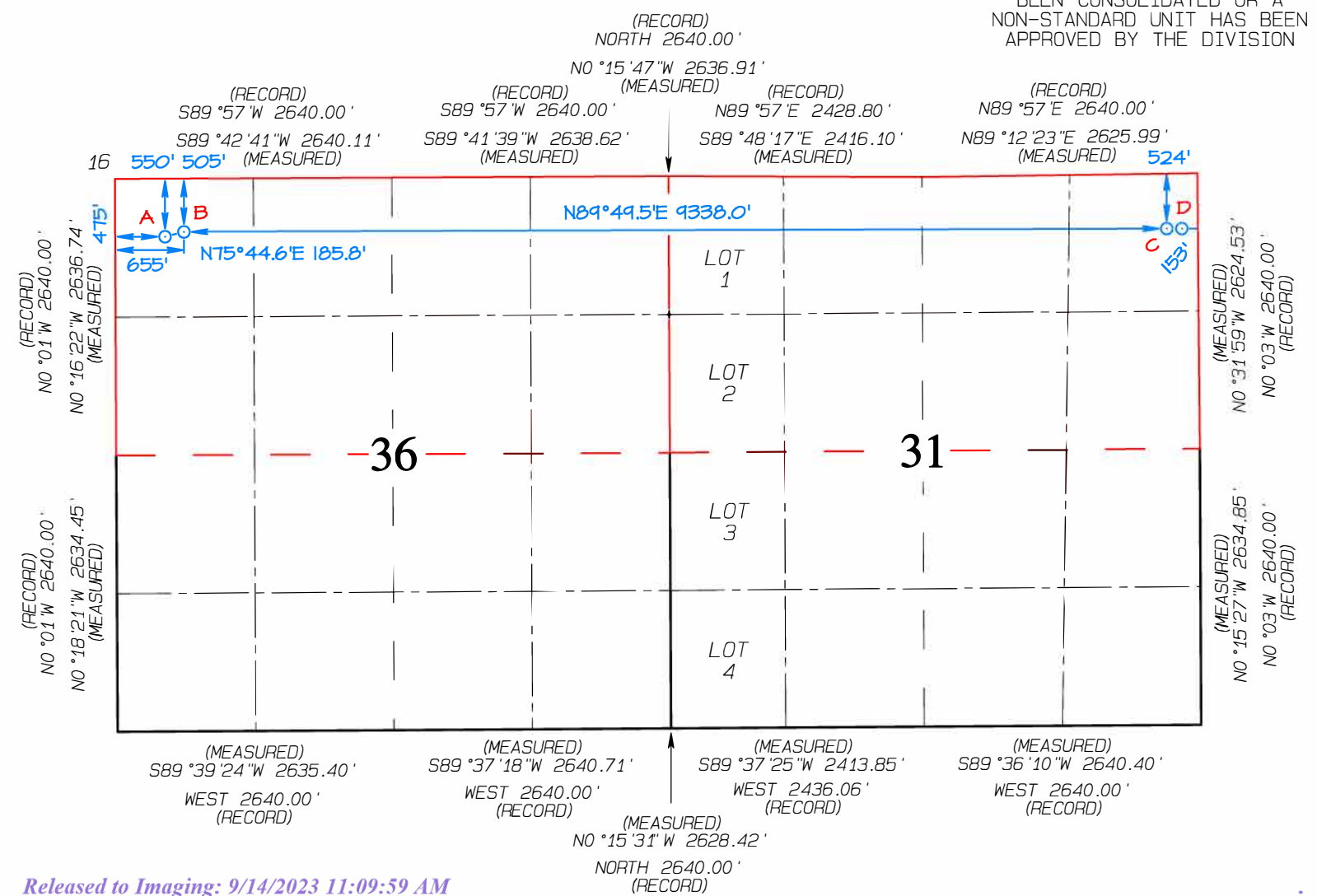
Signature Etta Trujillo Date 9/7/2023
Printed Name
Etta Trujillo
E-mail Address
etrujillo@logoresourcesllc.com

18 SURVEYOR CERTIFICATION
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.
Date Revised: AUGUST 25, 2023
Date of Survey: APRIL 20, 2016
Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

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





LOGOS Operating, LLC Operations Plan

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

Date:	September 8, 2023	Pool:	Basin Mancos
Well Name:	Rosa Unit 836H	GL Elevation:	6,563'
Surface Location:	Sec 36, T31N, R5W 550 FNL, 475 FWL (36.861857° N, 107.320952° W – NAD83)	Measured Depth:	17057' (RKB – 30')
Bottom Hole Location:	Sec 31, T31N, R4W 526 FNL, 153 FEL (36.861915° N, 107.287810° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF78768, CA Serial #NMNM78407E

I. GEOLOGY

A. Formation Tops (Based on 30'KB Elevation): Estimated top of important geological markers:
SURFACE FORMATION – NACIMIENTO

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,768'	2,762'	*POINT LOOKOUT	5,864'	5,848'
KIRTLAND	2,892'	2,885'	*MANCOS	6,409'	6,392'
*FRUITLAND	3,267'	3,259'	KICKOFF POINT	6,493'	6,475'
*PICTURED CLIFFS	3,621'	3,612'	LANDING POINT	7542'	7161'
LEWIS	3,721'	3,711'			
CHACRA	4,837'	4,824'			
*CLIFF HOUSE	5,647'	5,632'			
MENEFEE	5,681'	5,666'	TD	17,057'	7,163'

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

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

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

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

II. DRILLING

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

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

ROSA UNIT 836H



- B. BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing strings to one-third of internal yield pressure not to exceed **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 on each tour. BOP equipment will be tested a minimum of 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 but not more than once daily. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of the BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when 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 the first full test.
- C. GeoHazards:** There are no anticipated geohazards
- D. Maximum Anticipated Pressure:** 7163' TVD x 0.43 = 3080 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)	GL DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	320' or greater	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,484'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17057'	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:

- SURFACE CASING:** 13-3/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
- INTERMEDIATE CASING:** 9-5/8" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,000ft., 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. The operational use of an external casing packer may be utilized and placed below the DV tool(s), if a DV tool is utilized.
- 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. The centralizer program will be determined by wellbore conditions. Production casing to

ROSA UNIT 836H



be pressure tested during completion operations with frac stack installed.

C. CEMENTING:

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

1. SURFACE: Casing shall be set at ~ 331' BGL (361' RKB) and cemented to surface. TOC at Surface.
303 sks of 15.8 ppg Type Neat G, 1.15 cuft/sk yield or equivalent 250 sks of 14.6 ppg Type III with 1.39 cuft/sk yield, 30% excess.
2. INTERMEDIATE: Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. Operator proposes optional DV tools above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. If losses are not observed during the second stage a cancellation plug will be pumped and the remaining cement will be pumped during stage 2. If cement does not circulate to the DV tool(s) or to surface, a CBL will be run to determine TOC.

	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,984	500	0.31321	1.3	221	39	1.15	192	15.8
Stage 1 Lead	4,887	1,098	0.31321	1.3	447	80	1.97	227	12.4
					668	119		419	
Stage 2 Tail	4,287	600	0.31321	1.3	244	44	1.65	148	13.2
Stage 2 Lead	3,317	970	0.31321	1.3	395	70	1.97	200	12.4
					639	114		348	
Stage 3 Tail	2,667	650	0.31321	1.3	265	47	1.65	160	13.2
Stage 3 Lead	361	2,306	0.31321	1.3	939	167	1.97	477	12.4
Stage 3 Lead	-	361	0.36268	1	131	23	1.97	67	12.4
					1,334	238		703	
					2,642	471		1,471	

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

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

	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased hole Tail	6,384	100	0.2531	1	25	5	1.56	16	13.2
Open Hole Tail	6,484	10,573	0.2291	1.15	2,796	498	1.56	1,792	13.2
					2,821	502		1,809	

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 1576 psi (0.22 psi/ft * 7,163' TVD) for 30 minutes. Increase pressure to Open Toe sleeves.

D. STIMULATION

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

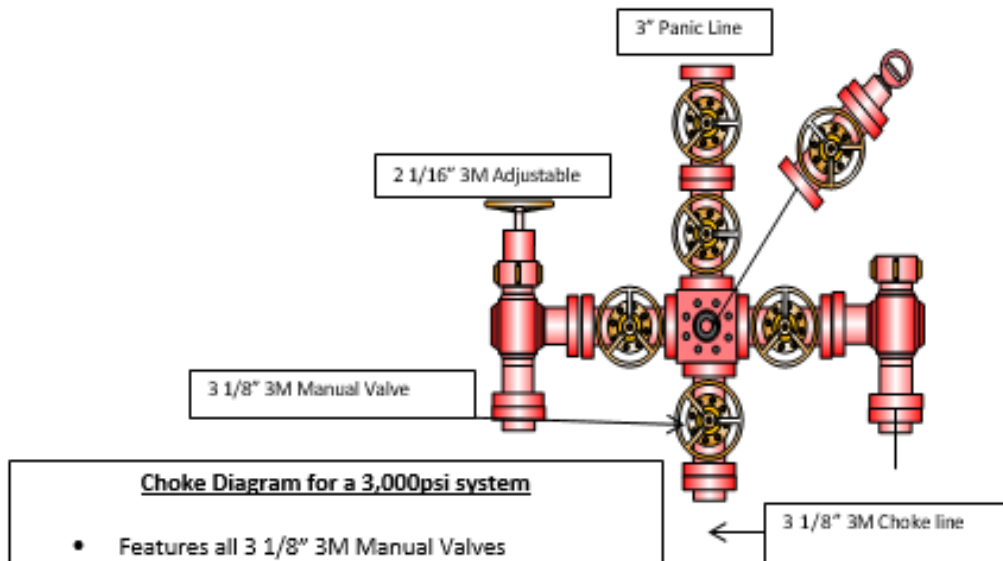
E. PRODUCTION TUBING

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 12-18 months after completion.

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

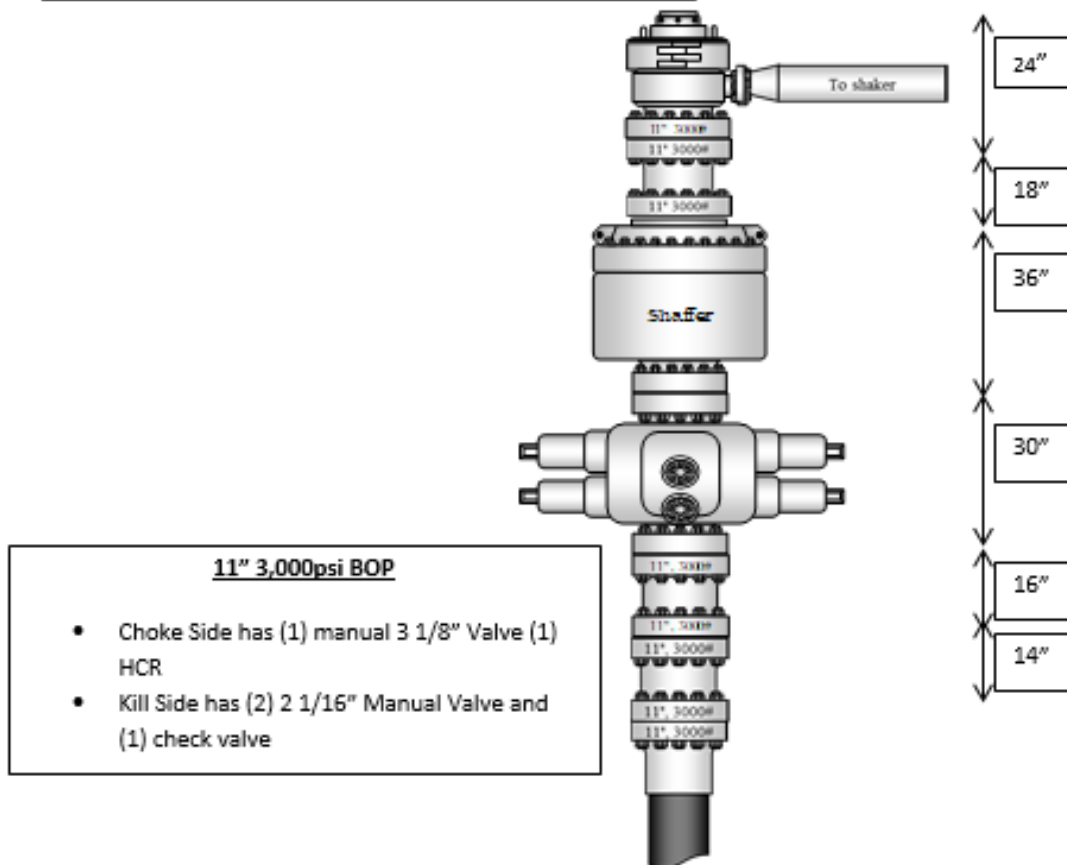


3M 11" B.O.P.E Diagram



Choke Diagram for a 3,000psi system

- Features all 3 1/8" 3M Manual Valves
- Two 2 1/16" Manual Adjustable Choke Valves
- 3" Panic Line and 2" Vent lines
- (2) 3 1/8" 3M ~~Coflex~~ Hose f/Choke to BOP



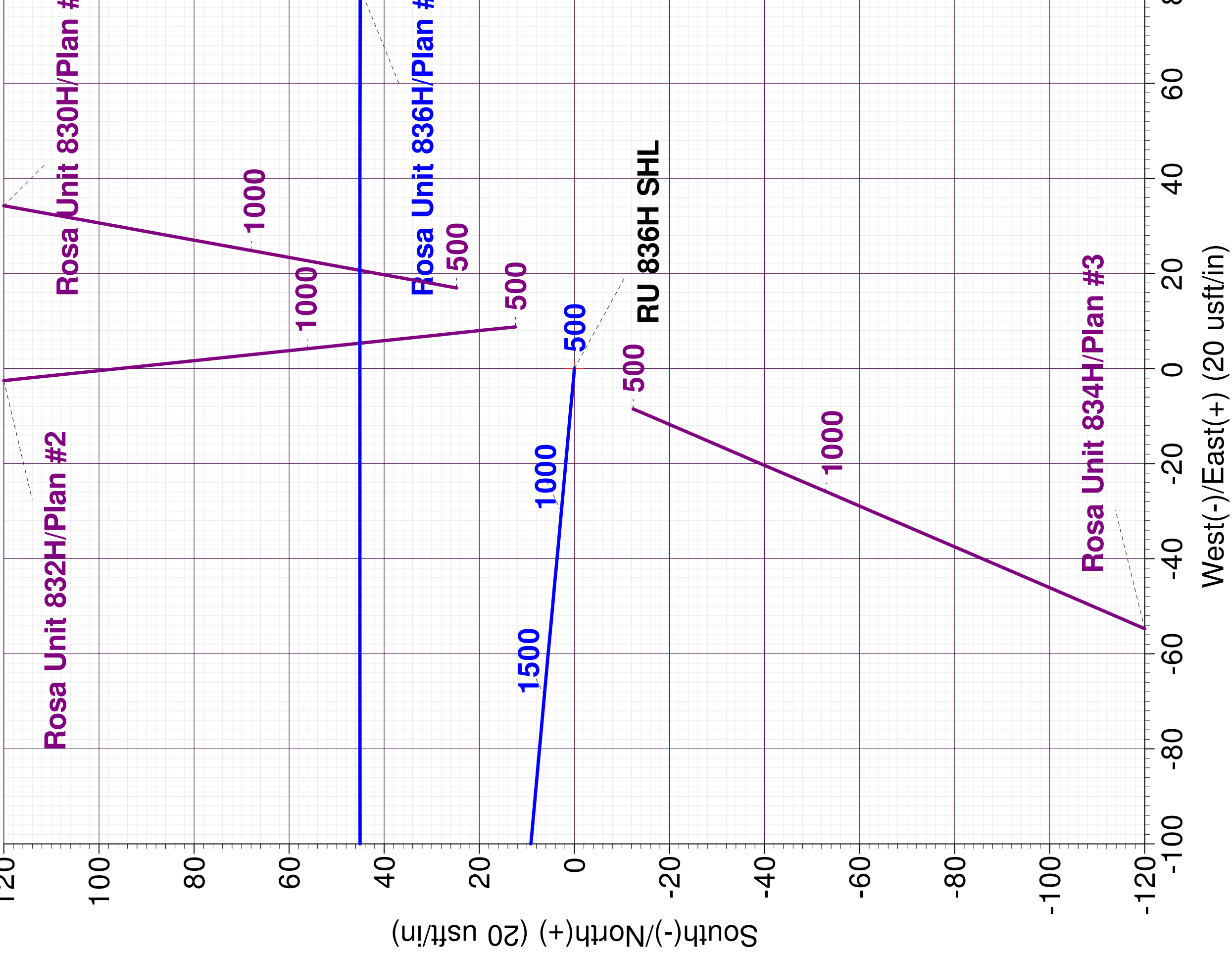
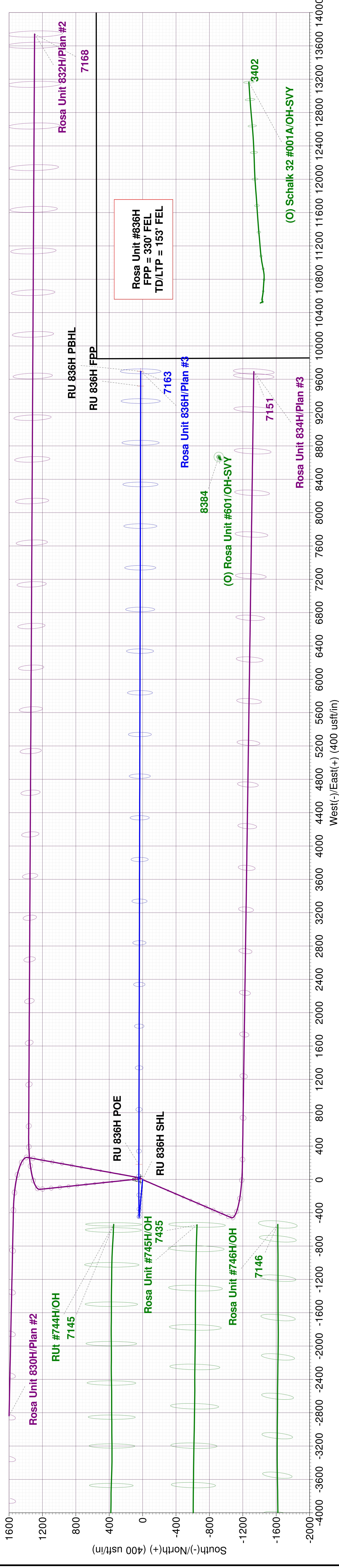
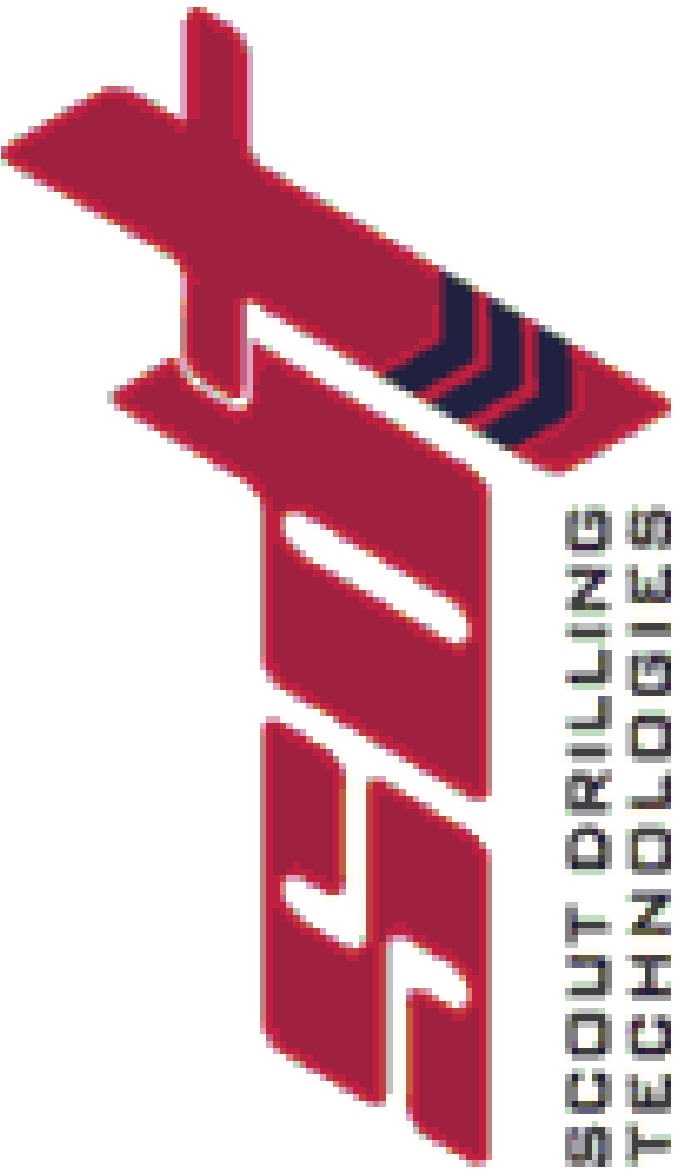
11" 3,000psi BOP

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

ROSA UNIT 836H



County: Rio Arriba, NM (NAD83)
Site: Rosa Unit 42
Well: Rosa Unit 836H
Depth Reference: 6563+30 @ 6593.00usft (H&P 530)
Rig: H&P 530
Plan: Plan #3
Job #: Prelim



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
3	722.35	4.45	275.24	722.13	0.79	-8.59	2.00	275.24	-8.59	Start 5770.47 hold at 722.35 MD
4	6492.83	4.45	275.24	6475.23	41.62	-454.15	0.00	0.00	-454.25	Start DLS 9.00 TFO 174.88
5	7541.91	89.99	90.13	7161.00	44.89	180.44	9.00	174.88	180.34	Start 9338.07 hold at 7541.91 MD
6	16879.97	89.99	90.13	7162.96	23.29	9518.48	0.00	0.00	9518.40	FPP @ 330' FEL
7	17056.99	89.99	90.13	7163.00	22.88	9695.50	0.00	0.00	9695.42	TD at 17056.99 @ 153' FEL

DESIGN TARGET DETAILS

Name	MD	Inc	Azi	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
RU 836H SHL				0.00	0.00	0.00	2133441.96	2872981.98	36.861857	-107.320952
RU 836H POE				7161.00	44.89	180.44	2133487.82	2873162.18	36.861980	-107.320335
RU 836H FPP				7162.96	23.29	9518.48	2133516.32	2882500.20	36.861917	-107.288415
RU 836H PBHL				7163.00	22.90	9695.50	2133516.88	2882677.22	36.861915	-107.287810

T

M

A

N

Azimuths to True North

Magnetic North: 8.46°

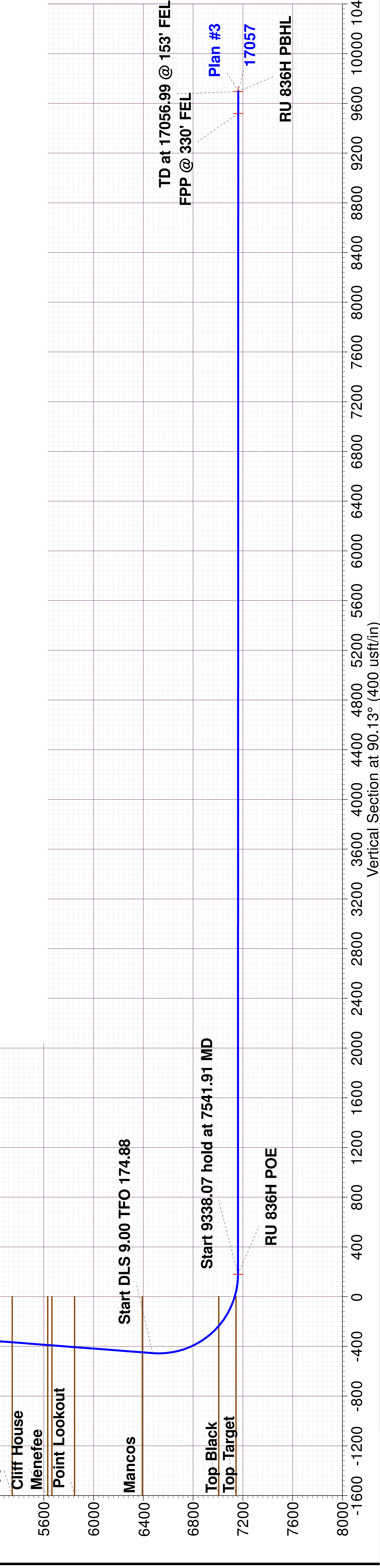
Magnetic Field Strength: 49495.6nT

Dip Angle: 63.43°

Date: 8/18/2023

Model: IGRF-2015

TOTAL CORRECTION: 8.46°



TVDPath	MDPath	Formation
2762.00	2768.38	Ojo Alamo
2885.00	2891.75	Kirtland
3259.00	3266.88	Fruitland
3300.00	3308.01	Top of Coals
3388.00	3396.27	Base of Coals
3612.00	3620.95	Pictured Cliffs
3711.00	3720.25	Lewis
4824.00	4836.61	Chacra
5347.00	5361.19	Upper Cliff House
5632.00	5647.05	Cliff House
5666.00	5681.15	Menefee
5848.00	5863.70	Point Lookout
6392.00	6409.34	Mancos
7006.00	7088.25	Top Black
7145.00	7399.01	Top Target

Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 42

Rosa Unit 836H

OH

Plan: Plan #3

Standard Planning Report

07 September, 2023

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 836H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

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

Site	Rosa Unit 42				
Site Position:		Northing:	2,133,465.56 usft	Latitude:	36.861919
From:	Lat/Long	Easting:	2,873,174.65 usft	Longitude:	-107.320293
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Rosa Unit 836H					
Well Position	+N/-S	0.00 usft	Northing:	2,133,441.96 usft	Latitude:	36.861857
	+E/-W	0.00 usft	Easting:	2,872,981.99 usft	Longitude:	-107.320952
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	6,563.00 usft
Grid Convergence:		0.31 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/18/2023	8.46	63.43	49,495.62268365

Design	Plan #3				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	90.13	

Plan Survey Tool Program	Date	8/22/2023			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	17,056.99 Plan #3 (OH)	B001Mb_MWD+HRGM		
			OWSG MWD + HRGM		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
722.35	4.45	275.24	722.13	0.79	-8.59	2.00	2.00	0.00	275.24	
6,492.83	4.45	275.24	6,475.23	41.62	-454.15	0.00	0.00	0.00	0.00	
7,541.91	89.99	90.13	7,161.00	44.89	180.44	9.00	8.15	16.67	174.88	RU 836H POE
16,879.97	89.99	90.13	7,162.96	23.29	9,518.48	0.00	0.00	0.00	0.00	RU 836H FPP
17,056.99	89.99	90.13	7,163.00	22.88	9,695.50	0.00	0.00	0.00	0.00	RU 836H PBHL

SDT

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Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
600.00	2.00	275.24	599.98	0.16	-1.74	-1.74	2.00	2.00	0.00
700.00	4.00	275.24	699.84	0.64	-6.95	-6.95	2.00	2.00	0.00
722.35	4.45	275.24	722.13	0.79	-8.59	-8.59	2.00	2.00	0.00
Start 5770.47 hold at 722.35 MD									
800.00	4.45	275.24	799.54	1.34	-14.58	-14.59	0.00	0.00	0.00
900.00	4.45	275.24	899.24	2.04	-22.31	-22.31	0.00	0.00	0.00
1,000.00	4.45	275.24	998.94	2.75	-30.03	-30.03	0.00	0.00	0.00
1,100.00	4.45	275.24	1,098.64	3.46	-37.75	-37.76	0.00	0.00	0.00
1,200.00	4.45	275.24	1,198.34	4.17	-45.47	-45.48	0.00	0.00	0.00
1,300.00	4.45	275.24	1,298.04	4.87	-53.19	-53.20	0.00	0.00	0.00
1,400.00	4.45	275.24	1,397.74	5.58	-60.91	-60.93	0.00	0.00	0.00
1,500.00	4.45	275.24	1,497.44	6.29	-68.63	-68.65	0.00	0.00	0.00
1,600.00	4.45	275.24	1,597.13	7.00	-76.36	-76.37	0.00	0.00	0.00
1,700.00	4.45	275.24	1,696.83	7.70	-84.08	-84.09	0.00	0.00	0.00
1,800.00	4.45	275.24	1,796.53	8.41	-91.80	-91.82	0.00	0.00	0.00
1,900.00	4.45	275.24	1,896.23	9.12	-99.52	-99.54	0.00	0.00	0.00
2,000.00	4.45	275.24	1,995.93	9.83	-107.24	-107.26	0.00	0.00	0.00
2,100.00	4.45	275.24	2,095.63	10.53	-114.96	-114.99	0.00	0.00	0.00
2,200.00	4.45	275.24	2,195.33	11.24	-122.68	-122.71	0.00	0.00	0.00
2,300.00	4.45	275.24	2,295.03	11.95	-130.41	-130.43	0.00	0.00	0.00
2,400.00	4.45	275.24	2,394.73	12.66	-138.13	-138.16	0.00	0.00	0.00
2,500.00	4.45	275.24	2,494.43	13.36	-145.85	-145.88	0.00	0.00	0.00
2,600.00	4.45	275.24	2,594.12	14.07	-153.57	-153.60	0.00	0.00	0.00
2,700.00	4.45	275.24	2,693.82	14.78	-161.29	-161.33	0.00	0.00	0.00
2,768.38	4.45	275.24	2,762.00	15.26	-166.57	-166.61	0.00	0.00	0.00
Ojo Alamo									
2,800.00	4.45	275.24	2,793.52	15.49	-169.01	-169.05	0.00	0.00	0.00
2,891.75	4.45	275.24	2,885.00	16.14	-176.10	-176.13	0.00	0.00	0.00
Kirtland									
2,900.00	4.45	275.24	2,893.22	16.19	-176.73	-176.77	0.00	0.00	0.00
3,000.00	4.45	275.24	2,992.92	16.90	-184.46	-184.49	0.00	0.00	0.00
3,100.00	4.45	275.24	3,092.62	17.61	-192.18	-192.22	0.00	0.00	0.00
3,200.00	4.45	275.24	3,192.32	18.32	-199.90	-199.94	0.00	0.00	0.00
3,266.88	4.45	275.24	3,259.00	18.79	-205.06	-205.11	0.00	0.00	0.00
Fruitland									
3,300.00	4.45	275.24	3,292.02	19.02	-207.62	-207.66	0.00	0.00	0.00
3,308.01	4.45	275.24	3,300.00	19.08	-208.24	-208.28	0.00	0.00	0.00
Top of Coals									
3,396.27	4.45	275.24	3,388.00	19.71	-215.05	-215.10	0.00	0.00	0.00
Base of Coals									
3,400.00	4.45	275.24	3,391.72	19.73	-215.34	-215.39	0.00	0.00	0.00
3,500.00	4.45	275.24	3,491.41	20.44	-223.06	-223.11	0.00	0.00	0.00
3,600.00	4.45	275.24	3,591.11	21.15	-230.79	-230.83	0.00	0.00	0.00
3,620.95	4.45	275.24	3,612.00	21.30	-232.40	-232.45	0.00	0.00	0.00
Pictured Cliffs									
3,700.00	4.45	275.24	3,690.81	21.85	-238.51	-238.56	0.00	0.00	0.00

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Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,720.25	4.45	275.24	3,711.00	22.00	-240.07	-240.12	0.00	0.00	0.00	
Lewis										
3,800.00	4.45	275.24	3,790.51	22.56	-246.23	-246.28	0.00	0.00	0.00	
3,900.00	4.45	275.24	3,890.21	23.27	-253.95	-254.00	0.00	0.00	0.00	
4,000.00	4.45	275.24	3,989.91	23.98	-261.67	-261.72	0.00	0.00	0.00	
4,100.00	4.45	275.24	4,089.61	24.69	-269.39	-269.45	0.00	0.00	0.00	
4,200.00	4.45	275.24	4,189.31	25.39	-277.11	-277.17	0.00	0.00	0.00	
4,300.00	4.45	275.24	4,289.01	26.10	-284.84	-284.89	0.00	0.00	0.00	
4,400.00	4.45	275.24	4,388.70	26.81	-292.56	-292.62	0.00	0.00	0.00	
4,500.00	4.45	275.24	4,488.40	27.52	-300.28	-300.34	0.00	0.00	0.00	
4,600.00	4.45	275.24	4,588.10	28.22	-308.00	-308.06	0.00	0.00	0.00	
4,700.00	4.45	275.24	4,687.80	28.93	-315.72	-315.79	0.00	0.00	0.00	
4,800.00	4.45	275.24	4,787.50	29.64	-323.44	-323.51	0.00	0.00	0.00	
4,836.61	4.45	275.24	4,824.00	29.90	-326.27	-326.34	0.00	0.00	0.00	
Chacra										
4,900.00	4.45	275.24	4,887.20	30.35	-331.16	-331.23	0.00	0.00	0.00	
5,000.00	4.45	275.24	4,986.90	31.05	-338.89	-338.96	0.00	0.00	0.00	
5,100.00	4.45	275.24	5,086.60	31.76	-346.61	-346.68	0.00	0.00	0.00	
5,200.00	4.45	275.24	5,186.30	32.47	-354.33	-354.40	0.00	0.00	0.00	
5,300.00	4.45	275.24	5,286.00	33.18	-362.05	-362.12	0.00	0.00	0.00	
5,361.19	4.45	275.24	5,347.00	33.61	-366.77	-366.85	0.00	0.00	0.00	
Upper Cliff House										
5,400.00	4.45	275.24	5,385.69	33.88	-369.77	-369.85	0.00	0.00	0.00	
5,500.00	4.45	275.24	5,485.39	34.59	-377.49	-377.57	0.00	0.00	0.00	
5,600.00	4.45	275.24	5,585.09	35.30	-385.21	-385.29	0.00	0.00	0.00	
5,647.05	4.45	275.24	5,632.00	35.63	-388.85	-388.93	0.00	0.00	0.00	
Cliff House										
5,681.15	4.45	275.24	5,666.00	35.87	-391.48	-391.56	0.00	0.00	0.00	
Menefee										
5,700.00	4.45	275.24	5,684.79	36.01	-392.94	-393.02	0.00	0.00	0.00	
5,800.00	4.45	275.24	5,784.49	36.71	-400.66	-400.74	0.00	0.00	0.00	
5,863.70	4.45	275.24	5,848.00	37.16	-405.58	-405.66	0.00	0.00	0.00	
Point Lookout										
5,900.00	4.45	275.24	5,884.19	37.42	-408.38	-408.46	0.00	0.00	0.00	
6,000.00	4.45	275.24	5,983.89	38.13	-416.10	-416.19	0.00	0.00	0.00	
6,100.00	4.45	275.24	6,083.59	38.84	-423.82	-423.91	0.00	0.00	0.00	
6,200.00	4.45	275.24	6,183.29	39.54	-431.54	-431.63	0.00	0.00	0.00	
6,300.00	4.45	275.24	6,282.98	40.25	-439.26	-439.35	0.00	0.00	0.00	
6,400.00	4.45	275.24	6,382.68	40.96	-446.99	-447.08	0.00	0.00	0.00	
6,409.34	4.45	275.24	6,392.00	41.02	-447.71	-447.80	0.00	0.00	0.00	
Mancos										
6,492.83	4.45	275.24	6,475.23	41.62	-454.15	-454.25	0.00	0.00	0.00	
Start DLS 9.00 TFO 174.88										
6,500.00	3.80	276.10	6,482.39	41.67	-454.67	-454.76	9.00	-8.96	12.10	
6,550.00	0.82	61.18	6,532.35	42.01	-456.00	-456.10	9.00	-5.97	290.15	
6,600.00	5.23	85.80	6,582.27	42.35	-453.42	-453.51	9.00	8.83	49.25	
6,650.00	9.72	87.82	6,631.83	42.68	-446.92	-447.02	9.00	8.99	4.04	
6,700.00	14.22	88.57	6,680.73	43.00	-436.56	-436.65	9.00	8.99	1.50	
6,750.00	18.72	88.96	6,728.67	43.29	-422.39	-422.48	9.00	9.00	0.79	
6,800.00	23.22	89.21	6,775.35	43.58	-404.50	-404.60	9.00	9.00	0.49	
6,850.00	27.72	89.38	6,820.48	43.84	-383.00	-383.10	9.00	9.00	0.34	
6,900.00	32.22	89.50	6,863.78	44.08	-358.04	-358.14	9.00	9.00	0.25	
6,950.00	36.72	89.60	6,904.99	44.30	-329.75	-329.85	9.00	9.00	0.20	

SDT

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Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,000.00	41.22	89.68	6,943.86	44.50	-298.31	-298.41	9.00	9.00	0.16	
7,050.00	45.72	89.75	6,980.14	44.67	-263.92	-264.02	9.00	9.00	0.13	
7,088.25	49.16	89.79	7,006.00	44.78	-235.76	-235.86	9.00	9.00	0.11	
Top Black										
7,100.00	50.22	89.80	7,013.60	44.81	-226.79	-226.90	9.00	9.00	0.11	
7,150.00	54.72	89.85	7,044.06	44.93	-187.15	-187.26	9.00	9.00	0.10	
7,200.00	59.22	89.90	7,071.31	45.02	-145.25	-145.35	9.00	9.00	0.09	
7,250.00	63.72	89.94	7,095.18	45.09	-101.33	-101.43	9.00	9.00	0.08	
7,300.00	68.22	89.97	7,115.54	45.12	-55.68	-55.78	9.00	9.00	0.07	
7,350.00	72.72	90.01	7,132.25	45.13	-8.57	-8.67	9.00	9.00	0.07	
7,399.01	77.13	90.04	7,145.00	45.11	38.74	38.64	9.00	9.00	0.07	
Top Target										
7,400.00	77.22	90.04	7,145.22	45.11	39.71	39.61	9.00	9.00	0.07	
7,450.00	81.72	90.07	7,154.36	45.06	88.85	88.75	9.00	9.00	0.06	
7,500.00	86.22	90.11	7,159.61	44.98	138.56	138.46	9.00	9.00	0.06	
7,541.91	89.99	90.13	7,161.00	44.89	180.44	180.34	9.00	9.00	0.06	
Start 9338.07 hold at 7541.91 MD										
7,600.00	89.99	90.13	7,161.01	44.76	238.53	238.43	0.00	0.00	0.00	
7,700.00	89.99	90.13	7,161.03	44.52	338.53	338.43	0.00	0.00	0.00	
7,800.00	89.99	90.13	7,161.05	44.29	438.53	438.43	0.00	0.00	0.00	
7,900.00	89.99	90.13	7,161.08	44.06	538.53	538.43	0.00	0.00	0.00	
8,000.00	89.99	90.13	7,161.10	43.83	638.53	638.43	0.00	0.00	0.00	
8,100.00	89.99	90.13	7,161.12	43.60	738.53	738.43	0.00	0.00	0.00	
8,200.00	89.99	90.13	7,161.14	43.37	838.53	838.43	0.00	0.00	0.00	
8,300.00	89.99	90.13	7,161.16	43.14	938.53	938.43	0.00	0.00	0.00	
8,400.00	89.99	90.13	7,161.18	42.91	1,038.53	1,038.43	0.00	0.00	0.00	
8,500.00	89.99	90.13	7,161.20	42.67	1,138.53	1,138.43	0.00	0.00	0.00	
8,600.00	89.99	90.13	7,161.22	42.44	1,238.53	1,238.43	0.00	0.00	0.00	
8,700.00	89.99	90.13	7,161.24	42.21	1,338.53	1,338.43	0.00	0.00	0.00	
8,800.00	89.99	90.13	7,161.26	41.98	1,438.53	1,438.43	0.00	0.00	0.00	
8,900.00	89.99	90.13	7,161.29	41.75	1,538.53	1,538.43	0.00	0.00	0.00	
9,000.00	89.99	90.13	7,161.31	41.52	1,638.53	1,638.43	0.00	0.00	0.00	
9,100.00	89.99	90.13	7,161.33	41.29	1,738.53	1,738.43	0.00	0.00	0.00	
9,200.00	89.99	90.13	7,161.35	41.06	1,838.53	1,838.43	0.00	0.00	0.00	
9,300.00	89.99	90.13	7,161.37	40.82	1,938.53	1,938.43	0.00	0.00	0.00	
9,400.00	89.99	90.13	7,161.39	40.59	2,038.53	2,038.43	0.00	0.00	0.00	
9,500.00	89.99	90.13	7,161.41	40.36	2,138.53	2,138.43	0.00	0.00	0.00	
9,600.00	89.99	90.13	7,161.43	40.13	2,238.53	2,238.43	0.00	0.00	0.00	
9,700.00	89.99	90.13	7,161.45	39.90	2,338.53	2,338.43	0.00	0.00	0.00	
9,800.00	89.99	90.13	7,161.48	39.67	2,438.53	2,438.43	0.00	0.00	0.00	
9,900.00	89.99	90.13	7,161.50	39.44	2,538.53	2,538.43	0.00	0.00	0.00	
10,000.00	89.99	90.13	7,161.52	39.20	2,638.53	2,638.43	0.00	0.00	0.00	
10,100.00	89.99	90.13	7,161.54	38.97	2,738.53	2,738.43	0.00	0.00	0.00	
10,200.00	89.99	90.13	7,161.56	38.74	2,838.53	2,838.43	0.00	0.00	0.00	
10,300.00	89.99	90.13	7,161.58	38.51	2,938.53	2,938.43	0.00	0.00	0.00	
10,400.00	89.99	90.13	7,161.60	38.28	3,038.53	3,038.43	0.00	0.00	0.00	
10,500.00	89.99	90.13	7,161.62	38.05	3,138.52	3,138.43	0.00	0.00	0.00	
10,600.00	89.99	90.13	7,161.64	37.82	3,238.52	3,238.43	0.00	0.00	0.00	
10,700.00	89.99	90.13	7,161.66	37.59	3,338.52	3,338.43	0.00	0.00	0.00	
10,800.00	89.99	90.13	7,161.69	37.35	3,438.52	3,438.43	0.00	0.00	0.00	
10,900.00	89.99	90.13	7,161.71	37.12	3,538.52	3,538.43	0.00	0.00	0.00	
11,000.00	89.99	90.13	7,161.73	36.89	3,638.52	3,638.43	0.00	0.00	0.00	
11,100.00	89.99	90.13	7,161.75	36.66	3,738.52	3,738.43	0.00	0.00	0.00	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 836H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,200.00	89.99	90.13	7,161.77	36.43	3,838.52	3,838.43	0.00	0.00	0.00
11,300.00	89.99	90.13	7,161.79	36.20	3,938.52	3,938.43	0.00	0.00	0.00
11,400.00	89.99	90.13	7,161.81	35.97	4,038.52	4,038.43	0.00	0.00	0.00
11,500.00	89.99	90.13	7,161.83	35.73	4,138.52	4,138.43	0.00	0.00	0.00
11,600.00	89.99	90.13	7,161.85	35.50	4,238.52	4,238.43	0.00	0.00	0.00
11,700.00	89.99	90.13	7,161.87	35.27	4,338.52	4,338.43	0.00	0.00	0.00
11,800.00	89.99	90.13	7,161.90	35.04	4,438.52	4,438.43	0.00	0.00	0.00
11,900.00	89.99	90.13	7,161.92	34.81	4,538.52	4,538.43	0.00	0.00	0.00
12,000.00	89.99	90.13	7,161.94	34.58	4,638.52	4,638.43	0.00	0.00	0.00
12,100.00	89.99	90.13	7,161.96	34.35	4,738.52	4,738.43	0.00	0.00	0.00
12,200.00	89.99	90.13	7,161.98	34.12	4,838.52	4,838.43	0.00	0.00	0.00
12,300.00	89.99	90.13	7,162.00	33.88	4,938.52	4,938.43	0.00	0.00	0.00
12,400.00	89.99	90.13	7,162.02	33.65	5,038.52	5,038.43	0.00	0.00	0.00
12,500.00	89.99	90.13	7,162.04	33.42	5,138.52	5,138.43	0.00	0.00	0.00
12,600.00	89.99	90.13	7,162.06	33.19	5,238.52	5,238.43	0.00	0.00	0.00
12,700.00	89.99	90.13	7,162.09	32.96	5,338.52	5,338.43	0.00	0.00	0.00
12,800.00	89.99	90.13	7,162.11	32.73	5,438.52	5,438.43	0.00	0.00	0.00
12,900.00	89.99	90.13	7,162.13	32.50	5,538.52	5,538.43	0.00	0.00	0.00
13,000.00	89.99	90.13	7,162.15	32.27	5,638.52	5,638.43	0.00	0.00	0.00
13,100.00	89.99	90.13	7,162.17	32.03	5,738.52	5,738.43	0.00	0.00	0.00
13,200.00	89.99	90.13	7,162.19	31.80	5,838.52	5,838.43	0.00	0.00	0.00
13,300.00	89.99	90.13	7,162.21	31.57	5,938.52	5,938.43	0.00	0.00	0.00
13,400.00	89.99	90.13	7,162.23	31.34	6,038.52	6,038.43	0.00	0.00	0.00
13,500.00	89.99	90.13	7,162.25	31.11	6,138.52	6,138.43	0.00	0.00	0.00
13,600.00	89.99	90.13	7,162.27	30.88	6,238.52	6,238.43	0.00	0.00	0.00
13,700.00	89.99	90.13	7,162.30	30.65	6,338.52	6,338.43	0.00	0.00	0.00
13,800.00	89.99	90.13	7,162.32	30.41	6,438.52	6,438.43	0.00	0.00	0.00
13,900.00	89.99	90.13	7,162.34	30.18	6,538.52	6,538.43	0.00	0.00	0.00
14,000.00	89.99	90.13	7,162.36	29.95	6,638.52	6,638.43	0.00	0.00	0.00
14,100.00	89.99	90.13	7,162.38	29.72	6,738.52	6,738.43	0.00	0.00	0.00
14,200.00	89.99	90.13	7,162.40	29.49	6,838.51	6,838.43	0.00	0.00	0.00
14,300.00	89.99	90.13	7,162.42	29.26	6,938.51	6,938.43	0.00	0.00	0.00
14,400.00	89.99	90.13	7,162.44	29.03	7,038.51	7,038.43	0.00	0.00	0.00
14,500.00	89.99	90.13	7,162.46	28.80	7,138.51	7,138.43	0.00	0.00	0.00
14,600.00	89.99	90.13	7,162.49	28.56	7,238.51	7,238.43	0.00	0.00	0.00
14,700.00	89.99	90.13	7,162.51	28.33	7,338.51	7,338.43	0.00	0.00	0.00
14,800.00	89.99	90.13	7,162.53	28.10	7,438.51	7,438.43	0.00	0.00	0.00
14,900.00	89.99	90.13	7,162.55	27.87	7,538.51	7,538.43	0.00	0.00	0.00
15,000.00	89.99	90.13	7,162.57	27.64	7,638.51	7,638.43	0.00	0.00	0.00
15,100.00	89.99	90.13	7,162.59	27.41	7,738.51	7,738.43	0.00	0.00	0.00
15,200.00	89.99	90.13	7,162.61	27.18	7,838.51	7,838.43	0.00	0.00	0.00
15,300.00	89.99	90.13	7,162.63	26.95	7,938.51	7,938.43	0.00	0.00	0.00
15,400.00	89.99	90.13	7,162.65	26.71	8,038.51	8,038.43	0.00	0.00	0.00
15,500.00	89.99	90.13	7,162.67	26.48	8,138.51	8,138.43	0.00	0.00	0.00
15,600.00	89.99	90.13	7,162.70	26.25	8,238.51	8,238.43	0.00	0.00	0.00
15,700.00	89.99	90.13	7,162.72	26.02	8,338.51	8,338.43	0.00	0.00	0.00
15,800.00	89.99	90.13	7,162.74	25.79	8,438.51	8,438.43	0.00	0.00	0.00
15,900.00	89.99	90.13	7,162.76	25.56	8,538.51	8,538.43	0.00	0.00	0.00
16,000.00	89.99	90.13	7,162.78	25.33	8,638.51	8,638.43	0.00	0.00	0.00
16,100.00	89.99	90.13	7,162.80	25.09	8,738.51	8,738.43	0.00	0.00	0.00
16,200.00	89.99	90.13	7,162.82	24.86	8,838.51	8,838.43	0.00	0.00	0.00
16,300.00	89.99	90.13	7,162.84	24.63	8,938.51	8,938.43	0.00	0.00	0.00
16,400.00	89.99	90.13	7,162.86	24.40	9,038.51	9,038.43	0.00	0.00	0.00
16,500.00	89.99	90.13	7,162.88	24.17	9,138.51	9,138.43	0.00	0.00	0.00

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 836H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
16,600.00	89.99	90.13	7,162.91	23.94	9,238.51	9,238.43	0.00	0.00	0.00	
16,700.00	89.99	90.13	7,162.93	23.71	9,338.51	9,338.43	0.00	0.00	0.00	
16,800.00	89.99	90.13	7,162.95	23.48	9,438.51	9,438.43	0.00	0.00	0.00	
16,879.97	89.99	90.13	7,162.96	23.29	9,518.48	9,518.40	0.00	0.00	0.00	
FPP @ 330' FEL										
16,900.00	89.99	90.13	7,162.97	23.24	9,538.51	9,538.43	0.00	0.00	0.00	
17,000.00	89.99	90.13	7,162.99	23.01	9,638.51	9,638.43	0.00	0.00	0.00	
17,056.99	89.99	90.13	7,163.00	22.88	9,695.50	9,695.42	0.00	0.00	0.00	
TD at 17056.99 @ 153' FEL										

Design Targets										
Target Name										
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- Shape										
RU 836H SHL	0.00	0.31	0.00	0.00	0.00	2,133,441.96	2,872,981.99	36.861857	-107.320952	
- plan hits target center										
- Point										
RU 836H POE	0.00	0.31	7,161.00	44.89	180.44	2,133,487.82	2,873,162.18	36.861980	-107.320335	
- plan hits target center										
- Point										
RU 836H FPP	0.00	0.00	7,162.96	23.29	9,518.48	2,133,516.32	2,882,500.21	36.861917	-107.288415	
- plan hits target center										
- Point										
RU 836H PBHL	0.00	0.33	7,163.00	22.90	9,695.50	2,133,516.88	2,882,677.22	36.861915	-107.287810	
- plan misses target center by 0.02usft at 17056.99usft MD (7163.00 TVD, 22.88 N, 9695.50 E)										
- Point										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,768.38	2,762.00	Ojo Alamo				
2,891.75	2,885.00	Kirtland				
3,266.88	3,259.00	Fruitland		0.00		
3,308.01	3,300.00	Top of Coals		0.00		
3,396.27	3,388.00	Base of Coals		0.00		
3,620.95	3,612.00	Pictured Cliffs				
3,720.25	3,711.00	Lewis		0.00		
4,836.61	4,824.00	Chacra		0.00		
5,361.19	5,347.00	Upper Cliff House		0.00		
5,647.05	5,632.00	Cliff House				
5,681.15	5,666.00	Menefee				
5,863.70	5,848.00	Point Lookout				
6,409.34	6,392.00	Mancos				
7,088.25	7,006.00	Top Black				
7,399.01	7,145.00	Top Target				

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 836H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 836H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	Start Build 2.00
722.35	722.13	0.79	-8.59	Start 5770.47 hold at 722.35 MD
6,492.83	6,475.23	41.62	-454.15	Start DLS 9.00 TFO 174.88
7,541.91	7,161.00	44.89	180.44	Start 9338.07 hold at 7541.91 MD
16,879.97	7,162.96	23.29	9,518.48	FPP @ 330' FEL
17,056.99	7,163.00	22.88	9,695.50	TD at 17056.99 @ 153' FEL

Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 42

Rosa Unit 836H

OH

Plan #3

Anticollision Report

07 September, 2023

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Reference	Plan #3		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCSWA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Max. Cent. Dist. of 100,000.00usft or Max. SF of 10	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	8/22/2023		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,056.99	Plan #3 (OH)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	

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 30						
Rosa Unit #664H - OH - OH	6,573.65	19,340.96	12,240.83	12,174.19	183.684	CC, ES
Rosa Unit #664H - OH - OH	6,750.00	19,340.96	12,266.18	12,199.19	183.122	SF
Rosa Unit 31						
Rosa Unit #744H - OH - OH	6,995.80	20,806.96	435.97	175.37	1.673	CC, ES, SF
Rosa Unit #745H - OH - OH	7,112.80	21,289.96	873.71	572.41	2.900	CC, ES, SF
Rosa Unit #746H - OH - OH	6,990.86	20,952.96	1,693.47	1,436.56	6.592	CC
Rosa Unit #746H - OH - OH	7,000.00	20,952.96	1,693.51	1,436.52	6.590	ES
Rosa Unit #746H - OH - OH	7,050.00	20,952.96	1,694.99	1,437.77	6.590	SF
Rosa Unit 42						
(O) Pre-Ongard Well #112 - OH - OH-TD	6,542.63	6,714.24	9,787.06	9,602.26	52.962	CC
(O) Pre-Ongard Well #112 - OH - OH-TD	6,550.00	6,721.61	9,787.10	9,602.06	52.893	ES
(O) Pre-Ongard Well #112 - OH - OH-TD	7,200.00	7,260.56	10,094.68	9,892.36	49.894	SF
(O) Rosa Unit #006C - OH - OH-SVY	6,558.45	7,397.47	8,482.56	8,429.09	158.651	CC, ES
(O) Rosa Unit #006C - OH - OH-SVY	6,900.00	7,727.80	8,568.95	8,514.19	156.457	SF
(O) Rosa Unit #112Y - OH - OH-INC	6,542.99	6,721.34	9,815.70	9,590.86	43.657	CC
(O) Rosa Unit #112Y - OH - OH-INC	6,550.00	6,730.52	9,815.74	9,590.60	43.599	ES
(O) Rosa Unit #112Y - OH - OH-INC	7,050.00	7,193.38	10,005.59	9,765.37	41.653	SF
(O) Rosa Unit #184C - OH - OH-INC	6,541.84	6,713.45	7,832.64	7,586.16	31.779	CC
(O) Rosa Unit #184C - OH - OH-INC	6,550.00	6,721.61	7,832.69	7,585.94	31.744	ES
(O) Rosa Unit #184C - OH - OH-INC	7,050.00	7,169.39	8,024.71	7,763.37	30.707	SF
(O) Rosa Unit #601 - OH - OH-SVY	16,032.52	7,527.43	936.18	681.21	3.672	CC, ES
(O) Rosa Unit #601 - OH - OH-SVY	16,100.00	7,527.44	938.60	682.59	3.666	SF
(O) Schalk 32 #001A - OH - OH-SVY	17,056.99	3,909.00	4,222.26	4,104.42	35.828	CC, ES, SF
(O) Schalk 32 #003H - OH - OH-SVY	17,056.99	3,800.00	4,783.63	4,625.06	30.168	CC, ES, SF
Rosa Unit 830H - OH - Plan #2	500.00	500.00	30.01	26.64	8.907	CC, ES
Rosa Unit 830H - OH - Plan #2	600.00	598.99	32.45	28.37	7.961	SF
Rosa Unit 832H - OH - Plan #2	500.00	500.00	15.20	11.83	4.512	CC, ES
Rosa Unit 832H - OH - Plan #2	17,056.99	16,863.35	1,293.11	811.15	2.683	SF
Rosa Unit 834H - OH - Plan #3	500.00	500.00	15.01	11.64	4.453	CC, ES
Rosa Unit 834H - OH - Plan #3	17,056.99	17,138.55	1,354.47	866.15	2.774	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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Offset Wellbore Centre		Distance		Rule Assigned:				
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	19,340.96	6,975.69	0.00	373.60	-83.40	1,457.09	-12,599.52	14,560.09					
100.00	100.00	19,340.96	6,975.69	0.25	373.60	-83.40	1,457.09	-12,599.52	14,511.25	14,449.68	61.56	235.710		
200.00	200.00	19,340.96	6,975.69	0.61	373.60	-83.40	1,457.09	-12,599.52	14,462.93	14,401.60	61.33	235.827		
300.00	300.00	19,340.96	6,975.69	0.97	373.60	-83.40	1,457.09	-12,599.52	14,415.14	14,353.98	61.16	235.688		
400.00	400.00	19,340.96	6,975.69	1.33	373.60	-83.40	1,457.09	-12,599.52	14,367.89	14,306.84	61.04	235.370		
500.00	500.00	19,340.96	6,975.69	1.68	373.60	-83.40	1,457.09	-12,599.52	14,321.18	14,260.22	60.96	234.933		
600.00	599.98	19,340.96	6,975.69	2.04	373.60	1.39	1,457.09	-12,599.52	14,273.48	14,212.57	60.91	234.343		
700.00	699.84	19,340.96	6,975.69	2.39	373.60	1.42	1,457.09	-12,599.52	14,223.26	14,162.38	60.88	233.609		
722.35	722.13	19,340.96	6,975.69	2.47	373.60	1.42	1,457.09	-12,599.52	14,211.70	14,150.81	60.89	233.386		
800.00	799.54	19,340.96	6,975.69	2.74	373.60	1.42	1,457.09	-12,599.52	14,171.47	14,110.61	60.86	232.850		
900.00	899.24	19,340.96	6,975.69	3.10	373.60	1.42	1,457.09	-12,599.52	14,120.12	14,059.30	60.82	232.150		
1,000.00	998.94	19,340.96	6,975.69	3.47	373.60	1.42	1,457.09	-12,599.52	14,069.30	14,008.51	60.79	231.425		
1,100.00	1,098.64	19,340.96	6,975.69	3.83	373.60	1.42	1,457.09	-12,599.52	14,019.00	13,958.23	60.77	230.683		
1,200.00	1,198.34	19,340.96	6,975.69	4.20	373.60	1.42	1,457.09	-12,599.52	13,969.24	13,908.49	60.75	229.929		
1,300.00	1,298.04	19,340.96	6,975.69	4.57	373.60	1.42	1,457.09	-12,599.52	13,920.02	13,859.28	60.74	229.165		
1,400.00	1,397.74	19,340.96	6,975.69	4.94	373.60	1.42	1,457.09	-12,599.52	13,871.35	13,810.62	60.73	228.394		
1,500.00	1,497.44	19,340.96	6,975.69	5.31	373.60	1.42	1,457.09	-12,599.52	13,823.23	13,762.50	60.73	227.618		
1,600.00	1,597.13	19,340.96	6,975.69	5.68	373.60	1.42	1,457.09	-12,599.52	13,775.66	13,714.94	60.73	226.839		
1,700.00	1,696.83	19,340.96	6,975.69	6.05	373.60	1.42	1,457.09	-12,599.52	13,728.66	13,667.93	60.73	226.057		
1,800.00	1,796.53	19,340.96	6,975.69	6.43	373.60	1.42	1,457.09	-12,599.52	13,682.23	13,621.50	60.74	225.273		
1,900.00	1,896.23	19,340.96	6,975.69	6.80	373.60	1.42	1,457.09	-12,599.52	13,636.38	13,575.63	60.74	224.488		
2,000.00	1,995.93	19,340.96	6,975.69	7.17	373.60	1.42	1,457.09	-12,599.52	13,591.10	13,530.35	60.76	223.701		
2,100.00	2,095.63	19,340.96	6,975.69	7.54	373.60	1.42	1,457.09	-12,599.52	13,546.41	13,485.64	60.77	222.914		
2,200.00	2,195.33	19,340.96	6,975.69	7.92	373.60	1.42	1,457.09	-12,599.52	13,502.32	13,441.53	60.79	222.126		
2,300.00	2,295.03	19,340.96	6,975.69	8.29	373.60	1.42	1,457.09	-12,599.52	13,458.82	13,398.02	60.81	221.338		
2,400.00	2,394.73	19,340.96	6,975.69	8.66	373.60	1.42	1,457.09	-12,599.52	13,415.93	13,355.10	60.83	220.548		
2,500.00	2,494.43	19,340.96	6,975.69	9.04	373.60	1.42	1,457.09	-12,599.52	13,373.65	13,312.79	60.86	219.758		
2,600.00	2,594.12	19,340.96	6,975.69	9.41	373.60	1.42	1,457.09	-12,599.52	13,331.98	13,271.10	60.89	218.967		
2,700.00	2,693.82	19,340.96	6,975.69	9.79	373.60	1.42	1,457.09	-12,599.52	13,290.94	13,230.02	60.92	218.175		
2,800.00	2,793.52	19,340.96	6,975.69	10.16	373.60	1.42	1,457.09	-12,599.52	13,250.52	13,189.57	60.96	217.382		
2,900.00	2,893.22	19,340.96	6,975.69	10.53	373.60	1.42	1,457.09	-12,599.52	13,210.74	13,149.74	61.00	216.587		
3,000.00	2,992.92	19,340.96	6,975.69	10.91	373.60	1.42	1,457.09	-12,599.52	13,171.59	13,110.56	61.04	215.791		
3,100.00	3,092.62	19,340.96	6,975.69	11.28	373.60	1.42	1,457.09	-12,599.52	13,133.09	13,072.01	61.09	214.992		
3,200.00	3,192.32	19,340.96	6,975.69	11.66	373.60	1.42	1,457.09	-12,599.52	13,095.25	13,034.11	61.14	214.191		
3,300.00	3,292.02	19,340.96	6,975.69	12.03	373.60	1.42	1,457.09	-12,599.52	13,058.05	12,996.86	61.19	213.387		
3,400.00	3,391.72	19,340.96	6,975.69	12.41	373.60	1.42	1,457.09	-12,599.52	13,021.52	12,960.27	61.25	212.580		
3,500.00	3,491.41	19,340.96	6,975.69	12.78	373.60	1.42	1,457.09	-12,599.52	12,985.66	12,924.34	61.32	211.770		
3,600.00	3,591.11	19,340.96	6,975.69	13.15	373.60	1.42	1,457.09	-12,599.52	12,950.47	12,889.08	61.39	210.956		
3,700.00	3,690.81	19,340.96	6,975.69	13.53	373.60	1.42	1,457.09	-12,599.52	12,915.95	12,854.49	61.46	210.138		
3,800.00	3,790.51	19,340.96	6,975.69	13.90	373.60	1.42	1,457.09	-12,599.52	12,882.13	12,820.58	61.54	209.316		
3,900.00	3,890.21	19,340.96	6,975.69	14.28	373.60	1.42	1,457.09	-12,599.52	12,848.99	12,787.36	61.63	208.488		
4,000.00	3,989.91	19,340.96	6,975.69	14.65	373.60	1.42	1,457.09	-12,599.52	12,816.54	12,754.82	61.72	207.656		
4,100.00	4,089.61	19,340.96	6,975.69	15.03	373.60	1.42	1,457.09	-12,599.52	12,784.80	12,722.98	61.82	206.818		
4,200.00	4,189.31	19,340.96	6,975.69	15.40	373.60	1.42	1,457.09	-12,599.52	12,753.76	12,691.84	61.92	205.974		
4,300.00	4,289.01	19,340.96	6,975.69	15.78	373.60	1.42	1,457.09	-12,599.52	12,723.43	12,661.40	62.03	205.123		
4,400.00	4,388.70	19,340.96	6,975.69	16.15	373.60	1.42	1,457.09	-12,599.52	12,693.81	12,631.67	62.14	204.266		
4,500.00	4,488.40	19,340.96	6,975.69	16.53	373.60	1.42	1,457.09	-12,599.52	12,664.92	12,602.65	62.27	203.402		
4,600.00	4,588.10	19,340.96	6,975.69	16.90	373.60	1.42	1,457.09	-12,599.52	12,636.75	12,574.36	62.39	202.531		
4,700.00	4,687.80	19,340.96	6,975.69	17.27	373.60	1.42	1,457.09	-12,599.52	12,609.31	12,546.78	62.53	201.651		
4,800.00	4,787.50	19,340.96	6,975.69	17.65	373.60	1.42	1,457.09	-12,599.52	12,582.61	12,519.93	62.67	200.764		
4,900.00	4,887.20	19,340.96	6,975.69	18.02	373.60	1.42	1,457.09	-12,599.52	12,556.64	12,493.82	62.82	199.868		
5,000.00	4,986.90	19,340.96	6,975.69	18.40	373.60	1.42	1,457.09	-12,599.52	12,531.42	12,468.44	62.98	198.964		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: Reference		396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM						Rule Assigned:		Offset Well Error: 0.00 usft				
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		
5,100.00	5,086.60	19,340.96	6,975.69	18.77	373.60	1.42	1,457.09	-12,599.52	12,506.95	12,443.80	63.15	198.051		
5,200.00	5,186.30	19,340.96	6,975.69	19.15	373.60	1.42	1,457.09	-12,599.52	12,483.24	12,419.91	63.33	197.129		
5,300.00	5,286.00	19,340.96	6,975.69	19.52	373.60	1.42	1,457.09	-12,599.52	12,460.27	12,396.77	63.51	196.198		
5,400.00	5,385.69	19,340.96	6,975.69	19.90	373.60	1.42	1,457.09	-12,599.52	12,438.08	12,374.37	63.70	195.257		
5,500.00	5,485.39	19,340.96	6,975.69	20.27	373.60	1.42	1,457.09	-12,599.52	12,416.64	12,352.74	63.90	194.307		
5,600.00	5,585.09	19,340.96	6,975.69	20.65	373.60	1.42	1,457.09	-12,599.52	12,395.98	12,331.87	64.11	193.348		
5,700.00	5,684.79	19,340.96	6,975.69	21.02	373.60	1.42	1,457.09	-12,599.52	12,376.09	12,311.76	64.33	192.378		
5,800.00	5,784.49	19,340.96	6,975.69	21.40	373.60	1.42	1,457.09	-12,599.52	12,356.98	12,292.42	64.56	191.399		
5,900.00	5,884.19	19,340.96	6,975.69	21.77	373.60	1.42	1,457.09	-12,599.52	12,338.64	12,273.84	64.80	190.411		
6,000.00	5,983.89	19,340.96	6,975.69	22.15	373.60	1.42	1,457.09	-12,599.52	12,321.10	12,256.05	65.05	189.413		
6,100.00	6,083.59	19,340.96	6,975.69	22.52	373.60	1.42	1,457.09	-12,599.52	12,304.34	12,239.03	65.31	188.406		
6,200.00	6,183.29	19,340.96	6,975.69	22.90	373.60	1.42	1,457.09	-12,599.52	12,288.37	12,222.79	65.58	187.389		
6,300.00	6,282.98	19,340.96	6,975.69	23.27	373.60	1.42	1,457.09	-12,599.52	12,273.19	12,207.34	65.86	186.364		
6,400.00	6,382.68	19,340.96	6,975.69	23.65	373.60	1.42	1,457.09	-12,599.52	12,258.82	12,192.67	66.15	185.330		
6,492.83	6,475.23	19,340.96	6,975.69	24.00	373.60	1.42	1,457.09	-12,599.52	12,246.19	12,179.76	66.42	184.363		
6,500.00	6,482.39	19,340.96	6,975.69	24.02	373.60	0.55	1,457.09	-12,599.52	12,245.28	12,178.83	66.45	184.289		
6,550.00	6,532.35	19,340.96	6,975.69	24.19	373.60	-144.55	1,457.09	-12,599.52	12,241.29	12,174.70	66.58	183.848		
6,573.65	6,555.99	19,340.96	6,975.69	24.26	373.60	-165.58	1,457.09	-12,599.52	12,240.83	12,174.19	66.64	183.684 CC, ES		
6,600.00	6,582.27	19,340.96	6,975.69	24.34	373.60	-169.16	1,457.09	-12,599.52	12,241.40	12,174.70	66.70	183.522		
6,650.00	6,631.83	19,340.96	6,975.69	24.49	373.60	-171.12	1,457.09	-12,599.52	12,245.61	12,178.80	66.81	183.292		
6,700.00	6,680.73	19,340.96	6,975.69	24.62	373.60	-171.77	1,457.09	-12,599.52	12,253.89	12,186.98	66.90	183.158		
6,750.00	6,728.67	19,340.96	6,975.69	24.74	373.60	-172.01	1,457.09	-12,599.52	12,266.18	12,199.19	66.98	183.122 SF		
6,800.00	6,775.35	19,340.96	6,975.69	24.86	373.60	-172.06	1,457.09	-12,599.52	12,282.39	12,215.34	67.05	183.184		
6,850.00	6,820.48	19,340.96	6,975.69	24.98	373.60	-171.97	1,457.09	-12,599.52	12,302.41	12,235.31	67.10	183.344		
6,900.00	6,863.78	19,340.96	6,975.69	25.09	373.60	-171.77	1,457.09	-12,599.52	12,326.09	12,258.96	67.14	183.600		
6,950.00	6,904.99	19,340.96	6,975.69	25.21	373.60	-171.46	1,457.09	-12,599.52	12,353.28	12,286.12	67.16	183.950		
7,000.00	6,943.86	19,340.96	6,975.69	25.33	373.60	-171.03	1,457.09	-12,599.52	12,383.77	12,316.61	67.16	184.391		
7,050.00	6,980.14	19,340.96	6,975.69	25.47	373.60	-170.46	1,457.09	-12,599.52	12,417.36	12,350.21	67.15	184.918		
7,100.00	7,013.60	19,340.96	6,975.69	25.62	373.60	-169.72	1,457.09	-12,599.52	12,453.81	12,386.69	67.13	185.527		
7,150.00	7,044.06	19,340.96	6,975.69	25.79	373.60	-168.74	1,457.09	-12,599.52	12,492.89	12,425.80	67.09	186.213		
7,200.00	7,071.31	19,340.96	6,975.69	26.00	373.60	-167.44	1,457.09	-12,599.52	12,534.31	12,467.27	67.04	186.970		
7,250.00	7,095.18	19,340.96	6,975.69	26.23	373.60	-165.67	1,457.09	-12,599.52	12,577.82	12,510.84	66.98	187.790		
7,300.00	7,115.54	19,340.96	6,975.69	26.50	373.60	-163.17	1,457.09	-12,599.52	12,623.11	12,556.20	66.91	188.666		
7,350.00	7,132.25	19,340.96	6,975.69	26.81	373.60	-159.43	1,457.09	-12,599.52	12,669.89	12,603.06	66.83	189.589		
7,400.00	7,145.22	19,340.96	6,975.69	27.16	373.60	-153.41	1,457.09	-12,599.52	12,717.85	12,651.11	66.74	190.552		
7,450.00	7,154.36	19,340.96	6,975.69	27.55	373.60	-142.59	1,457.09	-12,599.52	12,766.70	12,700.05	66.65	191.544		
7,500.00	7,159.61	19,340.96	6,975.69	27.97	373.60	-120.91	1,457.09	-12,599.52	12,816.12	12,749.56	66.56	192.555		
7,541.91	7,161.00	19,340.96	6,975.69	28.35	373.60	-89.66	1,457.09	-12,599.52	12,857.75	12,791.27	66.48	193.408		
7,600.00	7,161.01	19,340.96	6,975.69	28.92	373.60	-89.66	1,457.09	-12,599.52	12,915.51	12,849.14	66.37	194.592		
7,700.00	7,161.03	19,340.96	6,975.69	30.03	373.60	-89.66	1,457.09	-12,599.52	13,014.94	12,948.75	66.19	196.622		
7,800.00	7,161.05	19,340.96	6,975.69	31.29	373.60	-89.66	1,457.09	-12,599.52	13,114.38	13,048.36	66.02	198.640		
7,900.00	7,161.08	19,340.96	6,975.69	32.69	373.60	-89.66	1,457.09	-12,599.52	13,213.82	13,147.97	65.86	200.648		
8,000.00	7,161.10	19,340.96	6,975.69	34.20	373.60	-89.66	1,457.09	-12,599.52	13,313.28	13,247.58	65.70	202.644		
8,100.00	7,161.12	19,340.96	6,975.69	35.81	373.60	-89.66	1,457.09	-12,599.52	13,412.74	13,347.20	65.55	204.629		
8,200.00	7,161.14	19,340.96	6,975.69	37.52	373.60	-89.66	1,457.09	-12,599.52	13,512.21	13,446.81	65.40	206.603		
8,300.00	7,161.16	19,340.96	6,975.69	39.30	373.60	-89.66	1,457.09	-12,599.52	13,611.69	13,546.43	65.26	208.565		
8,400.00	7,161.18	19,340.96	6,975.69	41.15	373.60	-89.66	1,457.09	-12,599.52	13,711.18	13,646.05	65.13	210.515		
8,500.00	7,161.20	19,340.96	6,975.69	43.05	373.60	-89.66	1,457.09	-12,599.52	13,810.67	13,745.67	65.01	212.454		
8,600.00	7,161.22	19,340.96	6,975.69	45.01	373.60	-89.66	1,457.09	-12,599.52	13,910.17	13,845.29	64.89	214.380		
8,700.00	7,161.24	19,340.96	6,975.69	47.02	373.60	-89.66	1,457.09	-12,599.52	14,009.68	13,944.91	64.77	216.296		
8,800.00	7,161.26	19,340.96	6,975.69	49.06	373.60	-89.66	1,457.09	-12,599.52	14,109.20	14,044.54	64.66	218.199		
8,900.00	7,161.29	19,340.96	6,975.69	51.14	373.60	-89.66	1,457.09	-12,599.52	14,208.72	14,144.16	64.56	220.091		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM						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	
9,000.00	7,161.31	19,340.96	6,975.69	53.24	373.60	-89.66	1,457.09	-12,599.52	14,308.25	14,243.79	64.46	221.971	
9,100.00	7,161.33	19,340.96	6,975.69	55.38	373.60	-89.66	1,457.09	-12,599.52	14,407.78	14,343.42	64.37	223.839	
9,200.00	7,161.35	19,340.96	6,975.69	57.54	373.60	-89.66	1,457.09	-12,599.52	14,507.33	14,443.05	64.28	225.695	
9,300.00	7,161.37	19,340.96	6,975.69	59.72	373.60	-89.66	1,457.09	-12,599.52	14,606.87	14,542.68	64.19	227.539	
9,400.00	7,161.39	19,340.96	6,975.69	61.92	373.60	-89.66	1,457.09	-12,599.52	14,706.43	14,642.31	64.12	229.372	
9,500.00	7,161.41	19,340.96	6,975.69	64.13	373.60	-89.66	1,457.09	-12,599.52	14,805.99	14,741.95	64.04	231.193	
9,600.00	7,161.43	19,340.96	6,975.69	66.36	373.60	-89.66	1,457.09	-12,599.52	14,905.55	14,841.58	63.97	233.003	
9,700.00	7,161.45	19,340.96	6,975.69	68.61	373.60	-89.66	1,457.09	-12,599.52	15,005.12	14,941.22	63.91	234.800	
9,800.00	7,161.48	19,340.96	6,975.69	70.87	373.60	-89.66	1,457.09	-12,599.52	15,104.70	15,040.86	63.84	236.586	
9,900.00	7,161.50	19,340.96	6,975.69	73.14	373.60	-89.66	1,457.09	-12,599.52	15,204.29	15,140.50	63.79	238.360	
10,000.00	7,161.52	19,340.96	6,975.69	75.42	373.60	-89.66	1,457.09	-12,599.52	15,303.87	15,240.14	63.73	240.123	
10,100.00	7,161.54	19,340.96	6,975.69	77.71	373.60	-89.66	1,457.09	-12,599.52	15,403.47	15,339.78	63.68	241.874	
10,200.00	7,161.56	19,340.96	6,975.69	80.01	373.60	-89.66	1,457.09	-12,599.52	15,503.07	15,439.43	63.64	243.614	
10,300.00	7,161.58	19,340.96	6,975.69	82.32	373.60	-89.66	1,457.09	-12,599.52	15,602.67	15,539.07	63.60	245.342	
10,400.00	7,161.60	19,340.96	6,975.69	84.63	373.60	-89.66	1,457.09	-12,599.52	15,702.28	15,638.72	63.56	247.059	
10,500.00	7,161.62	19,340.96	6,975.69	86.95	373.60	-89.66	1,457.09	-12,599.52	15,801.89	15,738.37	63.52	248.765	
10,600.00	7,161.64	19,340.96	6,975.69	89.28	373.60	-89.66	1,457.09	-12,599.52	15,901.51	15,838.02	63.49	250.459	
10,700.00	7,161.66	19,340.96	6,975.69	91.61	373.60	-89.66	1,457.09	-12,599.52	16,001.14	15,937.67	63.46	252.142	
10,800.00	7,161.69	19,340.96	6,975.69	93.95	373.60	-89.66	1,457.09	-12,599.52	16,100.76	16,037.33	63.44	253.813	
10,900.00	7,161.71	19,340.96	6,975.69	96.29	373.60	-89.66	1,457.09	-12,599.52	16,200.40	16,136.98	63.41	255.474	
11,000.00	7,161.73	19,340.96	6,975.69	98.64	373.60	-89.66	1,457.09	-12,599.52	16,300.03	16,236.64	63.39	257.124	
11,100.00	7,161.75	19,340.96	6,975.69	100.99	373.60	-89.66	1,457.09	-12,599.52	16,399.68	16,336.30	63.38	258.762	
11,200.00	7,161.77	19,340.96	6,975.69	103.35	373.60	-89.66	1,457.09	-12,599.52	16,499.32	16,435.96	63.36	260.390	
11,300.00	7,161.79	19,340.96	6,975.69	105.71	373.60	-89.66	1,457.09	-12,599.52	16,598.97	16,535.62	63.35	262.007	
11,400.00	7,161.81	19,340.96	6,975.69	108.07	373.60	-89.66	1,457.09	-12,599.52	16,698.63	16,635.28	63.35	263.613	
11,500.00	7,161.83	19,340.96	6,975.69	110.44	373.60	-89.66	1,457.09	-12,599.52	16,798.29	16,734.95	63.34	265.208	
11,600.00	7,161.85	19,340.96	6,975.69	112.80	373.60	-89.66	1,457.09	-12,599.52	16,897.95	16,834.61	63.34	266.793	
11,700.00	7,161.87	19,340.96	6,975.69	115.18	373.60	-89.66	1,457.09	-12,599.52	16,997.62	16,934.28	63.34	268.367	
11,800.00	7,161.90	19,340.96	6,975.69	117.55	373.60	-89.66	1,457.09	-12,599.52	17,097.29	17,033.95	63.34	269.931	
11,900.00	7,161.92	19,340.96	6,975.69	119.93	373.60	-89.66	1,457.09	-12,599.52	17,196.96	17,133.62	63.34	271.484	
12,000.00	7,161.94	19,340.96	6,975.69	122.31	373.60	-89.66	1,457.09	-12,599.52	17,296.64	17,233.29	63.35	273.027	
12,100.00	7,161.96	19,340.96	6,975.69	124.69	373.60	-89.66	1,457.09	-12,599.52	17,396.32	17,332.96	63.36	274.559	
12,200.00	7,161.98	19,340.96	6,975.69	127.07	373.60	-89.66	1,457.09	-12,599.52	17,496.01	17,432.63	63.37	276.081	
12,300.00	7,162.00	19,340.96	6,975.69	129.46	373.60	-89.66	1,457.09	-12,599.52	17,595.69	17,532.31	63.39	277.594	
12,400.00	7,162.02	19,340.96	6,975.69	131.85	373.60	-89.66	1,457.09	-12,599.52	17,695.39	17,631.98	63.40	279.096	
12,500.00	7,162.04	19,340.96	6,975.69	134.24	373.60	-89.66	1,457.09	-12,599.52	17,795.08	17,731.66	63.42	280.588	
12,600.00	7,162.06	19,340.96	6,975.69	136.63	373.60	-89.66	1,457.09	-12,599.52	17,894.78	17,831.34	63.44	282.070	
12,700.00	7,162.09	19,340.96	6,975.69	139.02	373.60	-89.66	1,457.09	-12,599.52	17,994.49	17,931.02	63.46	283.543	
12,800.00	7,162.11	19,340.96	6,975.69	141.42	373.60	-89.66	1,457.09	-12,599.52	18,094.19	18,030.70	63.49	285.005	
12,900.00	7,162.13	19,340.96	6,975.69	143.81	373.60	-89.66	1,457.09	-12,599.52	18,193.90	18,130.39	63.51	286.458	
13,000.00	7,162.15	19,340.96	6,975.69	146.21	373.60	-89.66	1,457.09	-12,599.52	18,293.61	18,230.07	63.54	287.902	
13,100.00	7,162.17	19,340.96	6,975.69	148.61	373.60	-89.66	1,457.09	-12,599.52	18,393.33	18,329.76	63.57	289.335	
13,200.00	7,162.19	19,340.96	6,975.69	151.01	373.60	-89.66	1,457.09	-12,599.52	18,493.05	18,429.44	63.60	290.760	
13,300.00	7,162.21	19,340.96	6,975.69	153.41	373.60	-89.66	1,457.09	-12,599.52	18,592.77	18,529.13	63.64	292.175	
13,400.00	7,162.23	19,340.96	6,975.69	155.81	373.60	-89.66	1,457.09	-12,599.52	18,692.49	18,628.82	63.67	293.581	
13,500.00	7,162.25	19,340.96	6,975.69	158.21	373.60	-89.66	1,457.09	-12,599.52	18,792.22	18,728.51	63.71	294.977	
13,600.00	7,162.27	19,340.96	6,975.69	160.62	373.60	-89.66	1,457.09	-12,599.52	18,891.95	18,828.21	63.75	296.364	
13,700.00	7,162.30	19,340.96	6,975.69	163.02	373.60	-89.66	1,457.09	-12,599.52	18,991.68	18,927.90	63.79	297.742	
13,800.00	7,162.32	19,340.96	6,975.69	165.43	373.60	-89.66	1,457.09	-12,599.52	19,091.42	19,027.59	63.83	299.112	
13,900.00	7,162.34	19,340.96	6,975.69	167.84	373.60	-89.66	1,457.09	-12,599.52	19,191.16	19,127.29	63.87	300.472	
14,000.00	7,162.36	19,340.96	6,975.69	170.24	373.60	-89.66	1,457.09	-12,599.52	19,290.90	19,226.99	63.91	301.823	
14,100.00	7,162.38	19,340.96	6,975.69	172.65	373.60	-89.66	1,457.09	-12,599.52	19,390.64	19,326.68	63.96	303.166	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH											Offset Site Error: 0.00 usft
Survey Program: 396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM											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)	
14,200.00	7,162.40	19,340.96	6,975.69	175.06	373.60	-89.66	1,457.09	-12,599.52	19,490.39	19,426.38	
14,300.00	7,162.42	19,340.96	6,975.69	177.47	373.60	-89.66	1,457.09	-12,599.52	19,590.14	19,526.08	
14,400.00	7,162.44	19,340.96	6,975.69	179.88	373.60	-89.66	1,457.09	-12,599.52	19,689.89	19,625.79	
14,500.00	7,162.46	19,340.96	6,975.69	182.29	373.60	-89.66	1,457.09	-12,599.52	19,789.65	19,725.49	
14,600.00	7,162.49	19,340.96	6,975.69	184.71	373.60	-89.66	1,457.09	-12,599.52	19,889.40	19,825.19	
14,700.00	7,162.51	19,340.96	6,975.69	187.12	373.60	-89.66	1,457.09	-12,599.52	19,989.16	19,924.90	
14,800.00	7,162.53	19,340.96	6,975.69	189.53	373.60	-89.66	1,457.09	-12,599.52	20,088.92	20,024.60	
14,900.00	7,162.55	19,340.96	6,975.69	191.95	373.60	-89.66	1,457.09	-12,599.52	20,188.69	20,124.31	
15,000.00	7,162.57	19,340.96	6,975.69	194.36	373.60	-89.66	1,457.09	-12,599.52	20,288.46	20,224.02	
15,100.00	7,162.59	19,340.96	6,975.69	196.78	373.60	-89.66	1,457.09	-12,599.52	20,388.22	20,323.73	
15,200.00	7,162.61	19,340.96	6,975.69	199.19	373.60	-89.66	1,457.09	-12,599.52	20,487.99	20,423.44	
15,300.00	7,162.63	19,340.96	6,975.69	201.61	373.60	-89.66	1,457.09	-12,599.52	20,587.77	20,523.15	
15,400.00	7,162.65	19,340.96	6,975.69	204.03	373.60	-89.66	1,457.09	-12,599.52	20,687.54	20,622.86	
15,500.00	7,162.67	19,340.96	6,975.69	206.44	373.60	-89.66	1,457.09	-12,599.52	20,787.32	20,722.58	
15,600.00	7,162.70	19,340.96	6,975.69	208.86	373.60	-89.66	1,457.09	-12,599.52	20,887.10	20,822.29	
15,700.00	7,162.72	19,340.96	6,975.69	211.28	373.60	-89.66	1,457.09	-12,599.52	20,986.88	20,922.01	
15,800.00	7,162.74	19,340.96	6,975.69	213.70	373.60	-89.66	1,457.09	-12,599.52	21,086.67	21,021.73	
15,900.00	7,162.76	19,340.96	6,975.69	216.12	373.60	-89.66	1,457.09	-12,599.52	21,186.45	21,121.44	
16,000.00	7,162.78	19,340.96	6,975.69	218.54	373.60	-89.66	1,457.09	-12,599.52	21,286.24	21,221.16	
16,100.00	7,162.80	19,340.96	6,975.69	220.96	373.60	-89.66	1,457.09	-12,599.52	21,386.03	21,320.88	
16,200.00	7,162.82	19,340.96	6,975.69	223.38	373.60	-89.66	1,457.09	-12,599.52	21,485.82	21,420.60	
16,300.00	7,162.84	19,340.96	6,975.69	225.80	373.60	-89.66	1,457.09	-12,599.52	21,585.61	21,520.33	
16,400.00	7,162.86	19,340.96	6,975.69	228.22	373.60	-89.66	1,457.09	-12,599.52	21,685.41	21,620.05	
16,500.00	7,162.88	19,340.96	6,975.69	230.64	373.60	-89.66	1,457.09	-12,599.52	21,785.21	21,719.77	
16,600.00	7,162.91	19,340.96	6,975.69	233.06	373.60	-89.66	1,457.09	-12,599.52	21,885.01	21,819.50	
16,700.00	7,162.93	19,340.96	6,975.69	235.49	373.60	-89.66	1,457.09	-12,599.52	21,984.81	21,919.22	
16,800.00	7,162.95	19,340.96	6,975.69	237.91	373.60	-89.66	1,457.09	-12,599.52	22,084.61	22,018.95	
16,879.97	7,162.96	19,340.96	6,975.69	239.84	373.60	-89.66	1,457.09	-12,599.52	22,164.43	22,098.71	
16,900.00	7,162.97	19,340.96	6,975.69	240.33	373.60	-89.66	1,457.09	-12,599.52	22,184.42	22,118.68	
17,000.00	7,162.99	19,340.96	6,975.69	242.75	373.60	-89.66	1,457.09	-12,599.52	22,284.22	22,218.41	
17,056.99	7,163.00	19,340.96	6,975.69	244.13	373.60	-89.66	1,457.09	-12,599.52	22,341.11	22,275.25	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Rule Assigned:						
							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	20,806.96	7,074.42	0.00	336.82	-57.29	346.52	-539.64	7,174.16				
100.00	100.00	20,806.96	7,074.42	0.25	336.82	-57.29	346.52	-539.64	7,074.56	6,962.62	111.95	63.197	
200.00	200.00	20,806.96	7,074.42	0.61	336.82	-57.29	346.52	-539.64	6,974.98	6,863.00	111.98	62.288	
300.00	300.00	20,806.96	7,074.42	0.97	336.82	-57.29	346.52	-539.64	6,875.41	6,763.39	112.02	61.377	
400.00	400.00	20,806.96	7,074.42	1.33	336.82	-57.29	346.52	-539.64	6,775.85	6,663.78	112.07	60.462	
500.00	500.00	20,806.96	7,074.42	1.68	336.82	-57.29	346.52	-539.64	6,676.31	6,564.19	112.12	59.545	
600.00	599.98	20,806.96	7,074.42	2.04	336.82	41.15	346.52	-539.64	6,576.65	6,464.46	112.19	58.622	
700.00	699.84	20,806.96	7,074.42	2.39	336.82	69.43	346.52	-539.64	6,476.81	6,364.56	112.26	57.696	
722.35	722.13	20,806.96	7,074.42	2.47	336.82	78.41	346.52	-539.64	6,454.49	6,342.21	112.28	57.488	
800.00	799.54	20,806.96	7,074.42	2.74	336.82	78.41	346.52	-539.64	6,376.93	6,264.59	112.33	56.768	
900.00	899.24	20,806.96	7,074.42	3.10	336.82	78.41	346.52	-539.64	6,277.04	6,164.63	112.41	55.840	
1,000.00	998.94	20,806.96	7,074.42	3.47	336.82	78.41	346.52	-539.64	6,177.16	6,064.66	112.50	54.909	
1,100.00	1,098.64	20,806.96	7,074.42	3.83	336.82	78.41	346.52	-539.64	6,077.28	5,964.69	112.59	53.977	
1,200.00	1,198.34	20,806.96	7,074.42	4.20	336.82	78.41	346.52	-539.64	5,977.40	5,864.72	112.69	53.044	
1,300.00	1,298.04	20,806.96	7,074.42	4.57	336.82	78.41	346.52	-539.64	5,877.53	5,764.74	112.79	52.109	
1,400.00	1,397.74	20,806.96	7,074.42	4.94	336.82	78.41	346.52	-539.64	5,777.67	5,664.76	112.90	51.173	
1,500.00	1,497.44	20,806.96	7,074.42	5.31	336.82	78.41	346.52	-539.64	5,677.81	5,564.79	113.02	50.236	
1,600.00	1,597.13	20,806.96	7,074.42	5.68	336.82	78.41	346.52	-539.64	5,577.95	5,464.81	113.15	49.299	
1,700.00	1,696.83	20,806.96	7,074.42	6.05	336.82	78.41	346.52	-539.64	5,478.10	5,364.83	113.28	48.361	
1,800.00	1,796.53	20,806.96	7,074.42	6.43	336.82	78.41	346.52	-539.64	5,378.26	5,264.84	113.41	47.422	
1,900.00	1,896.23	20,806.96	7,074.42	6.80	336.82	78.41	346.52	-539.64	5,278.42	5,164.86	113.55	46.484	
2,000.00	1,995.93	20,806.96	7,074.42	7.17	336.82	78.41	346.52	-539.64	5,178.58	5,064.88	113.70	45.544	
2,100.00	2,095.63	20,806.96	7,074.42	7.54	336.82	78.41	346.52	-539.64	5,078.76	4,964.90	113.86	44.605	
2,200.00	2,195.33	20,806.96	7,074.42	7.92	336.82	78.41	346.52	-539.64	4,978.94	4,864.91	114.02	43.666	
2,300.00	2,295.03	20,806.96	7,074.42	8.29	336.82	78.41	346.52	-539.64	4,879.13	4,764.93	114.20	42.726	
2,400.00	2,394.73	20,806.96	7,074.42	8.66	336.82	78.41	346.52	-539.64	4,779.32	4,664.95	114.37	41.787	
2,500.00	2,494.43	20,806.96	7,074.42	9.04	336.82	78.41	346.52	-539.64	4,679.52	4,564.96	114.56	40.848	
2,600.00	2,594.12	20,806.96	7,074.42	9.41	336.82	78.41	346.52	-539.64	4,579.74	4,464.98	114.76	39.909	
2,700.00	2,693.82	20,806.96	7,074.42	9.79	336.82	78.41	346.52	-539.64	4,479.96	4,365.00	114.96	38.970	
2,800.00	2,793.52	20,806.96	7,074.42	10.16	336.82	78.41	346.52	-539.64	4,380.19	4,265.02	115.17	38.032	
2,900.00	2,893.22	20,806.96	7,074.42	10.53	336.82	78.41	346.52	-539.64	4,280.44	4,165.04	115.39	37.094	
3,000.00	2,992.92	20,806.96	7,074.42	10.91	336.82	78.41	346.52	-539.64	4,180.69	4,065.06	115.63	36.157	
3,100.00	3,092.62	20,806.96	7,074.42	11.28	336.82	78.41	346.52	-539.64	4,080.96	3,965.09	115.87	35.220	
3,200.00	3,192.32	20,806.96	7,074.42	11.66	336.82	78.41	346.52	-539.64	3,981.24	3,865.11	116.13	34.283	
3,300.00	3,292.02	20,806.96	7,074.42	12.03	336.82	78.41	346.52	-539.64	3,881.54	3,765.14	116.40	33.347	
3,400.00	3,391.72	20,806.96	7,074.42	12.41	336.82	78.41	346.52	-539.64	3,781.85	3,665.17	116.68	32.412	
3,500.00	3,491.41	20,806.96	7,074.42	12.78	336.82	78.41	346.52	-539.64	3,682.17	3,565.20	116.98	31.478	
3,600.00	3,591.11	20,806.96	7,074.42	13.15	336.82	78.41	346.52	-539.64	3,582.52	3,465.23	117.29	30.543	
3,700.00	3,690.81	20,806.96	7,074.42	13.53	336.82	78.41	346.52	-539.64	3,482.89	3,365.26	117.63	29.610	
3,800.00	3,790.51	20,806.96	7,074.42	13.90	336.82	78.41	346.52	-539.64	3,383.27	3,265.30	117.98	28.677	
3,900.00	3,890.21	20,806.96	7,074.42	14.28	336.82	78.41	346.52	-539.64	3,283.69	3,165.33	118.35	27.745	
4,000.00	3,989.91	20,806.96	7,074.42	14.65	336.82	78.41	346.52	-539.64	3,184.12	3,065.37	118.75	26.813	
4,100.00	4,089.61	20,806.96	7,074.42	15.03	336.82	78.41	346.52	-539.64	3,084.59	2,965.41	119.18	25.882	
4,200.00	4,189.31	20,806.96	7,074.42	15.40	336.82	78.41	346.52	-539.64	2,985.09	2,865.45	119.63	24.952	
4,300.00	4,289.01	20,806.96	7,074.42	15.78	336.82	78.41	346.52	-539.64	2,885.62	2,765.49	120.12	24.022	
4,400.00	4,388.70	20,806.96	7,074.42	16.15	336.82	78.41	346.52	-539.64	2,786.18	2,665.53	120.65	23.093	
4,500.00	4,488.40	20,806.96	7,074.42	16.53	336.82	78.41	346.52	-539.64	2,686.80	2,565.57	121.22	22.164	
4,600.00	4,588.10	20,806.96	7,074.42	16.90	336.82	78.41	346.52	-539.64	2,587.45	2,465.61	121.84	21.236	
4,700.00	4,687.80	20,806.96	7,074.42	17.27	336.82	78.41	346.52	-539.64	2,488.16	2,365.65	122.52	20.309	
4,800.00	4,787.50	20,806.96	7,074.42	17.65	336.82	78.41	346.52	-539.64	2,388.93	2,265.67	123.26	19.381	
4,900.00	4,887.20	20,806.96	7,074.42	18.02	336.82	78.41	346.52	-539.64	2,289.77	2,165.69	124.08	18.454	
5,000.00	4,986.90	20,806.96	7,074.42	18.40	336.82	78.41	346.52	-539.64	2,190.68	2,065.70	124.98	17.528	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis	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)			
5,100.00	5,086.60	20,806.96	7,074.42	18.77	336.82	78.41	346.52	-539.64	2,091.68	1,965.69	125.99	16.602	
5,200.00	5,186.30	20,806.96	7,074.42	19.15	336.82	78.41	346.52	-539.64	1,992.78	1,865.66	127.12	15.676	
5,300.00	5,286.00	20,806.96	7,074.42	19.52	336.82	78.41	346.52	-539.64	1,894.00	1,765.60	128.40	14.751	
5,400.00	5,385.69	20,806.96	7,074.42	19.90	336.82	78.41	346.52	-539.64	1,795.35	1,665.50	129.85	13.826	
5,500.00	5,485.39	20,806.96	7,074.42	20.27	336.82	78.41	346.52	-539.64	1,696.86	1,565.35	131.51	12.903	
5,600.00	5,585.09	20,806.96	7,074.42	20.65	336.82	78.41	346.52	-539.64	1,598.55	1,465.12	133.43	11.980	
5,700.00	5,684.79	20,806.96	7,074.42	21.02	336.82	78.41	346.52	-539.64	1,500.47	1,364.80	135.68	11.059	
5,800.00	5,784.49	20,806.96	7,074.42	21.40	336.82	78.41	346.52	-539.64	1,402.66	1,264.35	138.31	10.141	
5,900.00	5,884.19	20,806.96	7,074.42	21.77	336.82	78.41	346.52	-539.64	1,305.19	1,163.73	141.46	9.227	
6,000.00	5,983.89	20,806.96	7,074.42	22.15	336.82	78.41	346.52	-539.64	1,208.12	1,062.88	145.24	8.318	
6,100.00	6,083.59	20,806.96	7,074.42	22.52	336.82	78.41	346.52	-539.64	1,111.58	961.72	149.85	7.418	
6,200.00	6,183.29	20,806.96	7,074.42	22.90	336.82	78.41	346.52	-539.64	1,015.70	860.15	155.55	6.530	
6,300.00	6,282.98	20,806.96	7,074.42	23.27	336.82	78.41	346.52	-539.64	920.70	758.00	162.70	5.659	
6,400.00	6,382.68	20,806.96	7,074.42	23.65	336.82	78.41	346.52	-539.64	826.89	655.09	171.80	4.813	
6,492.83	6,475.23	20,806.96	7,074.42	24.00	336.82	78.41	346.52	-539.64	741.25	558.65	182.60	4.059	
6,500.00	6,482.39	20,806.96	7,074.42	24.02	336.82	76.12	346.52	-539.64	734.71	551.15	183.55	4.003	
6,550.00	6,532.35	20,806.96	7,074.42	24.19	336.82	-78.09	346.52	-539.64	689.63	498.96	190.67	3.617	
6,600.00	6,582.27	20,806.96	7,074.42	24.34	336.82	-110.34	346.52	-539.64	645.84	447.16	198.68	3.251	
6,650.00	6,631.83	20,806.96	7,074.42	24.49	336.82	-118.49	346.52	-539.64	603.90	396.31	207.60	2.909	
6,700.00	6,680.73	20,806.96	7,074.42	24.62	336.82	-124.04	346.52	-539.64	564.54	347.21	217.33	2.598	
6,750.00	6,728.67	20,806.96	7,074.42	24.74	336.82	-128.12	346.52	-539.64	528.57	300.96	227.61	2.322	
6,800.00	6,775.35	20,806.96	7,074.42	24.86	336.82	-131.14	346.52	-539.64	497.00	259.07	237.93	2.089	
6,850.00	6,820.48	20,806.96	7,074.42	24.98	336.82	-133.31	346.52	-539.64	470.90	223.42	247.48	1.903	
6,900.00	6,863.78	20,806.96	7,074.42	25.09	336.82	-134.77	346.52	-539.64	451.42	196.25	255.17	1.769	
6,950.00	6,904.99	20,806.96	7,074.42	25.21	336.82	-135.62	346.52	-539.64	439.55	179.74	259.82	1.692	
6,995.80	6,940.68	20,806.96	7,074.42	25.32	336.82	-135.90	346.52	-539.64	435.97	175.37	260.60	1.673 CC, ES, SF	
7,000.00	6,943.86	20,806.96	7,074.42	25.33	336.82	-135.90	346.52	-539.64	436.00	175.51	260.49	1.674	
7,050.00	6,980.14	20,806.96	7,074.42	25.47	336.82	-135.64	346.52	-539.64	440.98	184.10	256.88	1.717	
7,100.00	7,013.60	20,806.96	7,074.42	25.62	336.82	-134.81	346.52	-539.64	454.18	204.74	249.44	1.821	
7,150.00	7,044.06	20,806.96	7,074.42	25.79	336.82	-133.38	346.52	-539.64	474.85	235.66	239.19	1.985	
7,200.00	7,071.31	20,806.96	7,074.42	26.00	336.82	-131.27	346.52	-539.64	501.94	274.61	227.34	2.208	
7,250.00	7,095.18	20,806.96	7,074.42	26.23	336.82	-128.36	346.52	-539.64	534.33	319.41	214.92	2.486	
7,300.00	7,115.54	20,806.96	7,074.42	26.50	336.82	-124.50	346.52	-539.64	570.93	368.23	202.70	2.817	
7,350.00	7,132.25	20,806.96	7,074.42	26.81	336.82	-119.49	346.52	-539.64	610.78	419.64	191.14	3.195	
7,400.00	7,145.22	20,806.96	7,074.42	27.16	336.82	-113.11	346.52	-539.64	653.07	472.60	180.47	3.619	
7,450.00	7,154.36	20,806.96	7,074.42	27.55	336.82	-105.22	346.52	-539.64	697.12	526.34	170.78	4.082	
7,500.00	7,159.61	20,806.96	7,074.42	27.97	336.82	-95.83	346.52	-539.64	742.36	580.32	162.04	4.581	
7,541.91	7,161.00	20,806.96	7,074.42	28.35	336.82	-87.06	346.52	-539.64	780.86	625.44	155.42	5.024	
7,600.00	7,161.01	20,806.96	7,074.42	28.92	336.82	-87.06	346.52	-539.64	834.78	687.58	147.20	5.671	
7,700.00	7,161.03	20,806.96	7,074.42	30.03	336.82	-87.06	346.52	-539.64	928.78	793.60	135.19	6.870	
7,800.00	7,161.05	20,806.96	7,074.42	31.29	336.82	-87.06	346.52	-539.64	1,023.92	898.60	125.32	8.171	
7,900.00	7,161.08	20,806.96	7,074.42	32.69	336.82	-87.06	346.52	-539.64	1,119.91	1,002.81	117.10	9.564	
8,000.00	7,161.10	20,806.96	7,074.42	34.20	336.82	-87.06	346.52	-539.64	1,216.54	1,106.37	110.17	11.043	
8,100.00	7,161.12	20,806.96	7,074.42	35.81	336.82	-87.06	346.52	-539.64	1,313.67	1,209.41	104.26	12.600	
8,200.00	7,161.14	20,806.96	7,074.42	37.52	336.82	-87.06	346.52	-539.64	1,411.21	1,312.03	99.18	14.229	
8,300.00	7,161.16	20,806.96	7,074.42	39.30	336.82	-87.06	346.52	-539.64	1,509.07	1,414.31	94.76	15.924	
8,400.00	7,161.18	20,806.96	7,074.42	41.15	336.82	-87.06	346.52	-539.64	1,607.19	1,516.29	90.90	17.680	
8,500.00	7,161.20	20,806.96	7,074.42	43.05	336.82	-87.06	346.52	-539.64	1,705.53	1,618.03	87.51	19.490	
8,600.00	7,161.22	20,806.96	7,074.42	45.01	336.82	-87.06	346.52	-539.64	1,804.06	1,719.56	84.50	21.351	
8,700.00	7,161.24	20,806.96	7,074.42	47.02	336.82	-87.06	346.52	-539.64	1,902.73	1,820.92	81.81	23.257	
8,800.00	7,161.26	20,806.96	7,074.42	49.06	336.82	-87.06	346.52	-539.64	2,001.54	1,922.13	79.41	25.204	
8,900.00	7,161.29	20,806.96	7,074.42	51.14	336.82	-87.06	346.52	-539.64	2,100.46	2,023.21	77.26	27.189	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project						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
9,000.00	7,161.31	20,806.96	7,074.42	53.24	336.82	-87.06	346.52	-539.64	2,199.48	2,124.17	75.31	29.207	
9,100.00	7,161.33	20,806.96	7,074.42	55.38	336.82	-87.06	346.52	-539.64	2,298.58	2,225.04	73.54	31.255	
9,200.00	7,161.35	20,806.96	7,074.42	57.54	336.82	-87.06	346.52	-539.64	2,397.76	2,325.83	71.94	33.331	
9,300.00	7,161.37	20,806.96	7,074.42	59.72	336.82	-87.06	346.52	-539.64	2,497.01	2,426.53	70.48	35.431	
9,400.00	7,161.39	20,806.96	7,074.42	61.92	336.82	-87.06	346.52	-539.64	2,596.31	2,527.17	69.14	37.553	
9,500.00	7,161.41	20,806.96	7,074.42	64.13	336.82	-87.06	346.52	-539.64	2,695.66	2,627.75	67.91	39.693	
9,600.00	7,161.43	20,806.96	7,074.42	66.36	336.82	-87.06	346.52	-539.64	2,795.06	2,728.27	66.79	41.851	
9,700.00	7,161.45	20,806.96	7,074.42	68.61	336.82	-87.06	346.52	-539.64	2,894.50	2,828.75	65.75	44.023	
9,800.00	7,161.48	20,806.96	7,074.42	70.87	336.82	-87.06	346.52	-539.64	2,993.98	2,929.19	64.79	46.208	
9,900.00	7,161.50	20,806.96	7,074.42	73.14	336.82	-87.06	346.52	-539.64	3,093.49	3,029.58	63.91	48.404	
10,000.00	7,161.52	20,806.96	7,074.42	75.42	336.82	-87.06	346.52	-539.64	3,193.03	3,129.94	63.09	50.609	
10,100.00	7,161.54	20,806.96	7,074.42	77.71	336.82	-87.06	346.52	-539.64	3,292.60	3,230.27	62.33	52.822	
10,200.00	7,161.56	20,806.96	7,074.42	80.01	336.82	-87.06	346.52	-539.64	3,392.20	3,330.57	61.63	55.041	
10,300.00	7,161.58	20,806.96	7,074.42	82.32	336.82	-87.06	346.52	-539.64	3,491.82	3,430.84	60.98	57.265	
10,400.00	7,161.60	20,806.96	7,074.42	84.63	336.82	-87.06	346.52	-539.64	3,591.46	3,531.09	60.37	59.493	
10,500.00	7,161.62	20,806.96	7,074.42	86.95	336.82	-87.06	346.52	-539.64	3,691.12	3,631.32	59.80	61.724	
10,600.00	7,161.64	20,806.96	7,074.42	89.28	336.82	-87.06	346.52	-539.64	3,790.79	3,731.52	59.27	63.957	
10,700.00	7,161.66	20,806.96	7,074.42	91.61	336.82	-87.06	346.52	-539.64	3,890.49	3,831.71	58.78	66.190	
10,800.00	7,161.69	20,806.96	7,074.42	93.95	336.82	-87.06	346.52	-539.64	3,990.20	3,931.88	58.32	68.424	
10,900.00	7,161.71	20,806.96	7,074.42	96.29	336.82	-87.06	346.52	-539.64	4,089.92	4,032.04	57.88	70.657	
11,000.00	7,161.73	20,806.96	7,074.42	98.64	336.82	-87.06	346.52	-539.64	4,189.66	4,132.18	57.48	72.888	
11,100.00	7,161.75	20,806.96	7,074.42	100.99	336.82	-87.06	346.52	-539.64	4,289.40	4,232.30	57.10	75.117	
11,200.00	7,161.77	20,806.96	7,074.42	103.35	336.82	-87.06	346.52	-539.64	4,389.17	4,332.42	56.75	77.343	
11,300.00	7,161.79	20,806.96	7,074.42	105.71	336.82	-87.06	346.52	-539.64	4,488.94	4,432.52	56.42	79.566	
11,400.00	7,161.81	20,806.96	7,074.42	108.07	336.82	-87.06	346.52	-539.64	4,588.72	4,532.61	56.11	81.785	
11,500.00	7,161.83	20,806.96	7,074.42	110.44	336.82	-87.06	346.52	-539.64	4,688.51	4,632.69	55.82	84.000	
11,600.00	7,161.85	20,806.96	7,074.42	112.80	336.82	-87.06	346.52	-539.64	4,788.31	4,732.76	55.54	86.210	
11,700.00	7,161.87	20,806.96	7,074.42	115.18	336.82	-87.06	346.52	-539.64	4,888.11	4,832.83	55.29	88.415	
11,800.00	7,161.90	20,806.96	7,074.42	117.55	336.82	-87.06	346.52	-539.64	4,987.93	4,932.88	55.05	90.614	
11,900.00	7,161.92	20,806.96	7,074.42	119.93	336.82	-87.06	346.52	-539.64	5,087.75	5,032.93	54.82	92.807	
12,000.00	7,161.94	20,806.96	7,074.42	122.31	336.82	-87.06	346.52	-539.64	5,187.58	5,132.97	54.61	94.995	
12,100.00	7,161.96	20,806.96	7,074.42	124.69	336.82	-87.06	346.52	-539.64	5,287.41	5,233.00	54.41	97.176	
12,200.00	7,161.98	20,806.96	7,074.42	127.07	336.82	-87.06	346.52	-539.64	5,387.26	5,333.03	54.23	99.350	
12,300.00	7,162.00	20,806.96	7,074.42	129.46	336.82	-87.06	346.52	-539.64	5,487.10	5,433.05	54.05	101.517	
12,400.00	7,162.02	20,806.96	7,074.42	131.85	336.82	-87.06	346.52	-539.64	5,586.96	5,533.07	53.89	103.677	
12,500.00	7,162.04	20,806.96	7,074.42	134.24	336.82	-87.06	346.52	-539.64	5,686.81	5,633.08	53.74	105.830	
12,600.00	7,162.06	20,806.96	7,074.42	136.63	336.82	-87.06	346.52	-539.64	5,786.68	5,733.08	53.59	107.975	
12,700.00	7,162.09	20,806.96	7,074.42	139.02	336.82	-87.06	346.52	-539.64	5,886.54	5,833.08	53.46	110.113	
12,800.00	7,162.11	20,806.96	7,074.42	141.42	336.82	-87.06	346.52	-539.64	5,986.42	5,933.08	53.33	112.243	
12,900.00	7,162.13	20,806.96	7,074.42	143.81	336.82	-87.06	346.52	-539.64	6,086.29	6,033.07	53.22	114.364	
13,000.00	7,162.15	20,806.96	7,074.42	146.21	336.82	-87.06	346.52	-539.64	6,186.17	6,133.06	53.11	116.478	
13,100.00	7,162.17	20,806.96	7,074.42	148.61	336.82	-87.06	346.52	-539.64	6,286.06	6,233.05	53.01	118.584	
13,200.00	7,162.19	20,806.96	7,074.42	151.01	336.82	-87.06	346.52	-539.64	6,385.94	6,333.03	52.92	120.681	
13,300.00	7,162.21	20,806.96	7,074.42	153.41	336.82	-87.06	346.52	-539.64	6,485.83	6,433.01	52.83	122.769	
13,400.00	7,162.23	20,806.96	7,074.42	155.81	336.82	-87.06	346.52	-539.64	6,585.73	6,532.98	52.75	124.850	
13,500.00	7,162.25	20,806.96	7,074.42	158.21	336.82	-87.06	346.52	-539.64	6,685.63	6,632.95	52.68	126.921	
13,600.00	7,162.27	20,806.96	7,074.42	160.62	336.82	-87.06	346.52	-539.64	6,785.53	6,732.92	52.61	128.984	
13,700.00	7,162.30	20,806.96	7,074.42	163.02	336.82	-87.06	346.52	-539.64	6,885.43	6,832.89	52.55	131.038	
13,800.00	7,162.32	20,806.96	7,074.42	165.43	336.82	-87.06	346.52	-539.64	6,985.34	6,932.85	52.49	133.084	
13,900.00	7,162.34	20,806.96	7,074.42	167.84	336.82	-87.06	346.52	-539.64	7,085.25	7,032.81	52.44	135.120	
14,000.00	7,162.36	20,806.96	7,074.42	170.24	336.82	-87.06	346.52	-539.64	7,185.16	7,132.77	52.39	137.148	
14,100.00	7,162.38	20,806.96	7,074.42	172.65	336.82	-87.06	346.52	-539.64	7,285.07	7,232.72	52.35	139.167	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project												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)			
14,200.00	7,162.40	20,806.96	7,074.42	175.06	336.82	-87.06	346.52	-539.64	7,384.99	7,332.68	52.31	141.177	
14,300.00	7,162.42	20,806.96	7,074.42	177.47	336.82	-87.06	346.52	-539.64	7,484.90	7,432.63	52.28	143.178	
14,400.00	7,162.44	20,806.96	7,074.42	179.88	336.82	-87.06	346.52	-539.64	7,584.83	7,532.58	52.25	145.169	
14,500.00	7,162.46	20,806.96	7,074.42	182.29	336.82	-87.06	346.52	-539.64	7,684.75	7,632.52	52.22	147.152	
14,600.00	7,162.49	20,806.96	7,074.42	184.71	336.82	-87.06	346.52	-539.64	7,784.67	7,732.47	52.20	149.126	
14,700.00	7,162.51	20,806.96	7,074.42	187.12	336.82	-87.06	346.52	-539.64	7,884.60	7,832.41	52.18	151.090	
14,800.00	7,162.53	20,806.96	7,074.42	189.53	336.82	-87.06	346.52	-539.64	7,984.53	7,932.36	52.17	153.045	
14,900.00	7,162.55	20,806.96	7,074.42	191.95	336.82	-87.06	346.52	-539.64	8,084.46	8,032.30	52.16	154.992	
15,000.00	7,162.57	20,806.96	7,074.42	194.36	336.82	-87.06	346.52	-539.64	8,184.39	8,132.24	52.15	156.929	
15,100.00	7,162.59	20,806.96	7,074.42	196.78	336.82	-87.06	346.52	-539.64	8,284.32	8,232.17	52.15	158.857	
15,200.00	7,162.61	20,806.96	7,074.42	199.19	336.82	-87.06	346.52	-539.64	8,384.26	8,332.11	52.15	160.775	
15,300.00	7,162.63	20,806.96	7,074.42	201.61	336.82	-87.06	346.52	-539.64	8,484.19	8,432.04	52.15	162.685	
15,400.00	7,162.65	20,806.96	7,074.42	204.03	336.82	-87.06	346.52	-539.64	8,584.13	8,531.98	52.16	164.585	
15,500.00	7,162.67	20,806.96	7,074.42	206.44	336.82	-87.06	346.52	-539.64	8,684.07	8,631.91	52.16	166.476	
15,600.00	7,162.70	20,806.96	7,074.42	208.86	336.82	-87.06	346.52	-539.64	8,784.01	8,731.84	52.17	168.358	
15,700.00	7,162.72	20,806.96	7,074.42	211.28	336.82	-87.06	346.52	-539.64	8,883.95	8,831.77	52.19	170.231	
15,800.00	7,162.74	20,806.96	7,074.42	213.70	336.82	-87.06	346.52	-539.64	8,983.90	8,931.70	52.20	172.095	
15,900.00	7,162.76	20,806.96	7,074.42	216.12	336.82	-87.06	346.52	-539.64	9,083.84	9,031.62	52.22	173.949	
16,000.00	7,162.78	20,806.96	7,074.42	218.54	336.82	-87.06	346.52	-539.64	9,183.79	9,131.55	52.24	175.795	
16,100.00	7,162.80	20,806.96	7,074.42	220.96	336.82	-87.06	346.52	-539.64	9,283.74	9,231.47	52.26	177.631	
16,200.00	7,162.82	20,806.96	7,074.42	223.38	336.82	-87.06	346.52	-539.64	9,383.68	9,331.40	52.29	179.458	
16,300.00	7,162.84	20,806.96	7,074.42	225.80	336.82	-87.06	346.52	-539.64	9,483.63	9,431.32	52.32	181.276	
16,400.00	7,162.86	20,806.96	7,074.42	228.22	336.82	-87.06	346.52	-539.64	9,583.58	9,531.24	52.35	183.084	
16,500.00	7,162.88	20,806.96	7,074.42	230.64	336.82	-87.06	346.52	-539.64	9,683.54	9,631.16	52.38	184.884	
16,600.00	7,162.91	20,806.96	7,074.42	233.06	336.82	-87.06	346.52	-539.64	9,783.49	9,731.08	52.41	186.674	
16,700.00	7,162.93	20,806.96	7,074.42	235.49	336.82	-87.06	346.52	-539.64	9,883.44	9,831.00	52.44	188.456	
16,800.00	7,162.95	20,806.96	7,074.42	237.91	336.82	-87.06	346.52	-539.64	9,983.40	9,930.91	52.48	190.228	
16,879.97	7,162.96	20,806.96	7,074.42	239.84	336.82	-87.06	346.52	-539.64	10,063.33	10,010.82	52.51	191.639	
16,900.00	7,162.97	20,806.96	7,074.42	240.33	336.82	-87.06	346.52	-539.64	10,083.35	10,030.83	52.52	191.991	
17,000.00	7,162.99	20,806.96	7,074.42	242.75	336.82	-87.06	346.52	-539.64	10,183.31	10,130.75	52.56	193.746	
17,056.99	7,163.00	20,806.96	7,074.42	244.13	336.82	-87.06	346.52	-539.64	10,240.27	10,187.69	52.58	194.742	

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project													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	21,289.96	7,363.81	0.00	339.92	-140.10	-651.69	-544.81	7,483.19				
100.00	100.00	21,289.96	7,363.81	0.25	339.92	-140.10	-651.69	-544.81	7,383.85	7,267.53	116.31	63.483	
200.00	200.00	21,289.96	7,363.81	0.61	339.92	-140.10	-651.69	-544.81	7,284.52	7,168.11	116.41	62.576	
300.00	300.00	21,289.96	7,363.81	0.97	339.92	-140.10	-651.69	-544.81	7,185.21	7,068.69	116.52	61.664	
400.00	400.00	21,289.96	7,363.81	1.33	339.92	-140.10	-651.69	-544.81	7,085.92	6,969.28	116.64	60.750	
500.00	500.00	21,289.96	7,363.81	1.68	339.92	-140.10	-651.69	-544.81	6,986.65	6,869.88	116.77	59.832	
600.00	599.98	21,289.96	7,363.81	2.04	339.92	-70.86	-651.69	-544.81	6,887.30	6,770.39	116.92	58.908	
700.00	699.84	21,289.96	7,363.81	2.39	339.92	-89.58	-651.69	-544.81	6,787.85	6,670.77	117.08	57.977	
722.35	722.13	21,289.96	7,363.81	2.47	339.92	-93.89	-651.69	-544.81	6,765.61	6,648.50	117.12	57.768	
800.00	799.54	21,289.96	7,363.81	2.74	339.92	-93.89	-651.69	-544.81	6,688.39	6,571.14	117.25	57.043	
900.00	899.24	21,289.96	7,363.81	3.10	339.92	-93.89	-651.69	-544.81	6,588.95	6,471.51	117.44	56.107	
1,000.00	998.94	21,289.96	7,363.81	3.47	339.92	-93.89	-651.69	-544.81	6,489.52	6,371.89	117.63	55.168	
1,100.00	1,098.64	21,289.96	7,363.81	3.83	339.92	-93.89	-651.69	-544.81	6,390.12	6,272.28	117.84	54.227	
1,200.00	1,198.34	21,289.96	7,363.81	4.20	339.92	-93.89	-651.69	-544.81	6,290.73	6,172.67	118.06	53.284	
1,300.00	1,298.04	21,289.96	7,363.81	4.57	339.92	-93.89	-651.69	-544.81	6,191.36	6,073.07	118.29	52.340	
1,400.00	1,397.74	21,289.96	7,363.81	4.94	339.92	-93.89	-651.69	-544.81	6,092.01	5,973.47	118.54	51.394	
1,500.00	1,497.44	21,289.96	7,363.81	5.31	339.92	-93.89	-651.69	-544.81	5,992.68	5,873.89	118.79	50.446	
1,600.00	1,597.13	21,289.96	7,363.81	5.68	339.92	-93.89	-651.69	-544.81	5,893.38	5,774.32	119.07	49.497	
1,700.00	1,696.83	21,289.96	7,363.81	6.05	339.92	-93.89	-651.69	-544.81	5,794.10	5,674.75	119.35	48.546	
1,800.00	1,796.53	21,289.96	7,363.81	6.43	339.92	-93.89	-651.69	-544.81	5,694.85	5,575.20	119.65	47.595	
1,900.00	1,896.23	21,289.96	7,363.81	6.80	339.92	-93.89	-651.69	-544.81	5,595.62	5,475.65	119.97	46.643	
2,000.00	1,995.93	21,289.96	7,363.81	7.17	339.92	-93.89	-651.69	-544.81	5,496.42	5,376.12	120.30	45.690	
2,100.00	2,095.63	21,289.96	7,363.81	7.54	339.92	-93.89	-651.69	-544.81	5,397.25	5,276.60	120.65	44.736	
2,200.00	2,195.33	21,289.96	7,363.81	7.92	339.92	-93.89	-651.69	-544.81	5,298.11	5,177.10	121.01	43.781	
2,300.00	2,295.03	21,289.96	7,363.81	8.29	339.92	-93.89	-651.69	-544.81	5,199.01	5,077.61	121.40	42.826	
2,400.00	2,394.73	21,289.96	7,363.81	8.66	339.92	-93.89	-651.69	-544.81	5,099.94	4,978.13	121.80	41.871	
2,500.00	2,494.43	21,289.96	7,363.81	9.04	339.92	-93.89	-651.69	-544.81	5,000.90	4,878.67	122.23	40.915	
2,600.00	2,594.12	21,289.96	7,363.81	9.41	339.92	-93.89	-651.69	-544.81	4,901.91	4,779.23	122.68	39.958	
2,700.00	2,693.82	21,289.96	7,363.81	9.79	339.92	-93.89	-651.69	-544.81	4,802.95	4,679.81	123.15	39.002	
2,800.00	2,793.52	21,289.96	7,363.81	10.16	339.92	-93.89	-651.69	-544.81	4,704.05	4,580.40	123.64	38.046	
2,900.00	2,893.22	21,289.96	7,363.81	10.53	339.92	-93.89	-651.69	-544.81	4,605.18	4,481.02	124.17	37.089	
3,000.00	2,992.92	21,289.96	7,363.81	10.91	339.92	-93.89	-651.69	-544.81	4,506.37	4,381.65	124.72	36.132	
3,100.00	3,092.62	21,289.96	7,363.81	11.28	339.92	-93.89	-651.69	-544.81	4,407.61	4,282.31	125.30	35.176	
3,200.00	3,192.32	21,289.96	7,363.81	11.66	339.92	-93.89	-651.69	-544.81	4,308.91	4,182.99	125.92	34.220	
3,300.00	3,292.02	21,289.96	7,363.81	12.03	339.92	-93.89	-651.69	-544.81	4,210.27	4,083.70	126.57	33.264	
3,400.00	3,391.72	21,289.96	7,363.81	12.41	339.92	-93.89	-651.69	-544.81	4,111.70	3,984.44	127.27	32.308	
3,500.00	3,491.41	21,289.96	7,363.81	12.78	339.92	-93.89	-651.69	-544.81	4,013.20	3,885.20	128.00	31.353	
3,600.00	3,591.11	21,289.96	7,363.81	13.15	339.92	-93.89	-651.69	-544.81	3,914.77	3,785.99	128.78	30.398	
3,700.00	3,690.81	21,289.96	7,363.81	13.53	339.92	-93.89	-651.69	-544.81	3,816.43	3,686.81	129.62	29.444	
3,800.00	3,790.51	21,289.96	7,363.81	13.90	339.92	-93.89	-651.69	-544.81	3,718.17	3,587.67	130.50	28.491	
3,900.00	3,890.21	21,289.96	7,363.81	14.28	339.92	-93.89	-651.69	-544.81	3,620.01	3,488.56	131.45	27.539	
4,000.00	3,989.91	21,289.96	7,363.81	14.65	339.92	-93.89	-651.69	-544.81	3,521.95	3,389.49	132.47	26.588	
4,100.00	4,089.61	21,289.96	7,363.81	15.03	339.92	-93.89	-651.69	-544.81	3,424.01	3,290.45	133.55	25.638	
4,200.00	4,189.31	21,289.96	7,363.81	15.40	339.92	-93.89	-651.69	-544.81	3,326.18	3,191.46	134.72	24.690	
4,300.00	4,289.01	21,289.96	7,363.81	15.78	339.92	-93.89	-651.69	-544.81	3,228.49	3,092.52	135.97	23.743	
4,400.00	4,388.70	21,289.96	7,363.81	16.15	339.92	-93.89	-651.69	-544.81	3,130.95	2,993.62	137.33	22.799	
4,500.00	4,488.40	21,289.96	7,363.81	16.53	339.92	-93.89	-651.69	-544.81	3,033.56	2,894.78	138.79	21.858	
4,600.00	4,588.10	21,289.96	7,363.81	16.90	339.92	-93.89	-651.69	-544.81	2,936.36	2,795.99	140.37	20.919	
4,700.00	4,687.80	21,289.96	7,363.81	17.27	339.92	-93.89	-651.69	-544.81	2,839.34	2,697.26	142.08	19.983	
4,800.00	4,787.50	21,289.96	7,363.81	17.65	339.92	-93.89	-651.69	-544.81	2,742.54	2,598.59	143.95	19.052	
4,900.00	4,887.20	21,289.96	7,363.81	18.02	339.92	-93.89	-651.69	-544.81	2,645.98	2,500.00	145.98	18.125	
5,000.00	4,986.90	21,289.96	7,363.81	18.40	339.92	-93.89	-651.69	-544.81	2,549.68	2,401.48	148.21	17.204	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project													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)			
5,100.00	5,086.60	21,289.96	7,363.81	18.77	339.92	-93.89	-651.69	-544.81	2,453.68	2,303.04	150.64	16.288	
5,200.00	5,186.30	21,289.96	7,363.81	19.15	339.92	-93.89	-651.69	-544.81	2,358.01	2,204.70	153.32	15.380	
5,300.00	5,286.00	21,289.96	7,363.81	19.52	339.92	-93.89	-651.69	-544.81	2,262.72	2,106.45	156.27	14.480	
5,400.00	5,385.69	21,289.96	7,363.81	19.90	339.92	-93.89	-651.69	-544.81	2,167.85	2,008.33	159.52	13.589	
5,500.00	5,485.39	21,289.96	7,363.81	20.27	339.92	-93.89	-651.69	-544.81	2,073.47	1,910.33	163.13	12.710	
5,600.00	5,585.09	21,289.96	7,363.81	20.65	339.92	-93.89	-651.69	-544.81	1,979.63	1,812.48	167.15	11.844	
5,700.00	5,684.79	21,289.96	7,363.81	21.02	339.92	-93.89	-651.69	-544.81	1,886.43	1,714.81	171.62	10.992	
5,800.00	5,784.49	21,289.96	7,363.81	21.40	339.92	-93.89	-651.69	-544.81	1,793.96	1,617.34	176.62	10.157	
5,900.00	5,884.19	21,289.96	7,363.81	21.77	339.92	-93.89	-651.69	-544.81	1,702.34	1,520.12	182.22	9.342	
6,000.00	5,983.89	21,289.96	7,363.81	22.15	339.92	-93.89	-651.69	-544.81	1,611.72	1,423.20	188.52	8.549	
6,100.00	6,083.59	21,289.96	7,363.81	22.52	339.92	-93.89	-651.69	-544.81	1,522.27	1,326.66	195.61	7.782	
6,200.00	6,183.29	21,289.96	7,363.81	22.90	339.92	-93.89	-651.69	-544.81	1,434.22	1,230.59	203.62	7.043	
6,300.00	6,282.98	21,289.96	7,363.81	23.27	339.92	-93.89	-651.69	-544.81	1,347.83	1,135.16	212.68	6.337	
6,400.00	6,382.68	21,289.96	7,363.81	23.65	339.92	-93.89	-651.69	-544.81	1,263.46	1,040.55	222.91	5.668	
6,492.83	6,475.23	21,289.96	7,363.81	24.00	339.92	-93.89	-651.69	-544.81	1,187.31	953.73	233.58	5.083	
6,500.00	6,482.39	21,289.96	7,363.81	24.02	339.92	-93.87	-651.69	-544.81	1,181.53	947.07	234.46	5.039	
6,550.00	6,532.35	21,289.96	7,363.81	24.19	339.92	126.96	-651.69	-544.81	1,141.74	900.99	240.75	4.743	
6,600.00	6,582.27	21,289.96	7,363.81	24.34	339.92	107.73	-651.69	-544.81	1,103.13	855.79	247.34	4.460	
6,650.00	6,631.83	21,289.96	7,363.81	24.49	339.92	110.50	-651.69	-544.81	1,066.08	811.89	254.19	4.194	
6,700.00	6,680.73	21,289.96	7,363.81	24.62	339.92	113.93	-651.69	-544.81	1,031.00	769.80	261.20	3.947	
6,750.00	6,728.67	21,289.96	7,363.81	24.74	339.92	117.10	-651.69	-544.81	998.32	730.08	268.24	3.722	
6,800.00	6,775.35	21,289.96	7,363.81	24.86	339.92	119.84	-651.69	-544.81	968.50	693.35	275.15	3.520	
6,850.00	6,820.48	21,289.96	7,363.81	24.98	339.92	122.13	-651.69	-544.81	942.00	660.28	281.72	3.344	
6,900.00	6,863.78	21,289.96	7,363.81	25.09	339.92	123.96	-651.69	-544.81	919.28	631.55	287.72	3.195	
6,950.00	6,904.99	21,289.96	7,363.81	25.21	339.92	125.37	-651.69	-544.81	900.76	607.86	292.90	3.075	
7,000.00	6,943.86	21,289.96	7,363.81	25.33	339.92	126.38	-651.69	-544.81	886.84	589.83	297.01	2.986	
7,050.00	6,980.14	21,289.96	7,363.81	25.47	339.92	127.00	-651.69	-544.81	877.81	577.98	299.83	2.928	
7,100.00	7,013.60	21,289.96	7,363.81	25.62	339.92	127.25	-651.69	-544.81	873.88	572.68	301.20	2.901	
7,112.80	7,021.70	21,289.96	7,363.81	25.66	339.92	127.25	-651.69	-544.81	873.71	572.41	301.31	2.900 CC, ES, SF	
7,150.00	7,044.06	21,289.96	7,363.81	25.79	339.92	127.12	-651.69	-544.81	875.16	574.12	301.03	2.907	
7,200.00	7,071.31	21,289.96	7,363.81	26.00	339.92	126.63	-651.69	-544.81	881.59	582.25	299.34	2.945	
7,250.00	7,095.18	21,289.96	7,363.81	26.23	339.92	125.75	-651.69	-544.81	893.04	596.82	296.22	3.015	
7,300.00	7,115.54	21,289.96	7,363.81	26.50	339.92	124.46	-651.69	-544.81	909.25	617.40	291.85	3.115	
7,350.00	7,132.25	21,289.96	7,363.81	26.81	339.92	122.75	-651.69	-544.81	929.87	643.42	286.45	3.246	
7,400.00	7,145.22	21,289.96	7,363.81	27.16	339.92	120.56	-651.69	-544.81	954.49	674.24	280.26	3.406	
7,450.00	7,154.36	21,289.96	7,363.81	27.55	339.92	117.86	-651.69	-544.81	982.67	709.16	273.51	3.593	
7,500.00	7,159.61	21,289.96	7,363.81	27.97	339.92	114.61	-651.69	-544.81	1,013.94	747.50	266.45	3.805	
7,541.91	7,161.00	21,289.96	7,363.81	28.35	339.92	111.42	-651.69	-544.81	1,042.20	781.79	260.41	4.002	
7,600.00	7,161.01	21,289.96	7,363.81	28.92	339.92	111.42	-651.69	-544.81	1,083.34	831.17	252.18	4.296	
7,700.00	7,161.03	21,289.96	7,363.81	30.03	339.92	111.42	-651.69	-544.81	1,157.57	918.78	238.79	4.848	
7,800.00	7,161.05	21,289.96	7,363.81	31.29	339.92	111.42	-651.69	-544.81	1,235.43	1,008.97	226.47	5.455	
7,900.00	7,161.08	21,289.96	7,363.81	32.69	339.92	111.42	-651.69	-544.81	1,316.30	1,101.08	215.22	6.116	
8,000.00	7,161.10	21,289.96	7,363.81	34.20	339.92	111.42	-651.69	-544.81	1,399.63	1,194.65	204.98	6.828	
8,100.00	7,161.12	21,289.96	7,363.81	35.81	339.92	111.42	-651.69	-544.81	1,485.03	1,289.34	195.69	7.589	
8,200.00	7,161.14	21,289.96	7,363.81	37.52	339.92	111.42	-651.69	-544.81	1,572.14	1,384.89	187.25	8.396	
8,300.00	7,161.16	21,289.96	7,363.81	39.30	339.92	111.42	-651.69	-544.81	1,660.71	1,481.13	179.59	9.247	
8,400.00	7,161.18	21,289.96	7,363.81	41.15	339.92	111.42	-651.69	-544.81	1,750.51	1,577.90	172.62	10.141	
8,500.00	7,161.20	21,289.96	7,363.81	43.05	339.92	111.42	-651.69	-544.81	1,841.37	1,675.10	166.27	11.075	
8,600.00	7,161.22	21,289.96	7,363.81	45.01	339.92	111.42	-651.69	-544.81	1,933.12	1,772.66	160.47	12.047	
8,700.00	7,161.24	21,289.96	7,363.81	47.02	339.92	111.42	-651.69	-544.81	2,025.66	1,870.50	155.16	13.055	
8,800.00	7,161.26	21,289.96	7,363.81	49.06	339.92	111.42	-651.69	-544.81	2,118.88	1,968.59	150.29	14.098	
8,900.00	7,161.29	21,289.96	7,363.81	51.14	339.92	111.42	-651.69	-544.81	2,212.68	2,066.87	145.82	15.175	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		409-B001Mb_MWD+HRGM, 21290-Project						Rule Assigned:				Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	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
9,000.00	7,161.31	21,289.96	7,363.81	53.24	339.92	111.42	-651.69	-544.81	2,307.01	2,165.32	141.69	16.282	
9,100.00	7,161.33	21,289.96	7,363.81	55.38	339.92	111.42	-651.69	-544.81	2,401.80	2,263.92	137.88	17.419	
9,200.00	7,161.35	21,289.96	7,363.81	57.54	339.92	111.42	-651.69	-544.81	2,496.99	2,362.63	134.36	18.584	
9,300.00	7,161.37	21,289.96	7,363.81	59.72	339.92	111.42	-651.69	-544.81	2,592.55	2,461.46	131.09	19.777	
9,400.00	7,161.39	21,289.96	7,363.81	61.92	339.92	111.42	-651.69	-544.81	2,688.43	2,560.37	128.05	20.994	
9,500.00	7,161.41	21,289.96	7,363.81	64.13	339.92	111.42	-651.69	-544.81	2,784.60	2,659.37	125.23	22.236	
9,600.00	7,161.43	21,289.96	7,363.81	66.36	339.92	111.42	-651.69	-544.81	2,881.03	2,758.43	122.59	23.501	
9,700.00	7,161.45	21,289.96	7,363.81	68.61	339.92	111.42	-651.69	-544.81	2,977.69	2,857.56	120.13	24.787	
9,800.00	7,161.48	21,289.96	7,363.81	70.87	339.92	111.42	-651.69	-544.81	3,074.57	2,956.75	117.82	26.094	
9,900.00	7,161.50	21,289.96	7,363.81	73.14	339.92	111.42	-651.69	-544.81	3,171.64	3,055.98	115.66	27.421	
10,000.00	7,161.52	21,289.96	7,363.81	75.42	339.92	111.42	-651.69	-544.81	3,268.89	3,155.25	113.64	28.766	
10,100.00	7,161.54	21,289.96	7,363.81	77.71	339.92	111.42	-651.69	-544.81	3,366.30	3,254.57	111.73	30.128	
10,200.00	7,161.56	21,289.96	7,363.81	80.01	339.92	111.42	-651.69	-544.81	3,463.86	3,353.92	109.94	31.507	
10,300.00	7,161.58	21,289.96	7,363.81	82.32	339.92	111.42	-651.69	-544.81	3,561.55	3,453.30	108.25	32.901	
10,400.00	7,161.60	21,289.96	7,363.81	84.63	339.92	111.42	-651.69	-544.81	3,659.37	3,552.71	106.66	34.310	
10,500.00	7,161.62	21,289.96	7,363.81	86.95	339.92	111.42	-651.69	-544.81	3,757.30	3,652.15	105.15	35.733	
10,600.00	7,161.64	21,289.96	7,363.81	89.28	339.92	111.42	-651.69	-544.81	3,855.34	3,751.62	103.73	37.169	
10,700.00	7,161.66	21,289.96	7,363.81	91.61	339.92	111.42	-651.69	-544.81	3,953.48	3,851.10	102.38	38.617	
10,800.00	7,161.69	21,289.96	7,363.81	93.95	339.92	111.42	-651.69	-544.81	4,051.71	3,950.61	101.10	40.076	
10,900.00	7,161.71	21,289.96	7,363.81	96.29	339.92	111.42	-651.69	-544.81	4,150.02	4,050.13	99.89	41.547	
11,000.00	7,161.73	21,289.96	7,363.81	98.64	339.92	111.42	-651.69	-544.81	4,248.41	4,149.67	98.74	43.027	
11,100.00	7,161.75	21,289.96	7,363.81	100.99	339.92	111.42	-651.69	-544.81	4,346.87	4,249.23	97.64	44.517	
11,200.00	7,161.77	21,289.96	7,363.81	103.35	339.92	111.42	-651.69	-544.81	4,445.41	4,348.80	96.61	46.016	
11,300.00	7,161.79	21,289.96	7,363.81	105.71	339.92	111.42	-651.69	-544.81	4,544.01	4,448.39	95.62	47.523	
11,400.00	7,161.81	21,289.96	7,363.81	108.07	339.92	111.42	-651.69	-544.81	4,642.66	4,547.99	94.67	49.038	
11,500.00	7,161.83	21,289.96	7,363.81	110.44	339.92	111.42	-651.69	-544.81	4,741.38	4,647.60	93.78	50.560	
11,600.00	7,161.85	21,289.96	7,363.81	112.80	339.92	111.42	-651.69	-544.81	4,840.14	4,747.22	92.92	52.089	
11,700.00	7,161.87	21,289.96	7,363.81	115.18	339.92	111.42	-651.69	-544.81	4,938.96	4,846.86	92.10	53.623	
11,800.00	7,161.90	21,289.96	7,363.81	117.55	339.92	111.42	-651.69	-544.81	5,037.82	4,946.50	91.32	55.164	
11,900.00	7,161.92	21,289.96	7,363.81	119.93	339.92	111.42	-651.69	-544.81	5,136.73	5,046.15	90.58	56.710	
12,000.00	7,161.94	21,289.96	7,363.81	122.31	339.92	111.42	-651.69	-544.81	5,235.68	5,145.81	89.87	58.260	
12,100.00	7,161.96	21,289.96	7,363.81	124.69	339.92	111.42	-651.69	-544.81	5,334.67	5,245.48	89.19	59.815	
12,200.00	7,161.98	21,289.96	7,363.81	127.07	339.92	111.42	-651.69	-544.81	5,433.69	5,345.16	88.53	61.374	
12,300.00	7,162.00	21,289.96	7,363.81	129.46	339.92	111.42	-651.69	-544.81	5,532.75	5,444.84	87.91	62.936	
12,400.00	7,162.02	21,289.96	7,363.81	131.85	339.92	111.42	-651.69	-544.81	5,631.84	5,544.53	87.31	64.502	
12,500.00	7,162.04	21,289.96	7,363.81	134.24	339.92	111.42	-651.69	-544.81	5,730.97	5,644.23	86.74	66.071	
12,600.00	7,162.06	21,289.96	7,363.81	136.63	339.92	111.42	-651.69	-544.81	5,830.12	5,743.93	86.19	67.642	
12,700.00	7,162.09	21,289.96	7,363.81	139.02	339.92	111.42	-651.69	-544.81	5,929.31	5,843.64	85.67	69.215	
12,800.00	7,162.11	21,289.96	7,363.81	141.42	339.92	111.42	-651.69	-544.81	6,028.52	5,943.35	85.16	70.790	
12,900.00	7,162.13	21,289.96	7,363.81	143.81	339.92	111.42	-651.69	-544.81	6,127.75	6,043.07	84.68	72.367	
13,000.00	7,162.15	21,289.96	7,363.81	146.21	339.92	111.42	-651.69	-544.81	6,227.01	6,142.80	84.21	73.945	
13,100.00	7,162.17	21,289.96	7,363.81	148.61	339.92	111.42	-651.69	-544.81	6,326.29	6,242.53	83.76	75.524	
13,200.00	7,162.19	21,289.96	7,363.81	151.01	339.92	111.42	-651.69	-544.81	6,425.60	6,342.26	83.34	77.104	
13,300.00	7,162.21	21,289.96	7,363.81	153.41	339.92	111.42	-651.69	-544.81	6,524.93	6,442.00	82.92	78.685	
13,400.00	7,162.23	21,289.96	7,363.81	155.81	339.92	111.42	-651.69	-544.81	6,624.27	6,541.74	82.53	80.266	
13,500.00	7,162.25	21,289.96	7,363.81	158.21	339.92	111.42	-651.69	-544.81	6,723.64	6,641.49	82.15	81.847	
13,600.00	7,162.27	21,289.96	7,363.81	160.62	339.92	111.42	-651.69	-544.81	6,823.02	6,741.24	81.78	83.428	
13,700.00	7,162.30	21,289.96	7,363.81	163.02	339.92	111.42	-651.69	-544.81	6,922.43	6,840.99	81.43	85.008	
13,800.00	7,162.32	21,289.96	7,363.81	165.43	339.92	111.42	-651.69	-544.81	7,021.85	6,940.75	81.10	86.588	
13,900.00	7,162.34	21,289.96	7,363.81	167.84	339.92	111.42	-651.69	-544.81	7,121.28	7,040.51	80.77	88.167	
14,000.00	7,162.36	21,289.96	7,363.81	170.24	339.92	111.42	-651.69	-544.81	7,220.73	7,140.28	80.46	89.745	
14,100.00	7,162.38	21,289.96	7,363.81	172.65	339.92	111.42	-651.69	-544.81	7,320.20	7,240.04	80.16	91.322	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project												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)			
14,200.00	7,162.40	21,289.96	7,363.81	175.06	339.92	111.42	-651.69	-544.81	7,419.68	7,339.81	79.87	92.898	
14,300.00	7,162.42	21,289.96	7,363.81	177.47	339.92	111.42	-651.69	-544.81	7,519.18	7,439.58	79.59	94.472	
14,400.00	7,162.44	21,289.96	7,363.81	179.88	339.92	111.42	-651.69	-544.81	7,618.68	7,539.36	79.32	96.045	
14,500.00	7,162.46	21,289.96	7,363.81	182.29	339.92	111.42	-651.69	-544.81	7,718.20	7,639.14	79.07	97.616	
14,600.00	7,162.49	21,289.96	7,363.81	184.71	339.92	111.42	-651.69	-544.81	7,817.74	7,738.92	78.82	99.184	
14,700.00	7,162.51	21,289.96	7,363.81	187.12	339.92	111.42	-651.69	-544.81	7,917.28	7,838.70	78.58	100.751	
14,800.00	7,162.53	21,289.96	7,363.81	189.53	339.92	111.42	-651.69	-544.81	8,016.84	7,938.48	78.35	102.316	
14,900.00	7,162.55	21,289.96	7,363.81	191.95	339.92	111.42	-651.69	-544.81	8,116.40	8,038.27	78.13	103.878	
15,000.00	7,162.57	21,289.96	7,363.81	194.36	339.92	111.42	-651.69	-544.81	8,215.98	8,138.06	77.92	105.438	
15,100.00	7,162.59	21,289.96	7,363.81	196.78	339.92	111.42	-651.69	-544.81	8,315.57	8,237.85	77.72	106.995	
15,200.00	7,162.61	21,289.96	7,363.81	199.19	339.92	111.42	-651.69	-544.81	8,415.17	8,337.64	77.52	108.550	
15,300.00	7,162.63	21,289.96	7,363.81	201.61	339.92	111.42	-651.69	-544.81	8,514.77	8,437.44	77.34	110.102	
15,400.00	7,162.65	21,289.96	7,363.81	204.03	339.92	111.42	-651.69	-544.81	8,614.39	8,537.23	77.15	111.651	
15,500.00	7,162.67	21,289.96	7,363.81	206.44	339.92	111.42	-651.69	-544.81	8,714.01	8,637.03	76.98	113.196	
15,600.00	7,162.70	21,289.96	7,363.81	208.86	339.92	111.42	-651.69	-544.81	8,813.65	8,736.83	76.81	114.739	
15,700.00	7,162.72	21,289.96	7,363.81	211.28	339.92	111.42	-651.69	-544.81	8,913.29	8,836.63	76.65	116.279	
15,800.00	7,162.74	21,289.96	7,363.81	213.70	339.92	111.42	-651.69	-544.81	9,012.94	8,936.44	76.50	117.815	
15,900.00	7,162.76	21,289.96	7,363.81	216.12	339.92	111.42	-651.69	-544.81	9,112.59	9,036.24	76.35	119.348	
16,000.00	7,162.78	21,289.96	7,363.81	218.54	339.92	111.42	-651.69	-544.81	9,212.26	9,136.05	76.21	120.877	
16,100.00	7,162.80	21,289.96	7,363.81	220.96	339.92	111.42	-651.69	-544.81	9,311.93	9,235.85	76.08	122.403	
16,200.00	7,162.82	21,289.96	7,363.81	223.38	339.92	111.42	-651.69	-544.81	9,411.61	9,335.66	75.95	123.925	
16,300.00	7,162.84	21,289.96	7,363.81	225.80	339.92	111.42	-651.69	-544.81	9,511.29	9,435.47	75.82	125.444	
16,400.00	7,162.86	21,289.96	7,363.81	228.22	339.92	111.42	-651.69	-544.81	9,610.98	9,535.28	75.70	126.958	
16,500.00	7,162.88	21,289.96	7,363.81	230.64	339.92	111.42	-651.69	-544.81	9,710.68	9,635.09	75.59	128.469	
16,600.00	7,162.91	21,289.96	7,363.81	233.06	339.92	111.42	-651.69	-544.81	9,810.39	9,734.91	75.48	129.976	
16,700.00	7,162.93	21,289.96	7,363.81	235.49	339.92	111.42	-651.69	-544.81	9,910.10	9,834.72	75.37	131.480	
16,800.00	7,162.95	21,289.96	7,363.81	237.91	339.92	111.42	-651.69	-544.81	10,009.81	9,934.54	75.27	132.979	
16,879.97	7,162.96	21,289.96	7,363.81	239.84	339.92	111.42	-651.69	-544.81	10,089.56	10,014.37	75.20	134.175	
16,900.00	7,162.97	21,289.96	7,363.81	240.33	339.92	111.42	-651.69	-544.81	10,109.53	10,034.36	75.18	134.474	
17,000.00	7,162.99	21,289.96	7,363.81	242.75	339.92	111.42	-651.69	-544.81	10,209.26	10,134.17	75.09	135.964	
17,056.99	7,163.00	21,289.96	7,363.81	244.13	339.92	111.42	-651.69	-544.81	10,266.10	10,191.06	75.04	136.812	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													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	
0.00	0.00	20,952.96	7,074.90	0.00	233.58	-161.55	-1,619.42	-540.21	7,347.00				
100.00	100.00	20,952.96	7,074.90	0.25	233.58	-161.55	-1,619.42	-540.21	7,249.78	7,126.29	123.48	58.710	
200.00	200.00	20,952.96	7,074.90	0.61	233.58	-161.55	-1,619.42	-540.21	7,152.63	7,028.89	123.74	57.803	
300.00	300.00	20,952.96	7,074.90	0.97	233.58	-161.55	-1,619.42	-540.21	7,055.56	6,931.54	124.01	56.893	
400.00	400.00	20,952.96	7,074.90	1.33	233.58	-161.55	-1,619.42	-540.21	6,958.57	6,834.27	124.31	55.979	
500.00	500.00	20,952.96	7,074.90	1.68	233.58	-161.55	-1,619.42	-540.21	6,861.67	6,737.05	124.62	55.062	
600.00	599.98	20,952.96	7,074.90	2.04	233.58	-84.51	-1,619.42	-540.21	6,764.78	6,639.83	124.95	54.139	
700.00	699.84	20,952.96	7,074.90	2.39	233.58	-92.32	-1,619.42	-540.21	6,667.90	6,542.59	125.31	53.212	
722.35	722.13	20,952.96	7,074.90	2.47	233.58	-94.05	-1,619.42	-540.21	6,646.26	6,520.87	125.39	53.005	
800.00	799.54	20,952.96	7,074.90	2.74	233.58	-94.05	-1,619.42	-540.21	6,571.12	6,445.43	125.68	52.283	
900.00	899.24	20,952.96	7,074.90	3.10	233.58	-94.05	-1,619.42	-540.21	6,474.43	6,348.35	126.08	51.351	
1,000.00	998.94	20,952.96	7,074.90	3.47	233.58	-94.05	-1,619.42	-540.21	6,377.85	6,251.35	126.50	50.417	
1,100.00	1,098.64	20,952.96	7,074.90	3.83	233.58	-94.05	-1,619.42	-540.21	6,281.38	6,154.44	126.94	49.482	
1,200.00	1,198.34	20,952.96	7,074.90	4.20	233.58	-94.05	-1,619.42	-540.21	6,185.02	6,057.61	127.41	48.545	
1,300.00	1,298.04	20,952.96	7,074.90	4.57	233.58	-94.05	-1,619.42	-540.21	6,088.78	5,960.88	127.90	47.606	
1,400.00	1,397.74	20,952.96	7,074.90	4.94	233.58	-94.05	-1,619.42	-540.21	5,992.66	5,864.24	128.41	46.667	
1,500.00	1,497.44	20,952.96	7,074.90	5.31	233.58	-94.05	-1,619.42	-540.21	5,896.66	5,767.71	128.95	45.728	
1,600.00	1,597.13	20,952.96	7,074.90	5.68	233.58	-94.05	-1,619.42	-540.21	5,800.81	5,671.29	129.52	44.788	
1,700.00	1,696.83	20,952.96	7,074.90	6.05	233.58	-94.05	-1,619.42	-540.21	5,705.09	5,574.99	130.11	43.849	
1,800.00	1,796.53	20,952.96	7,074.90	6.43	233.58	-94.05	-1,619.42	-540.21	5,609.53	5,478.80	130.73	42.910	
1,900.00	1,896.23	20,952.96	7,074.90	6.80	233.58	-94.05	-1,619.42	-540.21	5,514.12	5,382.74	131.38	41.972	
2,000.00	1,995.93	20,952.96	7,074.90	7.17	233.58	-94.05	-1,619.42	-540.21	5,418.88	5,286.82	132.06	41.034	
2,100.00	2,095.63	20,952.96	7,074.90	7.54	233.58	-94.05	-1,619.42	-540.21	5,323.81	5,191.04	132.77	40.098	
2,200.00	2,195.33	20,952.96	7,074.90	7.92	233.58	-94.05	-1,619.42	-540.21	5,228.93	5,095.41	133.52	39.164	
2,300.00	2,295.03	20,952.96	7,074.90	8.29	233.58	-94.05	-1,619.42	-540.21	5,134.24	4,999.94	134.30	38.231	
2,400.00	2,394.73	20,952.96	7,074.90	8.66	233.58	-94.05	-1,619.42	-540.21	5,039.76	4,904.64	135.11	37.300	
2,500.00	2,494.43	20,952.96	7,074.90	9.04	233.58	-94.05	-1,619.42	-540.21	4,945.49	4,809.52	135.97	36.371	
2,600.00	2,594.12	20,952.96	7,074.90	9.41	233.58	-94.05	-1,619.42	-540.21	4,851.45	4,714.58	136.87	35.446	
2,700.00	2,693.82	20,952.96	7,074.90	9.79	233.58	-94.05	-1,619.42	-540.21	4,757.66	4,619.85	137.81	34.523	
2,800.00	2,793.52	20,952.96	7,074.90	10.16	233.58	-94.05	-1,619.42	-540.21	4,664.12	4,525.32	138.80	33.603	
2,900.00	2,893.22	20,952.96	7,074.90	10.53	233.58	-94.05	-1,619.42	-540.21	4,570.86	4,431.02	139.84	32.686	
3,000.00	2,992.92	20,952.96	7,074.90	10.91	233.58	-94.05	-1,619.42	-540.21	4,477.89	4,336.96	140.93	31.774	
3,100.00	3,092.62	20,952.96	7,074.90	11.28	233.58	-94.05	-1,619.42	-540.21	4,385.23	4,243.15	142.07	30.866	
3,200.00	3,192.32	20,952.96	7,074.90	11.66	233.58	-94.05	-1,619.42	-540.21	4,292.89	4,149.62	143.28	29.962	
3,300.00	3,292.02	20,952.96	7,074.90	12.03	233.58	-94.05	-1,619.42	-540.21	4,200.91	4,056.37	144.54	29.064	
3,400.00	3,391.72	20,952.96	7,074.90	12.41	233.58	-94.05	-1,619.42	-540.21	4,109.30	3,963.43	145.87	28.171	
3,500.00	3,491.41	20,952.96	7,074.90	12.78	233.58	-94.05	-1,619.42	-540.21	4,018.10	3,870.82	147.27	27.283	
3,600.00	3,591.11	20,952.96	7,074.90	13.15	233.58	-94.05	-1,619.42	-540.21	3,927.32	3,778.57	148.75	26.403	
3,700.00	3,690.81	20,952.96	7,074.90	13.53	233.58	-94.05	-1,619.42	-540.21	3,837.00	3,686.70	150.30	25.529	
3,800.00	3,790.51	20,952.96	7,074.90	13.90	233.58	-94.05	-1,619.42	-540.21	3,747.17	3,595.23	151.94	24.662	
3,900.00	3,890.21	20,952.96	7,074.90	14.28	233.58	-94.05	-1,619.42	-540.21	3,657.87	3,504.20	153.67	23.804	
4,000.00	3,989.91	20,952.96	7,074.90	14.65	233.58	-94.05	-1,619.42	-540.21	3,569.13	3,413.64	155.49	22.954	
4,100.00	4,089.61	20,952.96	7,074.90	15.03	233.58	-94.05	-1,619.42	-540.21	3,481.01	3,323.59	157.42	22.113	
4,200.00	4,189.31	20,952.96	7,074.90	15.40	233.58	-94.05	-1,619.42	-540.21	3,393.55	3,234.10	159.45	21.283	
4,300.00	4,289.01	20,952.96	7,074.90	15.78	233.58	-94.05	-1,619.42	-540.21	3,306.79	3,145.20	161.60	20.463	
4,400.00	4,388.70	20,952.96	7,074.90	16.15	233.58	-94.05	-1,619.42	-540.21	3,220.81	3,056.94	163.86	19.655	
4,500.00	4,488.40	20,952.96	7,074.90	16.53	233.58	-94.05	-1,619.42	-540.21	3,135.66	2,969.39	166.26	18.860	
4,600.00	4,588.10	20,952.96	7,074.90	16.90	233.58	-94.05	-1,619.42	-540.21	3,051.40	2,882.61	168.79	18.078	
4,700.00	4,687.80	20,952.96	7,074.90	17.27	233.58	-94.05	-1,619.42	-540.21	2,968.13	2,796.66	171.46	17.310	
4,800.00	4,787.50	20,952.96	7,074.90	17.65	233.58	-94.05	-1,619.42	-540.21	2,885.91	2,711.63	174.29	16.558	
4,900.00	4,887.20	20,952.96	7,074.90	18.02	233.58	-94.05	-1,619.42	-540.21	2,804.86	2,627.59	177.27	15.823	
5,000.00	4,986.90	20,952.96	7,074.90	18.40	233.58	-94.05	-1,619.42	-540.21	2,725.06	2,544.65	180.41	15.105	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													Offset Well Error: 0.00 usft
Reference													
Offset													
Semi Major Axis													
Offset Wellbore Centre													
Distance													
Between Centres													
Between Ellipses													
Minimum Separation													
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)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,086.60	20,952.96	7,074.90	18.77	233.58	-94.05	-1,619.42	-540.21	2,646.63	2,462.92	183.72	14.406	
5,200.00	5,186.30	20,952.96	7,074.90	19.15	233.58	-94.05	-1,619.42	-540.21	2,569.71	2,382.51	187.20	13.727	
5,300.00	5,286.00	20,952.96	7,074.90	19.52	233.58	-94.05	-1,619.42	-540.21	2,494.42	2,303.56	190.85	13.070	
5,400.00	5,385.69	20,952.96	7,074.90	19.90	233.58	-94.05	-1,619.42	-540.21	2,420.92	2,226.23	194.68	12.435	
5,500.00	5,485.39	20,952.96	7,074.90	20.27	233.58	-94.05	-1,619.42	-540.21	2,349.38	2,150.69	198.69	11.825	
5,600.00	5,585.09	20,952.96	7,074.90	20.65	233.58	-94.05	-1,619.42	-540.21	2,279.98	2,077.12	202.85	11.240	
5,700.00	5,684.79	20,952.96	7,074.90	21.02	233.58	-94.05	-1,619.42	-540.21	2,212.92	2,005.75	207.17	10.682	
5,800.00	5,784.49	20,952.96	7,074.90	21.40	233.58	-94.05	-1,619.42	-540.21	2,148.43	1,936.80	211.63	10.152	
5,900.00	5,884.19	20,952.96	7,074.90	21.77	233.58	-94.05	-1,619.42	-540.21	2,086.73	1,870.54	216.20	9.652	
6,000.00	5,983.89	20,952.96	7,074.90	22.15	233.58	-94.05	-1,619.42	-540.21	2,028.10	1,807.25	220.84	9.183	
6,100.00	6,083.59	20,952.96	7,074.90	22.52	233.58	-94.05	-1,619.42	-540.21	1,972.79	1,747.26	225.53	8.747	
6,200.00	6,183.29	20,952.96	7,074.90	22.90	233.58	-94.05	-1,619.42	-540.21	1,921.10	1,690.90	230.20	8.345	
6,300.00	6,282.98	20,952.96	7,074.90	23.27	233.58	-94.05	-1,619.42	-540.21	1,873.33	1,638.52	234.80	7.978	
6,400.00	6,382.68	20,952.96	7,074.90	23.65	233.58	-94.05	-1,619.42	-540.21	1,829.77	1,590.52	239.26	7.648	
6,492.83	6,475.23	20,952.96	7,074.90	24.00	233.58	-94.05	-1,619.42	-540.21	1,793.39	1,550.20	243.19	7.374	
6,500.00	6,482.39	20,952.96	7,074.90	24.02	233.58	-94.66	-1,619.42	-540.21	1,790.75	1,547.27	243.49	7.355	
6,550.00	6,532.35	20,952.96	7,074.90	24.19	233.58	121.98	-1,619.42	-540.21	1,773.11	1,527.62	245.49	7.223	
6,600.00	6,582.27	20,952.96	7,074.90	24.34	233.58	98.91	-1,619.42	-540.21	1,756.91	1,509.51	247.40	7.101	
6,650.00	6,631.83	20,952.96	7,074.90	24.49	233.58	98.28	-1,619.42	-540.21	1,742.29	1,493.09	249.20	6.992	
6,700.00	6,680.73	20,952.96	7,074.90	24.62	233.58	98.74	-1,619.42	-540.21	1,729.38	1,478.51	250.87	6.894	
6,750.00	6,728.67	20,952.96	7,074.90	24.74	233.58	99.37	-1,619.42	-540.21	1,718.31	1,465.93	252.38	6.808	
6,800.00	6,775.35	20,952.96	7,074.90	24.86	233.58	99.97	-1,619.42	-540.21	1,709.18	1,455.46	253.72	6.736	
6,850.00	6,820.48	20,952.96	7,074.90	24.98	233.58	100.45	-1,619.42	-540.21	1,702.07	1,447.21	254.86	6.678	
6,900.00	6,863.78	20,952.96	7,074.90	25.09	233.58	100.79	-1,619.42	-540.21	1,697.06	1,441.27	255.80	6.634	
6,950.00	6,904.99	20,952.96	7,074.90	25.21	233.58	100.96	-1,619.42	-540.21	1,694.20	1,437.69	256.50	6.605	
6,990.86	6,936.94	20,952.96	7,074.90	25.31	233.58	100.98	-1,619.42	-540.21	1,693.47	1,436.56	256.91	6.592 CC	
7,000.00	6,943.86	20,952.96	7,074.90	25.33	233.58	100.96	-1,619.42	-540.21	1,693.51	1,436.52	256.98	6.590 ES	
7,050.00	6,980.14	20,952.96	7,074.90	25.47	233.58	100.78	-1,619.42	-540.21	1,694.99	1,437.77	257.22	6.590 SF	
7,100.00	7,013.60	20,952.96	7,074.90	25.62	233.58	100.42	-1,619.42	-540.21	1,698.65	1,441.41	257.24	6.603	
7,150.00	7,044.06	20,952.96	7,074.90	25.79	233.58	99.87	-1,619.42	-540.21	1,704.43	1,447.41	257.02	6.632	
7,200.00	7,071.31	20,952.96	7,074.90	26.00	233.58	99.14	-1,619.42	-540.21	1,712.29	1,455.70	256.59	6.673	
7,250.00	7,095.18	20,952.96	7,074.90	26.23	233.58	98.23	-1,619.42	-540.21	1,722.14	1,466.19	255.95	6.728	
7,300.00	7,115.54	20,952.96	7,074.90	26.50	233.58	97.13	-1,619.42	-540.21	1,733.90	1,478.76	255.13	6.796	
7,350.00	7,132.25	20,952.96	7,074.90	26.81	233.58	95.86	-1,619.42	-540.21	1,747.44	1,493.30	254.14	6.876	
7,400.00	7,145.22	20,952.96	7,074.90	27.16	233.58	94.42	-1,619.42	-540.21	1,762.66	1,509.66	253.00	6.967	
7,450.00	7,154.36	20,952.96	7,074.90	27.55	233.58	92.82	-1,619.42	-540.21	1,779.40	1,527.69	251.72	7.069	
7,500.00	7,159.61	20,952.96	7,074.90	27.97	233.58	91.06	-1,619.42	-540.21	1,797.54	1,547.22	250.32	7.181	
7,541.91	7,161.00	20,952.96	7,074.90	28.35	233.58	89.49	-1,619.42	-540.21	1,813.70	1,564.63	249.07	7.282	
7,600.00	7,161.01	20,952.96	7,074.90	28.92	233.58	89.49	-1,619.42	-540.21	1,837.43	1,590.18	247.25	7.432	
7,700.00	7,161.03	20,952.96	7,074.90	30.03	233.58	89.49	-1,619.42	-540.21	1,881.79	1,637.88	243.91	7.715	
7,800.00	7,161.05	20,952.96	7,074.90	31.29	233.58	89.49	-1,619.42	-540.21	1,930.31	1,689.94	240.37	8.031	
7,900.00	7,161.08	20,952.96	7,074.90	32.69	233.58	89.49	-1,619.42	-540.21	1,982.70	1,746.02	236.68	8.377	
8,000.00	7,161.10	20,952.96	7,074.90	34.20	233.58	89.49	-1,619.42	-540.21	2,038.64	1,805.76	232.88	8.754	
8,100.00	7,161.12	20,952.96	7,074.90	35.81	233.58	89.49	-1,619.42	-540.21	2,097.87	1,868.84	229.03	9.160	
8,200.00	7,161.14	20,952.96	7,074.90	37.52	233.58	89.49	-1,619.42	-540.21	2,160.10	1,934.94	225.16	9.594	
8,300.00	7,161.16	20,952.96	7,074.90	39.30	233.58	89.49	-1,619.42	-540.21	2,225.08	2,003.78	221.30	10.055	
8,400.00	7,161.18	20,952.96	7,074.90	41.15	233.58	89.49	-1,619.42	-540.21	2,292.59	2,075.11	217.48	10.541	
8,500.00	7,161.20	20,952.96	7,074.90	43.05	233.58	89.49	-1,619.42	-540.21	2,362.40	2,148.67	213.73	11.053	
8,600.00	7,161.22	20,952.96	7,074.90	45.01	233.58	89.49	-1,619.42	-540.21	2,434.32	2,224.27	210.06	11.589	
8,700.00	7,161.24	20,952.96	7,074.90	47.02	233.58	89.49	-1,619.42	-540.21	2,508.17	2,301.69	206.48	12.147	
8,800.00	7,161.26	20,952.96	7,074.90	49.06	233.58	89.49	-1,619.42	-540.21	2,583.77	2,380.77	203.00	12.728	
8,900.00	7,161.29	20,952.96	7,074.90	51.14	233.58	89.49	-1,619.42	-540.21	2,660.99	2,461.36	199.63	13.329	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													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
9,000.00	7,161.31	20,952.96	7,074.90	53.24	233.58	89.49	-1,619.42	-540.21	2,739.68	2,543.30	196.38	13.951	
9,100.00	7,161.33	20,952.96	7,074.90	55.38	233.58	89.49	-1,619.42	-540.21	2,819.72	2,626.48	193.24	14.592	
9,200.00	7,161.35	20,952.96	7,074.90	57.54	233.58	89.49	-1,619.42	-540.21	2,901.00	2,710.79	190.21	15.251	
9,300.00	7,161.37	20,952.96	7,074.90	59.72	233.58	89.49	-1,619.42	-540.21	2,983.42	2,796.11	187.30	15.928	
9,400.00	7,161.39	20,952.96	7,074.90	61.92	233.58	89.49	-1,619.42	-540.21	3,066.88	2,882.37	184.51	16.622	
9,500.00	7,161.41	20,952.96	7,074.90	64.13	233.58	89.49	-1,619.42	-540.21	3,151.31	2,969.49	181.82	17.332	
9,600.00	7,161.43	20,952.96	7,074.90	66.36	233.58	89.49	-1,619.42	-540.21	3,236.62	3,057.38	179.24	18.057	
9,700.00	7,161.45	20,952.96	7,074.90	68.61	233.58	89.49	-1,619.42	-540.21	3,322.75	3,145.99	176.77	18.797	
9,800.00	7,161.48	20,952.96	7,074.90	70.87	233.58	89.49	-1,619.42	-540.21	3,409.64	3,235.25	174.40	19.551	
9,900.00	7,161.50	20,952.96	7,074.90	73.14	233.58	89.49	-1,619.42	-540.21	3,497.24	3,325.12	172.12	20.319	
10,000.00	7,161.52	20,952.96	7,074.90	75.42	233.58	89.49	-1,619.42	-540.21	3,585.48	3,415.54	169.94	21.099	
10,100.00	7,161.54	20,952.96	7,074.90	77.71	233.58	89.49	-1,619.42	-540.21	3,674.32	3,506.48	167.84	21.891	
10,200.00	7,161.56	20,952.96	7,074.90	80.01	233.58	89.49	-1,619.42	-540.21	3,763.72	3,597.89	165.83	22.696	
10,300.00	7,161.58	20,952.96	7,074.90	82.32	233.58	89.49	-1,619.42	-540.21	3,853.64	3,689.74	163.91	23.511	
10,400.00	7,161.60	20,952.96	7,074.90	84.63	233.58	89.49	-1,619.42	-540.21	3,944.05	3,781.99	162.06	24.337	
10,500.00	7,161.62	20,952.96	7,074.90	86.95	233.58	89.49	-1,619.42	-540.21	4,034.91	3,874.63	160.28	25.173	
10,600.00	7,161.64	20,952.96	7,074.90	89.28	233.58	89.49	-1,619.42	-540.21	4,126.20	3,967.62	158.58	26.019	
10,700.00	7,161.66	20,952.96	7,074.90	91.61	233.58	89.49	-1,619.42	-540.21	4,217.88	4,060.93	156.95	26.875	
10,800.00	7,161.69	20,952.96	7,074.90	93.95	233.58	89.49	-1,619.42	-540.21	4,309.93	4,154.55	155.37	27.739	
10,900.00	7,161.71	20,952.96	7,074.90	96.29	233.58	89.49	-1,619.42	-540.21	4,402.32	4,248.46	153.87	28.612	
11,000.00	7,161.73	20,952.96	7,074.90	98.64	233.58	89.49	-1,619.42	-540.21	4,495.04	4,342.63	152.41	29.492	
11,100.00	7,161.75	20,952.96	7,074.90	100.99	233.58	89.49	-1,619.42	-540.21	4,588.07	4,437.05	151.02	30.381	
11,200.00	7,161.77	20,952.96	7,074.90	103.35	233.58	89.49	-1,619.42	-540.21	4,681.39	4,531.71	149.68	31.276	
11,300.00	7,161.79	20,952.96	7,074.90	105.71	233.58	89.49	-1,619.42	-540.21	4,774.97	4,626.58	148.39	32.179	
11,400.00	7,161.81	20,952.96	7,074.90	108.07	233.58	89.49	-1,619.42	-540.21	4,868.81	4,721.67	147.14	33.089	
11,500.00	7,161.83	20,952.96	7,074.90	110.44	233.58	89.49	-1,619.42	-540.21	4,962.89	4,816.95	145.95	34.005	
11,600.00	7,161.85	20,952.96	7,074.90	112.80	233.58	89.49	-1,619.42	-540.21	5,057.20	4,912.41	144.80	34.926	
11,700.00	7,161.87	20,952.96	7,074.90	115.18	233.58	89.49	-1,619.42	-540.21	5,151.72	5,008.04	143.69	35.854	
11,800.00	7,161.90	20,952.96	7,074.90	117.55	233.58	89.49	-1,619.42	-540.21	5,246.45	5,103.84	142.62	36.787	
11,900.00	7,161.92	20,952.96	7,074.90	119.93	233.58	89.49	-1,619.42	-540.21	5,341.37	5,199.79	141.58	37.726	
12,000.00	7,161.94	20,952.96	7,074.90	122.31	233.58	89.49	-1,619.42	-540.21	5,436.47	5,295.88	140.59	38.669	
12,100.00	7,161.96	20,952.96	7,074.90	124.69	233.58	89.49	-1,619.42	-540.21	5,531.74	5,392.11	139.63	39.618	
12,200.00	7,161.98	20,952.96	7,074.90	127.07	233.58	89.49	-1,619.42	-540.21	5,627.18	5,488.48	138.70	40.570	
12,300.00	7,162.00	20,952.96	7,074.90	129.46	233.58	89.49	-1,619.42	-540.21	5,722.77	5,584.97	137.81	41.528	
12,400.00	7,162.02	20,952.96	7,074.90	131.85	233.58	89.49	-1,619.42	-540.21	5,818.51	5,681.57	136.94	42.489	
12,500.00	7,162.04	20,952.96	7,074.90	134.24	233.58	89.49	-1,619.42	-540.21	5,914.40	5,778.29	136.11	43.454	
12,600.00	7,162.06	20,952.96	7,074.90	136.63	233.58	89.49	-1,619.42	-540.21	6,010.41	5,875.11	135.30	44.422	
12,700.00	7,162.09	20,952.96	7,074.90	139.02	233.58	89.49	-1,619.42	-540.21	6,106.56	5,972.04	134.52	45.395	
12,800.00	7,162.11	20,952.96	7,074.90	141.42	233.58	89.49	-1,619.42	-540.21	6,202.82	6,069.06	133.77	46.370	
12,900.00	7,162.13	20,952.96	7,074.90	143.81	233.58	89.49	-1,619.42	-540.21	6,299.21	6,166.17	133.04	47.349	
13,000.00	7,162.15	20,952.96	7,074.90	146.21	233.58	89.49	-1,619.42	-540.21	6,395.70	6,263.37	132.33	48.330	
13,100.00	7,162.17	20,952.96	7,074.90	148.61	233.58	89.49	-1,619.42	-540.21	6,492.30	6,360.65	131.65	49.315	
13,200.00	7,162.19	20,952.96	7,074.90	151.01	233.58	89.49	-1,619.42	-540.21	6,589.00	6,458.01	130.99	50.302	
13,300.00	7,162.21	20,952.96	7,074.90	153.41	233.58	89.49	-1,619.42	-540.21	6,685.80	6,555.45	130.35	51.292	
13,400.00	7,162.23	20,952.96	7,074.90	155.81	233.58	89.49	-1,619.42	-540.21	6,782.69	6,652.96	129.73	52.283	
13,500.00	7,162.25	20,952.96	7,074.90	158.21	233.58	89.49	-1,619.42	-540.21	6,879.67	6,750.54	129.13	53.278	
13,600.00	7,162.27	20,952.96	7,074.90	160.62	233.58	89.49	-1,619.42	-540.21	6,976.74	6,848.19	128.55	54.274	
13,700.00	7,162.30	20,952.96	7,074.90	163.02	233.58	89.49	-1,619.42	-540.21	7,073.88	6,945.90	127.98	55.272	
13,800.00	7,162.32	20,952.96	7,074.90	165.43	233.58	89.49	-1,619.42	-540.21	7,171.11	7,043.67	127.44	56.272	
13,900.00	7,162.34	20,952.96	7,074.90	167.84	233.58	89.49	-1,619.42	-540.21	7,268.41	7,141.50	126.91	57.274	
14,000.00	7,162.36	20,952.96	7,074.90	170.24	233.58	89.49	-1,619.42	-540.21	7,365.78	7,239.39	126.39	58.277	
14,100.00	7,162.38	20,952.96	7,074.90	172.65	233.58	89.49	-1,619.42	-540.21	7,463.23	7,337.33	125.89	59.282	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Offset Wellbore Centre			Rule Assigned:					
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	
14,200.00	7,162.40	20,952.96	7,074.90	175.06	233.58	89.49	-1,619.42	-540.21	7,560.74	7,435.33	125.41	60.288		
14,300.00	7,162.42	20,952.96	7,074.90	177.47	233.58	89.49	-1,619.42	-540.21	7,658.31	7,533.37	124.94	61.295		
14,400.00	7,162.44	20,952.96	7,074.90	179.88	233.58	89.49	-1,619.42	-540.21	7,755.95	7,631.46	124.49	62.304		
14,500.00	7,162.46	20,952.96	7,074.90	182.29	233.58	89.49	-1,619.42	-540.21	7,853.64	7,729.60	124.04	63.313		
14,600.00	7,162.49	20,952.96	7,074.90	184.71	233.58	89.49	-1,619.42	-540.21	7,951.39	7,827.78	123.62	64.324		
14,700.00	7,162.51	20,952.96	7,074.90	187.12	233.58	89.49	-1,619.42	-540.21	8,049.20	7,926.00	123.20	65.335		
14,800.00	7,162.53	20,952.96	7,074.90	189.53	233.58	89.49	-1,619.42	-540.21	8,147.06	8,024.27	122.79	66.347		
14,900.00	7,162.55	20,952.96	7,074.90	191.95	233.58	89.49	-1,619.42	-540.21	8,244.97	8,122.57	122.40	67.360		
15,000.00	7,162.57	20,952.96	7,074.90	194.36	233.58	89.49	-1,619.42	-540.21	8,342.93	8,220.92	122.02	68.374		
15,100.00	7,162.59	20,952.96	7,074.90	196.78	233.58	89.49	-1,619.42	-540.21	8,440.94	8,319.30	121.65	69.388		
15,200.00	7,162.61	20,952.96	7,074.90	199.19	233.58	89.49	-1,619.42	-540.21	8,539.00	8,417.71	121.29	70.403		
15,300.00	7,162.63	20,952.96	7,074.90	201.61	233.58	89.49	-1,619.42	-540.21	8,637.10	8,516.16	120.94	71.418		
15,400.00	7,162.65	20,952.96	7,074.90	204.03	233.58	89.49	-1,619.42	-540.21	8,735.24	8,614.65	120.60	72.433		
15,500.00	7,162.67	20,952.96	7,074.90	206.44	233.58	89.49	-1,619.42	-540.21	8,833.43	8,713.16	120.27	73.449		
15,600.00	7,162.70	20,952.96	7,074.90	208.86	233.58	89.49	-1,619.42	-540.21	8,931.65	8,811.71	119.95	74.465		
15,700.00	7,162.72	20,952.96	7,074.90	211.28	233.58	89.49	-1,619.42	-540.21	9,029.92	8,910.28	119.63	75.480		
15,800.00	7,162.74	20,952.96	7,074.90	213.70	233.58	89.49	-1,619.42	-540.21	9,128.22	9,008.89	119.33	76.496		
15,900.00	7,162.76	20,952.96	7,074.90	216.12	233.58	89.49	-1,619.42	-540.21	9,226.56	9,107.52	119.03	77.513		
16,000.00	7,162.78	20,952.96	7,074.90	218.54	233.58	89.49	-1,619.42	-540.21	9,324.93	9,206.19	118.75	78.528		
16,100.00	7,162.80	20,952.96	7,074.90	220.96	233.58	89.49	-1,619.42	-540.21	9,423.34	9,304.87	118.47	79.544		
16,200.00	7,162.82	20,952.96	7,074.90	223.38	233.58	89.49	-1,619.42	-540.21	9,521.78	9,403.59	118.19	80.560		
16,300.00	7,162.84	20,952.96	7,074.90	225.80	233.58	89.49	-1,619.42	-540.21	9,620.25	9,502.32	117.93	81.576		
16,400.00	7,162.86	20,952.96	7,074.90	228.22	233.58	89.49	-1,619.42	-540.21	9,718.76	9,601.08	117.67	82.591		
16,500.00	7,162.88	20,952.96	7,074.90	230.64	233.58	89.49	-1,619.42	-540.21	9,817.29	9,699.87	117.42	83.606		
16,600.00	7,162.91	20,952.96	7,074.90	233.06	233.58	89.49	-1,619.42	-540.21	9,915.86	9,798.68	117.18	84.620		
16,700.00	7,162.93	20,952.96	7,074.90	235.49	233.58	89.49	-1,619.42	-540.21	10,014.45	9,897.51	116.94	85.634		
16,800.00	7,162.95	20,952.96	7,074.90	237.91	233.58	89.49	-1,619.42	-540.21	10,113.07	9,996.36	116.71	86.648		
16,879.97	7,162.96	20,952.96	7,074.90	239.84	233.58	89.49	-1,619.42	-540.21	10,191.96	10,075.42	116.53	87.458		
16,900.00	7,162.97	20,952.96	7,074.90	240.33	233.58	89.49	-1,619.42	-540.21	10,211.72	10,095.23	116.49	87.661		
17,000.00	7,162.99	20,952.96	7,074.90	242.75	233.58	89.49	-1,619.42	-540.21	10,310.39	10,194.12	116.27	88.674		
17,056.99	7,163.00	20,952.96	7,074.90	244.13	233.58	89.49	-1,619.42	-540.21	10,366.64	10,250.49	116.15	89.251		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD													Offset Site Error:	0.00 usft
Survey Program:		400-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)	
0.00	0.00	187.00	187.00	0.00	3.46	-82.33	1,367.54	-10,152.92	10,244.61					
100.00	100.00	287.00	287.00	0.25	5.31	-82.33	1,367.54	-10,152.92	10,244.61	10,239.05	5.56	1,843.784		
200.00	200.00	387.00	387.00	0.61	7.15	-82.33	1,367.54	-10,152.92	10,244.61	10,236.85	7.76	1,319.628		
300.00	300.00	487.01	487.00	0.97	8.96	-82.33	1,367.54	-10,152.92	10,244.61	10,234.68	9.93	1,031.701		
400.00	400.00	587.01	587.00	1.33	10.76	-82.33	1,367.54	-10,152.92	10,244.61	10,232.52	12.09	847.345		
500.00	500.00	687.01	687.00	1.68	12.57	-82.33	1,367.54	-10,152.92	10,244.61	10,230.36	14.25	718.887		
600.00	599.98	787.82	787.82	2.04	14.38	2.44	1,368.27	-10,152.92	10,242.96	10,226.55	16.42	623.857		
700.00	699.84	889.47	889.46	2.39	16.21	2.45	1,368.14	-10,152.92	10,237.72	10,219.12	18.60	550.407		
722.35	722.13	912.16	912.15	2.47	16.62	2.45	1,368.09	-10,152.92	10,236.07	10,216.98	19.09	536.196		
800.00	799.54	990.95	990.94	2.74	18.04	2.45	1,367.88	-10,152.92	10,230.02	10,209.24	20.78	492.268		
900.00	899.24	1,086.26	1,086.24	3.10	19.76	2.45	1,367.54	-10,152.92	10,222.23	10,199.38	22.85	447.302		
1,000.00	998.94	1,185.96	1,185.94	3.47	21.60	2.45	1,367.54	-10,152.92	10,214.49	10,189.44	25.05	407.789		
1,100.00	1,098.64	1,285.66	1,285.64	3.83	23.45	2.45	1,367.54	-10,152.92	10,206.74	10,179.49	27.25	374.623		
1,200.00	1,198.34	1,385.36	1,385.34	4.20	25.29	2.45	1,367.54	-10,152.92	10,198.99	10,169.55	29.44	346.393		
1,300.00	1,298.04	1,485.06	1,485.04	4.57	27.13	2.46	1,367.54	-10,152.92	10,191.24	10,159.60	31.64	322.075		
1,400.00	1,397.74	1,584.76	1,584.74	4.94	28.97	2.46	1,367.54	-10,152.92	10,183.50	10,149.66	33.84	300.912		
1,500.00	1,497.44	1,684.92	1,684.90	5.31	30.82	2.46	1,368.10	-10,152.92	10,175.83	10,139.77	36.05	282.262		
1,600.00	1,597.13	1,785.19	1,785.17	5.68	32.67	2.46	1,368.04	-10,152.92	10,168.07	10,129.81	38.26	265.748		
1,700.00	1,696.83	1,885.46	1,885.44	6.05	34.53	2.47	1,367.95	-10,152.92	10,160.31	10,119.84	40.47	251.035		
1,800.00	1,796.53	1,985.73	1,985.70	6.43	36.38	2.47	1,367.81	-10,152.92	10,152.55	10,109.86	42.69	237.846		
1,900.00	1,896.23	2,085.99	2,085.97	6.80	38.23	2.47	1,367.62	-10,152.92	10,144.78	10,099.88	44.90	225.954		
2,000.00	1,995.93	2,182.99	2,182.93	7.17	40.37	2.47	1,367.54	-10,152.92	10,137.02	10,089.62	47.39	213.890		
2,100.00	2,095.63	2,282.69	2,282.63	7.54	42.80	2.47	1,367.54	-10,152.92	10,129.27	10,079.08	50.19	201.831		
2,200.00	2,195.33	2,382.39	2,382.33	7.92	45.23	2.47	1,367.54	-10,152.92	10,121.52	10,068.54	52.98	191.043		
2,300.00	2,295.03	2,483.62	2,483.55	8.29	47.70	2.48	1,368.51	-10,152.92	10,113.91	10,058.10	55.81	181.215		
2,400.00	2,394.73	2,586.30	2,586.23	8.66	50.21	2.48	1,368.28	-10,152.92	10,106.13	10,047.45	58.68	172.230		
2,500.00	2,494.43	2,688.98	2,688.91	9.04	52.72	2.48	1,367.83	-10,152.92	10,098.33	10,036.78	61.54	164.082		
2,600.00	2,594.12	2,781.50	2,781.12	9.41	55.22	2.48	1,367.54	-10,152.92	10,090.54	10,026.13	64.41	156.670		
2,700.00	2,693.82	2,881.29	2,880.82	9.79	58.17	2.48	1,367.54	-10,152.92	10,082.79	10,015.08	67.72	148.900		
2,800.00	2,793.52	2,980.99	2,980.52	10.16	61.08	2.48	1,367.54	-10,152.92	10,075.05	10,004.06	70.99	141.923		
2,900.00	2,893.22	3,097.94	3,097.41	10.53	64.50	2.49	1,368.46	-10,152.92	10,067.44	9,992.67	74.77	134.650		
3,000.00	2,992.92	3,180.64	3,179.92	10.91	66.86	2.49	1,367.54	-10,152.92	10,059.55	9,982.05	77.50	129.805		
3,100.00	3,092.62	3,280.45	3,279.70	11.28	69.59	2.50	1,368.77	-10,152.92	10,051.97	9,971.38	80.59	124.735		
3,200.00	3,192.32	3,407.06	3,406.28	11.66	73.05	2.49	1,367.50	-10,152.92	10,044.09	9,959.68	84.41	118.996		
3,300.00	3,292.02	3,479.87	3,479.02	12.03	74.87	2.49	1,367.54	-10,152.92	10,036.31	9,949.73	86.58	115.917		
3,400.00	3,391.72	3,579.57	3,578.72	12.41	77.35	2.50	1,367.54	-10,152.92	10,028.57	9,939.14	89.43	112.139		
3,500.00	3,491.41	3,679.27	3,678.41	12.78	79.84	2.50	1,367.54	-10,152.92	10,020.82	9,928.54	92.28	108.593		
3,600.00	3,591.11	3,778.97	3,778.11	13.15	82.33	2.50	1,367.54	-10,152.92	10,013.07	9,917.95	95.13	105.260		
3,700.00	3,690.81	3,878.67	3,877.81	13.53	84.81	2.50	1,367.54	-10,152.92	10,005.33	9,907.35	97.98	102.120		
3,800.00	3,790.51	3,978.37	3,977.51	13.90	87.30	2.50	1,367.54	-10,152.92	9,997.58	9,896.76	100.82	99.158		
3,900.00	3,890.21	4,080.81	4,079.90	14.28	89.86	2.53	1,371.28	-10,152.92	9,990.34	9,886.59	103.74	96.300		
4,000.00	3,989.91	4,183.64	4,182.72	14.65	92.42	2.53	1,370.96	-10,152.92	9,982.55	9,875.88	106.67	93.585		
4,100.00	4,089.61	4,286.47	4,285.53	15.03	94.99	2.53	1,370.39	-10,152.92	9,974.73	9,865.13	109.59	91.015		
4,200.00	4,189.31	4,389.31	4,388.35	15.40	97.55	2.52	1,369.59	-10,152.92	9,966.88	9,854.36	112.52	88.578		
4,300.00	4,289.01	4,492.14	4,491.17	15.78	100.12	2.52	1,368.56	-10,152.92	9,959.00	9,843.55	115.45	86.264		
4,400.00	4,388.70	4,576.96	4,575.70	16.15	102.24	2.52	1,367.54	-10,152.92	9,951.10	9,833.17	117.93	84.383		
4,500.00	4,488.40	4,676.66	4,675.40	16.53	104.83	2.52	1,367.54	-10,152.92	9,943.36	9,822.47	120.89	82.254		
4,600.00	4,588.10	4,776.36	4,775.10	16.90	107.43	2.52	1,367.54	-10,152.92	9,935.61	9,811.76	123.84	80.227		
4,700.00	4,687.80	4,876.06	4,874.80	17.27	110.02	2.52	1,367.54	-10,152.92	9,927.86	9,801.06	126.80	78.294		
4,800.00	4,787.50	4,981.09	4,979.80	17.65	112.76	2.53	1,369.39	-10,152.92	9,920.37	9,790.47	129.90	76.370		
4,900.00	4,887.20	5,086.78	5,085.47	18.02	115.51	2.53	1,368.74	-10,152.92	9,912.54	9,779.52	133.01	74.524		
5,000.00	4,986.90	5,192.47	5,191.15	18.40	118.27	2.53	1,367.61	-10,152.92	9,904.65	9,768.52	136.13	72.761		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD													Offset Site Error:	0.00 usft
Survey Program:		400-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)	
5,100.00	5,086.60	5,275.10	5,273.60	18.77	120.59	2.53	1,367.54	-10,152.92	9,896.88	9,758.07	138.81	71.298		
5,200.00	5,186.30	5,374.80	5,373.30	19.15	123.40	2.53	1,367.54	-10,152.92	9,889.13	9,747.15	141.98	69.649		
5,300.00	5,286.00	5,474.50	5,473.00	19.52	126.21	2.53	1,367.54	-10,152.92	9,881.38	9,736.22	145.16	68.072		
5,400.00	5,385.69	5,574.20	5,572.69	19.90	129.03	2.53	1,367.54	-10,152.92	9,873.64	9,725.30	148.34	66.563		
5,500.00	5,485.39	5,673.90	5,672.39	20.27	131.84	2.54	1,367.54	-10,152.92	9,865.89	9,714.38	151.51	65.117		
5,600.00	5,585.09	5,773.60	5,772.09	20.65	134.65	2.54	1,367.54	-10,152.92	9,858.15	9,703.46	154.69	63.730		
5,700.00	5,684.79	5,873.30	5,871.79	21.02	137.47	2.54	1,367.54	-10,152.92	9,850.40	9,692.54	157.86	62.399		
5,800.00	5,784.49	5,975.40	5,973.81	21.40	140.35	2.57	1,372.79	-10,152.92	9,843.36	9,682.26	161.10	61.099		
5,900.00	5,884.19	6,078.15	6,076.54	21.77	143.25	2.57	1,372.49	-10,152.92	9,835.58	9,671.21	164.37	59.840		
6,000.00	5,983.89	6,180.91	6,179.28	22.15	146.15	2.57	1,371.96	-10,152.92	9,827.76	9,660.13	167.63	58.629		
6,100.00	6,083.59	6,283.67	6,282.02	22.52	149.05	2.57	1,371.19	-10,152.92	9,819.91	9,649.03	170.89	57.464		
6,200.00	6,183.29	6,386.44	6,384.77	22.90	151.95	2.57	1,370.20	-10,152.92	9,812.04	9,637.89	174.15	56.342		
6,300.00	6,282.98	6,489.21	6,487.51	23.27	154.85	2.56	1,368.98	-10,152.92	9,804.13	9,626.72	177.41	55.262		
6,400.00	6,382.68	6,591.98	6,590.25	23.65	157.75	2.56	1,367.52	-10,152.92	9,796.19	9,615.52	180.67	54.221		
6,492.83	6,475.23	6,664.48	6,662.23	24.00	159.89	2.56	1,367.54	-10,152.92	9,788.99	9,605.83	183.15	53.447		
6,500.00	6,482.39	6,671.64	6,669.39	24.02	160.10	1.68	1,367.54	-10,152.92	9,788.47	9,605.08	183.39	53.375		
6,542.63	6,524.98	6,714.24	6,711.98	24.17	161.36	-89.94	1,367.54	-10,152.92	9,787.06	9,602.26	184.79	52.962 CC		
6,550.00	6,532.35	6,721.61	6,719.35	24.19	161.58	-143.39	1,367.54	-10,152.92	9,787.10	9,602.06	185.04	52.893 ES		
6,600.00	6,582.27	6,771.53	6,769.27	24.34	163.05	-167.97	1,367.54	-10,152.92	9,789.62	9,602.95	186.67	52.444		
6,650.00	6,631.83	6,821.09	6,818.83	24.49	164.51	-169.90	1,367.54	-10,152.92	9,796.01	9,607.73	188.28	52.029		
6,700.00	6,680.73	6,869.99	6,867.73	24.62	165.95	-170.52	1,367.54	-10,152.92	9,806.24	9,616.37	189.87	51.647		
6,750.00	6,728.67	6,917.92	6,915.67	24.74	167.37	-170.73	1,367.54	-10,152.92	9,820.23	9,628.81	191.42	51.302		
6,800.00	6,775.35	6,964.60	6,962.35	24.86	168.75	-170.74	1,367.54	-10,152.92	9,837.92	9,644.99	192.93	50.993		
6,850.00	6,820.48	7,009.73	7,007.48	24.98	170.08	-170.60	1,367.54	-10,152.92	9,859.18	9,664.81	194.38	50.722		
6,900.00	6,863.78	7,053.03	7,050.78	25.09	171.36	-170.34	1,367.54	-10,152.92	9,883.90	9,688.13	195.76	50.489		
6,950.00	6,904.99	7,094.25	7,091.99	25.21	172.57	-169.97	1,367.54	-10,152.92	9,911.90	9,714.82	197.08	50.294		
7,000.00	6,943.86	7,133.11	7,130.86	25.33	173.72	-169.46	1,367.54	-10,152.92	9,943.03	9,744.72	198.31	50.138		
7,050.00	6,980.14	7,169.39	7,167.14	25.47	174.79	-168.80	1,367.54	-10,152.92	9,977.09	9,777.63	199.46	50.021		
7,100.00	7,013.60	7,202.86	7,200.60	25.62	175.78	-167.94	1,367.54	-10,152.92	10,013.87	9,813.36	200.51	49.941		
7,150.00	7,044.06	7,233.31	7,231.06	25.79	176.68	-166.81	1,367.54	-10,152.92	10,053.15	9,851.68	201.47	49.899		
7,200.00	7,071.31	7,260.56	7,258.31	26.00	177.48	-165.33	1,367.54	-10,152.92	10,094.68	9,892.36	202.32	49.894 SF		
7,250.00	7,095.18	7,284.50	7,282.14	26.23	178.19	-163.25	1,373.58	-10,152.92	10,139.00	9,935.93	203.07	49.929		
7,300.00	7,115.54	7,305.57	7,303.21	26.50	178.81	-160.42	1,373.57	-10,152.92	10,184.26	9,980.54	203.72	49.991		
7,350.00	7,132.25	7,322.87	7,320.51	26.81	179.32	-156.25	1,373.56	-10,152.92	10,230.97	10,026.71	204.26	50.089		
7,400.00	7,145.22	7,336.30	7,333.93	27.16	179.72	-149.66	1,373.54	-10,152.92	10,278.84	10,074.16	204.67	50.221		
7,450.00	7,154.36	7,345.76	7,343.39	27.55	179.99	-138.33	1,373.53	-10,152.92	10,327.57	10,122.61	204.97	50.387		
7,500.00	7,159.61	7,351.19	7,348.82	27.97	180.15	-117.49	1,373.52	-10,152.92	10,376.88	10,171.74	205.14	50.585		
7,541.91	7,161.00	7,352.63	7,350.26	28.35	180.20	-90.19	1,373.51	-10,152.92	10,418.43	10,213.24	205.19	50.774		
7,600.00	7,161.01	7,352.64	7,350.27	28.92	180.20	-90.20	1,373.51	-10,152.92	10,476.07	10,270.86	205.21	51.052		
7,700.00	7,161.03	7,352.67	7,350.30	30.03	180.20	-90.20	1,373.51	-10,152.92	10,575.29	10,370.06	205.23	51.529		
7,800.00	7,161.05	7,352.69	7,350.32	31.29	180.20	-90.20	1,373.51	-10,152.92	10,674.54	10,469.27	205.26	52.004		
7,900.00	7,161.08	7,352.71	7,350.34	32.69	180.20	-90.20	1,373.51	-10,152.92	10,773.79	10,568.50	205.30	52.479		
8,000.00	7,161.10	7,352.73	7,350.36	34.20	180.20	-90.20	1,373.51	-10,152.92	10,873.06	10,667.73	205.33	52.953		
8,100.00	7,161.12	7,352.75	7,350.38	35.81	180.20	-90.20	1,373.51	-10,152.92	10,972.35	10,766.98	205.37	53.426		
8,200.00	7,161.14	7,352.78	7,350.41	37.52	180.20	-90.20	1,373.51	-10,152.92	11,071.65	10,866.23	205.42	53.898		
8,300.00	7,161.16	7,352.80	7,350.43	39.30	180.20	-90.20	1,373.51	-10,152.92	11,170.96	10,965.49	205.46	54.370		
8,400.00	7,161.18	7,352.82	7,350.45	41.15	180.20	-90.20	1,373.51	-10,152.92	11,270.28	11,064.76	205.51	54.840		
8,500.00	7,161.20	7,352.84	7,350.47	43.05	180.20	-90.20	1,373.51	-10,152.92	11,369.61	11,164.05	205.56	55.309		
8,600.00	7,161.22	7,352.87	7,350.49	45.01	180.20	-90.21	1,373.51	-10,152.92	11,468.96	11,263.34	205.62	55.778		
8,700.00	7,161.24	7,352.89	7,350.52	47.02	180.20	-90.21	1,373.51	-10,152.92	11,568.31	11,362.64	205.68	56.245		
8,800.00	7,161.26	7,352.91	7,350.54	49.06	180.21	-90.21	1,373.51	-10,152.92	11,667.68	11,461.94	205.73	56.712		
8,900.00	7,161.29	7,352.93	7,350.56	51.14	180.21	-90.21	1,373.51	-10,152.92	11,767.06	11,561.26	205.80	57.178		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD												Offset Site Error:	0.00 usft
Survey Program:		400-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)
9,000.00	7,161.31	7,352.95	7,350.58	53.24	180.21	-90.21	1,373.51	-10,152.92	11,866.45	11,660.59	205.86	57.643	
9,100.00	7,161.33	7,352.98	7,350.61	55.38	180.21	-90.21	1,373.51	-10,152.92	11,965.84	11,759.92	205.92	58.108	
9,200.00	7,161.35	7,353.00	7,350.63	57.54	180.21	-90.21	1,373.51	-10,152.92	12,065.25	11,859.26	205.99	58.571	
9,300.00	7,161.37	7,353.02	7,350.65	59.72	180.21	-90.21	1,373.51	-10,152.92	12,164.67	11,958.61	206.06	59.034	
9,400.00	7,161.39	7,353.04	7,350.67	61.92	180.21	-90.21	1,373.51	-10,152.92	12,264.10	12,057.97	206.13	59.496	
9,500.00	7,161.41	7,353.06	7,350.69	64.13	180.21	-90.21	1,373.51	-10,152.92	12,363.54	12,157.33	206.20	59.958	
9,600.00	7,161.43	7,353.09	7,350.72	66.36	180.21	-90.21	1,373.51	-10,152.92	12,462.98	12,256.70	206.28	60.418	
9,700.00	7,161.45	7,353.11	7,350.74	68.61	180.21	-90.22	1,373.51	-10,152.92	12,562.44	12,356.08	206.35	60.878	
9,800.00	7,161.48	7,353.13	7,350.76	70.87	180.21	-90.22	1,373.51	-10,152.92	12,661.90	12,455.47	206.43	61.337	
9,900.00	7,161.50	7,353.15	7,350.78	73.14	180.21	-90.22	1,373.51	-10,152.92	12,761.37	12,554.86	206.51	61.796	
10,000.00	7,161.52	7,353.18	7,350.80	75.42	180.21	-90.22	1,373.51	-10,152.92	12,860.85	12,654.26	206.59	62.254	
10,100.00	7,161.54	7,353.20	7,350.83	77.71	180.21	-90.22	1,373.51	-10,152.92	12,960.34	12,753.67	206.67	62.711	
10,200.00	7,161.56	7,353.22	7,350.85	80.01	180.21	-90.22	1,373.51	-10,152.92	13,059.84	12,853.09	206.75	63.167	
10,300.00	7,161.58	7,353.24	7,350.87	82.32	180.22	-90.22	1,373.51	-10,152.92	13,159.34	12,952.51	206.83	63.623	
10,400.00	7,161.60	7,353.26	7,350.89	84.63	180.22	-90.22	1,373.51	-10,152.92	13,258.85	13,051.93	206.92	64.078	
10,500.00	7,161.62	7,353.29	7,350.92	86.95	180.22	-90.22	1,373.51	-10,152.92	13,358.37	13,151.37	207.00	64.532	
10,600.00	7,161.64	7,353.31	7,350.94	89.28	180.22	-90.22	1,373.51	-10,152.92	13,457.90	13,250.80	207.09	64.986	
10,700.00	7,161.66	7,353.33	7,350.96	91.61	180.22	-90.23	1,373.51	-10,152.92	13,557.43	13,350.25	207.18	65.439	
10,800.00	7,161.69	7,353.35	7,350.98	93.95	180.22	-90.23	1,373.51	-10,152.92	13,656.97	13,449.70	207.27	65.891	
10,900.00	7,161.71	7,353.37	7,351.00	96.29	180.22	-90.23	1,373.51	-10,152.92	13,756.51	13,549.16	207.35	66.343	
11,000.00	7,161.73	7,353.40	7,351.03	98.64	180.22	-90.23	1,373.51	-10,152.92	13,856.07	13,648.62	207.44	66.794	
11,100.00	7,161.75	7,353.42	7,351.05	100.99	180.22	-90.23	1,373.51	-10,152.92	13,955.62	13,748.09	207.53	67.245	
11,200.00	7,161.77	7,353.44	7,351.07	103.35	180.22	-90.23	1,373.51	-10,152.92	14,055.19	13,847.56	207.63	67.695	
11,300.00	7,161.79	7,353.46	7,351.09	105.71	180.22	-90.23	1,373.51	-10,152.92	14,154.76	13,947.04	207.72	68.144	
11,400.00	7,161.81	7,353.49	7,351.11	108.07	180.22	-90.23	1,373.51	-10,152.92	14,254.34	14,046.53	207.81	68.593	
11,500.00	7,161.83	7,353.51	7,351.14	110.44	180.22	-90.23	1,373.51	-10,152.92	14,353.92	14,146.02	207.90	69.041	
11,600.00	7,161.85	7,353.53	7,351.16	112.80	180.22	-90.23	1,373.51	-10,152.92	14,453.51	14,245.51	208.00	69.488	
11,700.00	7,161.87	7,353.55	7,351.18	115.18	180.22	-90.24	1,373.51	-10,152.92	14,553.10	14,345.01	208.09	69.935	
11,800.00	7,161.90	7,353.57	7,351.20	117.55	180.23	-90.24	1,373.51	-10,152.92	14,652.70	14,444.51	208.19	70.382	
11,900.00	7,161.92	7,353.60	7,351.23	119.93	180.23	-90.24	1,373.51	-10,152.92	14,752.31	14,544.02	208.29	70.827	
12,000.00	7,161.94	7,353.62	7,351.25	122.31	180.23	-90.24	1,373.51	-10,152.92	14,851.92	14,643.54	208.38	71.273	
12,100.00	7,161.96	7,353.64	7,351.27	124.69	180.23	-90.24	1,373.51	-10,152.92	14,951.54	14,743.06	208.48	71.717	
12,200.00	7,161.98	7,353.66	7,351.29	127.07	180.23	-90.24	1,373.51	-10,152.92	15,051.16	14,842.58	208.58	72.161	
12,300.00	7,162.00	7,353.68	7,351.31	129.46	180.23	-90.24	1,373.51	-10,152.92	15,150.78	14,942.11	208.67	72.605	
12,400.00	7,162.02	7,353.71	7,351.34	131.85	180.23	-90.24	1,373.51	-10,152.92	15,250.41	15,041.64	208.77	73.048	
12,500.00	7,162.04	7,353.73	7,351.36	134.24	180.23	-90.24	1,373.51	-10,152.92	15,350.05	15,141.18	208.87	73.490	
12,600.00	7,162.06	7,353.75	7,351.38	136.63	180.23	-90.24	1,373.51	-10,152.92	15,449.69	15,240.72	208.97	73.932	
12,700.00	7,162.09	7,353.77	7,351.40	139.02	180.23	-90.24	1,373.51	-10,152.92	15,549.34	15,340.26	209.07	74.373	
12,800.00	7,162.11	7,353.80	7,351.42	141.42	180.23	-90.25	1,373.51	-10,152.92	15,648.99	15,439.81	209.17	74.814	
12,900.00	7,162.13	7,353.82	7,351.45	143.81	180.23	-90.25	1,373.51	-10,152.92	15,748.64	15,539.37	209.27	75.254	
13,000.00	7,162.15	7,353.84	7,351.47	146.21	180.23	-90.25	1,373.51	-10,152.92	15,848.30	15,638.92	209.37	75.694	
13,100.00	7,162.17	7,353.86	7,351.49	148.61	180.23	-90.25	1,373.51	-10,152.92	15,947.96	15,738.48	209.48	76.133	
13,200.00	7,162.19	7,353.88	7,351.51	151.01	180.23	-90.25	1,373.51	-10,152.92	16,047.63	15,838.05	209.58	76.571	
13,300.00	7,162.21	7,353.91	7,351.54	153.41	180.23	-90.25	1,373.51	-10,152.92	16,147.30	15,937.62	209.68	77.009	
13,400.00	7,162.23	7,353.93	7,351.56	155.81	180.24	-90.25	1,373.51	-10,152.92	16,246.97	16,037.19	209.78	77.447	
13,500.00	7,162.25	7,353.95	7,351.58	158.21	180.24	-90.25	1,373.51	-10,152.92	16,346.65	16,136.77	209.89	77.884	
13,600.00	7,162.27	7,353.97	7,351.60	160.62	180.24	-90.25	1,373.51	-10,152.92	16,446.34	16,236.35	209.99	78.320	
13,700.00	7,162.30	7,353.99	7,351.62	163.02	180.24	-90.25	1,373.51	-10,152.92	16,546.02	16,335.93	210.09	78.756	
13,800.00	7,162.32	7,354.02	7,351.65	165.43	180.24	-90.26	1,373.51	-10,152.92	16,645.71	16,435.52	210.20	79.191	
13,900.00	7,162.34	7,354.04	7,351.67	167.84	180.24	-90.26	1,373.51	-10,152.92	16,745.41	16,535.11	210.30	79.626	
14,000.00	7,162.36	7,354.06	7,351.69	170.24	180.24	-90.26	1,373.51	-10,152.92	16,845.10	16,634.70	210.41	80.060	
14,100.00	7,162.38	7,354.08	7,351.71	172.65	180.24	-90.26	1,373.51	-10,152.92	16,944.81	16,734.30	210.51	80.494	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD											Offset Site Error: 0.00 usft				
Survey Program: 400-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		
14,200.00	7,162.40	7,354.11	7,351.73	175.06	180.24	-90.26	1,373.51	-10,152.92	17,044.51	16,833.90	210.62	80.927			
14,300.00	7,162.42	7,354.13	7,351.76	177.47	180.24	-90.26	1,373.51	-10,152.92	17,144.22	16,933.50	210.72	81.360			
14,400.00	7,162.44	7,354.15	7,351.78	179.88	180.24	-90.26	1,373.51	-10,152.92	17,243.93	17,033.10	210.83	81.792			
14,500.00	7,162.46	7,354.17	7,351.80	182.29	180.24	-90.26	1,373.51	-10,152.92	17,343.65	17,132.71	210.93	82.224			
14,600.00	7,162.49	7,354.19	7,351.82	184.71	180.24	-90.26	1,373.51	-10,152.92	17,443.36	17,232.33	211.04	82.655			
14,700.00	7,162.51	7,354.22	7,351.85	187.12	180.24	-90.26	1,373.51	-10,152.92	17,543.09	17,331.94	211.14	83.086			
14,800.00	7,162.53	7,354.24	7,351.87	189.53	180.24	-90.27	1,373.51	-10,152.92	17,642.81	17,431.56	211.25	83.516			
14,900.00	7,162.55	7,354.26	7,351.89	191.95	180.25	-90.27	1,373.51	-10,152.92	17,742.54	17,531.18	211.36	83.946			
15,000.00	7,162.57	7,354.28	7,351.91	194.36	180.25	-90.27	1,373.51	-10,152.92	17,842.27	17,630.80	211.46	84.375			
15,100.00	7,162.59	7,354.30	7,351.93	196.78	180.25	-90.27	1,373.51	-10,152.92	17,942.00	17,730.43	211.57	84.803			
15,200.00	7,162.61	7,354.33	7,351.96	199.19	180.25	-90.27	1,373.51	-10,152.92	18,041.74	17,830.06	211.68	85.231			
15,300.00	7,162.63	7,354.35	7,351.98	201.61	180.25	-90.27	1,373.51	-10,152.92	18,141.48	17,929.69	211.79	85.659			
15,400.00	7,162.65	7,354.37	7,352.00	204.03	180.25	-90.27	1,373.51	-10,152.92	18,241.22	18,029.33	211.90	86.086			
15,500.00	7,162.67	7,354.39	7,352.02	206.44	180.25	-90.27	1,373.51	-10,152.92	18,340.97	18,128.96	212.00	86.513			
15,600.00	7,162.70	7,354.42	7,352.04	208.86	180.25	-90.27	1,373.51	-10,152.92	18,440.71	18,228.60	212.11	86.939			
15,700.00	7,162.72	7,354.44	7,352.07	211.28	180.25	-90.27	1,373.51	-10,152.92	18,540.46	18,328.24	212.22	87.364			
15,800.00	7,162.74	7,354.46	7,352.09	213.70	180.25	-90.28	1,373.51	-10,152.92	18,640.22	18,427.89	212.33	87.789			
15,900.00	7,162.76	7,354.48	7,352.11	216.12	180.25	-90.28	1,373.51	-10,152.92	18,739.97	18,527.54	212.44	88.214			
16,000.00	7,162.78	7,354.50	7,352.13	218.54	180.25	-90.28	1,373.51	-10,152.92	18,839.73	18,627.19	212.55	88.638			
16,100.00	7,162.80	7,354.53	7,352.16	220.96	180.25	-90.28	1,373.51	-10,152.92	18,939.49	18,726.84	212.66	89.061			
16,200.00	7,162.82	7,354.55	7,352.18	223.38	180.25	-90.28	1,373.51	-10,152.92	19,039.26	18,826.49	212.77	89.484			
16,300.00	7,162.84	7,354.57	7,352.20	225.80	180.25	-90.28	1,373.51	-10,152.92	19,139.02	18,926.15	212.88	89.907			
16,400.00	7,162.86	7,354.59	7,352.22	228.22	180.26	-90.28	1,373.51	-10,152.92	19,238.79	19,025.81	212.99	90.329			
16,500.00	7,162.88	7,354.61	7,352.24	230.64	180.26	-90.28	1,373.51	-10,152.92	19,338.56	19,125.47	213.10	90.751			
16,600.00	7,162.91	7,354.64	7,352.27	233.06	180.26	-90.28	1,373.51	-10,152.92	19,438.34	19,225.13	213.21	91.172			
16,700.00	7,162.93	7,354.66	7,352.29	235.49	180.26	-90.28	1,373.51	-10,152.92	19,538.11	19,324.80	213.32	91.592			
16,800.00	7,162.95	7,354.68	7,352.31	237.91	180.26	-90.28	1,373.51	-10,152.92	19,637.89	19,424.46	213.43	92.012			
16,879.97	7,162.96	7,354.70	7,352.33	239.84	180.26	-90.29	1,373.51	-10,152.92	19,717.69	19,504.17	213.52	92.348			
16,900.00	7,162.97	7,354.70	7,352.33	240.33	180.26	-90.29	1,373.51	-10,152.92	19,737.67	19,524.13	213.54	92.432			
17,000.00	7,162.99	7,354.73	7,352.35	242.75	180.26	-90.29	1,373.51	-10,152.92	19,837.45	19,623.80	213.65	92.851			
17,056.99	7,163.00	7,354.74	7,352.37	244.13	180.26	-90.29	1,373.51	-10,152.92	19,894.32	19,680.61	213.71	93.089			

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 348-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	3,507.87	3,070.22	0.00	29.68	-76.83	2,084.02	-8,904.16	9,587.94				
100.00	100.00	3,598.34	3,153.11	0.25	30.38	-76.67	2,102.67	-8,873.09	9,558.04	9,534.67	23.36	409.158	
200.00	200.00	3,596.00	3,150.97	0.61	30.37	-76.67	2,102.16	-8,873.90	9,528.57	9,505.02	23.55	404.652	
300.00	300.00	3,626.00	3,178.54	0.97	30.59	-76.62	2,108.48	-8,863.92	9,499.91	9,475.90	24.01	395.606	
400.00	400.00	3,626.00	3,178.54	1.33	30.59	-76.62	2,108.48	-8,863.92	9,472.09	9,447.74	24.34	389.094	
500.00	500.00	3,642.78	3,194.09	1.68	30.71	-76.59	2,111.90	-8,858.62	9,445.15	9,420.36	24.79	381.023	
600.00	599.98	3,663.12	3,213.03	2.04	30.85	8.29	2,115.96	-8,852.41	9,417.38	9,392.11	25.27	372.695	
700.00	699.84	3,722.00	3,267.95	2.39	31.25	8.49	2,127.57	-8,834.63	9,386.79	9,360.83	25.96	361.518	
722.35	722.13	3,722.00	3,267.95	2.47	31.25	8.51	2,127.57	-8,834.63	9,379.59	9,353.53	26.06	359.949	
800.00	799.54	3,753.00	3,296.97	2.74	31.46	8.56	2,133.50	-8,825.50	9,354.53	9,328.03	26.50	352.992	
900.00	899.24	3,785.00	3,327.04	3.10	31.66	8.62	2,139.42	-8,816.29	9,322.81	9,295.79	27.03	344.936	
1,000.00	998.94	3,828.01	3,367.59	3.47	31.93	8.69	2,147.11	-8,804.19	9,291.66	9,264.06	27.61	336.549	
1,100.00	1,098.64	3,848.00	3,386.55	3.83	32.05	8.72	2,150.35	-8,798.74	9,261.18	9,233.10	28.08	329.854	
1,200.00	1,198.34	3,879.00	3,416.16	4.20	32.22	8.76	2,154.79	-8,790.69	9,231.48	9,202.89	28.58	322.953	
1,300.00	1,298.04	3,900.93	3,437.21	4.57	32.33	8.79	2,157.60	-8,785.26	9,202.52	9,173.48	29.05	316.799	
1,400.00	1,397.74	3,927.08	3,462.41	4.94	32.46	8.82	2,160.70	-8,778.95	9,174.25	9,144.72	29.53	310.713	
1,500.00	1,497.44	3,943.00	3,477.78	5.31	32.54	8.84	2,162.49	-8,775.25	9,146.77	9,116.80	29.97	305.235	
1,600.00	1,597.13	3,943.00	3,477.78	5.68	32.54	8.84	2,162.49	-8,775.25	9,120.23	9,089.88	30.35	300.507	
1,700.00	1,696.83	3,974.00	3,507.89	6.05	32.68	8.87	2,165.69	-8,768.61	9,094.46	9,063.62	30.83	294.942	
1,800.00	1,796.53	3,974.00	3,507.89	6.43	32.68	8.87	2,165.69	-8,768.61	9,069.65	9,038.43	31.22	290.523	
1,900.00	1,896.23	4,006.00	3,539.17	6.80	32.81	8.90	2,168.67	-8,762.55	9,045.75	9,014.05	31.70	285.384	
2,000.00	1,995.93	4,017.21	3,550.15	7.17	32.85	8.91	2,169.68	-8,760.54	9,022.66	8,990.55	32.11	280.976	
2,100.00	2,095.63	4,037.00	3,569.56	7.54	32.92	8.93	2,171.46	-8,757.09	9,000.39	8,967.84	32.55	276.501	
2,200.00	2,195.33	4,068.00	3,600.02	7.92	33.03	8.96	2,174.18	-8,752.04	8,978.98	8,945.96	33.02	271.940	
2,300.00	2,295.03	4,068.00	3,600.02	8.29	33.03	8.96	2,174.18	-8,752.04	8,958.42	8,925.02	33.40	268.224	
2,400.00	2,394.73	4,099.00	3,630.58	8.66	33.13	8.98	2,176.79	-8,747.54	8,938.76	8,904.90	33.86	263.994	
2,500.00	2,494.43	4,120.18	3,651.50	9.04	33.19	9.00	2,178.52	-8,744.70	8,919.94	8,885.65	34.29	260.124	
2,600.00	2,594.12	4,161.00	3,691.86	9.41	33.31	9.03	2,181.78	-8,739.53	8,901.88	8,867.11	34.77	256.026	
2,700.00	2,693.82	4,177.66	3,708.35	9.79	33.35	9.05	2,183.11	-8,737.55	8,884.55	8,849.37	35.19	252.506	
2,800.00	2,793.52	4,193.00	3,723.55	10.16	33.39	9.06	2,184.30	-8,735.83	8,868.10	8,832.50	35.60	249.126	
2,900.00	2,893.22	4,225.00	3,755.30	10.53	33.47	9.08	2,186.61	-8,732.65	8,852.54	8,816.50	36.04	245.626	
3,000.00	2,992.92	4,237.97	3,768.19	10.91	33.50	9.09	2,187.47	-8,731.51	8,837.83	8,801.39	36.44	242.547	
3,100.00	3,092.62	4,256.00	3,786.13	11.28	33.54	9.10	2,188.59	-8,730.06	8,824.01	8,787.17	36.84	239.505	
3,200.00	3,192.32	4,299.26	3,829.23	11.66	33.61	9.12	2,190.81	-8,727.05	8,810.94	8,773.65	37.29	236.309	
3,300.00	3,292.02	4,335.68	3,865.55	12.03	33.67	9.14	2,192.27	-8,724.89	8,798.57	8,760.86	37.71	233.337	
3,400.00	3,391.72	4,366.98	3,896.80	12.41	33.72	9.15	2,193.35	-8,723.32	8,786.94	8,748.82	38.12	230.533	
3,500.00	3,491.41	4,395.08	3,924.86	12.78	33.75	9.16	2,194.22	-8,722.17	8,776.10	8,737.59	38.51	227.866	
3,600.00	3,591.11	4,414.00	3,943.76	13.15	33.77	9.16	2,194.73	-8,721.56	8,766.10	8,727.20	38.90	225.367	
3,700.00	3,690.81	4,476.00	4,005.74	13.53	33.83	9.18	2,195.86	-8,720.22	8,756.81	8,717.48	39.32	222.699	
3,800.00	3,790.51	4,612.95	4,142.65	13.90	33.95	9.20	2,197.57	-8,717.65	8,747.70	8,707.88	39.82	219.703	
3,900.00	3,890.21	4,713.84	4,243.51	14.28	34.06	9.22	2,198.75	-8,715.39	8,738.18	8,697.87	40.31	216.790	
4,000.00	3,989.91	4,814.83	4,344.47	14.65	34.19	9.24	2,199.95	-8,713.12	8,728.64	8,687.84	40.80	213.934	
4,100.00	4,089.61	4,915.82	4,445.42	15.03	34.31	9.26	2,201.15	-8,710.82	8,719.09	8,677.80	41.29	211.144	
4,200.00	4,189.31	5,016.80	4,546.37	15.40	34.43	9.28	2,202.37	-8,708.50	8,709.52	8,667.73	41.79	208.420	
4,300.00	4,289.01	5,117.79	4,647.32	15.78	34.55	9.30	2,203.60	-8,706.16	8,699.94	8,657.66	42.28	205.757	
4,400.00	4,388.70	5,218.76	4,748.26	16.15	34.67	9.32	2,204.83	-8,703.81	8,690.34	8,647.56	42.78	203.155	
4,500.00	4,488.40	5,319.73	4,849.20	16.53	34.79	9.34	2,206.08	-8,701.43	8,680.72	8,637.45	43.27	200.612	
4,600.00	4,588.10	5,420.70	4,950.13	16.90	34.91	9.36	2,207.34	-8,699.03	8,671.09	8,627.33	43.77	198.124	
4,700.00	4,687.80	5,521.66	5,051.05	17.27	35.04	9.39	2,208.61	-8,696.61	8,661.45	8,617.19	44.26	195.692	
4,800.00	4,787.50	5,622.62	5,151.98	17.65	35.16	9.41	2,209.90	-8,694.17	8,651.78	8,607.03	44.76	193.312	
4,900.00	4,887.20	5,723.58	5,252.89	18.02	35.28	9.43	2,211.19	-8,691.71	8,642.10	8,596.85	45.25	190.983	
5,000.00	4,986.90	5,824.53	5,353.80	18.40	35.40	9.45	2,212.49	-8,689.23	8,632.41	8,586.66	45.75	188.703	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 348-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)			
5,100.00	5,086.60	5,925.47	5,454.71	18.77	35.52	9.47	2,213.80	-8,686.72	8,622.70	8,576.46	46.24	186.471	
5,200.00	5,186.30	6,026.42	5,555.61	19.15	35.65	9.49	2,215.13	-8,684.20	8,612.97	8,566.24	46.74	184.286	
5,300.00	5,286.00	6,127.35	5,656.51	19.52	35.77	9.51	2,216.46	-8,681.66	8,603.23	8,556.00	47.23	182.146	
5,400.00	5,385.69	6,228.29	5,757.40	19.90	35.89	9.53	2,217.81	-8,679.10	8,593.47	8,545.74	47.73	180.049	
5,500.00	5,485.39	6,329.22	5,858.29	20.27	36.01	9.56	2,219.16	-8,676.51	8,583.70	8,535.47	48.22	177.994	
5,600.00	5,585.09	6,430.14	5,959.17	20.65	36.14	9.58	2,220.53	-8,673.91	8,573.91	8,525.19	48.72	175.981	
5,700.00	5,684.79	6,531.06	6,060.04	21.02	36.26	9.60	2,221.91	-8,671.28	8,564.11	8,514.89	49.22	174.007	
5,800.00	5,784.49	6,631.97	6,160.91	21.40	36.38	9.62	2,223.30	-8,668.64	8,554.28	8,504.57	49.71	172.072	
5,900.00	5,884.19	6,732.89	6,261.78	21.77	36.50	9.65	2,224.70	-8,665.97	8,544.45	8,494.24	50.21	170.174	
6,000.00	5,983.89	6,833.79	6,362.64	22.15	36.63	9.67	2,226.11	-8,663.29	8,534.60	8,483.89	50.71	168.313	
6,100.00	6,083.59	6,934.69	6,463.50	22.52	36.75	9.69	2,227.53	-8,660.58	8,524.73	8,473.53	51.20	166.487	
6,200.00	6,183.29	7,035.59	6,564.35	22.90	36.87	9.71	2,228.96	-8,657.85	8,514.85	8,463.15	51.70	164.695	
6,300.00	6,282.98	7,136.49	6,665.19	23.27	37.00	9.74	2,230.40	-8,655.11	8,504.95	8,452.75	52.20	162.937	
6,400.00	6,382.68	7,237.37	6,766.03	23.65	37.12	9.76	2,231.86	-8,652.34	8,495.03	8,442.34	52.70	161.211	
6,492.83	6,475.23	7,331.02	6,859.64	24.00	37.23	9.78	2,233.21	-8,649.75	8,485.82	8,432.66	53.16	159.637	
6,500.00	6,482.39	7,338.26	6,866.87	24.02	37.24	8.90	2,233.32	-8,649.55	8,485.14	8,431.95	53.19	159.518	
6,550.00	6,532.35	7,388.89	6,917.48	24.19	37.30	-136.21	2,234.06	-8,648.14	8,482.61	8,429.18	53.43	158.764	
6,558.45	6,540.80	7,397.47	6,926.05	24.22	37.31	-150.14	2,234.18	-8,647.90	8,482.56	8,429.09	53.47	158.651 CC, ES	
6,600.00	6,582.27	7,439.59	6,968.15	24.34	37.37	-160.78	2,234.80	-8,646.73	8,483.86	8,430.21	53.65	158.130	
6,650.00	6,631.83	7,490.03	7,018.56	24.49	37.43	-162.68	2,235.54	-8,645.32	8,488.90	8,435.04	53.86	157.597	
6,700.00	6,680.73	7,539.91	7,068.42	24.62	37.49	-163.22	2,236.28	-8,643.92	8,497.69	8,443.62	54.07	157.163	
6,750.00	6,728.67	7,588.93	7,117.41	24.74	37.55	-163.31	2,237.00	-8,642.53	8,510.18	8,455.91	54.26	156.832	
6,800.00	6,775.35	7,636.77	7,165.23	24.86	37.61	-163.15	2,237.71	-8,641.18	8,526.28	8,471.84	54.44	156.605	
6,850.00	6,820.48	7,683.16	7,211.59	24.98	37.66	-162.81	2,238.40	-8,639.86	8,545.92	8,491.30	54.61	156.480	
6,900.00	6,863.78	7,727.80	7,256.21	25.09	37.72	-162.29	2,239.07	-8,638.59	8,568.95	8,514.19	54.77	156.457 SF	
6,950.00	6,904.99	7,770.41	7,298.80	25.21	37.77	-161.59	2,239.71	-8,637.38	8,595.26	8,540.35	54.91	156.533	
7,000.00	6,943.86	7,810.74	7,339.12	25.33	37.82	-160.69	2,240.32	-8,636.22	8,624.67	8,569.63	55.04	156.705	
7,050.00	6,980.14	7,848.54	7,376.90	25.47	37.87	-159.54	2,240.89	-8,635.13	8,657.00	8,601.85	55.15	156.969	
7,100.00	7,013.60	7,883.58	7,411.91	25.62	37.91	-158.10	2,241.42	-8,634.12	8,692.07	8,636.82	55.25	157.321	
7,150.00	7,044.06	7,915.63	7,443.95	25.79	37.95	-156.27	2,241.90	-8,633.20	8,729.65	8,674.31	55.34	157.754	
7,200.00	7,071.31	7,944.51	7,472.81	26.00	37.98	-153.94	2,242.34	-8,632.36	8,769.52	8,714.11	55.41	158.263	
7,250.00	7,095.18	7,970.03	7,498.31	26.23	38.02	-150.92	2,242.73	-8,631.62	8,811.43	8,755.96	55.47	158.842	
7,300.00	7,115.54	7,992.03	7,520.30	26.50	38.04	-146.94	2,243.07	-8,630.99	8,855.13	8,799.61	55.52	159.484	
7,350.00	7,132.25	8,010.38	7,538.64	26.81	38.06	-141.58	2,243.35	-8,630.45	8,900.35	8,844.79	55.56	160.181	
7,400.00	7,145.22	8,024.96	7,553.22	27.16	38.08	-134.21	2,243.57	-8,630.03	8,946.82	8,891.22	55.60	160.925	
7,450.00	7,154.36	8,035.69	7,563.94	27.55	38.10	-123.99	2,243.73	-8,629.71	8,994.23	8,938.61	55.62	161.708	
7,500.00	7,159.61	8,042.49	7,570.74	27.97	38.10	-110.14	2,243.84	-8,629.52	9,042.32	8,986.68	55.64	162.522	
7,541.91	7,161.00	8,045.14	7,573.39	28.35	38.11	-95.90	2,243.88	-8,629.44	9,082.92	9,027.27	55.65	163.220	
7,600.00	7,161.01	8,046.87	7,575.12	28.92	38.11	-95.95	2,243.90	-8,629.39	9,139.31	9,083.65	55.66	164.193	
7,700.00	7,161.03	8,049.86	7,578.10	30.03	38.11	-96.03	2,243.95	-8,629.30	9,236.42	9,180.73	55.69	165.841	
7,800.00	7,161.05	8,052.84	7,581.08	31.29	38.12	-96.10	2,244.00	-8,629.21	9,333.60	9,277.86	55.74	167.453	
7,900.00	7,161.08	8,055.82	7,584.06	32.69	38.12	-96.18	2,244.04	-8,629.13	9,430.83	9,375.04	55.79	169.031	
8,000.00	7,161.10	8,058.81	7,587.04	34.20	38.12	-96.26	2,244.09	-8,629.04	9,528.12	9,472.27	55.86	170.577	
8,100.00	7,161.12	8,061.79	7,590.03	35.81	38.13	-96.33	2,244.13	-8,628.95	9,625.47	9,569.54	55.93	172.092	
8,200.00	7,161.14	8,064.78	7,593.02	37.52	38.13	-96.41	2,244.18	-8,628.87	9,722.87	9,666.85	56.01	173.578	
8,300.00	7,161.16	8,067.77	7,596.00	39.30	38.13	-96.49	2,244.22	-8,628.78	9,820.32	9,764.21	56.10	175.035	
8,400.00	7,161.18	8,070.76	7,598.99	41.15	38.14	-96.57	2,244.27	-8,628.69	9,917.82	9,861.61	56.20	176.465	
8,500.00	7,161.20	8,073.75	7,601.98	43.05	38.14	-96.64	2,244.32	-8,628.60	10,015.36	9,959.06	56.31	177.870	
8,600.00	7,161.22	8,076.74	7,604.97	45.01	38.15	-96.72	2,244.36	-8,628.52	10,112.96	10,056.54	56.42	179.251	
8,700.00	7,161.24	8,079.74	7,607.96	47.02	38.15	-96.80	2,244.41	-8,628.43	10,210.60	10,154.07	56.53	180.608	
8,800.00	7,161.26	8,082.73	7,610.96	49.06	38.15	-96.88	2,244.45	-8,628.34	10,308.28	10,251.63	56.66	181.943	
8,900.00	7,161.29	8,085.73	7,613.95	51.14	38.16	-96.95	2,244.50	-8,628.25	10,406.01	10,349.23	56.78	183.258	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY												Offset Site Error: 0.00 usft	
Survey Program:		348-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)
9,000.00	7,161.31	8,088.72	7,616.95	53.24	38.16	-97.03	2,244.55	-8,628.17	10,503.78	10,446.87	56.91	184.553	
9,100.00	7,161.33	8,091.72	7,619.94	55.38	38.16	-97.11	2,244.59	-8,628.08	10,601.59	10,544.54	57.05	185.829	
9,200.00	7,161.35	8,094.72	7,622.94	57.54	38.17	-97.19	2,244.64	-8,627.99	10,699.44	10,642.25	57.19	187.088	
9,300.00	7,161.37	8,097.72	7,625.94	59.72	38.17	-97.26	2,244.68	-8,627.90	10,797.33	10,740.00	57.33	188.329	
9,400.00	7,161.39	8,100.73	7,628.94	61.92	38.18	-97.34	2,244.73	-8,627.81	10,895.26	10,837.78	57.48	189.555	
9,500.00	7,161.41	8,103.73	7,631.94	64.13	38.18	-97.42	2,244.78	-8,627.73	10,993.22	10,935.60	57.63	190.766	
9,600.00	7,161.43	8,106.73	7,634.95	66.36	38.18	-97.50	2,244.82	-8,627.64	11,091.22	11,033.44	57.78	191.962	
9,700.00	7,161.45	8,109.74	7,637.95	68.61	38.19	-97.57	2,244.87	-8,627.55	11,189.25	11,131.32	57.93	193.145	
9,800.00	7,161.48	8,112.75	7,640.96	70.87	38.19	-97.65	2,244.91	-8,627.46	11,287.32	11,229.23	58.09	194.316	
9,900.00	7,161.50	8,115.76	7,643.96	73.14	38.19	-97.73	2,244.96	-8,627.37	11,385.42	11,327.18	58.25	195.474	
10,000.00	7,161.52	8,118.76	7,646.97	75.42	38.20	-97.81	2,245.01	-8,627.29	11,483.55	11,425.15	58.40	196.620	
10,100.00	7,161.54	8,121.78	7,649.98	77.71	38.20	-97.88	2,245.05	-8,627.20	11,581.72	11,523.15	58.57	197.756	
10,200.00	7,161.56	8,124.79	7,652.99	80.01	38.20	-97.96	2,245.10	-8,627.11	11,679.91	11,621.18	58.73	198.881	
10,300.00	7,161.58	8,127.80	7,656.00	82.32	38.21	-98.04	2,245.15	-8,627.02	11,778.13	11,719.24	58.89	199.997	
10,400.00	7,161.60	8,130.82	7,659.01	84.63	38.21	-98.12	2,245.19	-8,626.93	11,876.38	11,817.33	59.06	201.103	
10,500.00	7,161.62	8,133.83	7,662.03	86.95	38.22	-98.19	2,245.24	-8,626.84	11,974.66	11,915.44	59.22	202.200	
10,600.00	7,161.64	8,136.85	7,665.04	89.28	38.22	-98.27	2,245.29	-8,626.76	12,072.97	12,013.58	59.39	203.289	
10,700.00	7,161.66	8,139.87	7,668.06	91.61	38.22	-98.35	2,245.33	-8,626.67	12,171.31	12,111.75	59.56	204.370	
10,800.00	7,161.69	8,142.89	7,671.08	93.95	38.23	-98.43	2,245.38	-8,626.58	12,269.67	12,209.94	59.72	205.444	
10,900.00	7,161.71	8,145.91	7,674.10	96.29	38.23	-98.50	2,245.43	-8,626.49	12,368.05	12,308.16	59.89	206.510	
11,000.00	7,161.73	8,148.93	7,677.12	98.64	38.23	-98.58	2,245.47	-8,626.40	12,466.46	12,406.41	60.06	207.569	
11,100.00	7,161.75	8,151.95	7,680.14	100.99	38.24	-98.66	2,245.52	-8,626.31	12,564.90	12,504.67	60.23	208.622	
11,200.00	7,161.77	8,154.98	7,683.16	103.35	38.24	-98.74	2,245.57	-8,626.22	12,663.36	12,602.96	60.40	209.669	
11,300.00	7,161.79	8,158.00	7,686.19	105.71	38.25	-98.81	2,245.61	-8,626.13	12,761.84	12,701.28	60.57	210.709	
11,400.00	7,161.81	8,161.03	7,689.21	108.07	38.25	-98.89	2,245.66	-8,626.05	12,860.35	12,799.61	60.74	211.744	
11,500.00	7,161.83	8,164.06	7,692.24	110.44	38.25	-98.97	2,245.71	-8,625.96	12,958.88	12,897.97	60.90	212.774	
11,600.00	7,161.85	8,167.09	7,695.27	112.80	38.26	-99.05	2,245.75	-8,625.87	13,057.42	12,996.35	61.07	213.798	
11,700.00	7,161.87	8,170.12	7,698.30	115.18	38.26	-99.12	2,245.80	-8,625.78	13,156.00	13,094.75	61.24	214.817	
11,800.00	7,161.90	8,173.15	7,701.33	117.55	38.26	-99.20	2,245.85	-8,625.69	13,254.59	13,193.17	61.41	215.832	
11,900.00	7,161.92	8,176.18	7,704.36	119.93	38.27	-99.28	2,245.89	-8,625.60	13,353.20	13,291.62	61.58	216.841	
12,000.00	7,161.94	8,179.22	7,707.39	122.31	38.27	-99.35	2,245.94	-8,625.51	13,451.83	13,390.08	61.75	217.847	
12,100.00	7,161.96	8,182.25	7,710.42	124.69	38.28	-99.43	2,245.99	-8,625.42	13,550.48	13,488.56	61.92	218.848	
12,200.00	7,161.98	8,185.29	7,713.46	127.07	38.28	-99.51	2,246.03	-8,625.33	13,649.15	13,587.06	62.09	219.845	
12,300.00	7,162.00	8,188.33	7,716.50	129.46	38.28	-99.59	2,246.08	-8,625.24	13,747.84	13,685.58	62.25	220.838	
12,400.00	7,162.02	8,191.37	7,719.53	131.85	38.29	-99.66	2,246.13	-8,625.15	13,846.54	13,784.12	62.42	221.827	
12,500.00	7,162.04	8,194.41	7,722.57	134.24	38.29	-99.74	2,246.17	-8,625.06	13,945.27	13,882.68	62.59	222.813	
12,600.00	7,162.06	8,197.45	7,725.61	136.63	38.29	-99.82	2,246.22	-8,624.97	14,044.01	13,981.26	62.75	223.795	
12,700.00	7,162.09	8,200.50	7,728.66	139.02	38.30	-99.90	2,246.27	-8,624.88	14,142.77	14,079.85	62.92	224.773	
12,800.00	7,162.11	8,203.54	7,731.70	141.42	38.30	-99.97	2,246.32	-8,624.79	14,241.54	14,178.46	63.09	225.748	
12,900.00	7,162.13	8,206.59	7,734.74	143.81	38.31	-100.05	2,246.36	-8,624.70	14,340.34	14,277.08	63.25	226.720	
13,000.00	7,162.15	8,209.63	7,737.79	146.21	38.31	-100.13	2,246.41	-8,624.61	14,439.14	14,375.73	63.42	227.689	
13,100.00	7,162.17	8,212.68	7,740.84	148.61	38.31	-100.21	2,246.46	-8,624.52	14,537.97	14,474.39	63.58	228.655	
13,200.00	7,162.19	8,215.73	7,743.88	151.01	38.32	-100.28	2,246.50	-8,624.43	14,636.81	14,573.06	63.74	229.617	
13,300.00	7,162.21	8,218.78	7,746.93	153.41	38.32	-100.36	2,246.55	-8,624.34	14,735.66	14,671.75	63.91	230.577	
13,400.00	7,162.23	8,221.83	7,749.98	155.81	38.32	-100.44	2,246.60	-8,624.25	14,834.53	14,770.46	64.07	231.534	
13,500.00	7,162.25	8,224.89	7,753.03	158.21	38.33	-100.52	2,246.65	-8,624.16	14,933.41	14,869.18	64.23	232.488	
13,600.00	7,162.27	8,227.94	7,756.09	160.62	38.33	-100.59	2,246.69	-8,624.07	15,032.31	14,967.91	64.39	233.440	
13,700.00	7,162.30	8,231.00	7,759.14	163.02	38.34	-100.67	2,246.74	-8,623.98	15,131.22	15,066.66	64.56	234.388	
13,800.00	7,162.32	8,234.06	7,762.20	165.43	38.34	-100.75	2,246.79	-8,623.89	15,230.14	15,165.43	64.72	235.335	
13,900.00	7,162.34	8,237.11	7,765.25	167.84	38.34	-100.82	2,246.84	-8,623.80	15,329.08	15,264.21	64.88	236.278	
14,000.00	7,162.36	8,240.17	7,768.31	170.24	38.35	-100.90	2,246.88	-8,623.71	15,428.03	15,363.00	65.04	237.219	
14,100.00	7,162.38	8,243.24	7,771.37	172.65	38.35	-100.98	2,246.93	-8,623.62	15,527.00	15,461.80	65.20	238.158	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY											Offset Site Error: 0.00 usft
Survey Program: 348-APC_ISCWSA REV 2 MWD											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)	
14,200.00	7,162.40	8,246.30	7,774.43	175.06	38.35	-101.06	2,246.98	-8,623.53	15,625.98	15,560.62	
14,300.00	7,162.42	8,249.36	7,777.49	177.47	38.36	-101.13	2,247.03	-8,623.44	15,724.96	15,659.45	
14,400.00	7,162.44	8,252.43	7,780.56	179.88	38.36	-101.21	2,247.07	-8,623.35	15,823.97	15,758.29	
14,500.00	7,162.46	8,255.49	7,783.62	182.29	38.37	-101.29	2,247.12	-8,623.26	15,922.98	15,857.15	
14,600.00	7,162.49	8,258.56	7,786.69	184.71	38.37	-101.36	2,247.17	-8,623.17	16,022.00	15,956.02	
14,700.00	7,162.51	8,261.63	7,789.75	187.12	38.37	-101.44	2,247.22	-8,623.08	16,121.04	16,054.90	
14,800.00	7,162.53	8,264.70	7,792.82	189.53	38.38	-101.52	2,247.26	-8,622.99	16,220.09	16,153.79	
14,900.00	7,162.55	8,267.77	7,795.89	191.95	38.38	-101.60	2,247.31	-8,622.90	16,319.15	16,252.69	
15,000.00	7,162.57	8,270.84	7,798.96	194.36	38.38	-101.67	2,247.36	-8,622.81	16,418.22	16,351.61	
15,100.00	7,162.59	8,273.92	7,802.04	196.78	38.39	-101.75	2,247.41	-8,622.71	16,517.30	16,450.54	
15,200.00	7,162.61	8,276.99	7,805.11	199.19	38.39	-101.83	2,247.46	-8,622.62	16,616.39	16,549.47	
15,300.00	7,162.63	8,280.07	7,808.18	201.61	38.40	-101.90	2,247.50	-8,622.53	16,715.49	16,648.42	
15,400.00	7,162.65	8,283.15	7,811.26	204.03	38.40	-101.98	2,247.55	-8,622.44	16,814.60	16,747.38	
15,500.00	7,162.67	8,286.22	7,814.34	206.44	38.40	-102.06	2,247.60	-8,622.35	16,913.72	16,846.35	
15,600.00	7,162.70	8,289.30	7,817.41	208.86	38.41	-102.14	2,247.65	-8,622.26	17,012.85	16,945.33	
15,700.00	7,162.72	8,292.39	7,820.49	211.28	38.41	-102.21	2,247.70	-8,622.17	17,111.99	17,044.32	
15,800.00	7,162.74	8,295.47	7,823.58	213.70	38.41	-102.29	2,247.74	-8,622.08	17,211.14	17,143.32	
15,900.00	7,162.76	8,298.55	7,826.66	216.12	38.42	-102.37	2,247.79	-8,621.98	17,310.30	17,242.33	
16,000.00	7,162.78	8,301.64	7,829.74	218.54	38.42	-102.44	2,247.84	-8,621.89	17,409.47	17,341.34	
16,100.00	7,162.80	8,304.72	7,832.83	220.96	38.43	-102.52	2,247.89	-8,621.80	17,508.64	17,440.37	
16,200.00	7,162.82	8,307.81	7,835.91	223.38	38.43	-102.60	2,247.94	-8,621.71	17,607.83	17,539.41	
16,300.00	7,162.84	8,310.90	7,839.00	225.80	38.43	-102.67	2,247.98	-8,621.62	17,707.02	17,638.45	
16,400.00	7,162.86	8,313.99	7,842.09	228.22	38.44	-102.75	2,248.03	-8,621.53	17,806.23	17,737.51	
16,500.00	7,162.88	8,317.08	7,845.18	230.64	38.44	-102.83	2,248.08	-8,621.43	17,905.44	17,836.57	
16,600.00	7,162.91	8,320.18	7,848.27	233.06	38.44	-102.90	2,248.13	-8,621.34	18,004.66	17,935.65	
16,700.00	7,162.93	8,323.27	7,851.36	235.49	38.45	-102.98	2,248.18	-8,621.25	18,103.88	18,034.73	
16,800.00	7,162.95	8,326.37	7,854.46	237.91	38.45	-103.06	2,248.22	-8,621.16	18,203.12	18,133.82	
16,879.97	7,162.96	8,328.84	7,856.93	239.84	38.46	-103.12	2,248.26	-8,621.08	18,282.49	18,213.07	
16,900.00	7,162.97	8,329.46	7,857.55	240.33	38.46	-103.13	2,248.27	-8,621.07	18,302.36	18,232.92	
17,000.00	7,162.99	8,332.56	7,860.65	242.75	38.46	-103.21	2,248.32	-8,620.97	18,401.61	18,332.02	
17,056.99	7,163.00	8,334.33	7,862.41	244.13	38.46	-103.26	2,248.35	-8,620.92	18,458.18	18,388.51	

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 200-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	187.00	187.00	0.00	5.60	-82.19	1,395.77	-10,177.83	10,273.09				
100.00	100.00	287.04	287.00	0.25	8.60	-82.19	1,395.77	-10,177.83	10,273.09	10,264.24	8.85	1,160.543	
200.00	200.00	415.15	415.06	0.61	12.44	-82.19	1,395.48	-10,177.83	10,273.09	10,260.04	13.05	787.263	
212.40	212.40	431.56	431.46	0.65	12.93	-82.19	1,395.13	-10,177.83	10,273.05	10,259.47	13.59	756.195	
300.00	300.00	487.16	487.00	0.97	14.60	-82.19	1,395.77	-10,177.83	10,273.09	10,257.52	15.57	659.992	
400.00	400.00	615.31	615.10	1.33	18.44	-82.19	1,395.48	-10,177.83	10,273.09	10,253.32	19.76	519.794	
412.40	412.40	631.72	631.50	1.37	18.93	-82.19	1,395.12	-10,177.83	10,273.05	10,252.75	20.30	506.066	
500.00	500.00	687.28	687.00	1.68	20.59	-82.19	1,395.77	-10,177.83	10,273.09	10,250.81	22.28	461.112	
600.00	599.98	815.44	815.11	2.04	24.43	2.57	1,395.48	-10,177.83	10,271.34	10,244.87	26.47	388.030	
700.00	699.84	887.24	886.84	2.39	26.59	2.58	1,395.77	-10,177.83	10,266.12	10,237.15	28.97	354.346	
722.35	722.13	912.63	912.20	2.47	27.35	2.59	1,396.63	-10,177.83	10,264.59	10,234.78	29.81	344.292	
800.00	799.54	1,014.99	1,014.54	2.74	30.41	2.58	1,395.48	-10,177.83	10,258.46	10,225.31	33.15	309.432	
900.00	899.24	1,086.77	1,086.24	3.10	32.56	2.59	1,395.77	-10,177.83	10,250.71	10,215.06	35.65	287.501	
1,000.00	998.94	1,214.32	1,213.74	3.47	36.39	2.59	1,395.50	-10,177.83	10,242.97	10,203.14	39.83	257.167	
1,100.00	1,098.64	1,286.29	1,285.64	3.83	38.54	2.59	1,395.77	-10,177.83	10,235.22	10,192.88	42.34	241.729	
1,200.00	1,198.34	1,413.65	1,412.95	4.20	42.36	2.59	1,395.51	-10,177.83	10,227.48	10,180.96	46.51	219.880	
1,300.00	1,298.04	1,485.81	1,485.04	4.57	44.52	2.59	1,395.77	-10,177.83	10,219.73	10,170.70	49.03	208.422	
1,400.00	1,397.74	1,612.98	1,612.16	4.94	48.33	2.60	1,395.52	-10,177.83	10,211.99	10,158.79	53.20	191.949	
1,500.00	1,497.44	1,685.33	1,684.44	5.31	50.50	2.60	1,395.77	-10,177.83	10,204.24	10,148.51	55.73	183.106	
1,600.00	1,597.13	1,812.30	1,811.37	5.68	54.30	2.60	1,395.54	-10,177.83	10,196.50	10,136.60	59.89	170.249	
1,700.00	1,696.83	1,884.85	1,883.83	6.05	56.48	2.60	1,395.77	-10,177.83	10,188.75	10,126.32	62.43	163.215	
1,800.00	1,796.53	2,011.63	2,010.57	6.43	60.28	2.60	1,395.55	-10,177.83	10,181.01	10,114.42	66.58	152.907	
1,900.00	1,896.23	2,084.37	2,083.23	6.80	62.46	2.61	1,395.77	-10,177.83	10,173.25	10,104.13	69.12	147.176	
2,000.00	1,995.93	2,210.96	2,209.78	7.17	66.25	2.61	1,395.56	-10,177.83	10,165.52	10,092.24	73.28	138.730	
2,100.00	2,095.63	2,283.89	2,282.63	7.54	68.44	2.61	1,395.77	-10,177.83	10,157.76	10,081.94	75.82	133.969	
2,200.00	2,195.33	2,410.29	2,408.99	7.92	72.22	2.61	1,395.58	-10,177.83	10,150.03	10,070.06	79.97	126.925	
2,300.00	2,295.03	2,483.41	2,482.03	8.29	74.41	2.61	1,395.77	-10,177.83	10,142.27	10,059.75	82.52	122.905	
2,400.00	2,394.73	2,609.62	2,608.20	8.66	78.20	2.62	1,395.59	-10,177.83	10,134.53	10,047.87	86.66	116.943	
2,500.00	2,494.43	2,682.93	2,681.43	9.04	80.39	2.62	1,395.77	-10,177.83	10,126.78	10,037.56	89.22	113.502	
2,600.00	2,594.12	2,808.96	2,807.41	9.41	84.17	2.62	1,395.60	-10,177.83	10,119.04	10,025.69	93.36	108.391	
2,700.00	2,693.82	2,882.45	2,880.82	9.79	86.37	2.62	1,395.77	-10,177.83	10,111.29	10,015.37	95.92	105.413	
2,800.00	2,793.52	3,008.29	3,006.62	10.16	90.14	2.62	1,395.62	-10,177.83	10,103.55	10,003.50	100.05	100.984	
2,900.00	2,893.22	3,081.97	3,080.22	10.53	92.35	2.63	1,395.77	-10,177.83	10,095.80	9,993.17	102.62	98.379	
3,000.00	2,992.92	3,207.62	3,205.83	10.91	96.11	2.63	1,395.63	-10,177.83	10,088.06	9,981.32	106.75	94.505	
3,100.00	3,092.62	3,281.49	3,279.62	11.28	98.33	2.63	1,395.77	-10,177.83	10,080.30	9,970.98	109.32	92.207	
3,200.00	3,192.32	3,406.95	3,405.04	11.66	102.09	2.63	1,395.64	-10,177.83	10,072.57	9,959.13	113.44	88.791	
3,300.00	3,292.02	3,481.01	3,479.02	12.03	104.31	2.63	1,395.77	-10,177.83	10,064.81	9,948.79	116.02	86.748	
3,400.00	3,391.72	3,606.28	3,604.25	12.41	108.06	2.64	1,395.65	-10,177.83	10,057.08	9,936.95	120.14	83.714	
3,500.00	3,491.41	3,680.53	3,678.41	12.78	110.29	2.64	1,395.77	-10,177.83	10,049.32	9,926.60	122.72	81.885	
3,600.00	3,591.11	3,805.62	3,803.46	13.15	114.03	2.64	1,395.67	-10,177.83	10,041.59	9,914.76	126.83	79.172	
3,700.00	3,690.81	3,880.05	3,877.81	13.53	116.26	2.64	1,395.77	-10,177.83	10,033.83	9,904.40	129.43	77.526	
3,800.00	3,790.51	4,004.95	4,002.67	13.90	120.01	2.64	1,395.68	-10,177.83	10,026.10	9,892.58	133.53	75.086	
3,900.00	3,890.21	4,079.57	4,077.21	14.28	122.24	2.65	1,395.77	-10,177.83	10,018.34	9,882.21	136.13	73.595	
4,000.00	3,989.91	4,204.28	4,201.89	14.65	125.98	2.65	1,395.69	-10,177.83	10,010.61	9,870.39	140.22	71.390	
4,100.00	4,089.61	4,279.09	4,276.61	15.03	128.22	2.65	1,395.77	-10,177.83	10,002.85	9,860.02	142.83	70.034	
4,200.00	4,189.31	4,403.62	4,401.10	15.40	131.95	2.65	1,395.70	-10,177.83	9,995.12	9,848.20	146.92	68.031	
4,300.00	4,289.01	4,478.61	4,476.01	15.78	134.20	2.65	1,395.77	-10,177.83	9,987.36	9,837.83	149.53	66.791	
4,400.00	4,388.70	4,602.95	4,600.31	16.15	137.93	2.66	1,395.71	-10,177.83	9,979.63	9,826.02	153.62	64.965	
4,500.00	4,488.40	4,678.12	4,675.40	16.53	140.18	2.66	1,395.77	-10,177.83	9,971.87	9,815.63	156.23	63.827	
4,600.00	4,588.10	4,802.29	4,799.53	16.90	143.90	2.66	1,395.73	-10,177.83	9,964.14	9,803.83	160.31	62.155	
4,700.00	4,687.80	4,877.64	4,874.80	17.27	146.16	2.66	1,395.77	-10,177.83	9,956.38	9,793.44	162.93	61.107	
4,800.00	4,787.50	5,001.63	4,998.74	17.65	149.87	2.67	1,395.74	-10,177.83	9,948.65	9,781.65	167.01	59.570	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		200-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	4,887.20	5,077.16	5,074.20	18.02	152.13	2.67	1,395.77	-10,177.83	9,940.88	9,771.25	169.64	58.601	
5,000.00	4,986.90	5,200.96	5,197.96	18.40	155.84	2.67	1,395.75	-10,177.83	9,933.17	9,759.46	173.70	57.184	
5,100.00	5,086.60	5,276.68	5,273.60	18.77	158.11	2.67	1,395.77	-10,177.83	9,925.39	9,749.06	176.34	56.286	
5,200.00	5,186.30	5,400.30	5,397.17	19.15	161.82	2.67	1,395.76	-10,177.83	9,917.68	9,737.27	180.40	54.976	
5,300.00	5,286.00	5,476.20	5,473.00	19.52	164.09	2.68	1,395.77	-10,177.83	9,909.90	9,726.86	183.04	54.141	
5,400.00	5,385.69	5,599.64	5,596.39	19.90	167.79	2.68	1,395.77	-10,177.83	9,902.19	9,715.09	187.10	52.925	
5,500.00	5,485.39	5,675.72	5,672.39	20.27	170.07	2.68	1,395.77	-10,177.83	9,894.41	9,704.67	189.74	52.147	
5,600.00	5,585.09	5,798.97	5,795.60	20.65	173.76	2.68	1,395.78	-10,177.83	9,886.70	9,692.90	193.79	51.017	
5,700.00	5,684.79	5,875.24	5,871.79	21.02	176.05	2.68	1,395.77	-10,177.83	9,878.92	9,682.48	196.44	50.289	
5,800.00	5,784.49	5,998.31	5,994.82	21.40	179.74	2.69	1,395.80	-10,177.83	9,871.21	9,670.72	200.49	49.235	
5,900.00	5,884.19	6,074.76	6,071.19	21.77	182.03	2.69	1,395.77	-10,177.83	9,863.43	9,660.28	203.15	48.553	
6,000.00	5,983.89	6,197.65	6,194.04	22.15	185.71	2.69	1,395.81	-10,177.83	9,855.72	9,648.53	207.19	47.569	
6,100.00	6,083.59	6,274.28	6,270.59	22.52	188.01	2.69	1,395.77	-10,177.83	9,847.94	9,638.09	209.85	46.929	
6,200.00	6,183.29	6,396.99	6,393.25	22.90	191.68	2.70	1,395.82	-10,177.83	9,840.23	9,626.34	213.88	46.007	
6,300.00	6,282.98	6,473.80	6,469.98	23.27	193.98	2.70	1,395.77	-10,177.83	9,832.45	9,615.90	216.55	45.405	
6,400.00	6,382.68	6,596.33	6,592.47	23.65	197.66	2.70	1,395.83	-10,177.83	9,824.74	9,604.16	220.58	44.540	
6,492.83	6,475.23	6,666.17	6,662.23	24.00	199.75	2.70	1,395.77	-10,177.83	9,817.51	9,594.50	223.01	44.022	
6,500.00	6,482.39	6,673.32	6,669.39	24.02	199.96	1.83	1,395.77	-10,177.83	9,817.00	9,593.74	223.25	43.972	
6,542.99	6,525.34	6,721.34	6,717.38	24.17	201.40	-94.34	1,396.60	-10,177.83	9,815.70	9,590.86	224.84	43.657 CC	
6,550.00	6,532.35	6,730.52	6,726.56	24.19	201.68	-143.24	1,396.56	-10,177.83	9,815.74	9,590.60	225.14	43.599 ES	
6,600.00	6,582.27	6,795.92	6,791.94	24.34	203.64	-167.83	1,395.84	-10,177.83	9,818.18	9,590.93	227.25	43.204	
6,650.00	6,631.83	6,822.90	6,818.83	24.49	204.44	-169.76	1,395.77	-10,177.83	9,824.53	9,596.32	228.22	43.049	
6,700.00	6,680.73	6,871.80	6,867.73	24.62	205.91	-170.37	1,395.77	-10,177.83	9,834.75	9,604.93	229.83	42.792	
6,750.00	6,728.67	6,925.85	6,921.77	24.74	207.53	-170.58	1,396.58	-10,177.83	9,848.86	9,617.28	231.58	42.529	
6,800.00	6,775.35	6,986.98	6,982.88	24.86	209.36	-170.59	1,395.98	-10,177.83	9,866.48	9,632.94	233.54	42.247	
6,850.00	6,820.48	7,011.66	7,007.48	24.98	210.10	-170.44	1,395.77	-10,177.83	9,887.68	9,653.28	234.40	42.183	
6,900.00	6,863.78	7,054.96	7,050.78	25.09	211.40	-170.18	1,395.77	-10,177.83	9,912.39	9,676.58	235.81	42.036	
6,950.00	6,904.99	7,096.17	7,091.99	25.21	212.63	-169.79	1,395.77	-10,177.83	9,940.38	9,703.24	237.14	41.918	
7,000.00	6,943.86	7,145.88	7,141.68	25.33	214.12	-169.28	1,396.46	-10,177.83	9,971.60	9,732.88	238.72	41.772	
7,050.00	6,980.14	7,193.38	7,189.16	25.47	215.55	-168.62	1,395.88	-10,177.83	10,005.59	9,765.37	240.21	41.653 SF	
7,100.00	7,013.60	7,204.91	7,200.60	25.62	215.89	-167.72	1,395.77	-10,177.83	10,042.32	9,801.69	240.63	41.734	
7,150.00	7,044.06	7,235.36	7,231.06	25.79	216.80	-166.58	1,395.77	-10,177.83	10,081.58	9,839.98	241.60	41.729	
7,200.00	7,071.31	7,262.61	7,258.31	26.00	217.62	-165.07	1,395.77	-10,177.83	10,123.10	9,880.64	242.46	41.751	
7,250.00	7,095.18	7,286.49	7,282.18	26.23	218.34	-163.03	1,395.77	-10,177.83	10,166.62	9,923.40	243.22	41.800	
7,300.00	7,115.54	7,308.98	7,304.66	26.50	219.01	-160.16	1,396.63	-10,177.83	10,211.98	9,968.06	243.92	41.866	
7,350.00	7,132.25	7,330.85	7,326.52	26.81	219.67	-155.98	1,396.56	-10,177.83	10,258.67	10,014.06	244.60	41.940	
7,400.00	7,145.22	7,347.82	7,343.49	27.16	220.17	-149.40	1,396.44	-10,177.83	10,306.52	10,061.39	245.13	42.045	
7,450.00	7,154.36	7,359.78	7,355.45	27.55	220.53	-138.14	1,396.33	-10,177.83	10,355.23	10,109.73	245.50	42.179	
7,500.00	7,159.61	7,366.66	7,362.33	27.97	220.74	-117.61	1,396.25	-10,177.83	10,404.52	10,158.80	245.72	42.342	
7,541.91	7,161.00	7,368.48	7,364.15	28.35	220.79	-90.79	1,396.23	-10,177.83	10,446.06	10,200.27	245.79	42.500	
7,600.00	7,161.01	7,368.50	7,364.17	28.92	220.79	-90.79	1,396.23	-10,177.83	10,503.68	10,257.88	245.80	42.732	
7,700.00	7,161.03	7,368.53	7,364.20	30.03	220.79	-90.79	1,396.23	-10,177.83	10,602.89	10,357.06	245.83	43.131	
7,800.00	7,161.05	7,368.56	7,364.23	31.29	220.80	-90.79	1,396.23	-10,177.83	10,702.11	10,456.25	245.86	43.529	
7,900.00	7,161.08	7,368.59	7,364.26	32.69	220.80	-90.80	1,396.23	-10,177.83	10,801.34	10,555.45	245.90	43.927	
8,000.00	7,161.10	7,368.62	7,364.29	34.20	220.80	-90.80	1,396.23	-10,177.83	10,900.59	10,654.66	245.93	44.323	
8,100.00	7,161.12	7,368.65	7,364.32	35.81	220.80	-90.80	1,396.23	-10,177.83	10,999.85	10,753.88	245.97	44.719	
8,200.00	7,161.14	7,368.68	7,364.35	37.52	220.80	-90.80	1,396.23	-10,177.83	11,099.13	10,853.11	246.02	45.115	
8,300.00	7,161.16	7,368.71	7,364.38	39.30	220.80	-90.80	1,396.23	-10,177.83	11,198.42	10,952.35	246.07	45.510	
8,400.00	7,161.18	7,368.74	7,364.41	41.15	220.80	-90.80	1,396.23	-10,177.83	11,297.72	11,051.60	246.12	45.904	
8,500.00	7,161.20	7,368.78	7,364.44	43.05	220.80	-90.80	1,396.23	-10,177.83	11,397.03	11,150.86	246.17	46.297	
8,600.00	7,161.22	7,368.81	7,364.47	45.01	220.80	-90.81	1,396.23	-10,177.83	11,496.36	11,250.13	246.23	46.690	
8,700.00	7,161.24	7,368.84	7,364.50	47.02	220.80	-90.81	1,396.23	-10,177.83	11,595.69	11,349.41	246.28	47.082	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC												Offset Site Error:	0.00 usft	
Survey Program:		200-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)				
8,800.00	7,161.26	7,368.87	7,364.53	49.06	220.80	-90.81	1,396.23	-10,177.83	11,695.04	11,448.70	246.35	47.474		
8,900.00	7,161.29	7,368.90	7,364.56	51.14	220.81	-90.81	1,396.22	-10,177.83	11,794.40	11,547.99	246.41	47.865		
9,000.00	7,161.31	7,368.93	7,364.59	53.24	220.81	-90.81	1,396.22	-10,177.83	11,893.77	11,647.30	246.47	48.256		
9,100.00	7,161.33	7,368.96	7,364.62	55.38	220.81	-90.81	1,396.22	-10,177.83	11,993.15	11,746.61	246.54	48.646		
9,200.00	7,161.35	7,368.99	7,364.66	57.54	220.81	-90.81	1,396.22	-10,177.83	12,092.54	11,845.93	246.61	49.035		
9,300.00	7,161.37	7,369.02	7,364.69	59.72	220.81	-90.81	1,396.22	-10,177.83	12,191.94	11,945.26	246.68	49.424		
9,400.00	7,161.39	7,369.05	7,364.72	61.92	220.81	-90.82	1,396.22	-10,177.83	12,291.35	12,044.60	246.75	49.813		
9,500.00	7,161.41	7,369.08	7,364.75	64.13	220.81	-90.82	1,396.22	-10,177.83	12,390.77	12,143.95	246.83	50.201		
9,600.00	7,161.43	7,369.11	7,364.78	66.36	220.81	-90.82	1,396.22	-10,177.83	12,490.20	12,243.30	246.90	50.588		
9,700.00	7,161.45	7,369.14	7,364.81	68.61	220.81	-90.82	1,396.22	-10,177.83	12,589.64	12,342.66	246.98	50.975		
9,800.00	7,161.48	7,369.17	7,364.84	70.87	220.81	-90.82	1,396.22	-10,177.83	12,689.09	12,442.03	247.06	51.361		
9,900.00	7,161.50	7,369.20	7,364.87	73.14	220.81	-90.82	1,396.22	-10,177.83	12,788.54	12,541.41	247.14	51.747		
10,000.00	7,161.52	7,369.23	7,364.90	75.42	220.82	-90.82	1,396.22	-10,177.83	12,888.01	12,640.79	247.22	52.132		
10,100.00	7,161.54	7,369.27	7,364.93	77.71	220.82	-90.82	1,396.22	-10,177.83	12,987.48	12,740.18	247.30	52.517		
10,200.00	7,161.56	7,369.30	7,364.96	80.01	220.82	-90.83	1,396.22	-10,177.83	13,086.96	12,839.57	247.38	52.901		
10,300.00	7,161.58	7,369.33	7,364.99	82.32	220.82	-90.83	1,396.22	-10,177.83	13,186.45	12,938.98	247.47	53.285		
10,400.00	7,161.60	7,369.36	7,365.02	84.63	220.82	-90.83	1,396.22	-10,177.83	13,285.94	13,038.39	247.56	53.669		
10,500.00	7,161.62	7,369.39	7,365.05	86.95	220.82	-90.83	1,396.22	-10,177.83	13,385.45	13,137.80	247.64	54.051		
10,600.00	7,161.64	7,369.42	7,365.08	89.28	220.82	-90.83	1,396.22	-10,177.83	13,484.96	13,237.23	247.73	54.434		
10,700.00	7,161.66	7,369.45	7,365.11	91.61	220.82	-90.83	1,396.22	-10,177.83	13,584.47	13,336.65	247.82	54.816		
10,800.00	7,161.69	7,369.48	7,365.15	93.95	220.82	-90.83	1,396.22	-10,177.83	13,684.00	13,436.09	247.91	55.198		
10,900.00	7,161.71	7,369.51	7,365.18	96.29	220.82	-90.84	1,396.22	-10,177.83	13,783.53	13,535.53	248.00	55.579		
11,000.00	7,161.73	7,369.54	7,365.21	98.64	220.82	-90.84	1,396.22	-10,177.83	13,883.07	13,634.98	248.09	55.959		
11,100.00	7,161.75	7,369.57	7,365.24	100.99	220.83	-90.84	1,396.22	-10,177.83	13,982.61	13,734.43	248.18	56.340		
11,200.00	7,161.77	7,369.60	7,365.27	103.35	220.83	-90.84	1,396.22	-10,177.83	14,082.17	13,833.89	248.28	56.719		
11,300.00	7,161.79	7,369.63	7,365.30	105.71	220.83	-90.84	1,396.22	-10,177.83	14,181.72	13,933.35	248.37	57.099		
11,400.00	7,161.81	7,369.66	7,365.33	108.07	220.83	-90.84	1,396.22	-10,177.83	14,281.29	14,032.82	248.47	57.478		
11,500.00	7,161.83	7,369.70	7,365.36	110.44	220.83	-90.84	1,396.22	-10,177.83	14,380.86	14,132.30	248.56	57.856		
11,600.00	7,161.85	7,369.73	7,365.39	112.80	220.83	-90.84	1,396.21	-10,177.83	14,480.43	14,231.78	248.66	58.234		
11,700.00	7,161.87	7,369.76	7,365.42	115.18	220.83	-90.85	1,396.21	-10,177.83	14,580.02	14,331.26	248.75	58.612		
11,800.00	7,161.90	7,369.79	7,365.45	117.55	220.83	-90.85	1,396.21	-10,177.83	14,679.60	14,430.75	248.85	58.989		
11,900.00	7,161.92	7,369.82	7,365.48	119.93	220.83	-90.85	1,396.21	-10,177.83	14,779.20	14,530.25	248.95	59.366		
12,000.00	7,161.94	7,369.85	7,365.51	122.31	220.83	-90.85	1,396.21	-10,177.83	14,878.79	14,629.75	249.05	59.743		
12,100.00	7,161.96	7,369.88	7,365.54	124.69	220.83	-90.85	1,396.21	-10,177.83	14,978.40	14,729.25	249.15	60.119		
12,200.00	7,161.98	7,369.91	7,365.58	127.07	220.84	-90.85	1,396.21	-10,177.83	15,078.01	14,828.76	249.25	60.495		
12,300.00	7,162.00	7,369.94	7,365.61	129.46	220.84	-90.85	1,396.21	-10,177.83	15,177.62	14,928.28	249.35	60.870		
12,400.00	7,162.02	7,369.97	7,365.64	131.85	220.84	-90.86	1,396.21	-10,177.83	15,277.24	15,027.79	249.45	61.245		
12,500.00	7,162.04	7,370.00	7,365.67	134.24	220.84	-90.86	1,396.21	-10,177.83	15,376.87	15,127.32	249.55	61.619		
12,600.00	7,162.06	7,370.03	7,365.70	136.63	220.84	-90.86	1,396.21	-10,177.83	15,476.49	15,226.85	249.65	61.993		
12,700.00	7,162.09	7,370.06	7,365.73	139.02	220.84	-90.86	1,396.21	-10,177.83	15,576.13	15,326.38	249.75	62.367		
12,800.00	7,162.11	7,370.09	7,365.76	141.42	220.84	-90.86	1,396.21	-10,177.83	15,675.77	15,425.91	249.85	62.740		
12,900.00	7,162.13	7,370.13	7,365.79	143.81	220.84	-90.86	1,396.21	-10,177.83	15,775.41	15,525.46	249.95	63.113		
13,000.00	7,162.15	7,370.16	7,365.82	146.21	220.84	-90.86	1,396.21	-10,177.83	15,875.06	15,625.00	250.06	63.486		
13,100.00	7,162.17	7,370.19	7,365.85	148.61	220.84	-90.86	1,396.21	-10,177.83	15,974.71	15,724.55	250.16	63.858		
13,200.00	7,162.19	7,370.22	7,365.88	151.01	220.85	-90.87	1,396.21	-10,177.83	16,074.37	15,824.10	250.26	64.230		
13,300.00	7,162.21	7,370.25	7,365.91	153.41	220.85	-90.87	1,396.21	-10,177.83	16,174.03	15,923.66	250.37	64.601		
13,400.00	7,162.23	7,370.28	7,365.94	155.81	220.85	-90.87	1,396.21	-10,177.83	16,273.69	16,023.22	250.47	64.972		
13,500.00	7,162.25	7,370.31	7,365.97	158.21	220.85	-90.87	1,396.21	-10,177.83	16,373.36	16,122.78	250.58	65.343		
13,600.00	7,162.27	7,370.34	7,366.01	160.62	220.85	-90.87	1,396.21	-10,177.83	16,473.03	16,222.35	250.68	65.713		
13,700.00	7,162.30	7,370.37	7,366.04	163.02	220.85	-90.87	1,396.21	-10,177.83	16,572.71	16,321.92	250.79	66.083		
13,800.00	7,162.32	7,370.40	7,366.07	165.43	220.85	-90.87	1,396.21	-10,177.83	16,672.39	16,421.50	250.89	66.452		
13,900.00	7,162.34	7,370.43	7,366.10	167.84	220.85	-90.88	1,396.21	-10,177.83	16,772.07	16,521.08	251.00	66.822		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC											Offset Site Error: 0.00 usft
Survey Program: 200-A027Ua_INC-ONLY											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)	
14,000.00	7,162.36	7,370.46	7,366.13	170.24	220.85	-90.88	1,396.21	-10,177.83	16,871.76	16,620.66	
14,100.00	7,162.38	7,370.49	7,366.16	172.65	220.85	-90.88	1,396.21	-10,177.83	16,971.45	16,720.24	
14,200.00	7,162.40	7,370.53	7,366.19	175.06	220.85	-90.88	1,396.20	-10,177.83	17,071.15	16,819.83	
14,300.00	7,162.42	7,370.56	7,366.22	177.47	220.86	-90.88	1,396.20	-10,177.83	17,170.85	16,919.42	
14,400.00	7,162.44	7,370.59	7,366.25	179.88	220.86	-90.88	1,396.20	-10,177.83	17,270.55	17,019.02	
14,500.00	7,162.46	7,370.62	7,366.28	182.29	220.86	-90.88	1,396.20	-10,177.83	17,370.26	17,118.62	
14,600.00	7,162.49	7,370.65	7,366.31	184.71	220.86	-90.88	1,396.20	-10,177.83	17,469.97	17,218.22	
14,700.00	7,162.51	7,370.68	7,366.34	187.12	220.86	-90.89	1,396.20	-10,177.83	17,569.68	17,317.82	
14,800.00	7,162.53	7,370.71	7,366.37	189.53	220.86	-90.89	1,396.20	-10,177.83	17,669.39	17,417.43	
14,900.00	7,162.55	7,370.74	7,366.41	191.95	220.86	-90.89	1,396.20	-10,177.83	17,769.11	17,517.04	
15,000.00	7,162.57	7,370.77	7,366.44	194.36	220.86	-90.89	1,396.20	-10,177.83	17,868.83	17,616.66	
15,100.00	7,162.59	7,370.80	7,366.47	196.78	220.86	-90.89	1,396.20	-10,177.83	17,968.56	17,716.27	
15,200.00	7,162.61	7,370.83	7,366.50	199.19	220.86	-90.89	1,396.20	-10,177.83	18,068.29	17,815.89	
15,300.00	7,162.63	7,370.86	7,366.53	201.61	220.86	-90.89	1,396.20	-10,177.83	18,168.02	17,915.52	
15,400.00	7,162.65	7,370.89	7,366.56	204.03	220.87	-90.90	1,396.20	-10,177.83	18,267.75	18,015.14	
15,500.00	7,162.67	7,370.93	7,366.59	206.44	220.87	-90.90	1,396.20	-10,177.83	18,367.49	18,114.77	
15,600.00	7,162.70	7,370.96	7,366.62	208.86	220.87	-90.90	1,396.20	-10,177.83	18,467.23	18,214.40	
15,700.00	7,162.72	7,370.99	7,366.65	211.28	220.87	-90.90	1,396.20	-10,177.83	18,566.97	18,314.03	
15,800.00	7,162.74	7,371.02	7,366.68	213.70	220.87	-90.90	1,396.20	-10,177.83	18,666.72	18,413.67	
15,900.00	7,162.76	7,371.05	7,366.71	216.12	220.87	-90.90	1,396.20	-10,177.83	18,766.47	18,513.30	
16,000.00	7,162.78	7,371.08	7,366.74	218.54	220.87	-90.90	1,396.20	-10,177.83	18,866.22	18,612.94	
16,100.00	7,162.80	7,371.11	7,366.78	220.96	220.87	-90.90	1,396.20	-10,177.83	18,965.97	18,712.59	
16,200.00	7,162.82	7,371.14	7,366.81	223.38	220.87	-90.91	1,396.20	-10,177.83	19,065.73	18,812.23	
16,300.00	7,162.84	7,371.17	7,366.84	225.80	220.87	-90.91	1,396.20	-10,177.83	19,165.49	18,911.88	
16,400.00	7,162.86	7,371.20	7,366.87	228.22	220.87	-90.91	1,396.20	-10,177.83	19,265.25	19,011.53	
16,500.00	7,162.88	7,371.23	7,366.90	230.64	220.88	-90.91	1,396.20	-10,177.83	19,365.01	19,111.18	
16,600.00	7,162.91	7,371.26	7,366.93	233.06	220.88	-90.91	1,396.20	-10,177.83	19,464.78	19,210.84	
16,700.00	7,162.93	7,371.30	7,366.96	235.49	220.88	-90.91	1,396.20	-10,177.83	19,564.54	19,310.49	
16,800.00	7,162.95	7,371.33	7,366.99	237.91	220.88	-90.91	1,396.19	-10,177.83	19,664.32	19,410.15	
16,879.97	7,162.96	7,371.35	7,367.02	239.84	220.88	-90.91	1,396.19	-10,177.83	19,744.11	19,489.86	
16,900.00	7,162.97	7,371.36	7,367.02	240.33	220.88	-90.92	1,396.19	-10,177.83	19,764.09	19,509.81	
17,000.00	7,162.99	7,371.39	7,367.05	242.75	220.88	-90.92	1,396.19	-10,177.83	19,863.86	19,609.48	
17,056.99	7,163.00	7,371.41	7,367.07	244.13	220.88	-90.92	1,396.19	-10,177.83	19,920.73	19,666.28	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC													Offset Site Error: 0.00 usft
Survey Program: 159-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	183.00	183.00	0.00	3.27	-92.05	-296.21	-8,281.39	8,286.68				
100.00	100.00	283.00	283.00	0.25	5.16	-92.05	-296.21	-8,281.39	8,286.68	8,281.27	5.42	1,530.287	
200.00	200.00	383.00	383.00	0.61	7.06	-92.05	-296.21	-8,281.39	8,286.68	8,279.02	7.67	1,080.898	
262.79	262.79	445.78	445.78	0.83	8.25	-92.05	-295.91	-8,281.39	8,286.67	8,277.59	9.08	912.635	
300.00	300.00	482.91	482.91	0.97	8.95	-92.05	-295.91	-8,281.39	8,286.67	8,276.75	9.92	835.682	
400.00	400.00	582.68	582.68	1.33	10.84	-92.05	-295.98	-8,281.39	8,286.67	8,274.51	12.16	681.296	
500.00	500.00	682.45	682.45	1.68	12.73	-92.05	-296.13	-8,281.39	8,286.68	8,272.27	14.41	575.059	
600.00	599.98	783.02	782.98	2.04	14.79	-7.29	-296.21	-8,281.39	8,284.95	8,268.13	16.82	492.487	
700.00	699.84	882.88	882.84	2.39	16.95	-7.31	-296.21	-8,281.39	8,279.76	8,260.43	19.33	428.252	
722.35	722.13	905.17	905.13	2.47	17.43	-7.31	-296.21	-8,281.39	8,278.13	8,258.23	19.90	416.043	
800.00	799.54	982.58	982.54	2.74	19.11	-7.32	-296.21	-8,281.39	8,272.15	8,250.31	21.84	378.690	
900.00	899.24	1,081.40	1,081.35	3.10	21.24	-7.32	-295.19	-8,281.39	8,264.43	8,240.09	24.33	339.622	
1,000.00	998.94	1,180.14	1,180.08	3.47	23.38	-7.33	-295.65	-8,281.39	8,256.75	8,229.93	26.82	307.803	
1,100.00	1,098.64	1,281.78	1,281.64	3.83	25.75	-7.34	-296.21	-8,281.39	8,249.08	8,219.53	29.55	279.180	
1,200.00	1,198.34	1,381.48	1,381.34	4.20	28.56	-7.35	-296.21	-8,281.39	8,241.39	8,208.68	32.71	251.944	
1,300.00	1,298.04	1,481.18	1,481.04	4.57	31.36	-7.35	-296.21	-8,281.39	8,233.70	8,197.83	35.88	229.506	
1,400.00	1,397.74	1,580.22	1,580.06	4.94	34.15	-7.35	-294.80	-8,281.39	8,225.96	8,186.94	39.02	210.800	
1,500.00	1,497.44	1,678.74	1,678.57	5.31	36.93	-7.36	-295.21	-8,281.39	8,218.28	8,176.13	42.16	194.953	
1,600.00	1,597.13	1,777.27	1,777.09	5.68	39.70	-7.37	-296.02	-8,281.39	8,210.62	8,165.34	45.29	181.297	
1,700.00	1,696.83	1,880.32	1,879.83	6.05	43.62	-7.38	-296.21	-8,281.39	8,202.94	8,153.38	49.56	165.514	
1,800.00	1,796.53	1,980.02	1,979.53	6.43	47.62	-7.39	-296.21	-8,281.39	8,195.25	8,141.33	53.92	151.981	
1,900.00	1,896.23	2,079.49	2,078.92	6.80	51.61	-7.37	-292.92	-8,281.38	8,187.44	8,129.16	58.28	140.493	
2,000.00	1,995.93	2,176.71	2,176.11	7.17	55.52	-7.38	-293.41	-8,281.38	8,179.77	8,117.23	62.54	130.792	
2,100.00	2,095.63	2,273.98	2,273.33	7.54	59.42	-7.40	-294.73	-8,281.39	8,172.13	8,105.32	66.81	122.327	
2,200.00	2,195.33	2,379.71	2,378.33	7.92	64.03	-7.42	-296.21	-8,281.39	8,164.49	8,092.72	71.77	113.751	
2,300.00	2,295.03	2,473.83	2,472.38	8.29	68.83	-7.42	-295.30	-8,281.39	8,156.77	8,079.84	76.93	106.027	
2,400.00	2,394.73	2,579.56	2,577.73	8.66	74.21	-7.43	-296.21	-8,281.39	8,149.11	8,066.44	82.67	98.570	
2,500.00	2,494.43	2,679.26	2,677.43	9.04	79.28	-7.44	-296.21	-8,281.39	8,141.42	8,053.32	88.11	92.404	
2,600.00	2,594.12	2,775.36	2,773.30	9.41	84.17	-7.42	-292.35	-8,281.38	8,133.59	8,040.23	93.36	87.122	
2,700.00	2,693.82	2,869.65	2,867.45	9.79	88.97	-7.44	-294.41	-8,281.39	8,125.98	8,027.47	98.52	82.483	
2,800.00	2,793.52	2,979.42	2,976.52	10.16	94.07	-7.46	-296.21	-8,281.39	8,118.36	8,014.38	103.98	78.076	
2,900.00	2,893.22	3,079.12	3,076.22	10.53	98.34	-7.47	-296.21	-8,281.39	8,110.67	8,002.07	108.60	74.683	
3,000.00	2,992.92	3,178.82	3,175.92	10.91	102.60	-7.47	-296.21	-8,281.39	8,102.98	7,989.76	113.22	71.566	
3,100.00	3,092.62	3,278.03	3,274.96	11.28	106.84	-7.44	-291.05	-8,281.38	8,095.09	7,977.27	117.83	68.704	
3,200.00	3,192.32	3,375.20	3,372.07	11.66	110.99	-7.45	-291.63	-8,281.38	8,087.43	7,965.09	122.34	66.106	
3,300.00	3,292.02	3,472.42	3,469.23	12.03	115.15	-7.47	-293.07	-8,281.38	8,079.80	7,952.94	126.86	63.692	
3,400.00	3,391.72	3,569.69	3,566.40	12.41	119.30	-7.49	-295.35	-8,281.39	8,072.20	7,940.82	131.38	61.444	
3,500.00	3,491.41	3,678.41	3,674.41	12.78	123.55	-7.51	-296.21	-8,281.39	8,064.54	7,928.55	135.99	59.304	
3,600.00	3,591.11	3,778.11	3,774.11	13.15	127.31	-7.52	-296.21	-8,281.39	8,056.85	7,916.75	140.10	57.506	
3,700.00	3,690.81	3,876.29	3,872.20	13.53	131.01	-7.50	-293.28	-8,281.38	8,049.05	7,904.88	144.17	55.832	
3,800.00	3,790.51	3,972.71	3,968.57	13.90	134.65	-7.52	-294.29	-8,281.39	8,041.40	7,893.24	148.16	54.275	
3,900.00	3,890.21	4,077.74	4,073.21	14.28	138.54	-7.54	-296.21	-8,281.39	8,033.79	7,881.38	152.41	52.710	
4,000.00	3,989.91	4,177.44	4,172.91	14.65	141.78	-7.54	-296.21	-8,281.39	8,026.10	7,870.09	156.01	51.445	
4,100.00	4,089.61	4,277.14	4,272.61	15.03	145.01	-7.55	-296.21	-8,281.39	8,018.42	7,858.80	159.61	50.237	
4,200.00	4,189.31	4,376.84	4,372.31	15.40	148.25	-7.56	-296.21	-8,281.39	8,010.73	7,847.52	163.21	49.082	
4,300.00	4,289.01	4,476.54	4,472.01	15.78	151.49	-7.57	-296.21	-8,281.39	8,003.04	7,836.23	166.81	47.977	
4,400.00	4,388.70	4,576.24	4,571.70	16.15	154.73	-7.57	-296.21	-8,281.39	7,995.36	7,824.95	170.41	46.918	
4,500.00	4,488.40	4,675.94	4,671.40	16.53	157.97	-7.58	-296.21	-8,281.39	7,987.67	7,813.66	174.01	45.904	
4,600.00	4,588.10	4,775.64	4,771.10	16.90	161.20	-7.59	-296.21	-8,281.39	7,979.98	7,802.38	177.61	44.930	
4,700.00	4,687.80	4,875.33	4,870.80	17.27	164.44	-7.60	-296.21	-8,281.39	7,972.30	7,791.09	181.21	43.995	
4,800.00	4,787.50	4,975.03	4,970.50	17.65	167.68	-7.60	-296.21	-8,281.39	7,964.61	7,779.80	184.81	43.097	
4,900.00	4,887.20	5,074.73	5,070.20	18.02	170.92	-7.61	-296.21	-8,281.39	7,956.93	7,768.52	188.41	42.233	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC												Offset Site Error:	0.00 usft		
Survey Program:		159-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	4,986.90	5,174.43	5,169.90	18.40	174.16	-7.62	-296.21	-8,281.39	7,949.24	7,757.23	192.01	41.401			
5,100.00	5,086.60	5,273.61	5,268.79	18.77	177.38	-7.54	-284.16	-8,281.38	7,941.06	7,745.47	195.59	40.601			
5,200.00	5,186.30	5,372.78	5,367.93	19.15	180.60	-7.55	-284.44	-8,281.38	7,933.39	7,734.21	199.17	39.832			
5,300.00	5,286.00	5,471.96	5,467.08	19.52	183.82	-7.56	-284.92	-8,281.38	7,925.72	7,722.96	202.75	39.090			
5,400.00	5,385.69	5,571.14	5,566.24	19.90	187.04	-7.57	-285.59	-8,281.38	7,918.06	7,711.72	206.34	38.374			
5,500.00	5,485.39	5,670.34	5,665.40	20.27	190.26	-7.58	-286.45	-8,281.38	7,910.41	7,700.49	209.92	37.683			
5,600.00	5,585.09	5,769.54	5,764.57	20.65	193.48	-7.60	-287.50	-8,281.38	7,902.76	7,689.26	213.50	37.015			
5,700.00	5,684.79	5,868.75	5,863.74	21.02	196.71	-7.62	-288.74	-8,281.38	7,895.13	7,678.04	217.09	36.368			
5,800.00	5,784.49	5,967.97	5,962.91	21.40	199.93	-7.63	-290.18	-8,281.38	7,887.50	7,666.83	220.67	35.743			
5,900.00	5,884.19	6,067.19	6,062.08	21.77	203.15	-7.65	-291.81	-8,281.38	7,879.89	7,655.63	224.26	35.138			
6,000.00	5,983.89	6,166.42	6,161.25	22.15	206.37	-7.67	-293.63	-8,281.38	7,872.28	7,644.44	227.84	34.552			
6,100.00	6,083.59	6,265.65	6,260.43	22.52	209.60	-7.70	-295.65	-8,281.39	7,864.68	7,633.26	231.42	33.984			
6,200.00	6,183.29	6,372.54	6,366.29	22.90	212.86	-7.71	-296.21	-8,281.39	7,857.02	7,621.97	235.05	33.427			
6,300.00	6,282.98	6,472.24	6,465.98	23.27	215.84	-7.72	-296.21	-8,281.39	7,849.34	7,610.94	238.39	32.926			
6,400.00	6,382.68	6,571.94	6,565.68	23.65	218.83	-7.72	-296.21	-8,281.39	7,841.65	7,599.91	241.74	32.439			
6,492.83	6,475.23	6,664.49	6,658.23	24.00	221.59	-7.73	-296.21	-8,281.39	7,834.52	7,589.68	244.84	31.998			
6,500.00	6,482.39	6,671.64	6,665.39	24.02	221.81	-8.59	-296.21	-8,281.39	7,834.01	7,588.93	245.08	31.965			
6,541.84	6,524.19	6,713.45	6,707.19	24.16	223.06	-89.93	-296.21	-8,281.39	7,832.64	7,586.16	246.47	31.779 CC			
6,550.00	6,532.35	6,721.61	6,715.35	24.19	223.30	-153.65	-296.21	-8,281.39	7,832.69	7,585.94	246.75	31.744 ES			
6,600.00	6,582.27	6,771.53	6,765.27	24.34	224.79	-178.27	-296.21	-8,281.39	7,835.29	7,586.89	248.40	31.543			
6,650.00	6,631.83	6,821.09	6,814.83	24.49	226.28	179.70	-296.21	-8,281.39	7,841.79	7,591.76	250.03	31.363			
6,700.00	6,680.73	6,869.99	6,863.73	24.62	227.74	178.92	-296.21	-8,281.39	7,852.16	7,600.52	251.64	31.204			
6,750.00	6,728.67	6,917.93	6,911.67	24.74	229.17	178.48	-296.21	-8,281.39	7,866.33	7,613.12	253.21	31.067			
6,800.00	6,775.35	6,964.60	6,958.35	24.86	230.57	178.17	-296.21	-8,281.39	7,884.21	7,629.48	254.73	30.951			
6,850.00	6,820.48	7,009.73	7,003.48	24.98	231.92	177.92	-296.21	-8,281.39	7,905.70	7,649.50	256.20	30.858			
6,900.00	6,863.78	7,053.04	7,046.78	25.09	233.21	177.68	-296.21	-8,281.39	7,930.65	7,673.05	257.60	30.787			
6,950.00	6,904.99	7,094.25	7,087.99	25.21	234.44	177.44	-296.21	-8,281.39	7,958.93	7,700.00	258.93	30.738			
7,000.00	6,943.86	7,133.11	7,126.86	25.33	235.61	177.18	-296.21	-8,281.39	7,990.34	7,730.17	260.18	30.711			
7,050.00	6,980.14	7,169.39	7,163.14	25.47	236.69	176.88	-296.21	-8,281.39	8,024.71	7,763.37	261.33	30.707 SF			
7,100.00	7,013.60	7,202.86	7,196.60	25.62	237.69	176.52	-296.21	-8,281.39	8,061.81	7,799.41	262.40	30.724			
7,150.00	7,044.06	7,233.31	7,227.06	25.79	238.60	176.08	-296.21	-8,281.39	8,101.42	7,838.06	263.36	30.762			
7,200.00	7,071.31	7,260.56	7,254.31	26.00	239.42	175.52	-296.21	-8,281.39	8,143.29	7,879.07	264.22	30.820			
7,250.00	7,095.18	7,284.44	7,278.18	26.23	240.13	174.76	-296.21	-8,281.39	8,187.17	7,922.20	264.97	30.899			
7,300.00	7,115.54	7,304.80	7,298.54	26.50	240.74	173.69	-296.21	-8,281.39	8,232.79	7,967.19	265.60	30.997			
7,350.00	7,132.25	7,321.51	7,315.25	26.81	241.24	172.06	-296.21	-8,281.39	8,279.86	8,013.74	266.12	31.113			
7,400.00	7,145.22	7,334.48	7,328.22	27.16	241.63	169.31	-296.21	-8,281.39	8,328.09	8,061.57	266.52	31.248			
7,450.00	7,154.36	7,343.62	7,337.36	27.55	241.90	163.72	-296.21	-8,281.39	8,377.19	8,110.39	266.80	31.399			
7,500.00	7,159.61	7,348.87	7,342.61	27.97	242.06	147.29	-296.21	-8,281.39	8,426.86	8,159.90	266.96	31.566			
7,541.91	7,161.00	7,350.26	7,344.00	28.35	242.10	90.28	-296.21	-8,281.39	8,468.70	8,201.69	267.00	31.717			
7,600.00	7,161.01	7,350.27	7,344.01	28.92	242.10	90.28	-296.21	-8,281.39	8,526.74	8,259.73	267.01	31.934			
7,700.00	7,161.03	7,350.29	7,344.03	30.03	242.10	90.29	-296.21	-8,281.39	8,626.65	8,359.64	267.01	32.308			
7,800.00	7,161.05	7,350.31	7,344.05	31.29	242.10	90.29	-296.21	-8,281.39	8,726.56	8,459.54	267.02	32.681			
7,900.00	7,161.08	7,350.33	7,344.08	32.69	242.10	90.29	-296.21	-8,281.39	8,826.48	8,559.45	267.03	33.054			
8,000.00	7,161.10	7,350.35	7,344.10	34.20	242.10	90.30	-296.21	-8,281.39	8,926.40	8,659.36	267.04	33.427			
8,100.00	7,161.12	7,350.38	7,344.12	35.81	242.10	90.30	-296.21	-8,281.39	9,026.32	8,759.27	267.05	33.800			
8,200.00	7,161.14	7,350.40	7,344.14	37.52	242.10	90.30	-296.21	-8,281.39	9,126.24	8,859.17	267.06	34.173			
8,300.00	7,161.16	7,350.42	7,344.16	39.30	242.10	90.31	-296.21	-8,281.39	9,226.16	8,959.08	267.08	34.545			
8,400.00	7,161.18	7,350.44	7,344.18	41.15	242.10	90.31	-296.21	-8,281.39	9,326.08	9,058.99	267.09	34.917			
8,500.00	7,161.20	7,350.46	7,344.20	43.05	242.11	90.31	-296.21	-8,281.39	9,426.01	9,158.90	267.11	35.289			
8,600.00	7,161.22	7,350.48	7,344.22	45.01	242.11	90.32	-296.21	-8,281.39	9,525.94	9,258.81	267.12	35.661			
8,700.00	7,161.24	7,350.50	7,344.24	47.02	242.11	90.32	-296.21	-8,281.39	9,625.87	9,358.72	267.14	36.033			
8,800.00	7,161.26	7,350.52	7,344.26	49.06	242.11	90.32	-296.21	-8,281.39	9,725.80	9,458.64	267.16	36.404			

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC											Offset Site Error: 0.00 usft				
Survey Program: 159-A027Ua_INC-ONLY				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		
8,900.00	7,161.29	7,350.54	7,344.29	51.14	242.11	90.33	-296.21	-8,281.39	9,825.73	9,558.55	267.18	36.775			
9,000.00	7,161.31	7,350.56	7,344.31	53.24	242.11	90.33	-296.21	-8,281.39	9,925.66	9,658.46	267.20	37.147			
9,100.00	7,161.33	7,350.59	7,344.33	55.38	242.11	90.33	-296.21	-8,281.39	10,025.60	9,758.37	267.23	37.517			
9,200.00	7,161.35	7,350.61	7,344.35	57.54	242.11	90.34	-296.21	-8,281.39	10,125.53	9,858.28	267.25	37.888			
9,300.00	7,161.37	7,350.63	7,344.37	59.72	242.11	90.34	-296.21	-8,281.39	10,225.47	9,958.20	267.27	38.258			
9,400.00	7,161.39	7,350.65	7,344.39	61.92	242.11	90.34	-296.21	-8,281.39	10,325.41	10,058.11	267.30	38.629			
9,500.00	7,161.41	7,350.67	7,344.41	64.13	242.11	90.35	-296.21	-8,281.39	10,425.35	10,158.02	267.33	38.999			
9,600.00	7,161.43	7,350.69	7,344.43	66.36	242.11	90.35	-296.21	-8,281.39	10,525.29	10,257.93	267.35	39.368			
9,700.00	7,161.45	7,350.71	7,344.45	68.61	242.11	90.35	-296.21	-8,281.39	10,625.23	10,357.85	267.38	39.738			
9,800.00	7,161.48	7,350.73	7,344.48	70.87	242.11	90.36	-296.21	-8,281.39	10,725.17	10,457.76	267.41	40.107			
9,900.00	7,161.50	7,350.75	7,344.50	73.14	242.11	90.36	-296.21	-8,281.39	10,825.12	10,557.67	267.44	40.476			
10,000.00	7,161.52	7,350.78	7,344.52	75.42	242.11	90.36	-296.21	-8,281.39	10,925.06	10,657.59	267.48	40.845			
10,100.00	7,161.54	7,350.80	7,344.54	77.71	242.12	90.37	-296.21	-8,281.39	11,025.01	10,757.50	267.51	41.214			
10,200.00	7,161.56	7,350.82	7,344.56	80.01	242.12	90.37	-296.21	-8,281.39	11,124.95	10,857.41	267.54	41.582			
10,300.00	7,161.58	7,350.84	7,344.58	82.32	242.12	90.37	-296.21	-8,281.39	11,224.90	10,957.33	267.58	41.950			
10,400.00	7,161.60	7,350.86	7,344.60	84.63	242.12	90.38	-296.21	-8,281.39	11,324.85	11,057.24	267.61	42.318			
10,500.00	7,161.62	7,350.88	7,344.62	86.95	242.12	90.38	-296.21	-8,281.39	11,424.80	11,157.15	267.65	42.686			
10,600.00	7,161.64	7,350.90	7,344.64	89.28	242.12	90.38	-296.21	-8,281.39	11,524.75	11,257.07	267.69	43.053			
10,700.00	7,161.66	7,350.92	7,344.66	91.61	242.12	90.39	-296.21	-8,281.39	11,624.70	11,356.98	267.72	43.420			
10,800.00	7,161.69	7,350.94	7,344.69	93.95	242.12	90.39	-296.21	-8,281.39	11,724.66	11,456.89	267.76	43.787			
10,900.00	7,161.71	7,350.96	7,344.71	96.29	242.12	90.39	-296.21	-8,281.39	11,824.61	11,556.80	267.80	44.154			
11,000.00	7,161.73	7,350.99	7,344.73	98.64	242.12	90.40	-296.21	-8,281.39	11,924.56	11,656.72	267.85	44.520			
11,100.00	7,161.75	7,351.01	7,344.75	100.99	242.12	90.40	-296.21	-8,281.39	12,024.52	11,756.63	267.89	44.886			
11,200.00	7,161.77	7,351.03	7,344.77	103.35	242.12	90.41	-296.21	-8,281.39	12,124.47	11,856.54	267.93	45.252			
11,300.00	7,161.79	7,351.05	7,344.79	105.71	242.12	90.41	-296.21	-8,281.39	12,224.43	11,956.45	267.97	45.618			
11,400.00	7,161.81	7,351.07	7,344.81	108.07	242.12	90.41	-296.21	-8,281.39	12,324.39	12,056.37	268.02	45.983			
11,500.00	7,161.83	7,351.09	7,344.83	110.44	242.12	90.42	-296.21	-8,281.39	12,424.34	12,156.28	268.06	46.348			
11,600.00	7,161.85	7,351.11	7,344.85	112.80	242.12	90.42	-296.21	-8,281.39	12,524.30	12,256.19	268.11	46.713			
11,700.00	7,161.87	7,351.13	7,344.87	115.18	242.13	90.42	-296.21	-8,281.39	12,624.26	12,356.10	268.16	47.078			
11,800.00	7,161.90	7,351.15	7,344.90	117.55	242.13	90.43	-296.21	-8,281.39	12,724.22	12,456.01	268.21	47.442			
11,900.00	7,161.92	7,351.17	7,344.92	119.93	242.13	90.43	-296.21	-8,281.39	12,824.18	12,555.92	268.26	47.806			
12,000.00	7,161.94	7,351.20	7,344.94	122.31	242.13	90.43	-296.21	-8,281.39	12,924.14	12,655.84	268.31	48.170			
12,100.00	7,161.96	7,351.22	7,344.96	124.69	242.13	90.44	-296.21	-8,281.39	13,024.10	12,755.75	268.36	48.533			
12,200.00	7,161.98	7,351.24	7,344.98	127.07	242.13	90.44	-296.21	-8,281.39	13,124.06	12,855.66	268.41	48.896			
12,300.00	7,162.00	7,351.26	7,345.00	129.46	242.13	90.44	-296.21	-8,281.39	13,224.03	12,955.57	268.46	49.259			
12,400.00	7,162.02	7,351.28	7,345.02	131.85	242.13	90.45	-296.21	-8,281.39	13,323.99	13,055.48	268.51	49.621			
12,500.00	7,162.04	7,351.30	7,345.04	134.24	242.13	90.45	-296.21	-8,281.39	13,423.95	13,155.39	268.57	49.984			
12,600.00	7,162.06	7,351.32	7,345.06	136.63	242.13	90.45	-296.21	-8,281.39	13,523.92	13,255.30	268.62	50.346			
12,700.00	7,162.09	7,351.34	7,345.09	139.02	242.13	90.46	-296.21	-8,281.39	13,623.88	13,355.20	268.68	50.707			
12,800.00	7,162.11	7,351.36	7,345.11	141.42	242.13	90.46	-296.21	-8,281.39	13,723.85	13,455.11	268.73	51.069			
12,900.00	7,162.13	7,351.39	7,345.13	143.81	242.13	90.46	-296.21	-8,281.39	13,823.81	13,555.02	268.79	51.430			
13,000.00	7,162.15	7,351.41	7,345.15	146.21	242.13	90.47	-296.21	-8,281.39	13,923.78	13,654.93	268.85	51.790			
13,100.00	7,162.17	7,351.43	7,345.17	148.61	242.13	90.47	-296.21	-8,281.39	14,023.75	13,754.84	268.91	52.151			
13,200.00	7,162.19	7,351.45	7,345.19	151.01	242.13	90.47	-296.21	-8,281.39	14,123.71	13,854.75	268.97	52.511			
13,300.00	7,162.21	7,351.47	7,345.21	153.41	242.14	90.48	-296.21	-8,281.39	14,223.68	13,954.65	269.03	52.871			
13,400.00	7,162.23	7,351.49	7,345.23	155.81	242.14	90.48	-296.21	-8,281.39	14,323.65	14,054.56	269.09	53.230			
13,500.00	7,162.25	7,351.51	7,345.25	158.21	242.14	90.48	-296.21	-8,281.39	14,423.62	14,154.47	269.15	53.590			
13,600.00	7,162.27	7,351.53	7,345.27	160.62	242.14	90.49	-296.21	-8,281.39	14,523.59	14,254.37	269.21	53.949			
13,700.00	7,162.30	7,351.55	7,345.30	163.02	242.14	90.49	-296.21	-8,281.39	14,623.56	14,354.28	269.28	54.307			
13,800.00	7,162.32	7,351.57	7,345.32	165.43	242.14	90.49	-296.21	-8,281.39	14,723.53	14,454.19	269.34	54.665			
13,900.00	7,162.34	7,351.60	7,345.34	167.84	242.14	90.50	-296.21	-8,281.39	14,823.50	14,554.09	269.40	55.023			
14,000.00	7,162.36	7,351.62	7,345.36	170.24	242.14	90.50	-296.21	-8,281.39	14,923.47	14,654.00	269.47	55.381			

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		159-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)
14,100.00	7,162.38	7,351.64	7,345.38	172.65	242.14	90.50	-296.21	-8,281.39	15,023.44	14,753.90	269.54	55.738	
14,200.00	7,162.40	7,351.66	7,345.40	175.06	242.14	90.51	-296.21	-8,281.39	15,123.41	14,853.81	269.60	56.095	
14,300.00	7,162.42	7,351.68	7,345.42	177.47	242.14	90.51	-296.21	-8,281.39	15,223.38	14,953.71	269.67	56.452	
14,400.00	7,162.44	7,351.70	7,345.44	179.88	242.14	90.51	-296.21	-8,281.39	15,323.35	15,053.61	269.74	56.808	
14,500.00	7,162.46	7,351.72	7,345.46	182.29	242.14	90.52	-296.21	-8,281.39	15,423.32	15,153.52	269.81	57.164	
14,600.00	7,162.49	7,351.74	7,345.49	184.71	242.14	90.52	-296.21	-8,281.39	15,523.30	15,253.42	269.88	57.520	
14,700.00	7,162.51	7,351.76	7,345.51	187.12	242.14	90.52	-296.21	-8,281.39	15,623.27	15,353.32	269.95	57.875	
14,800.00	7,162.53	7,351.78	7,345.53	189.53	242.15	90.53	-296.21	-8,281.39	15,723.24	15,453.23	270.02	58.230	
14,900.00	7,162.55	7,351.81	7,345.55	191.95	242.15	90.53	-296.21	-8,281.39	15,823.22	15,553.13	270.09	58.585	
15,000.00	7,162.57	7,351.83	7,345.57	194.36	242.15	90.53	-296.21	-8,281.39	15,923.19	15,653.03	270.16	58.940	
15,100.00	7,162.59	7,351.85	7,345.59	196.78	242.15	90.54	-296.21	-8,281.39	16,023.17	15,752.93	270.23	59.294	
15,200.00	7,162.61	7,351.87	7,345.61	199.19	242.15	90.54	-296.21	-8,281.39	16,123.14	15,852.83	270.31	59.647	
15,300.00	7,162.63	7,351.89	7,345.63	201.61	242.15	90.54	-296.21	-8,281.39	16,223.12	15,952.73	270.38	60.001	
15,400.00	7,162.65	7,351.91	7,345.65	204.03	242.15	90.55	-296.21	-8,281.39	16,323.09	16,052.63	270.46	60.354	
15,500.00	7,162.67	7,351.93	7,345.67	206.44	242.15	90.55	-296.21	-8,281.39	16,423.07	16,152.53	270.53	60.706	
15,600.00	7,162.70	7,351.95	7,345.70	208.86	242.15	90.55	-296.21	-8,281.39	16,523.04	16,252.43	270.61	61.059	
15,700.00	7,162.72	7,351.97	7,345.72	211.28	242.15	90.56	-296.21	-8,281.39	16,623.02	16,352.33	270.69	61.411	
15,800.00	7,162.74	7,352.00	7,345.74	213.70	242.15	90.56	-296.21	-8,281.39	16,723.00	16,452.23	270.76	61.762	
15,900.00	7,162.76	7,352.02	7,345.76	216.12	242.15	90.56	-296.21	-8,281.39	16,822.97	16,552.13	270.84	62.114	
16,000.00	7,162.78	7,352.04	7,345.78	218.54	242.15	90.57	-296.21	-8,281.39	16,922.95	16,652.03	270.92	62.465	
16,100.00	7,162.80	7,352.06	7,345.80	220.96	242.15	90.57	-296.21	-8,281.39	17,022.93	16,751.93	271.00	62.815	
16,200.00	7,162.82	7,352.08	7,345.82	223.38	242.15	90.57	-296.21	-8,281.39	17,122.91	16,851.83	271.08	63.166	
16,300.00	7,162.84	7,352.10	7,345.84	225.80	242.15	90.58	-296.21	-8,281.39	17,222.88	16,951.72	271.16	63.515	
16,400.00	7,162.86	7,352.12	7,345.86	228.22	242.16	90.58	-296.21	-8,281.39	17,322.86	17,051.62	271.24	63.865	
16,500.00	7,162.88	7,352.14	7,345.88	230.64	242.16	90.58	-296.21	-8,281.39	17,422.84	17,151.52	271.32	64.214	
16,600.00	7,162.91	7,352.16	7,345.91	233.06	242.16	90.59	-296.21	-8,281.39	17,522.82	17,251.41	271.41	64.563	
16,700.00	7,162.93	7,352.18	7,345.93	235.49	242.16	90.59	-296.21	-8,281.39	17,622.80	17,351.31	271.49	64.912	
16,800.00	7,162.95	7,352.21	7,345.95	237.91	242.16	90.59	-296.21	-8,281.39	17,722.78	17,451.20	271.57	65.260	
16,879.97	7,162.96	7,352.22	7,345.96	239.84	242.16	90.59	-296.21	-8,281.39	17,802.73	17,531.10	271.64	65.538	
16,900.00	7,162.97	7,352.23	7,345.97	240.33	242.16	90.60	-296.21	-8,281.39	17,822.76	17,551.10	271.66	65.608	
17,000.00	7,162.99	7,352.25	7,345.99	242.75	242.16	90.60	-296.21	-8,281.39	17,922.74	17,651.00	271.74	65.955	
17,056.99	7,163.00	7,352.26	7,346.00	244.13	242.16	90.60	-296.21	-8,281.39	17,979.72	17,707.93	271.79	66.153	

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis	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	367.78	367.78	0.00	0.64	96.17	-933.45	8,633.85	8,684.17				
100.00	100.00	469.19	469.19	0.25	0.94	96.17	-933.73	8,633.85	8,684.19	8,683.00	1.19	7,290.257	
200.00	200.00	560.80	560.80	0.61	1.26	96.18	-934.21	8,633.83	8,684.23	8,682.36	1.87	4,644.586	
300.00	300.00	645.54	645.54	0.97	1.56	96.18	-934.27	8,633.98	8,684.42	8,681.89	2.52	3,440.055	
400.00	400.00	735.14	735.13	1.33	1.87	96.18	-934.36	8,634.30	8,684.78	8,681.59	3.20	2,716.995	
500.00	500.00	832.67	832.67	1.68	2.21	96.18	-934.43	8,634.69	8,685.18	8,681.28	3.90	2,229.018	
600.00	599.98	948.34	948.34	2.04	2.62	-179.06	-934.58	8,635.18	8,687.38	8,682.73	4.65	1,867.267	
700.00	699.84	1,055.06	1,055.06	2.39	2.99	-179.06	-934.56	8,635.27	8,692.69	8,687.31	5.37	1,617.274	
722.35	722.13	1,071.70	1,071.70	2.47	3.05	-179.06	-934.60	8,635.30	8,694.38	8,688.86	5.51	1,576.747	
800.00	799.54	1,139.38	1,139.37	2.74	3.29	-179.06	-934.86	8,635.49	8,700.64	8,694.62	6.02	1,444.802	
900.00	899.24	1,249.45	1,249.44	3.10	3.67	-179.05	-935.32	8,635.80	8,708.72	8,701.96	6.76	1,288.630	
1,000.00	998.94	1,342.52	1,342.51	3.47	4.00	-179.05	-936.11	8,635.88	8,716.66	8,709.22	7.44	1,172.081	
1,100.00	1,098.64	1,414.75	1,414.74	3.83	4.25	-179.05	-936.54	8,636.18	8,724.88	8,716.84	8.04	1,084.597	
1,200.00	1,198.34	1,500.00	1,499.98	4.20	4.55	-179.04	-937.20	8,636.75	8,733.37	8,724.67	8.70	1,003.992	
1,300.00	1,298.04	1,635.64	1,635.61	4.57	5.02	-179.04	-938.31	8,637.33	8,741.62	8,732.09	9.53	917.241	
1,400.00	1,397.74	1,731.74	1,731.71	4.94	5.36	-179.04	-938.67	8,637.73	8,749.81	8,739.59	10.22	855.805	
1,500.00	1,497.44	1,845.52	1,845.50	5.31	5.76	-179.04	-938.96	8,638.01	8,757.83	8,746.85	10.98	797.582	
1,600.00	1,597.13	1,942.95	1,942.93	5.68	6.10	-179.04	-938.83	8,638.30	8,765.87	8,754.19	11.68	750.513	
1,700.00	1,696.83	2,058.18	2,058.15	6.05	6.50	-179.04	-938.92	8,638.53	8,773.83	8,761.38	12.44	705.180	
1,800.00	1,796.53	2,152.39	2,152.36	6.43	6.83	-179.04	-938.70	8,638.62	8,781.66	8,768.52	13.13	668.810	
1,900.00	1,896.23	2,268.58	2,268.55	6.80	7.23	-179.04	-938.39	8,638.86	8,789.60	8,775.70	13.90	632.525	
2,000.00	1,995.93	2,358.98	2,358.95	7.17	7.55	-179.05	-937.82	8,638.86	8,797.29	8,782.72	14.57	603.754	
2,100.00	2,095.63	2,441.77	2,441.73	7.54	7.84	-179.06	-936.94	8,639.14	8,805.26	8,790.04	15.22	578.555	
2,200.00	2,195.33	2,538.17	2,538.13	7.92	8.17	-179.06	-935.95	8,639.52	8,813.30	8,797.38	15.92	553.730	
2,300.00	2,295.03	2,660.87	2,660.82	8.29	8.60	-179.07	-934.71	8,639.97	8,821.32	8,804.62	16.71	528.031	
2,400.00	2,394.73	2,755.14	2,755.08	8.66	8.93	-179.08	-933.49	8,640.08	8,829.06	8,811.66	17.40	507.549	
2,500.00	2,494.43	2,846.72	2,846.66	9.04	9.25	-179.09	-932.45	8,640.41	8,837.03	8,818.96	18.08	488.898	
2,600.00	2,594.12	2,970.37	2,970.30	9.41	9.68	-179.10	-931.21	8,640.62	8,844.85	8,825.98	18.87	468.754	
2,700.00	2,693.82	3,048.99	3,048.92	9.79	9.96	-179.10	-930.35	8,640.69	8,852.59	8,833.09	19.50	453.910	
2,800.00	2,793.52	3,122.33	3,122.25	10.16	10.21	-179.11	-929.63	8,641.04	8,860.70	8,840.58	20.12	440.429	
2,900.00	2,893.22	3,224.79	3,224.71	10.53	10.57	-179.12	-928.54	8,641.61	8,868.88	8,848.05	20.84	425.623	
3,000.00	2,992.92	3,321.68	3,321.59	10.91	10.91	-179.12	-927.67	8,642.16	8,877.11	8,855.57	21.54	412.186	
3,100.00	3,092.62	3,433.20	3,433.10	11.28	11.30	-179.13	-926.85	8,642.67	8,885.24	8,862.95	22.29	398.654	
3,200.00	3,192.32	3,529.90	3,529.80	11.66	11.64	-179.14	-926.02	8,643.08	8,893.32	8,870.34	22.99	386.890	
3,300.00	3,292.02	3,600.00	3,599.90	12.03	11.88	-179.14	-925.54	8,643.43	8,901.53	8,877.94	23.59	377.338	
3,400.00	3,391.72	3,654.32	3,654.21	12.41	12.07	-179.14	-925.27	8,643.92	8,910.17	8,886.03	24.14	369.147	
3,500.00	3,491.41	3,700.00	3,699.89	12.78	12.23	-179.15	-925.08	8,644.63	8,919.43	8,894.78	24.65	361.812	
3,600.00	3,591.11	3,792.07	3,791.94	13.15	12.55	-179.15	-924.84	8,646.38	8,929.03	8,903.70	25.33	352.449	
3,700.00	3,690.81	3,874.71	3,874.56	13.53	12.84	-179.15	-924.83	8,648.03	8,938.76	8,912.78	25.98	344.034	
3,800.00	3,790.51	3,986.67	3,986.50	13.90	13.24	-179.15	-924.96	8,650.34	8,948.57	8,921.84	26.74	334.694	
3,900.00	3,890.21	4,087.16	4,086.97	14.28	13.59	-179.15	-924.91	8,652.29	8,958.24	8,930.79	27.45	326.354	
4,000.00	3,989.91	4,214.66	4,214.45	14.65	14.03	-179.15	-925.43	8,654.53	8,967.79	8,939.53	28.26	317.326	
4,100.00	4,089.61	4,318.28	4,318.06	15.03	14.40	-179.15	-925.85	8,656.14	8,977.12	8,948.13	28.98	309.717	
4,200.00	4,189.31	4,400.00	4,399.77	15.40	14.68	-179.15	-926.38	8,657.46	8,986.54	8,956.91	29.63	303.294	
4,300.00	4,289.01	4,482.36	4,482.11	15.78	14.97	-179.15	-926.54	8,658.99	8,996.16	8,965.88	30.28	297.131	
4,400.00	4,388.70	4,547.39	4,547.12	16.15	15.20	-179.16	-925.92	8,660.45	9,006.04	8,975.18	30.86	291.833	
4,500.00	4,488.40	4,613.76	4,613.46	16.53	15.43	-179.17	-924.91	8,662.28	9,016.35	8,984.90	31.45	286.705	
4,600.00	4,588.10	5,018.49	5,017.85	16.90	16.85	-179.26	-910.83	8,668.48	9,025.66	8,992.40	33.27	271.309	
4,700.00	4,687.80	5,170.15	5,169.48	17.27	17.38	-179.28	-908.44	8,667.28	9,032.47	8,998.31	34.16	264.421	
4,800.00	4,787.50	5,276.68	5,276.01	17.65	17.75	-179.28	-907.62	8,665.85	9,038.80	9,003.91	34.89	259.055	
4,900.00	4,887.20	5,340.80	5,340.12	18.02	17.97	-179.28	-907.84	8,665.10	9,045.43	9,009.95	35.47	254.991	
5,000.00	4,986.90	5,400.00	5,399.31	18.40	18.18	-179.28	-908.25	8,664.63	9,052.48	9,016.44	36.04	251.195	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 400-A020Ga_GYRO-NS, 6400-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)			
5,100.00	5,086.60	5,475.57	5,474.88	18.77	18.44	-179.28	-908.63	8,664.33	9,059.89	9,023.23	36.66	247.134	
5,200.00	5,186.30	5,528.85	5,528.16	19.15	18.63	-179.28	-908.63	8,664.32	9,067.66	9,030.46	37.20	243.742	
5,300.00	5,286.00	5,600.00	5,599.31	19.52	18.87	-179.28	-908.74	8,664.89	9,076.13	9,038.32	37.81	240.059	
5,400.00	5,385.69	5,653.28	5,652.59	19.90	19.06	-179.28	-908.87	8,665.54	9,084.95	9,046.60	38.35	236.901	
5,500.00	5,485.39	5,742.59	5,741.89	20.27	19.37	-179.28	-909.09	8,666.48	9,093.79	9,054.76	39.02	233.046	
5,600.00	5,585.09	5,884.05	5,883.34	20.65	19.87	-179.27	-910.11	8,668.24	9,102.96	9,063.08	39.88	228.235	
5,700.00	5,684.79	6,034.74	6,034.02	21.02	20.39	-179.27	-910.86	8,668.66	9,110.96	9,070.18	40.78	223.422	
5,800.00	5,784.49	6,155.21	6,154.49	21.40	20.79	-179.27	-911.34	8,668.87	9,118.94	9,077.41	41.54	219.534	
5,900.00	5,884.19	6,255.92	6,255.20	21.77	21.09	-179.26	-911.72	8,669.04	9,126.91	9,084.70	42.20	216.259	
6,000.00	5,983.89	6,376.28	6,375.55	22.15	21.45	-179.27	-911.45	8,668.92	9,134.54	9,091.61	42.93	212.773	
6,100.00	6,083.59	6,454.31	6,453.59	22.52	22.02	-179.27	-911.34	8,668.87	9,142.20	9,098.35	43.86	208.462	
6,200.00	6,183.29	6,552.59	6,551.86	22.90	22.91	-179.27	-910.46	8,668.87	9,149.86	9,104.75	45.11	202.830	
6,300.00	6,282.98	6,644.01	6,643.26	23.27	23.75	-179.27	-910.99	8,668.87	9,157.68	9,111.37	46.30	197.778	
6,400.00	6,382.68	6,753.45	6,752.68	23.65	24.97	-179.27	-911.34	8,668.87	9,165.46	9,117.57	47.89	191.397	
6,492.83	6,475.23	6,845.99	6,845.23	24.00	26.07	-179.27	-911.34	8,668.87	9,172.66	9,123.33	49.33	185.952	
6,500.00	6,482.39	6,853.15	6,852.39	24.02	26.16	-179.86	-911.34	8,668.87	9,173.18	9,123.74	49.44	185.544	
6,550.00	6,532.35	6,903.01	6,902.25	24.19	26.75	34.79	-911.11	8,668.87	9,174.52	9,124.31	50.21	182.741	
6,600.00	6,582.27	6,952.46	6,951.69	24.34	27.34	10.21	-911.12	8,668.87	9,171.98	9,121.03	50.95	180.006	
6,650.00	6,631.83	7,001.55	7,000.79	24.49	27.93	8.27	-911.17	8,668.87	9,165.56	9,113.87	51.69	177.311	
6,700.00	6,680.73	7,049.99	7,049.22	24.62	28.51	7.65	-911.23	8,668.87	9,155.29	9,102.87	52.42	174.668	
6,750.00	6,728.67	7,097.47	7,096.70	24.74	29.07	7.42	-911.32	8,668.87	9,141.24	9,088.12	53.12	172.088	
6,800.00	6,775.35	7,146.14	7,145.35	24.86	29.78	7.39	-911.34	8,668.87	9,123.48	9,069.52	53.95	169.095	
6,850.00	6,820.48	7,191.27	7,190.48	24.98	30.48	7.50	-911.34	8,668.87	9,102.13	9,047.36	54.77	166.192	
6,900.00	6,863.78	7,234.57	7,233.78	25.09	31.14	7.71	-911.34	8,668.87	9,077.33	9,021.78	55.54	163.424	
6,950.00	6,904.99	7,275.78	7,274.99	25.21	31.78	8.04	-911.34	8,668.87	9,049.22	8,992.94	56.28	160.797	
7,000.00	6,943.86	7,314.65	7,313.86	25.33	32.38	8.49	-911.34	8,668.87	9,017.98	8,961.02	56.96	158.312	
7,050.00	6,980.14	7,350.81	7,350.01	25.47	32.94	9.06	-910.31	8,668.87	8,983.69	8,926.10	57.60	155.974	
7,100.00	7,013.60	7,383.15	7,382.34	25.62	33.43	9.83	-910.33	8,668.87	8,946.79	8,888.63	58.16	153.827	
7,150.00	7,044.06	7,412.57	7,411.76	25.79	33.89	10.82	-910.38	8,668.87	8,907.40	8,848.73	58.67	151.819	
7,200.00	7,071.31	7,438.89	7,438.09	26.00	34.29	12.15	-910.46	8,668.87	8,865.76	8,806.63	59.12	149.953	
7,250.00	7,095.18	7,461.96	7,461.16	26.23	34.65	13.95	-910.55	8,668.87	8,822.11	8,762.60	59.52	148.228	
7,300.00	7,115.54	7,481.63	7,480.83	26.50	34.95	16.49	-910.64	8,668.87	8,776.74	8,716.89	59.85	146.644	
7,350.00	7,132.25	7,497.78	7,496.97	26.81	35.20	20.28	-910.72	8,668.87	8,729.92	8,669.80	60.12	145.200	
7,400.00	7,145.22	7,510.31	7,509.50	27.16	35.39	26.37	-910.79	8,668.87	8,681.95	8,621.61	60.33	143.897	
7,450.00	7,154.36	7,519.14	7,518.33	27.55	35.53	37.25	-910.85	8,668.87	8,633.10	8,572.62	60.48	142.732	
7,500.00	7,159.61	7,524.22	7,523.41	27.97	35.61	58.80	-910.88	8,668.87	8,583.69	8,523.12	60.57	141.704	
7,541.91	7,161.00	7,525.56	7,524.75	28.35	35.63	89.51	-910.89	8,668.87	8,542.07	8,481.47	60.60	140.948	
7,600.00	7,161.01	7,525.57	7,524.76	28.92	35.63	89.51	-910.89	8,668.87	8,484.33	8,423.71	60.62	139.966	
7,700.00	7,161.03	7,525.60	7,524.78	30.03	35.63	89.51	-910.89	8,668.87	8,384.95	8,324.31	60.64	138.268	
7,800.00	7,161.05	7,525.62	7,524.81	31.29	35.63	89.51	-910.89	8,668.87	8,285.58	8,224.91	60.67	136.561	
7,900.00	7,161.08	7,525.64	7,524.83	32.69	35.63	89.51	-910.89	8,668.87	8,186.23	8,125.52	60.71	134.845	
8,000.00	7,161.10	7,525.66	7,524.85	34.20	35.63	89.51	-910.89	8,668.87	8,086.89	8,026.14	60.75	133.119	
8,100.00	7,161.12	7,525.68	7,524.87	35.81	35.63	89.52	-910.89	8,668.87	7,987.57	7,926.78	60.80	131.384	
8,200.00	7,161.14	7,525.70	7,524.89	37.52	35.63	89.52	-910.89	8,668.87	7,888.27	7,827.42	60.85	129.639	
8,300.00	7,161.16	7,525.73	7,524.92	39.30	35.63	89.52	-910.89	8,668.87	7,788.99	7,728.08	60.91	127.884	
8,400.00	7,161.18	7,525.75	7,524.94	41.15	35.63	89.52	-910.89	8,668.87	7,689.72	7,628.75	60.97	126.118	
8,500.00	7,161.20	7,525.77	7,524.96	43.05	35.63	89.52	-910.89	8,668.87	7,590.48	7,529.43	61.04	124.343	
8,600.00	7,161.22	7,525.79	7,524.98	45.01	35.63	89.52	-910.89	8,668.87	7,491.25	7,430.13	61.12	122.558	
8,700.00	7,161.24	7,525.81	7,525.00	47.02	35.63	89.52	-910.89	8,668.87	7,392.04	7,330.83	61.21	120.762	
8,800.00	7,161.26	7,525.84	7,525.03	49.06	35.63	89.53	-910.89	8,668.87	7,292.86	7,231.55	61.31	118.956	
8,900.00	7,161.29	7,525.86	7,525.05	51.14	35.63	89.53	-910.89	8,668.87	7,193.70	7,132.29	61.41	117.139	
9,000.00	7,161.31	7,525.88	7,525.07	53.24	35.63	89.53	-910.89	8,668.87	7,094.56	7,033.04	61.52	115.312	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error:	0.00 usft	
Survey Program:		400-A020Ga_GYRO-NS, 6400-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)					
9,100.00	7,161.33	7,525.90	7,525.09	55.38	35.63	89.53	-910.89	8,668.87	6,995.45	6,933.80	61.65	113.474			
9,200.00	7,161.35	7,525.92	7,525.11	57.54	35.63	89.53	-910.89	8,668.87	6,896.36	6,834.58	61.78	111.626			
9,300.00	7,161.37	7,525.95	7,525.14	59.72	35.63	89.53	-910.89	8,668.87	6,797.30	6,735.38	61.92	109.767			
9,400.00	7,161.39	7,525.97	7,525.16	61.92	35.64	89.53	-910.89	8,668.87	6,698.27	6,636.19	62.08	107.898			
9,500.00	7,161.41	7,525.99	7,525.18	64.13	35.64	89.53	-910.89	8,668.87	6,599.26	6,537.02	62.25	106.018			
9,600.00	7,161.43	7,526.01	7,525.20	66.36	35.64	89.54	-910.89	8,668.87	6,500.29	6,437.86	62.43	104.127			
9,700.00	7,161.45	7,526.03	7,525.22	68.61	35.64	89.54	-910.89	8,668.87	6,401.35	6,338.73	62.62	102.226			
9,800.00	7,161.48	7,526.06	7,525.25	70.87	35.64	89.54	-910.89	8,668.87	6,302.44	6,239.61	62.83	100.315			
9,900.00	7,161.50	7,526.08	7,525.27	73.14	35.64	89.54	-910.89	8,668.87	6,203.57	6,140.52	63.05	98.393			
10,000.00	7,161.52	7,526.10	7,525.29	75.42	35.64	89.54	-910.89	8,668.87	6,104.73	6,041.45	63.29	96.462			
10,100.00	7,161.54	7,526.12	7,525.31	77.71	35.64	89.54	-910.89	8,668.87	6,005.94	5,942.39	63.54	94.520			
10,200.00	7,161.56	7,526.14	7,525.33	80.01	35.64	89.54	-910.89	8,668.87	5,907.18	5,843.36	63.81	92.569			
10,300.00	7,161.58	7,526.17	7,525.36	82.32	35.64	89.55	-910.89	8,668.87	5,808.46	5,744.36	64.10	90.609			
10,400.00	7,161.60	7,526.19	7,525.38	84.63	35.64	89.55	-910.89	8,668.87	5,709.79	5,645.38	64.42	88.640			
10,500.00	7,161.62	7,526.21	7,525.40	86.95	35.64	89.55	-910.89	8,668.87	5,611.17	5,546.42	64.75	86.663			
10,600.00	7,161.64	7,526.23	7,525.42	89.28	35.64	89.55	-910.89	8,668.87	5,512.60	5,447.50	65.10	84.677			
10,700.00	7,161.66	7,526.25	7,525.44	91.61	35.64	89.55	-910.89	8,668.87	5,414.08	5,348.60	65.48	82.684			
10,800.00	7,161.69	7,526.28	7,525.47	93.95	35.64	89.55	-910.89	8,668.87	5,315.61	5,249.73	65.88	80.684			
10,900.00	7,161.71	7,526.30	7,525.49	96.29	35.64	89.55	-910.89	8,668.87	5,217.20	5,150.89	66.31	78.677			
11,000.00	7,161.73	7,526.32	7,525.51	98.64	35.64	89.55	-910.89	8,668.87	5,118.86	5,052.09	66.77	76.665			
11,100.00	7,161.75	7,526.34	7,525.53	100.99	35.64	89.56	-910.89	8,668.87	5,020.58	4,953.32	67.26	74.648			
11,200.00	7,161.77	7,526.36	7,525.55	103.35	35.64	89.56	-910.89	8,668.87	4,922.37	4,854.59	67.78	72.627			
11,300.00	7,161.79	7,526.39	7,525.58	105.71	35.64	89.56	-910.89	8,668.87	4,824.23	4,755.90	68.33	70.603			
11,400.00	7,161.81	7,526.41	7,525.60	108.07	35.64	89.56	-910.90	8,668.87	4,726.17	4,657.25	68.92	68.576			
11,500.00	7,161.83	7,526.43	7,525.62	110.44	35.64	89.56	-910.90	8,668.87	4,628.20	4,558.65	69.55	66.549			
11,600.00	7,161.85	7,526.45	7,525.64	112.80	35.64	89.56	-910.90	8,668.87	4,530.31	4,460.09	70.21	64.521			
11,700.00	7,161.87	7,526.47	7,525.66	115.18	35.64	89.56	-910.90	8,668.87	4,432.51	4,361.59	70.93	62.494			
11,800.00	7,161.90	7,526.50	7,525.69	117.55	35.64	89.57	-910.90	8,668.87	4,334.82	4,263.14	71.69	60.470			
11,900.00	7,161.92	7,526.52	7,525.71	119.93	35.64	89.57	-910.90	8,668.87	4,237.24	4,164.74	72.49	58.450			
12,000.00	7,161.94	7,526.54	7,525.73	122.31	35.64	89.57	-910.90	8,668.87	4,139.77	4,066.41	73.35	56.435			
12,100.00	7,161.96	7,526.56	7,525.75	124.69	35.64	89.57	-910.90	8,668.87	4,042.42	3,968.15	74.27	54.427			
12,200.00	7,161.98	7,526.58	7,525.77	127.07	35.64	89.57	-910.90	8,668.87	3,945.21	3,869.96	75.25	52.427			
12,300.00	7,162.00	7,526.61	7,525.80	129.46	35.64	89.57	-910.90	8,668.87	3,848.14	3,771.84	76.29	50.438			
12,400.00	7,162.02	7,526.63	7,525.82	131.85	35.65	89.57	-910.90	8,668.87	3,751.22	3,673.81	77.41	48.460			
12,500.00	7,162.04	7,526.65	7,525.84	134.24	35.65	89.57	-910.90	8,668.87	3,654.47	3,575.87	78.60	46.496			
12,600.00	7,162.06	7,526.67	7,525.86	136.63	35.65	89.58	-910.90	8,668.87	3,557.90	3,478.03	79.87	44.548			
12,700.00	7,162.09	7,526.69	7,525.88	139.02	35.65	89.58	-910.90	8,668.87	3,461.52	3,380.30	81.22	42.617			
12,800.00	7,162.11	7,526.72	7,525.91	141.42	35.65	89.58	-910.90	8,668.87	3,365.36	3,282.68	82.67	40.706			
12,900.00	7,162.13	7,526.74	7,525.93	143.81	35.65	89.58	-910.90	8,668.87	3,269.42	3,185.20	84.23	38.816			
13,000.00	7,162.15	7,526.76	7,525.95	146.21	35.65	89.58	-910.90	8,668.87	3,173.74	3,087.85	85.89	36.951			
13,100.00	7,162.17	7,526.78	7,525.97	148.61	35.65	89.58	-910.90	8,668.87	3,078.33	2,990.66	87.67	35.111			
13,200.00	7,162.19	7,526.80	7,525.99	151.01	35.65	89.58	-910.90	8,668.87	2,983.22	2,893.64	89.59	33.300			
13,300.00	7,162.21	7,526.83	7,526.02	153.41	35.65	89.59	-910.90	8,668.87	2,888.44	2,796.81	91.64	31.520			
13,400.00	7,162.23	7,526.85	7,526.04	155.81	35.65	89.59	-910.90	8,668.87	2,794.03	2,700.18	93.85	29.773			
13,500.00	7,162.25	7,526.87	7,526.06	158.21	35.65	89.59	-910.90	8,668.87	2,700.02	2,603.80	96.22	28.061			
13,600.00	7,162.27	7,526.89	7,526.08	160.62	35.65	89.59	-910.90	8,668.87	2,606.45	2,507.67	98.78	26.386			
13,700.00	7,162.30	7,526.91	7,526.10	163.02	35.65	89.59	-910.90	8,668.87	2,513.38	2,411.84	101.54	24.752			
13,800.00	7,162.32	7,526.94	7,526.13	165.43	35.65	89.59	-910.90	8,668.87	2,420.86	2,316.34	104.52	23.161			
13,900.00	7,162.34	7,526.96	7,526.15	167.84	35.65	89.59	-910.90	8,668.87	2,328.97	2,221.22	107.75	21.615			
14,000.00	7,162.36	7,526.98	7,526.17	170.24	35.65	89.60	-910.90	8,668.87	2,237.76	2,126.52	111.24	20.117			
14,100.00	7,162.38	7,527.00	7,526.19	172.65	35.65	89.60	-910.90	8,668.87	2,147.34	2,032.32	115.02	18.669			
14,200.00	7,162.40	7,527.03	7,526.21	175.06	35.65	89.60	-910.90	8,668.87	2,057.81	1,938.67	119.13	17.273			

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Rule Assigned:		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.00	7,162.42	7,527.05	7,526.24	177.47	35.65	89.60	-910.90	8,668.87	1,969.28	1,845.68	123.60	15.933	
14,400.00	7,162.44	7,527.07	7,526.26	179.88	35.65	89.60	-910.90	8,668.87	1,881.90	1,753.45	128.45	14.650	
14,500.00	7,162.46	7,527.09	7,526.28	182.29	35.65	89.60	-910.90	8,668.87	1,795.84	1,662.10	133.74	13.428	
14,600.00	7,162.49	7,527.11	7,526.30	184.71	35.65	89.60	-910.90	8,668.87	1,711.30	1,571.80	139.50	12.267	
14,700.00	7,162.51	7,527.14	7,526.32	187.12	35.65	89.60	-910.90	8,668.87	1,628.51	1,482.74	145.77	11.172	
14,800.00	7,162.53	7,527.16	7,526.35	189.53	35.65	89.61	-910.90	8,668.87	1,547.75	1,395.16	152.59	10.143	
14,900.00	7,162.55	7,527.18	7,526.37	191.95	35.65	89.61	-910.90	8,668.87	1,469.36	1,309.37	160.00	9.184	
15,000.00	7,162.57	7,527.20	7,526.39	194.36	35.65	89.61	-910.90	8,668.87	1,393.75	1,225.74	168.01	8.296	
15,100.00	7,162.59	7,527.22	7,526.41	196.78	35.65	89.61	-910.90	8,668.87	1,321.37	1,144.74	176.63	7.481	
15,200.00	7,162.61	7,527.25	7,526.43	199.19	35.65	89.61	-910.90	8,668.87	1,252.80	1,066.98	185.83	6.742	
15,300.00	7,162.63	7,527.27	7,526.46	201.61	35.66	89.61	-910.90	8,668.87	1,188.70	993.18	195.53	6.080	
15,400.00	7,162.65	7,527.29	7,526.48	204.03	35.66	89.61	-910.90	8,668.87	1,129.83	924.25	205.58	5.496	
15,500.00	7,162.67	7,527.31	7,526.50	206.44	35.66	89.62	-910.90	8,668.87	1,077.04	861.28	215.76	4.992	
15,600.00	7,162.70	7,527.33	7,526.52	208.86	35.66	89.62	-910.90	8,668.87	1,031.26	805.53	225.73	4.569	
15,700.00	7,162.72	7,527.36	7,526.54	211.28	35.66	89.62	-910.90	8,668.87	993.48	758.43	235.05	4.227	
15,800.00	7,162.74	7,527.38	7,526.57	213.70	35.66	89.62	-910.90	8,668.87	964.62	721.40	243.22	3.966	
15,900.00	7,162.76	7,527.40	7,526.59	216.12	35.66	89.62	-910.90	8,668.87	945.51	695.81	249.70	3.787	
16,000.00	7,162.78	7,527.42	7,526.61	218.54	35.66	89.62	-910.90	8,668.87	936.74	682.68	254.06	3.687	
16,032.52	7,162.79	7,527.43	7,526.62	219.33	35.66	89.62	-910.90	8,668.87	936.18	681.21	254.96	3.672	CC, ES
16,100.00	7,162.80	7,527.44	7,526.63	220.96	35.66	89.62	-910.90	8,668.87	938.60	682.59	256.01	3.666	SF
16,200.00	7,162.82	7,527.47	7,526.65	223.38	35.66	89.62	-910.90	8,668.87	951.04	695.50	255.53	3.722	
16,300.00	7,162.84	7,527.49	7,526.68	225.80	35.66	89.63	-910.90	8,668.87	973.64	720.82	252.82	3.851	
16,400.00	7,162.86	7,527.51	7,526.70	228.22	35.66	89.63	-910.90	8,668.87	1,005.72	757.48	248.24	4.051	
16,500.00	7,162.88	7,527.53	7,526.72	230.64	35.66	89.63	-910.90	8,668.87	1,046.40	804.14	242.26	4.319	
16,600.00	7,162.91	7,527.55	7,526.74	233.06	35.66	89.63	-910.90	8,668.87	1,094.74	859.37	235.37	4.651	
16,700.00	7,162.93	7,527.58	7,526.76	235.49	35.66	89.63	-910.90	8,668.87	1,149.76	921.80	227.96	5.044	
16,800.00	7,162.95	7,527.60	7,526.79	237.91	35.66	89.63	-910.90	8,668.87	1,210.56	990.18	220.37	5.493	
16,879.97	7,162.96	7,527.62	7,526.80	239.84	35.66	89.63	-910.90	8,668.87	1,262.77	1,048.43	214.34	5.891	
16,900.00	7,162.97	7,527.62	7,526.81	240.33	35.66	89.63	-910.90	8,668.87	1,276.30	1,063.45	212.85	5.996	
17,000.00	7,162.99	7,527.64	7,526.83	242.75	35.66	89.64	-910.90	8,668.87	1,346.27	1,140.71	205.56	6.549	
17,056.99	7,163.00	7,527.65	7,526.84	244.13	35.66	89.64	-910.90	8,668.87	1,387.79	1,186.25	201.54	6.886	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
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	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	293.38	293.36	0.00	0.55	97.65	-1,411.93	10,516.39	10,611.15				
100.00	100.00	369.82	369.79	0.25	0.81	97.65	-1,413.26	10,517.05	10,612.21	10,611.16	1.05	N/A	
200.00	200.00	474.39	474.34	0.61	1.18	97.66	-1,415.29	10,517.93	10,613.31	10,611.53	1.78	5,964.353	
300.00	300.00	576.21	576.14	0.97	1.54	97.67	-1,417.33	10,518.69	10,614.31	10,611.82	2.49	4,254.433	
400.00	400.00	655.28	655.18	1.33	1.81	97.68	-1,418.71	10,519.41	10,615.45	10,612.32	3.13	3,392.248	
500.00	500.00	772.77	772.66	1.68	2.22	97.69	-1,420.43	10,520.58	10,616.64	10,612.75	3.90	2,724.931	
600.00	599.98	878.33	878.21	2.04	2.59	-177.54	-1,421.88	10,521.50	10,619.44	10,614.82	4.62	2,299.619	
700.00	699.84	985.64	985.50	2.39	2.96	-177.53	-1,423.23	10,522.38	10,625.64	10,620.30	5.34	1,988.296	
722.35	722.13	1,009.59	1,009.45	2.47	3.05	-177.52	-1,423.52	10,522.57	10,627.50	10,621.99	5.51	1,929.002	
800.00	799.54	1,086.73	1,086.58	2.74	3.32	-177.52	-1,424.41	10,523.16	10,634.22	10,628.17	6.05	1,757.706	
900.00	899.24	1,179.58	1,179.42	3.10	3.64	-177.52	-1,425.44	10,523.92	10,642.93	10,636.20	6.72	1,582.624	
1,000.00	998.94	1,273.15	1,272.98	3.47	3.97	-177.51	-1,426.43	10,524.76	10,651.69	10,644.29	7.40	1,438.538	
1,100.00	1,098.64	1,367.75	1,367.57	3.83	4.30	-177.51	-1,427.48	10,525.64	10,660.51	10,652.42	8.09	1,317.808	
1,200.00	1,198.34	1,463.77	1,463.58	4.20	4.63	-177.51	-1,428.63	10,526.57	10,669.37	10,660.59	8.78	1,215.036	
1,300.00	1,298.04	1,562.02	1,561.82	4.57	4.98	-177.50	-1,430.14	10,527.49	10,678.25	10,668.77	9.48	1,126.160	
1,400.00	1,397.74	1,665.38	1,665.16	4.94	5.34	-177.49	-1,432.05	10,528.42	10,687.14	10,676.94	10.20	1,047.603	
1,500.00	1,497.44	1,775.71	1,775.47	5.31	5.72	-177.49	-1,433.82	10,529.36	10,695.94	10,684.99	10.95	977.146	
1,600.00	1,597.13	1,892.68	1,892.43	5.68	6.13	-177.48	-1,435.26	10,530.27	10,704.62	10,692.91	11.71	913.848	
1,700.00	1,696.83	2,013.81	2,013.55	6.05	6.55	-177.48	-1,436.31	10,531.05	10,713.12	10,700.62	12.50	857.317	
1,800.00	1,796.53	2,145.42	2,145.15	6.43	7.01	-177.48	-1,437.18	10,531.59	10,721.36	10,708.04	13.31	805.212	
1,900.00	1,896.23	2,255.11	2,254.84	6.80	7.39	-177.48	-1,437.79	10,531.80	10,729.37	10,715.31	14.06	763.255	
2,000.00	1,995.93	2,352.40	2,352.13	7.17	7.73	-177.48	-1,438.13	10,532.02	10,737.38	10,722.63	14.76	727.630	
2,100.00	2,095.63	2,485.75	2,485.48	7.54	8.20	-177.48	-1,438.29	10,532.21	10,745.30	10,729.72	15.58	689.621	
2,200.00	2,195.33	2,615.93	2,615.66	7.92	8.65	-177.48	-1,438.19	10,531.94	10,752.82	10,736.42	16.39	655.886	
2,300.00	2,295.03	2,719.05	2,718.78	8.29	9.01	-177.48	-1,437.97	10,531.62	10,760.23	10,743.12	17.11	628.805	
2,400.00	2,394.73	2,843.30	2,843.03	8.66	9.44	-177.49	-1,437.58	10,531.14	10,767.56	10,749.65	17.90	601.386	
2,500.00	2,494.43	2,984.95	2,984.68	9.04	9.93	-177.49	-1,437.07	10,530.10	10,774.53	10,755.77	18.76	574.409	
2,600.00	2,594.12	3,086.80	3,086.51	9.41	10.29	-177.50	-1,436.66	10,529.19	10,781.34	10,761.87	19.47	553.670	
2,700.00	2,693.82	3,208.65	3,208.36	9.79	10.71	-177.50	-1,436.13	10,527.96	10,788.04	10,767.78	20.26	532.547	
2,800.00	2,793.52	3,348.20	3,347.90	10.16	11.20	-177.50	-1,435.73	10,526.07	10,794.41	10,773.31	21.10	511.475	
2,900.00	2,893.22	3,435.00	3,434.69	10.53	11.50	-177.50	-1,435.68	10,524.74	10,800.63	10,778.87	21.77	496.181	
3,000.00	2,992.92	3,435.00	3,434.69	10.91	11.50	-177.50	-1,435.68	10,524.74	10,807.41	10,785.28	22.13	488.450	
3,100.00	3,092.62	3,467.00	3,466.67	11.28	11.61	-177.51	-1,434.72	10,524.80	10,814.95	10,792.35	22.60	478.630	
3,200.00	3,192.32	3,467.00	3,466.67	11.66	11.61	-177.51	-1,434.72	10,524.80	10,823.26	10,800.31	22.95	471.589	
3,300.00	3,292.02	3,467.00	3,466.67	12.03	11.61	-177.51	-1,434.72	10,524.80	10,832.49	10,809.19	23.30	464.844	
3,400.00	3,391.72	3,467.00	3,466.67	12.41	11.61	-177.51	-1,434.72	10,524.80	10,842.64	10,818.99	23.65	458.380	
3,500.00	3,491.41	3,467.00	3,466.67	12.78	11.61	-177.51	-1,434.72	10,524.80	10,853.70	10,829.70	24.00	452.184	
3,600.00	3,591.11	3,467.00	3,466.67	13.15	11.61	-177.51	-1,434.72	10,524.80	10,865.67	10,841.32	24.35	446.245	
3,700.00	3,690.81	3,467.00	3,466.67	13.53	11.61	-177.51	-1,434.72	10,524.80	10,878.54	10,853.85	24.69	440.551	
3,800.00	3,790.51	3,467.00	3,466.67	13.90	11.61	-177.51	-1,434.72	10,524.80	10,892.32	10,867.28	25.03	435.090	
3,900.00	3,890.21	3,467.00	3,466.67	14.28	11.61	-177.51	-1,434.72	10,524.80	10,907.00	10,881.62	25.37	429.854	
4,000.00	3,989.91	3,467.00	3,466.67	14.65	11.61	-177.51	-1,434.72	10,524.80	10,922.57	10,896.86	25.71	424.831	
4,100.00	4,089.61	3,467.00	3,466.67	15.03	11.61	-177.51	-1,434.72	10,524.80	10,939.03	10,912.99	26.04	420.012	
4,200.00	4,189.31	3,467.00	3,466.67	15.40	11.61	-177.51	-1,434.72	10,524.80	10,956.39	10,930.01	26.38	415.390	
4,300.00	4,289.01	3,467.00	3,466.67	15.78	11.61	-177.51	-1,434.72	10,524.80	10,974.62	10,947.92	26.71	410.956	
4,400.00	4,388.70	3,467.00	3,466.67	16.15	11.61	-177.51	-1,434.72	10,524.80	10,993.74	10,966.71	27.03	406.701	
4,500.00	4,488.40	3,467.00	3,466.67	16.53	11.61	-177.51	-1,434.72	10,524.80	11,013.73	10,986.37	27.36	402.619	
4,600.00	4,588.10	3,469.00	3,468.64	16.90	11.65	-177.51	-1,434.62	10,525.08	11,034.58	11,006.90	27.68	398.655	
4,700.00	4,687.80	3,469.00	3,468.64	17.27	11.65	-177.51	-1,434.62	10,525.08	11,056.29	11,028.29	28.00	394.926	
4,800.00	4,787.50	3,469.00	3,468.64	17.65	11.65	-177.51	-1,434.62	10,525.08	11,078.86	11,050.55	28.31	391.347	
4,900.00	4,887.20	3,469.00	3,468.64	18.02	11.65	-177.51	-1,434.62	10,525.08	11,102.28	11,073.66	28.62	387.914	
5,000.00	4,986.90	3,469.00	3,468.64	18.40	11.65	-177.51	-1,434.62	10,525.08	11,126.55	11,097.62	28.93	384.621	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM													Offset Well Error: 0.00 usft
Reference													
Offset													
Semi Major Axis													
Highside													
Offset Wellbore Centre													
Distance													
Between													
Ellipses													
Minimum													
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)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,086.60	3,469.00	3,468.64	18.77	11.65	-177.51	-1,434.62	10,525.08	11,151.67	11,122.43	29.23	381.461	
5,200.00	5,186.30	3,469.00	3,468.64	19.15	11.65	-177.51	-1,434.62	10,525.08	11,177.62	11,148.09	29.54	378.430	
5,300.00	5,286.00	3,469.00	3,468.64	19.52	11.65	-177.51	-1,434.62	10,525.08	11,204.41	11,174.57	29.84	375.524	
5,400.00	5,385.69	3,469.00	3,468.64	19.90	11.65	-177.51	-1,434.62	10,525.08	11,232.02	11,201.89	30.13	372.736	
5,500.00	5,485.39	3,469.00	3,468.64	20.27	11.65	-177.51	-1,434.62	10,525.08	11,260.46	11,230.03	30.43	370.063	
5,600.00	5,585.09	3,469.00	3,468.64	20.65	11.65	-177.51	-1,434.62	10,525.08	11,289.71	11,258.99	30.72	367.500	
5,700.00	5,684.79	3,469.00	3,468.64	21.02	11.65	-177.51	-1,434.62	10,525.08	11,319.76	11,288.75	31.01	365.043	
5,800.00	5,784.49	3,469.00	3,468.64	21.40	11.65	-177.51	-1,434.62	10,525.08	11,350.62	11,319.32	31.30	362.689	
5,900.00	5,884.19	3,469.00	3,468.64	21.77	11.65	-177.51	-1,434.62	10,525.08	11,382.27	11,350.69	31.58	360.432	
6,000.00	5,983.89	3,469.00	3,468.64	22.15	11.65	-177.51	-1,434.62	10,525.08	11,414.71	11,382.85	31.86	358.271	
6,100.00	6,083.59	3,469.00	3,468.64	22.52	11.65	-177.51	-1,434.62	10,525.08	11,447.93	11,415.80	32.14	356.200	
6,200.00	6,183.29	3,469.00	3,468.64	22.90	11.65	-177.51	-1,434.62	10,525.08	11,481.93	11,449.52	32.41	354.217	
6,300.00	6,282.98	3,469.00	3,468.64	23.27	11.65	-177.51	-1,434.62	10,525.08	11,516.70	11,484.01	32.69	352.318	
6,400.00	6,382.68	3,485.45	3,484.44	23.65	11.66	-177.52	-1,433.92	10,529.60	11,551.93	11,518.95	32.97	350.341	
6,492.83	6,475.23	3,502.00	3,500.18	24.00	11.67	-177.53	-1,433.32	10,534.69	11,585.63	11,552.40	33.24	348.582	
6,500.00	6,482.39	3,502.00	3,500.18	24.02	11.67	-178.42	-1,433.32	10,534.69	11,588.20	11,554.95	33.26	348.463	
6,550.00	6,532.35	3,502.00	3,500.18	24.19	11.67	36.32	-1,433.32	10,534.69	11,604.14	11,570.76	33.38	347.669	
6,600.00	6,582.27	3,502.00	3,500.18	24.34	11.67	11.57	-1,433.32	10,534.69	11,616.54	11,583.05	33.49	346.906	
6,650.00	6,631.83	3,502.00	3,500.18	24.49	11.67	9.46	-1,433.32	10,534.69	11,625.33	11,591.74	33.59	346.090	
6,700.00	6,680.73	3,502.00	3,500.18	24.62	11.67	8.67	-1,433.32	10,534.69	11,630.48	11,596.80	33.69	345.225	
6,750.00	6,728.67	3,502.00	3,500.18	24.74	11.67	8.28	-1,433.32	10,534.69	11,631.96	11,598.18	33.78	344.321	
6,800.00	6,775.35	3,502.00	3,500.18	24.86	11.67	8.07	-1,433.32	10,534.69	11,629.76	11,595.89	33.87	343.387	
6,850.00	6,820.48	3,502.00	3,500.18	24.98	11.67	7.99	-1,433.32	10,534.69	11,623.89	11,589.94	33.95	342.428	
6,900.00	6,863.78	3,502.00	3,500.18	25.09	11.67	7.99	-1,433.32	10,534.69	11,614.38	11,580.37	34.01	341.449	
6,950.00	6,904.99	3,502.00	3,500.18	25.21	11.67	8.06	-1,433.32	10,534.69	11,601.28	11,567.21	34.08	340.452	
7,000.00	6,943.86	3,502.00	3,500.18	25.33	11.67	8.21	-1,433.32	10,534.69	11,584.66	11,550.53	34.13	339.439	
7,050.00	6,980.14	3,502.00	3,500.18	25.47	11.67	8.42	-1,433.32	10,534.69	11,564.61	11,530.44	34.17	338.410	
7,100.00	7,013.60	3,502.00	3,500.18	25.62	11.67	8.72	-1,433.32	10,534.69	11,541.23	11,507.02	34.21	337.364	
7,150.00	7,044.06	3,502.00	3,500.18	25.79	11.67	9.10	-1,433.32	10,534.69	11,514.65	11,480.41	34.24	336.301	
7,200.00	7,071.31	3,502.00	3,500.18	26.00	11.67	9.59	-1,433.32	10,534.69	11,485.01	11,450.75	34.26	335.218	
7,250.00	7,095.18	3,502.00	3,500.18	26.23	11.67	10.20	-1,433.32	10,534.69	11,452.47	11,418.20	34.28	334.115	
7,300.00	7,115.54	3,502.00	3,500.18	26.50	11.67	10.98	-1,433.32	10,534.69	11,417.21	11,382.92	34.29	332.990	
7,350.00	7,132.25	3,502.00	3,500.18	26.81	11.67	11.96	-1,433.32	10,534.69	11,379.42	11,345.13	34.29	331.842	
7,400.00	7,145.22	3,502.00	3,500.18	27.16	11.67	13.23	-1,433.32	10,534.69	11,339.30	11,305.01	34.29	330.669	
7,450.00	7,154.36	3,502.00	3,500.18	27.55	11.67	14.90	-1,433.32	10,534.69	11,297.09	11,262.80	34.29	329.469	
7,500.00	7,159.61	3,517.59	3,514.80	27.97	11.68	17.21	-1,432.81	10,540.07	11,252.67	11,218.37	34.30	328.066	
7,541.91	7,161.00	3,533.00	3,529.01	28.35	11.68	19.87	-1,432.30	10,546.00	11,214.78	11,180.47	34.31	326.855	
7,600.00	7,161.01	3,533.00	3,529.01	28.92	11.68	19.87	-1,432.30	10,546.00	11,161.09	11,126.80	34.30	325.408	
7,700.00	7,161.03	3,533.00	3,529.01	30.03	11.68	19.87	-1,432.30	10,546.00	11,068.79	11,034.51	34.28	322.897	
7,800.00	7,161.05	3,533.00	3,529.01	31.29	11.68	19.87	-1,432.30	10,546.00	10,976.61	10,942.34	34.27	320.301	
7,900.00	7,161.08	3,533.00	3,529.01	32.69	11.68	19.87	-1,432.30	10,546.00	10,884.58	10,850.31	34.27	317.620	
8,000.00	7,161.10	3,533.00	3,529.01	34.20	11.68	19.87	-1,432.30	10,546.00	10,792.68	10,758.40	34.28	314.852	
8,100.00	7,161.12	3,533.00	3,529.01	35.81	11.68	19.87	-1,432.30	10,546.00	10,700.93	10,666.64	34.30	311.996	
8,200.00	7,161.14	3,533.00	3,529.01	37.52	11.68	19.87	-1,432.30	10,546.00	10,609.34	10,575.01	34.33	309.050	
8,300.00	7,161.16	3,533.00	3,529.01	39.30	11.68	19.87	-1,432.30	10,546.00	10,517.89	10,483.52	34.37	306.014	
8,400.00	7,161.18	3,533.00	3,529.01	41.15	11.68	19.87	-1,432.30	10,546.00	10,426.60	10,392.18	34.42	302.887	
8,500.00	7,161.20	3,533.00	3,529.01	43.05	11.68	19.87	-1,432.30	10,546.00	10,335.47	10,300.98	34.49	299.669	
8,600.00	7,161.22	3,533.00	3,529.01	45.01	11.68	19.87	-1,432.30	10,546.00	10,244.51	10,209.94	34.57	296.360	
8,700.00	7,161.24	3,533.00	3,529.01	47.02	11.68	19.87	-1,432.30	10,546.00	10,153.72	10,119.06	34.66	292.961	
8,800.00	7,161.26	3,533.00	3,529.01	49.06	11.68	19.87	-1,432.30	10,546.00	10,063.10	10,028.34	34.76	289.473	
8,900.00	7,161.29	3,533.00	3,529.01	51.14	11.68	19.87	-1,432.30	10,546.00	9,972.66	9,937.78	34.88	285.896	
9,000.00	7,161.31	3,533.00	3,529.01	53.24	11.68	19.87	-1,432.30	10,546.00	9,882.41	9,847.39	35.02	282.233	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM						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		
9,100.00	7,161.33	3,533.00	3,529.01	55.38	11.68	19.87	-1,432.30	10,546.00	9,792.34	9,757.18	35.16	278.486		
9,200.00	7,161.35	3,533.00	3,529.01	57.54	11.68	19.87	-1,432.30	10,546.00	9,702.47	9,667.15	35.33	274.656		
9,300.00	7,161.37	3,533.00	3,529.01	59.72	11.68	19.87	-1,432.30	10,546.00	9,612.80	9,577.30	35.50	270.748		
9,400.00	7,161.39	3,547.64	3,542.30	61.92	11.69	19.93	-1,431.87	10,552.11	9,523.13	9,487.42	35.71	266.650		
9,500.00	7,161.41	3,561.00	3,554.30	64.13	11.70	19.98	-1,431.56	10,557.99	9,433.92	9,397.99	35.94	262.509		
9,600.00	7,161.43	3,561.00	3,554.30	66.36	11.70	19.98	-1,431.56	10,557.99	9,344.76	9,308.59	36.16	258.395		
9,700.00	7,161.45	3,561.00	3,554.30	68.61	11.70	19.98	-1,431.56	10,557.99	9,255.81	9,219.41	36.41	254.218		
9,800.00	7,161.48	3,561.00	3,554.30	70.87	11.70	19.98	-1,431.56	10,557.99	9,167.10	9,130.43	36.67	249.983		
9,900.00	7,161.50	3,561.00	3,554.30	73.14	11.70	19.98	-1,431.56	10,557.99	9,078.62	9,041.67	36.95	245.694		
10,000.00	7,161.52	3,561.00	3,554.30	75.42	11.70	19.98	-1,431.56	10,557.99	8,990.38	8,953.13	37.25	241.356		
10,100.00	7,161.54	3,561.00	3,554.30	77.71	11.70	19.98	-1,431.56	10,557.99	8,902.39	8,864.82	37.57	236.976		
10,200.00	7,161.56	3,561.00	3,554.30	80.01	11.70	19.98	-1,431.56	10,557.99	8,814.65	8,776.75	37.90	232.558		
10,300.00	7,161.58	3,561.00	3,554.30	82.32	11.70	19.98	-1,431.56	10,557.99	8,727.18	8,688.92	38.26	228.108		
10,400.00	7,161.60	3,575.89	3,567.54	84.63	11.70	20.04	-1,431.55	10,564.81	8,639.81	8,601.16	38.64	223.569		
10,500.00	7,161.62	3,592.00	3,581.73	86.95	11.71	20.11	-1,432.20	10,572.41	8,552.93	8,513.87	39.05	219.007		
10,600.00	7,161.64	3,592.00	3,581.73	89.28	11.71	20.11	-1,432.20	10,572.41	8,466.12	8,426.66	39.47	214.506		
10,700.00	7,161.66	3,592.00	3,581.73	91.61	11.71	20.11	-1,432.20	10,572.41	8,379.62	8,339.71	39.90	209.997		
10,800.00	7,161.69	3,592.00	3,581.73	93.95	11.71	20.11	-1,432.20	10,572.41	8,293.41	8,253.05	40.36	205.485		
10,900.00	7,161.71	3,592.00	3,581.73	96.29	11.71	20.11	-1,432.20	10,572.41	8,207.52	8,166.68	40.84	200.977		
11,000.00	7,161.73	3,592.00	3,581.73	98.64	11.71	20.11	-1,432.20	10,572.41	8,121.95	8,080.61	41.34	196.478		
11,100.00	7,161.75	3,592.00	3,581.73	100.99	11.71	20.11	-1,432.20	10,572.41	8,036.72	7,994.86	41.86	191.993		
11,200.00	7,161.77	3,592.00	3,581.73	103.35	11.71	20.11	-1,432.20	10,572.41	7,951.83	7,909.42	42.40	187.528		
11,300.00	7,161.79	3,592.00	3,581.73	105.71	11.71	20.11	-1,432.20	10,572.41	7,867.29	7,824.32	42.97	183.088		
11,400.00	7,161.81	3,592.00	3,581.73	108.07	11.71	20.11	-1,432.20	10,572.41	7,783.12	7,739.56	43.56	178.678		
11,500.00	7,161.83	3,592.00	3,581.73	110.44	11.71	20.11	-1,432.20	10,572.41	7,699.33	7,655.16	44.17	174.303		
11,600.00	7,161.85	3,592.00	3,581.73	112.80	11.71	20.11	-1,432.20	10,572.41	7,615.93	7,571.12	44.81	169.968		
11,700.00	7,161.87	3,592.00	3,581.73	115.18	11.71	20.11	-1,432.20	10,572.41	7,532.93	7,487.47	45.47	165.676		
11,800.00	7,161.90	3,607.09	3,594.73	117.55	11.72	20.19	-1,433.29	10,579.98	7,449.90	7,403.74	46.16	161.392		
11,900.00	7,161.92	3,623.00	3,607.94	119.93	11.73	20.27	-1,434.80	10,588.71	7,368.04	7,321.16	46.88	157.176		
12,000.00	7,161.94	3,623.00	3,607.94	122.31	11.73	20.27	-1,434.80	10,588.71	7,286.12	7,238.51	47.61	153.040		
12,100.00	7,161.96	3,623.00	3,607.94	124.69	11.73	20.27	-1,434.80	10,588.71	7,204.65	7,156.28	48.37	148.962		
12,200.00	7,161.98	3,623.00	3,607.94	127.07	11.73	20.27	-1,434.80	10,588.71	7,123.65	7,074.50	49.15	144.944		
12,300.00	7,162.00	3,623.00	3,607.94	129.46	11.73	20.27	-1,434.80	10,588.71	7,043.14	6,993.19	49.95	140.990		
12,400.00	7,162.02	3,623.00	3,607.94	131.85	11.73	20.27	-1,434.80	10,588.71	6,963.14	6,912.35	50.79	137.102		
12,500.00	7,162.04	3,623.00	3,607.94	134.24	11.73	20.27	-1,434.80	10,588.71	6,883.66	6,832.01	51.65	133.282		
12,600.00	7,162.06	3,623.00	3,607.94	136.63	11.73	20.27	-1,434.80	10,588.71	6,804.72	6,752.18	52.53	129.533		
12,700.00	7,162.09	3,623.00	3,607.94	139.02	11.73	20.27	-1,434.80	10,588.71	6,726.34	6,672.89	53.44	125.856		
12,800.00	7,162.11	3,623.00	3,607.94	141.42	11.73	20.27	-1,434.80	10,588.71	6,648.54	6,594.16	54.38	122.252		
12,900.00	7,162.13	3,623.00	3,607.94	143.81	11.73	20.27	-1,434.80	10,588.71	6,571.34	6,515.99	55.35	118.723		
13,000.00	7,162.15	3,623.00	3,607.94	146.21	11.73	20.27	-1,434.80	10,588.71	6,494.77	6,438.42	56.34	115.270		
13,100.00	7,162.17	3,623.00	3,607.94	148.61	11.73	20.27	-1,434.80	10,588.71	6,418.83	6,361.47	57.37	111.895		
13,200.00	7,162.19	3,623.00	3,607.94	151.01	11.73	20.27	-1,434.80	10,588.71	6,343.57	6,285.16	58.41	108.597		
13,300.00	7,162.21	3,638.04	3,619.89	153.41	11.75	20.35	-1,436.39	10,597.69	6,268.54	6,209.03	59.50	105.353		
13,400.00	7,162.23	3,654.00	3,631.96	155.81	11.77	20.43	-1,438.08	10,608.01	6,194.89	6,134.28	60.61	102.207		
13,500.00	7,162.25	3,654.00	3,631.96	158.21	11.77	20.43	-1,438.08	10,608.01	6,121.46	6,059.71	61.74	99.141		
13,600.00	7,162.27	3,654.00	3,631.96	160.62	11.77	20.43	-1,438.08	10,608.01	6,048.79	5,985.88	62.91	96.154		
13,700.00	7,162.30	3,654.00	3,631.96	163.02	11.77	20.43	-1,438.08	10,608.01	5,976.91	5,912.81	64.10	93.246		
13,800.00	7,162.32	3,654.00	3,631.96	165.43	11.77	20.43	-1,438.08	10,608.01	5,905.85	5,840.53	65.32	90.417		
13,900.00	7,162.34	3,654.00	3,631.96	167.84	11.77	20.43	-1,438.08	10,608.01	5,835.63	5,769.07	66.57	87.666		
14,000.00	7,162.36	3,654.00	3,631.96	170.24	11.77	20.43	-1,438.08	10,608.01	5,766.30	5,698.45	67.84	84.993		
14,100.00	7,162.38	3,654.00	3,631.96	172.65	11.77	20.43	-1,438.08	10,608.01	5,697.88	5,628.72	69.15	82.398		
14,200.00	7,162.40	3,654.00	3,631.96	175.06	11.77	20.43	-1,438.08	10,608.01	5,630.40	5,559.91	70.48	79.881		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM						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	
14,300.00	7,162.42	3,654.00	3,631.96	177.47	11.77	20.43	-1,438.08	10,608.01	5,563.90	5,492.05	71.85	77.440		
14,400.00	7,162.44	3,686.00	3,654.28	179.88	11.81	20.57	-1,441.32	10,630.68	5,498.19	5,424.93	73.25	75.056		
14,500.00	7,162.46	3,686.00	3,654.28	182.29	11.81	20.57	-1,441.32	10,630.68	5,433.33	5,358.66	74.67	72.760		
14,600.00	7,162.49	3,686.00	3,654.28	184.71	11.81	20.57	-1,441.32	10,630.68	5,369.56	5,293.44	76.12	70.538		
14,700.00	7,162.51	3,686.00	3,654.28	187.12	11.81	20.57	-1,441.32	10,630.68	5,306.90	5,229.30	77.60	68.390		
14,800.00	7,162.53	3,686.00	3,654.28	189.53	11.81	20.57	-1,441.32	10,630.68	5,245.40	5,166.30	79.10	66.314		
14,900.00	7,162.55	3,686.00	3,654.28	191.95	11.81	20.57	-1,441.32	10,630.68	5,185.11	5,104.48	80.63	64.310		
15,000.00	7,162.57	3,686.00	3,654.28	194.36	11.81	20.57	-1,441.32	10,630.68	5,126.05	5,043.87	82.18	62.378		
15,100.00	7,162.59	3,702.95	3,665.12	196.78	11.86	20.65	-1,442.90	10,643.62	5,067.82	4,984.06	83.77	60.499		
15,200.00	7,162.61	3,718.00	3,674.12	199.19	11.91	20.71	-1,444.17	10,655.60	5,011.24	4,925.87	85.37	58.698		
15,300.00	7,162.63	3,718.00	3,674.12	201.61	11.91	20.71	-1,444.17	10,655.60	4,955.66	4,868.66	87.00	56.963		
15,400.00	7,162.65	3,718.00	3,674.12	204.03	11.91	20.71	-1,444.17	10,655.60	4,901.49	4,812.85	88.64	55.296		
15,500.00	7,162.67	3,718.00	3,674.12	206.44	11.91	20.71	-1,444.17	10,655.60	4,848.78	4,758.48	90.30	53.694		
15,600.00	7,162.70	3,750.00	3,691.79	208.86	12.05	20.81	-1,445.83	10,682.22	4,797.34	4,705.36	91.99	52.152		
15,700.00	7,162.72	3,750.00	3,691.79	211.28	12.05	20.81	-1,445.83	10,682.22	4,747.13	4,653.44	93.69	50.669		
15,800.00	7,162.74	3,750.00	3,691.79	213.70	12.05	20.81	-1,445.83	10,682.22	4,698.51	4,603.10	95.41	49.248		
15,900.00	7,162.76	3,765.56	3,699.79	216.12	12.13	20.86	-1,446.44	10,695.55	4,651.26	4,554.12	97.14	47.883		
16,000.00	7,162.78	3,782.00	3,707.89	218.54	12.22	20.92	-1,447.60	10,709.81	4,605.67	4,506.78	98.90	46.570		
16,100.00	7,162.80	3,782.00	3,707.89	220.96	12.22	20.92	-1,447.60	10,709.81	4,561.52	4,460.87	100.65	45.320		
16,200.00	7,162.82	3,814.00	3,722.96	223.38	12.43	21.02	-1,449.63	10,737.96	4,518.77	4,416.30	102.46	44.102		
16,300.00	7,162.84	3,814.00	3,722.96	225.80	12.43	21.02	-1,449.63	10,737.96	4,477.59	4,373.36	104.23	42.957		
16,400.00	7,162.86	3,845.00	3,736.61	228.22	12.67	21.11	-1,451.58	10,765.72	4,437.91	4,331.84	106.07	41.838		
16,500.00	7,162.88	3,845.00	3,736.61	230.64	12.67	21.11	-1,451.58	10,765.72	4,399.90	4,292.04	107.85	40.795		
16,600.00	7,162.91	3,845.00	3,736.61	233.06	12.67	21.11	-1,451.58	10,765.72	4,363.85	4,254.22	109.63	39.806		
16,700.00	7,162.93	3,862.22	3,743.50	235.49	12.83	21.16	-1,453.00	10,781.44	4,329.43	4,217.97	111.46	38.842		
16,800.00	7,162.95	3,877.00	3,748.86	237.91	12.96	21.20	-1,454.11	10,795.17	4,297.03	4,183.76	113.28	37.934		
16,879.97	7,162.96	3,877.00	3,748.86	239.84	12.96	21.20	-1,454.11	10,795.17	4,272.41	4,157.73	114.68	37.256		
16,900.00	7,162.97	3,877.00	3,748.86	240.33	12.96	21.20	-1,454.11	10,795.17	4,266.45	4,151.43	115.03	37.091		
17,000.00	7,162.99	3,895.11	3,754.79	242.75	13.14	21.25	-1,455.14	10,812.25	4,237.76	4,120.93	116.83	36.273		
17,056.99	7,163.00	3,909.00	3,758.90	244.13	13.29	21.27	-1,455.54	10,825.50	4,222.26	4,104.42	117.85	35.828 CC, ES, 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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 100-B001Mb_MWD+HRGM												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	364.00	364.00	0.00	1.30	103.87	-2,641.11	10,692.89	11,014.24				
100.00	100.00	464.00	464.00	0.25	1.66	103.87	-2,641.11	10,692.89	11,014.24	11,012.32	1.91	5,753.849	
200.00	200.00	564.00	564.00	0.61	2.02	103.87	-2,641.11	10,692.89	11,014.24	11,011.61	2.63	4,186.043	
300.00	300.00	664.00	664.00	0.97	2.38	103.87	-2,641.11	10,692.89	11,014.24	11,010.89	3.35	3,289.674	
400.00	400.00	764.00	764.00	1.33	2.74	103.87	-2,641.11	10,692.89	11,014.24	11,010.17	4.07	2,709.485	
500.00	500.00	864.00	864.00	1.68	3.10	103.87	-2,641.11	10,692.89	11,014.24	11,009.46	4.78	2,303.265	
600.00	599.98	963.98	963.98	2.04	3.46	-171.36	-2,641.11	10,692.89	11,015.96	11,010.47	5.49	2,005.889	
700.00	699.84	1,063.84	1,063.84	2.39	3.81	-171.35	-2,641.11	10,692.89	11,021.14	11,014.94	6.20	1,777.666	
722.35	722.13	1,086.13	1,086.13	2.47	3.89	-171.34	-2,641.11	10,692.89	11,022.76	11,016.40	6.36	1,732.949	
800.00	799.54	1,163.54	1,163.54	2.74	4.17	-171.35	-2,641.11	10,692.89	11,028.72	11,021.81	6.91	1,596.089	
900.00	899.24	1,263.24	1,263.24	3.10	4.53	-171.35	-2,641.11	10,692.89	11,036.38	11,028.76	7.62	1,448.535	
1,000.00	998.94	1,362.94	1,362.94	3.47	4.89	-171.36	-2,641.11	10,692.89	11,044.05	11,035.72	8.33	1,325.758	
1,100.00	1,098.64	1,462.64	1,462.64	3.83	5.24	-171.37	-2,641.11	10,692.89	11,051.72	11,042.67	9.04	1,222.085	
1,200.00	1,198.34	1,562.34	1,562.34	4.20	5.60	-171.37	-2,641.11	10,692.89	11,059.38	11,049.63	9.76	1,133.427	
1,300.00	1,298.04	1,662.04	1,662.04	4.57	5.96	-171.38	-2,641.11	10,692.89	11,067.05	11,056.58	10.47	1,056.770	
1,400.00	1,397.74	1,761.74	1,761.74	4.94	6.32	-171.38	-2,641.11	10,692.89	11,074.72	11,063.53	11.19	989.850	
1,500.00	1,497.44	1,861.44	1,861.44	5.31	6.67	-171.39	-2,641.11	10,692.89	11,082.38	11,070.48	11.90	930.933	
1,600.00	1,597.13	1,961.13	1,961.13	5.68	7.03	-171.40	-2,641.11	10,692.89	11,090.05	11,077.43	12.62	878.673	
1,700.00	1,696.83	2,060.83	2,060.83	6.05	7.39	-171.40	-2,641.11	10,692.89	11,097.72	11,084.38	13.34	832.006	
1,800.00	1,796.53	2,160.53	2,160.53	6.43	7.74	-171.41	-2,641.11	10,692.89	11,105.38	11,091.33	14.06	790.084	
1,900.00	1,896.23	2,260.23	2,260.23	6.80	8.10	-171.41	-2,641.11	10,692.89	11,113.05	11,098.28	14.77	752.221	
2,000.00	1,995.93	2,359.93	2,359.93	7.17	8.46	-171.42	-2,641.11	10,692.89	11,120.72	11,105.23	15.49	717.856	
2,100.00	2,095.63	2,459.63	2,459.63	7.54	8.82	-171.43	-2,641.11	10,692.89	11,128.39	11,112.18	16.21	686.527	
2,200.00	2,195.33	2,559.33	2,559.33	7.92	9.17	-171.43	-2,641.11	10,692.89	11,136.05	11,119.13	16.93	657.850	
2,300.00	2,295.03	2,659.03	2,659.03	8.29	9.53	-171.44	-2,641.11	10,692.89	11,143.72	11,126.08	17.65	631.503	
2,400.00	2,394.73	2,758.73	2,758.73	8.66	9.89	-171.44	-2,641.11	10,692.89	11,151.39	11,133.03	18.36	607.212	
2,500.00	2,494.43	2,858.43	2,858.43	9.04	10.25	-171.45	-2,641.11	10,692.89	11,159.06	11,139.97	19.08	584.748	
2,600.00	2,594.12	2,958.12	2,958.12	9.41	10.60	-171.45	-2,641.11	10,692.89	11,166.73	11,146.92	19.80	563.912	
2,700.00	2,693.82	3,057.82	3,057.82	9.79	10.96	-171.46	-2,641.11	10,692.89	11,174.39	11,153.87	20.52	544.532	
2,800.00	2,793.52	3,157.52	3,157.52	10.16	11.32	-171.47	-2,641.11	10,692.89	11,182.06	11,160.82	21.24	526.463	
2,900.00	2,893.22	3,257.22	3,257.22	10.53	11.68	-171.47	-2,641.11	10,692.89	11,189.73	11,167.77	21.96	509.575	
3,000.00	2,992.92	3,356.92	3,356.92	10.91	12.03	-171.48	-2,641.11	10,692.89	11,197.40	11,174.72	22.68	493.757	
3,100.00	3,092.62	3,456.62	3,456.62	11.28	12.39	-171.48	-2,641.11	10,692.89	11,205.07	11,181.67	23.40	478.910	
3,200.00	3,192.32	3,459.00	3,459.00	11.66	12.40	-171.48	-2,641.11	10,692.89	11,213.16	11,189.40	23.76	471.907	
3,300.00	3,292.02	3,459.00	3,459.00	12.03	12.40	-171.48	-2,641.11	10,692.89	11,222.14	11,198.02	24.12	465.359	
3,400.00	3,391.72	3,459.00	3,459.00	12.41	12.40	-171.48	-2,641.11	10,692.89	11,232.00	11,207.53	24.47	459.075	
3,500.00	3,491.41	3,459.00	3,459.00	12.78	12.40	-171.48	-2,641.11	10,692.89	11,242.74	11,217.92	24.82	453.043	
3,600.00	3,591.11	3,459.00	3,459.00	13.15	12.40	-171.48	-2,641.11	10,692.89	11,254.35	11,229.19	25.16	447.253	
3,700.00	3,690.81	3,459.00	3,459.00	13.53	12.40	-171.48	-2,641.11	10,692.89	11,266.85	11,241.34	25.51	441.694	
3,800.00	3,790.51	3,459.00	3,459.00	13.90	12.40	-171.48	-2,641.11	10,692.89	11,280.22	11,254.36	25.85	436.355	
3,900.00	3,890.21	3,500.00	3,499.87	14.28	12.55	-171.49	-2,641.13	10,695.69	11,294.36	11,268.02	26.35	428.704	
4,000.00	3,989.91	3,500.00	3,499.87	14.65	12.55	-171.49	-2,641.13	10,695.69	11,309.11	11,282.42	26.68	423.818	
4,100.00	4,089.61	3,500.00	3,499.87	15.03	12.55	-171.49	-2,641.13	10,695.69	11,324.72	11,297.70	27.02	419.123	
4,200.00	4,189.31	3,500.00	3,499.87	15.40	12.55	-171.49	-2,641.13	10,695.69	11,341.19	11,313.83	27.35	414.612	
4,300.00	4,289.01	3,500.00	3,499.87	15.78	12.55	-171.49	-2,641.13	10,695.69	11,358.51	11,330.83	27.68	410.278	
4,400.00	4,388.70	3,500.00	3,499.87	16.15	12.55	-171.49	-2,641.13	10,695.69	11,376.69	11,348.68	28.01	406.114	
4,500.00	4,488.40	3,500.00	3,499.87	16.53	12.55	-171.49	-2,641.13	10,695.69	11,395.72	11,367.38	28.34	402.113	
4,600.00	4,588.10	3,500.00	3,499.87	16.90	12.55	-171.49	-2,641.13	10,695.69	11,415.59	11,386.92	28.66	398.268	
4,700.00	4,687.80	3,500.00	3,499.87	17.27	12.55	-171.49	-2,641.13	10,695.69	11,436.30	11,407.31	28.98	394.573	
4,800.00	4,787.50	3,500.00	3,499.87	17.65	12.55	-171.49	-2,641.13	10,695.69	11,457.84	11,428.54	29.30	391.023	
4,900.00	4,887.20	3,500.00	3,499.87	18.02	12.55	-171.49	-2,641.13	10,695.69	11,480.22	11,450.60	29.62	387.612	
5,000.00	4,986.90	3,500.00	3,499.87	18.40	12.55	-171.49	-2,641.13	10,695.69	11,503.42	11,473.49	29.93	384.334	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		100-B001Mb_MWD+HRGM						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)
5,100.00	5,086.60	3,500.00	3,499.87	18.77	12.55	-171.49	-2,641.13	10,695.69	11,527.45	11,497.20	30.24	381.185	
5,200.00	5,186.30	3,500.00	3,499.87	19.15	12.55	-171.49	-2,641.13	10,695.69	11,552.28	11,521.74	30.55	378.160	
5,300.00	5,286.00	3,500.00	3,499.87	19.52	12.55	-171.49	-2,641.13	10,695.69	11,577.93	11,547.08	30.85	375.254	
5,400.00	5,385.69	3,500.00	3,499.87	19.90	12.55	-171.49	-2,641.13	10,695.69	11,604.39	11,573.23	31.16	372.462	
5,500.00	5,485.39	3,500.00	3,499.87	20.27	12.55	-171.49	-2,641.13	10,695.69	11,631.64	11,600.19	31.46	369.781	
5,600.00	5,585.09	3,500.00	3,499.87	20.65	12.55	-171.49	-2,641.13	10,695.69	11,659.69	11,627.94	31.75	367.206	
5,700.00	5,684.79	3,500.00	3,499.87	21.02	12.55	-171.49	-2,641.13	10,695.69	11,688.53	11,656.48	32.05	364.733	
5,800.00	5,784.49	3,500.00	3,499.87	21.40	12.55	-171.49	-2,641.13	10,695.69	11,718.15	11,685.81	32.34	362.359	
5,900.00	5,884.19	3,500.00	3,499.87	21.77	12.55	-171.49	-2,641.13	10,695.69	11,748.54	11,715.91	32.63	360.080	
6,000.00	5,983.89	3,500.00	3,499.87	22.15	12.55	-171.49	-2,641.13	10,695.69	11,779.71	11,746.79	32.91	357.893	
6,100.00	6,083.59	3,500.00	3,499.87	22.52	12.55	-171.49	-2,641.13	10,695.69	11,811.64	11,778.44	33.20	355.794	
6,200.00	6,183.29	3,500.00	3,499.87	22.90	12.55	-171.49	-2,641.13	10,695.69	11,844.33	11,810.85	33.48	353.780	
6,300.00	6,282.98	3,500.00	3,499.87	23.27	12.55	-171.49	-2,641.13	10,695.69	11,877.77	11,844.01	33.76	351.848	
6,400.00	6,382.68	3,500.00	3,499.87	23.65	12.55	-171.49	-2,641.13	10,695.69	11,911.95	11,877.92	34.03	349.996	
6,492.83	6,475.23	3,500.00	3,499.87	24.00	12.55	-171.49	-2,641.13	10,695.69	11,944.35	11,910.06	34.29	348.344	
6,500.00	6,482.39	3,500.00	3,499.87	24.02	12.55	-172.41	-2,641.13	10,695.69	11,946.84	11,912.53	34.31	348.223	
6,550.00	6,532.35	3,500.00	3,499.87	24.19	12.55	42.19	-2,641.13	10,695.69	11,962.26	11,927.83	34.43	347.414	
6,600.00	6,582.27	3,500.00	3,499.87	24.34	12.55	17.33	-2,641.13	10,695.69	11,974.19	11,939.65	34.54	346.639	
6,650.00	6,631.83	3,548.82	3,547.49	24.49	12.72	15.16	-2,641.20	10,706.24	11,978.62	11,943.77	34.85	343.693	
6,700.00	6,680.73	3,550.07	3,548.68	24.62	12.72	14.33	-2,641.20	10,706.61	11,983.22	11,948.26	34.96	342.774	
6,750.00	6,728.67	3,600.00	3,594.87	24.74	12.90	13.93	-2,641.33	10,725.42	11,988.14	11,952.88	35.26	339.976	
6,800.00	6,775.35	3,600.00	3,594.87	24.86	12.90	13.76	-2,641.33	10,725.42	11,985.29	11,949.94	35.35	339.042	
6,850.00	6,820.48	3,600.00	3,594.87	24.98	12.90	13.74	-2,641.33	10,725.42	11,978.84	11,943.41	35.43	338.084	
6,900.00	6,863.78	3,600.00	3,594.87	25.09	12.90	13.84	-2,641.33	10,725.42	11,968.81	11,933.31	35.50	337.104	
6,950.00	6,904.99	3,600.00	3,594.87	25.21	12.90	14.04	-2,641.33	10,725.42	11,955.27	11,919.70	35.57	336.104	
7,000.00	6,943.86	3,600.00	3,594.87	25.33	12.90	14.36	-2,641.33	10,725.42	11,938.28	11,902.66	35.63	335.084	
7,050.00	6,980.14	3,600.00	3,594.87	25.47	12.90	14.80	-2,641.33	10,725.42	11,917.94	11,882.26	35.68	334.042	
7,100.00	7,013.60	3,600.00	3,594.87	25.62	12.90	15.37	-2,641.33	10,725.42	11,894.35	11,858.63	35.72	332.976	
7,150.00	7,044.06	3,600.00	3,594.87	25.79	12.90	16.09	-2,641.33	10,725.42	11,867.63	11,831.88	35.76	331.883	
7,200.00	7,071.31	3,600.00	3,594.87	26.00	12.90	16.98	-2,641.33	10,725.42	11,837.94	11,802.15	35.79	330.761	
7,250.00	7,095.18	3,600.00	3,594.87	26.23	12.90	18.10	-2,641.33	10,725.42	11,805.44	11,769.62	35.82	329.606	
7,300.00	7,115.54	3,600.00	3,594.87	26.50	12.90	19.48	-2,641.33	10,725.42	11,770.29	11,734.45	35.84	328.415	
7,350.00	7,132.25	3,600.00	3,594.87	26.81	12.90	21.22	-2,641.33	10,725.42	11,732.71	11,696.85	35.86	327.185	
7,400.00	7,145.22	3,600.00	3,594.87	27.16	12.90	23.43	-2,641.33	10,725.42	11,692.89	11,657.01	35.88	325.915	
7,450.00	7,154.36	3,600.00	3,594.87	27.55	12.90	26.27	-2,641.33	10,725.42	11,651.05	11,615.16	35.89	324.603	
7,500.00	7,159.61	3,600.00	3,594.87	27.97	12.90	30.00	-2,641.33	10,725.42	11,607.45	11,571.54	35.91	323.247	
7,541.91	7,161.00	3,600.00	3,594.87	28.35	12.90	34.09	-2,641.33	10,725.42	11,569.72	11,533.79	35.92	322.071	
7,600.00	7,161.01	3,600.00	3,594.87	28.92	12.90	34.09	-2,641.33	10,725.42	11,516.77	11,480.83	35.94	320.439	
7,700.00	7,161.03	3,600.00	3,594.87	30.03	12.90	34.09	-2,641.33	10,725.42	11,425.74	11,389.76	35.98	317.541	
7,800.00	7,161.05	3,600.00	3,594.87	31.29	12.90	34.09	-2,641.33	10,725.42	11,334.86	11,298.82	36.04	314.484	
7,900.00	7,161.08	3,600.00	3,594.87	32.69	12.90	34.09	-2,641.33	10,725.42	11,244.14	11,208.01	36.12	311.267	
8,000.00	7,161.10	3,600.00	3,594.87	34.20	12.90	34.09	-2,641.33	10,725.42	11,153.57	11,117.35	36.23	307.891	
8,100.00	7,161.12	3,600.00	3,594.87	35.81	12.90	34.09	-2,641.33	10,725.42	11,063.17	11,026.82	36.35	304.357	
8,200.00	7,161.14	3,600.00	3,594.87	37.52	12.90	34.09	-2,641.33	10,725.42	10,972.93	10,936.44	36.49	300.670	
8,300.00	7,161.16	3,600.00	3,594.87	39.30	12.90	34.09	-2,641.33	10,725.42	10,882.87	10,846.20	36.66	296.832	
8,400.00	7,161.18	3,600.00	3,594.87	41.15	12.90	34.09	-2,641.33	10,725.42	10,792.98	10,756.12	36.86	292.848	
8,500.00	7,161.20	3,600.00	3,594.87	43.05	12.90	34.09	-2,641.33	10,725.42	10,703.27	10,666.19	37.07	288.725	
8,600.00	7,161.22	3,600.00	3,594.87	45.01	12.90	34.09	-2,641.33	10,725.42	10,613.74	10,576.43	37.31	284.468	
8,700.00	7,161.24	3,600.00	3,594.87	47.02	12.90	34.09	-2,641.33	10,725.42	10,524.40	10,486.82	37.58	280.086	
8,800.00	7,161.26	3,600.00	3,594.87	49.06	12.90	34.09	-2,641.33	10,725.42	10,435.26	10,397.39	37.87	275.587	
8,900.00	7,161.29	3,600.00	3,594.87	51.14	12.90	34.09	-2,641.33	10,725.42	10,346.31	10,308.13	38.18	270.980	
9,000.00	7,161.31	3,600.00	3,594.87	53.24	12.90	34.09	-2,641.33	10,725.42	10,257.57	10,219.04	38.52	266.275	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		100-B001Mb_MWD+HRGM						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		Distance		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
9,100.00	7,161.33	3,600.00	3,594.87	55.38	12.90	34.09	-2,641.33	10,725.42	10,169.03	10,130.14	38.89	261.482		
9,200.00	7,161.35	3,600.00	3,594.87	57.54	12.90	34.09	-2,641.33	10,725.42	10,080.71	10,041.43	39.28	256.611		
9,300.00	7,161.37	3,600.00	3,594.87	59.72	12.90	34.09	-2,641.33	10,725.42	9,992.61	9,952.91	39.70	251.674		
9,400.00	7,161.39	3,600.00	3,594.87	61.92	12.90	34.09	-2,641.33	10,725.42	9,904.74	9,864.59	40.15	246.681		
9,500.00	7,161.41	3,600.00	3,594.87	64.13	12.90	34.09	-2,641.33	10,725.42	9,817.10	9,776.47	40.63	241.643		
9,600.00	7,161.43	3,600.00	3,594.87	66.36	12.90	34.09	-2,641.33	10,725.42	9,729.69	9,688.57	41.13	236.571		
9,700.00	7,161.45	3,600.00	3,594.87	68.61	12.90	34.09	-2,641.33	10,725.42	9,642.54	9,600.88	41.66	231.475		
9,800.00	7,161.48	3,600.00	3,594.87	70.87	12.90	34.09	-2,641.33	10,725.42	9,555.63	9,513.42	42.21	226.366		
9,900.00	7,161.50	3,600.00	3,594.87	73.14	12.90	34.09	-2,641.33	10,725.42	9,468.98	9,426.18	42.80	221.254		
10,000.00	7,161.52	3,600.00	3,594.87	75.42	12.90	34.09	-2,641.33	10,725.42	9,382.60	9,339.19	43.41	216.149		
10,100.00	7,161.54	3,600.00	3,594.87	77.71	12.90	34.09	-2,641.33	10,725.42	9,296.49	9,252.44	44.05	211.059		
10,200.00	7,161.56	3,600.00	3,594.87	80.01	12.90	34.09	-2,641.33	10,725.42	9,210.66	9,165.95	44.71	205.993		
10,300.00	7,161.58	3,600.00	3,594.87	82.32	12.90	34.09	-2,641.33	10,725.42	9,125.12	9,079.71	45.41	200.959		
10,400.00	7,161.60	3,600.00	3,594.87	84.63	12.90	34.09	-2,641.33	10,725.42	9,039.88	8,993.75	46.13	195.965		
10,500.00	7,161.62	3,600.00	3,594.87	86.95	12.90	34.09	-2,641.33	10,725.42	8,954.94	8,908.06	46.88	191.018		
10,600.00	7,161.64	3,600.00	3,594.87	89.28	12.90	34.09	-2,641.33	10,725.42	8,870.31	8,822.66	47.66	186.124		
10,700.00	7,161.66	3,600.00	3,594.87	91.61	12.90	34.09	-2,641.33	10,725.42	8,786.01	8,737.55	48.46	181.289		
10,800.00	7,161.69	3,600.00	3,594.87	93.95	12.90	34.09	-2,641.33	10,725.42	8,702.04	8,652.75	49.30	176.518		
10,900.00	7,161.71	3,600.00	3,594.87	96.29	12.90	34.09	-2,641.33	10,725.42	8,618.42	8,568.26	50.16	171.816		
11,000.00	7,161.73	3,600.00	3,594.87	98.64	12.90	34.09	-2,641.33	10,725.42	8,535.14	8,484.09	51.05	167.187		
11,100.00	7,161.75	3,600.00	3,594.87	100.99	12.90	34.09	-2,641.33	10,725.42	8,452.23	8,400.26	51.97	162.635		
11,200.00	7,161.77	3,613.75	3,606.98	103.35	12.96	34.18	-2,641.37	10,731.93	8,369.38	8,316.42	52.97	158.016		
11,300.00	7,161.79	3,627.76	3,619.00	105.71	13.01	34.26	-2,641.42	10,739.12	8,287.39	8,233.40	53.99	153.510		
11,400.00	7,161.81	3,627.76	3,619.00	108.07	13.01	34.26	-2,641.42	10,739.12	8,205.46	8,150.47	54.99	149.217		
11,500.00	7,161.83	3,627.76	3,619.00	110.44	13.01	34.26	-2,641.42	10,739.12	8,123.94	8,067.92	56.02	145.010		
11,600.00	7,161.85	3,627.76	3,619.00	112.80	13.01	34.26	-2,641.42	10,739.12	8,042.84	7,985.75	57.09	140.890		
11,700.00	7,161.87	3,627.76	3,619.00	115.18	13.01	34.26	-2,641.42	10,739.12	7,962.16	7,903.98	58.18	136.860		
11,800.00	7,161.90	3,627.76	3,619.00	117.55	13.01	34.26	-2,641.42	10,739.12	7,881.93	7,822.63	59.30	132.919		
11,900.00	7,161.92	3,627.76	3,619.00	119.93	13.01	34.26	-2,641.42	10,739.12	7,802.16	7,741.71	60.45	129.068		
12,000.00	7,161.94	3,627.76	3,619.00	122.31	13.01	34.26	-2,641.42	10,739.12	7,722.85	7,661.22	61.63	125.308		
12,100.00	7,161.96	3,627.76	3,619.00	124.69	13.01	34.26	-2,641.42	10,739.12	7,644.03	7,581.19	62.84	121.638		
12,200.00	7,161.98	3,627.76	3,619.00	127.07	13.01	34.26	-2,641.42	10,739.12	7,565.72	7,501.63	64.08	118.059		
12,300.00	7,162.00	3,627.76	3,619.00	129.46	13.01	34.26	-2,641.42	10,739.12	7,487.91	7,422.56	65.36	114.571		
12,400.00	7,162.02	3,627.76	3,619.00	131.85	13.01	34.26	-2,641.42	10,739.12	7,410.65	7,343.99	66.66	111.172		
12,500.00	7,162.04	3,627.76	3,619.00	134.24	13.01	34.26	-2,641.42	10,739.12	7,333.93	7,265.93	67.99	107.862		
12,600.00	7,162.06	3,627.76	3,619.00	136.63	13.01	34.26	-2,641.42	10,739.12	7,257.78	7,188.42	69.36	104.641		
12,700.00	7,162.09	3,627.76	3,619.00	139.02	13.01	34.26	-2,641.42	10,739.12	7,182.21	7,111.45	70.76	101.507		
12,800.00	7,162.11	3,627.76	3,619.00	141.42	13.01	34.26	-2,641.42	10,739.12	7,107.24	7,035.06	72.18	98.460		
12,900.00	7,162.13	3,627.76	3,619.00	143.81	13.01	34.26	-2,641.42	10,739.12	7,032.90	6,959.26	73.64	95.499		
13,000.00	7,162.15	3,627.76	3,619.00	146.21	13.01	34.26	-2,641.42	10,739.12	6,959.21	6,884.07	75.14	92.622		
13,100.00	7,162.17	3,627.76	3,619.00	148.61	13.01	34.26	-2,641.42	10,739.12	6,886.17	6,809.51	76.66	89.828		
13,200.00	7,162.19	3,627.76	3,619.00	151.01	13.01	34.26	-2,641.42	10,739.12	6,813.82	6,735.60	78.22	87.115		
13,300.00	7,162.21	3,627.76	3,619.00	153.41	13.01	34.26	-2,641.42	10,739.12	6,742.18	6,662.37	79.80	84.484		
13,400.00	7,162.23	3,664.69	3,648.95	155.81	13.14	34.46	-2,641.56	10,760.69	6,669.08	6,587.56	81.52	81.811		
13,500.00	7,162.25	3,700.00	3,674.90	158.21	13.27	34.65	-2,641.72	10,784.60	6,600.23	6,516.98	83.24	79.288		
13,600.00	7,162.27	3,700.00	3,674.90	160.62	13.27	34.65	-2,641.72	10,784.60	6,530.14	6,445.21	84.93	76.887		
13,700.00	7,162.30	3,700.00	3,674.90	163.02	13.27	34.65	-2,641.72	10,784.60	6,460.84	6,374.18	86.65	74.560		
13,800.00	7,162.32	3,700.00	3,674.90	165.43	13.27	34.65	-2,641.72	10,784.60	6,392.35	6,303.94	88.41	72.306		
13,900.00	7,162.34	3,700.00	3,674.90	167.84	13.27	34.65	-2,641.72	10,784.60	6,324.70	6,234.51	90.19	70.123		
14,000.00	7,162.36	3,700.00	3,674.90	170.24	13.27	34.65	-2,641.72	10,784.60	6,257.92	6,165.91	92.01	68.011		
14,100.00	7,162.38	3,700.00	3,674.90	172.65	13.27	34.65	-2,641.72	10,784.60	6,192.03	6,098.17	93.86	65.968		
14,200.00	7,162.40	3,700.00	3,674.90	175.06	13.27	34.65	-2,641.72	10,784.60	6,127.07	6,031.32	95.75	63.992		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		100-B001Mb_MWD+HRGM <th colspan="2">Rule Assigned:</th> <th colspan="4"></th> <th>Offset Well Error:</th> <td>0.00 usft</td>					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)	
14,300.00	7,162.42	3,700.00	3,674.90	177.47	13.27	34.65	-2,641.72	10,784.60	6,063.06	5,965.40	97.66	62.082		
14,400.00	7,162.44	3,700.00	3,674.90	179.88	13.27	34.65	-2,641.72	10,784.60	6,000.03	5,900.42	99.61	60.236		
14,500.00	7,162.46	3,700.00	3,674.90	182.29	13.27	34.65	-2,641.72	10,784.60	5,938.02	5,836.44	101.58	58.454		
14,600.00	7,162.49	3,700.00	3,674.90	184.71	13.27	34.65	-2,641.72	10,784.60	5,877.06	5,773.47	103.59	56.734		
14,700.00	7,162.51	3,700.00	3,674.90	187.12	13.27	34.65	-2,641.72	10,784.60	5,817.18	5,711.55	105.63	55.074		
14,800.00	7,162.53	3,700.00	3,674.90	189.53	13.27	34.65	-2,641.72	10,784.60	5,758.41	5,650.72	107.69	53.473		
14,900.00	7,162.55	3,700.00	3,674.90	191.95	13.27	34.65	-2,641.72	10,784.60	5,700.79	5,591.01	109.78	51.930		
15,000.00	7,162.57	3,700.00	3,674.90	194.36	13.27	34.65	-2,641.72	10,784.60	5,644.35	5,532.46	111.89	50.444		
15,100.00	7,162.59	3,700.00	3,674.90	196.78	13.27	34.65	-2,641.72	10,784.60	5,589.13	5,475.10	114.03	49.013		
15,200.00	7,162.61	3,700.00	3,674.90	199.19	13.27	34.65	-2,641.72	10,784.60	5,535.17	5,418.97	116.20	47.637		
15,300.00	7,162.63	3,700.00	3,674.90	201.61	13.27	34.65	-2,641.72	10,784.60	5,482.50	5,364.12	118.38	46.313		
15,400.00	7,162.65	3,700.00	3,674.90	204.03	13.27	34.65	-2,641.72	10,784.60	5,431.16	5,310.58	120.58	45.040		
15,500.00	7,162.67	3,700.00	3,674.90	206.44	13.27	34.65	-2,641.72	10,784.60	5,381.19	5,258.39	122.81	43.819		
15,600.00	7,162.70	3,750.77	3,706.90	208.86	13.54	34.87	-2,641.98	10,823.94	5,328.67	5,203.47	125.20	42.560		
15,700.00	7,162.72	3,800.00	3,731.17	211.28	13.80	35.04	-2,642.26	10,866.71	5,283.72	5,156.19	127.53	41.433		
15,800.00	7,162.74	3,800.00	3,731.17	213.70	13.80	35.04	-2,642.26	10,866.71	5,236.50	5,106.69	129.82	40.337		
15,900.00	7,162.76	3,800.00	3,731.17	216.12	13.80	35.04	-2,642.26	10,866.71	5,190.79	5,058.67	132.12	39.288		
16,000.00	7,162.78	3,800.00	3,731.17	218.54	13.80	35.04	-2,642.26	10,866.71	5,146.61	5,012.17	134.43	38.284		
16,100.00	7,162.80	3,800.00	3,731.17	220.96	13.80	35.04	-2,642.26	10,866.71	5,104.00	4,967.25	136.75	37.324		
16,200.00	7,162.82	3,800.00	3,731.17	223.38	13.80	35.04	-2,642.26	10,866.71	5,063.02	4,923.95	139.07	36.406		
16,300.00	7,162.84	3,800.00	3,731.17	225.80	13.80	35.04	-2,642.26	10,866.71	5,023.69	4,882.30	141.39	35.531		
16,400.00	7,162.86	3,800.00	3,731.17	228.22	13.80	35.04	-2,642.26	10,866.71	4,986.05	4,842.35	143.71	34.696		
16,500.00	7,162.88	3,800.00	3,731.17	230.64	13.80	35.04	-2,642.26	10,866.71	4,950.15	4,804.14	146.01	33.902		
16,600.00	7,162.91	3,800.00	3,731.17	233.06	13.80	35.04	-2,642.26	10,866.71	4,916.02	4,767.71	148.31	33.147		
16,700.00	7,162.93	3,800.00	3,731.17	235.49	13.80	35.04	-2,642.26	10,866.71	4,883.70	4,733.11	150.59	32.429		
16,800.00	7,162.95	3,800.00	3,731.17	237.91	13.80	35.04	-2,642.26	10,866.71	4,853.23	4,700.37	152.86	31.750		
16,879.97	7,162.96	3,800.00	3,731.17	239.84	13.80	35.04	-2,642.26	10,866.71	4,830.21	4,675.56	154.65	31.232		
16,900.00	7,162.97	3,800.00	3,731.17	240.33	13.80	35.04	-2,642.26	10,866.71	4,824.64	4,669.54	155.10	31.106		
17,000.00	7,162.99	3,800.00	3,731.17	242.75	13.80	35.04	-2,642.26	10,866.71	4,797.96	4,640.64	157.32	30.498		
17,056.99	7,163.00	3,800.00	3,731.17	244.13	13.80	35.04	-2,642.26	10,866.71	4,783.63	4,625.06	158.57	30.168 CC, ES, 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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - Plan #2													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	34.43	24.76	16.97	30.01				
100.00	100.00	100.00	100.00	0.25	0.25	34.43	24.76	16.97	30.01	29.51	0.50	59.804	
200.00	200.00	200.00	200.00	0.61	0.61	34.43	24.76	16.97	30.01	28.79	1.22	24.625	
300.00	300.00	300.00	300.00	0.97	0.97	34.43	24.76	16.97	30.01	28.08	1.94	15.505	
400.00	400.00	400.00	400.00	1.33	1.33	34.43	24.76	16.97	30.01	27.36	2.65	11.314	
500.00	500.00	500.00	500.00	1.68	1.68	34.43	24.76	16.97	30.01	26.64	3.37	8.907 CC, ES	
600.00	599.98	598.99	598.97	2.04	2.04	120.58	26.44	17.27	32.45	28.37	4.08	7.961 SF	
700.00	699.84	697.59	697.43	2.39	2.40	123.70	31.46	18.19	39.84	35.06	4.78	8.336	
722.35	722.13	719.54	719.32	2.47	2.48	124.44	33.03	18.47	42.19	37.25	4.94	8.541	
800.00	799.54	795.52	795.00	2.74	2.75	126.11	39.74	19.69	51.67	46.19	5.48	9.425	
900.00	899.24	892.71	891.48	3.10	3.11	126.14	51.20	21.77	66.48	60.30	6.18	10.759	
1,000.00	998.94	988.96	986.59	3.47	3.46	124.99	65.71	24.41	84.14	77.27	6.87	12.247	
1,100.00	1,098.64	1,084.06	1,080.02	3.83	3.83	123.36	83.13	27.57	104.70	97.14	7.56	13.858	
1,200.00	1,198.34	1,177.82	1,171.52	4.20	4.20	121.61	103.29	31.24	128.17	119.94	8.23	15.574	
1,300.00	1,298.04	1,274.44	1,265.42	4.57	4.60	120.08	125.66	35.30	153.25	144.31	8.94	17.138	
1,400.00	1,397.74	1,371.18	1,359.44	4.94	5.01	118.97	148.07	39.37	178.40	168.73	9.67	18.451	
1,500.00	1,497.44	1,467.91	1,453.45	5.31	5.43	118.14	170.48	43.44	203.60	193.21	10.40	19.584	
1,600.00	1,597.13	1,564.65	1,547.47	5.68	5.85	117.49	192.88	47.52	228.83	217.71	11.13	20.566	
1,700.00	1,696.83	1,661.38	1,641.49	6.05	6.27	116.97	215.29	51.59	254.09	242.23	11.86	21.424	
1,800.00	1,796.53	1,758.12	1,735.50	6.43	6.70	116.55	237.70	55.66	279.35	266.76	12.60	22.180	
1,900.00	1,896.23	1,854.86	1,829.52	6.80	7.12	116.19	260.10	59.73	304.64	291.30	13.33	22.850	
2,000.00	1,995.93	1,951.59	1,923.54	7.17	7.55	115.89	282.51	63.80	329.93	315.86	14.07	23.448	
2,100.00	2,095.63	2,048.33	2,017.55	7.54	7.99	115.64	304.91	67.87	355.22	340.41	14.81	23.985	
2,200.00	2,195.33	2,145.06	2,111.57	7.92	8.42	115.41	327.32	71.94	380.53	364.98	15.55	24.470	
2,300.00	2,295.03	2,241.80	2,205.59	8.29	8.86	115.22	349.73	76.01	405.84	389.54	16.29	24.909	
2,400.00	2,394.73	2,338.53	2,299.61	8.66	9.29	115.04	372.13	80.09	431.15	414.11	17.03	25.310	
2,500.00	2,494.43	2,435.27	2,393.62	9.04	9.73	114.89	394.54	84.16	456.46	438.69	17.78	25.676	
2,600.00	2,594.12	2,532.01	2,487.64	9.41	10.17	114.75	416.95	88.23	481.78	463.26	18.52	26.011	
2,700.00	2,693.82	2,628.74	2,581.66	9.79	10.61	114.63	439.35	92.30	507.10	487.84	19.27	26.321	
2,800.00	2,793.52	2,725.48	2,675.67	10.16	11.05	114.52	461.76	96.37	532.42	512.41	20.01	26.606	
2,900.00	2,893.22	2,822.21	2,769.69	10.53	11.49	114.42	484.17	100.44	557.75	536.99	20.76	26.871	
3,000.00	2,992.92	2,918.95	2,863.71	10.91	11.93	114.32	506.57	104.51	583.07	561.57	21.50	27.117	
3,100.00	3,092.62	3,015.68	2,957.72	11.28	12.37	114.24	528.98	108.58	608.40	586.15	22.25	27.346	
3,200.00	3,192.32	3,112.42	3,051.74	11.66	12.81	114.16	551.39	112.65	633.73	610.73	22.99	27.560	
3,300.00	3,292.02	3,209.16	3,145.76	12.03	13.25	114.09	573.79	116.73	659.06	635.32	23.74	27.759	
3,400.00	3,391.72	3,305.89	3,239.77	12.41	13.69	114.02	596.20	120.80	684.39	659.90	24.49	27.947	
3,500.00	3,491.41	3,402.63	3,333.79	12.78	14.14	113.96	618.60	124.87	709.72	684.48	25.24	28.123	
3,600.00	3,591.11	3,499.36	3,427.81	13.15	14.58	113.90	641.01	128.94	735.05	709.07	25.98	28.289	
3,700.00	3,690.81	3,596.10	3,521.83	13.53	15.02	113.85	663.42	133.01	760.38	733.65	26.73	28.445	
3,800.00	3,790.51	3,692.83	3,615.84	13.90	15.47	113.80	685.82	137.08	785.72	758.24	27.48	28.593	
3,900.00	3,890.21	3,789.57	3,709.86	14.28	15.91	113.75	708.23	141.15	811.05	782.82	28.23	28.732	
4,000.00	3,989.91	3,886.31	3,803.88	14.65	16.35	113.70	730.64	145.22	836.38	807.41	28.98	28.864	
4,100.00	4,089.61	3,983.04	3,897.89	15.03	16.80	113.66	753.04	149.30	861.72	831.99	29.73	28.990	
4,200.00	4,189.31	4,079.78	3,991.91	15.40	17.24	113.62	775.45	153.37	887.05	856.58	30.47	29.109	
4,300.00	4,289.01	4,176.51	4,085.93	15.78	17.68	113.58	797.86	157.44	912.39	881.17	31.22	29.222	
4,400.00	4,388.70	4,273.25	4,179.94	16.15	18.13	113.55	820.26	161.51	937.72	905.75	31.97	29.330	
4,500.00	4,488.40	4,369.98	4,273.96	16.53	18.57	113.52	842.67	165.58	963.06	930.34	32.72	29.432	
4,600.00	4,588.10	4,466.72	4,367.98	16.90	19.02	113.48	865.08	169.65	988.40	954.93	33.47	29.530	
4,700.00	4,687.80	4,563.46	4,461.99	17.27	19.46	113.45	887.48	173.72	1,013.73	979.51	34.22	29.624	
4,800.00	4,787.50	4,660.19	4,556.01	17.65	19.91	113.43	909.89	177.79	1,039.07	1,004.10	34.97	29.713	
4,900.00	4,887.20	4,756.93	4,650.03	18.02	20.35	113.40	932.29	181.86	1,064.41	1,028.69	35.72	29.799	
5,000.00	4,986.90	4,853.66	4,744.05	18.40	20.80	113.37	954.70	185.94	1,089.74	1,053.27	36.47	29.881	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - Plan #2													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	
5,100.00	5,086.60	4,950.40	4,838.06	18.77	21.24	113.35	977.11	190.01	1,115.08	1,077.86	37.22	29.959		
5,200.00	5,186.30	5,047.14	4,932.08	19.15	21.69	113.32	999.51	194.08	1,140.42	1,102.45	37.97	30.034		
5,300.00	5,286.00	5,143.87	5,026.10	19.52	22.13	113.30	1,021.92	198.15	1,165.76	1,127.04	38.72	30.107		
5,400.00	5,385.69	5,240.61	5,120.11	19.90	22.58	113.28	1,044.33	202.22	1,191.09	1,151.62	39.47	30.176		
5,500.00	5,485.39	5,337.34	5,214.13	20.27	23.02	113.26	1,066.73	206.29	1,216.43	1,176.21	40.22	30.243		
5,600.00	5,585.09	5,434.08	5,308.15	20.65	23.47	113.24	1,089.14	210.36	1,241.77	1,200.80	40.97	30.307		
5,700.00	5,684.79	5,530.81	5,402.16	21.02	23.91	113.22	1,111.55	214.43	1,267.11	1,225.39	41.72	30.369		
5,800.00	5,784.49	5,627.55	5,496.18	21.40	24.36	113.20	1,133.95	218.51	1,292.45	1,249.97	42.47	30.429		
5,900.00	5,884.19	5,724.29	5,590.20	21.77	24.80	113.18	1,156.36	222.58	1,317.79	1,274.56	43.23	30.486		
6,000.00	5,983.89	5,821.02	5,684.21	22.15	25.25	113.17	1,178.77	226.65	1,343.12	1,299.15	43.98	30.542		
6,100.00	6,083.59	5,917.76	5,778.23	22.52	25.69	113.15	1,201.17	230.72	1,368.46	1,323.73	44.73	30.595		
6,200.00	6,183.29	6,014.49	5,872.25	22.90	26.14	113.13	1,223.58	234.79	1,393.80	1,348.32	45.48	30.647		
6,300.00	6,282.98	6,111.23	5,966.27	23.27	26.58	113.12	1,245.98	238.86	1,419.14	1,372.91	46.23	30.697		
6,400.00	6,382.68	6,207.96	6,060.28	23.65	27.03	113.10	1,268.39	242.93	1,444.48	1,397.50	46.98	30.745		
6,492.83	6,475.23	6,297.76	6,147.55	24.00	27.44	113.09	1,289.19	246.71	1,468.00	1,420.32	47.68	30.788		
6,500.00	6,482.39	6,304.70	6,154.30	24.02	27.48	112.37	1,290.80	247.00	1,469.80	1,422.07	47.73	30.791		
6,550.00	6,532.35	6,353.29	6,201.53	24.19	27.70	-31.85	1,302.05	249.05	1,481.30	1,433.20	48.09	30.800		
6,600.00	6,582.27	6,402.00	6,248.86	24.34	27.92	-55.92	1,313.33	251.10	1,490.94	1,442.50	48.43	30.783		
6,650.00	6,631.83	6,450.51	6,296.02	24.49	28.15	-57.66	1,324.57	253.14	1,498.70	1,449.94	48.76	30.736		
6,700.00	6,680.73	6,498.55	6,342.70	24.62	28.37	-58.39	1,335.70	255.16	1,504.60	1,455.53	49.07	30.660		
6,750.00	6,728.67	6,545.80	6,388.63	24.74	28.59	-59.02	1,346.64	257.15	1,508.68	1,459.31	49.37	30.557		
6,800.00	6,775.35	6,591.99	6,433.51	24.86	28.80	-59.73	1,357.34	259.09	1,511.02	1,461.36	49.66	30.428		
6,850.00	6,820.48	6,636.81	6,477.08	24.98	29.01	-60.58	1,367.72	260.98	1,511.72	1,461.79	49.93	30.275		
6,900.00	6,863.78	6,680.01	6,519.06	25.09	29.21	-61.58	1,377.73	262.80	1,510.92	1,460.73	50.20	30.101		
6,950.00	6,904.99	6,941.43	6,768.73	25.21	30.32	-68.98	1,438.26	225.40	1,506.61	1,454.93	51.68	29.153		
7,000.00	6,943.86	7,033.93	6,850.35	25.33	30.65	-72.95	1,458.60	187.16	1,498.03	1,445.95	52.08	28.762		
7,050.00	6,980.14	7,086.00	6,893.74	25.47	30.82	-75.70	1,469.54	160.64	1,489.29	1,436.92	52.36	28.441		
7,100.00	7,013.60	7,129.74	6,928.66	25.62	30.95	-78.15	1,478.42	135.90	1,481.21	1,428.58	52.64	28.139		
7,150.00	7,044.06	7,129.17	6,928.22	25.79	30.95	-78.81	1,478.31	136.24	1,473.97	1,421.14	52.82	27.903		
7,200.00	7,071.31	7,121.09	6,921.94	26.00	30.92	-79.08	1,476.70	141.05	1,467.65	1,414.65	53.00	27.692		
7,250.00	7,095.18	7,108.56	6,912.06	26.23	30.89	-79.09	1,474.19	148.35	1,462.26	1,409.08	53.17	27.500		
7,300.00	7,115.54	7,093.18	6,899.76	26.50	30.84	-78.91	1,471.06	157.03	1,457.77	1,404.41	53.36	27.319		
7,350.00	7,132.25	7,075.88	6,885.68	26.81	30.78	-78.58	1,467.49	166.42	1,454.14	1,400.58	53.57	27.146		
7,400.00	7,145.22	7,057.24	6,870.23	27.16	30.72	-78.13	1,463.59	176.10	1,451.31	1,397.51	53.80	26.976		
7,450.00	7,154.36	7,037.61	6,853.68	27.55	30.66	-77.59	1,459.42	185.78	1,449.22	1,395.15	54.07	26.805		
7,500.00	7,159.61	7,017.25	6,836.20	27.97	30.59	-76.97	1,455.04	195.27	1,447.79	1,393.42	54.36	26.631		
7,541.91	7,161.00	7,000.00	6,821.17	28.35	30.53	-76.42	1,451.28	202.85	1,447.04	1,392.40	54.64	26.482		
7,565.09	7,161.01	6,990.28	6,812.61	28.57	30.50	-76.07	1,449.15	206.93	1,446.89	1,392.07	54.81	26.398		
7,600.00	7,161.01	6,977.10	6,800.91	28.92	30.45	-75.59	1,446.24	212.25	1,447.24	1,392.17	55.08	26.277		
7,700.00	7,161.03	6,950.00	6,776.53	30.03	30.35	-74.60	1,440.19	222.41	1,452.31	1,396.27	56.03	25.919		
7,800.00	7,161.05	6,920.24	6,749.28	31.29	30.24	-73.49	1,433.46	232.32	1,463.51	1,406.44	57.07	25.645		
7,900.00	7,161.08	6,900.00	6,730.51	32.69	30.16	-72.72	1,428.84	238.30	1,480.92	1,422.67	58.25	25.423		
8,000.00	7,161.10	6,883.42	6,715.00	34.20	30.09	-72.09	1,425.03	242.75	1,504.45	1,444.96	59.49	25.289		
8,100.00	7,161.12	6,869.54	6,701.93	35.81	30.04	-71.56	1,421.83	246.15	1,533.89	1,473.15	60.74	25.254		
8,200.00	7,161.14	6,850.00	6,683.41	37.52	29.96	-70.81	1,417.31	250.43	1,569.01	1,507.13	61.88	25.354		
8,300.00	7,161.16	6,850.00	6,683.41	39.30	29.96	-70.81	1,417.31	250.43	1,609.37	1,546.21	63.16	25.480		
8,400.00	7,161.18	6,850.00	6,683.41	41.15	29.96	-70.81	1,417.31	250.43	1,654.80	1,590.44	64.36	25.713		
8,500.00	7,161.20	6,831.35	6,665.62	43.05	29.88	-70.10	1,412.98	253.98	1,704.63	1,639.37	65.26	26.119		
8,600.00	7,161.22	6,824.62	6,659.17	45.01	29.85	-69.84	1,411.41	255.12	1,758.76	1,692.56	66.20	26.568		
8,700.00	7,161.24	6,818.64	6,653.44	47.02	29.82	-69.61	1,410.02	256.08	1,816.72	1,749.67	67.05	27.097		
8,800.00	7,161.26	6,800.00	6,635.51	49.06	29.74	-68.89	1,405.67	258.72	1,878.31	1,810.64	67.67	27.757		
8,900.00	7,161.29	6,800.00	6,635.51	51.14	29.74	-68.89	1,405.67	258.72	1,942.84	1,874.44	68.40	28.403		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - Plan #2													Offset Site Error:	0.00 usft
Survey Program:		0-MWD+HRGM+MS						Rule Assigned:					Offset Well Error:	0.00 usft
Reference		Offset		Semi Maior 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)				
9,000.00	7,161.31	6,800.00	6,635.51	53.24	29.74	-68.89	1,405.67	258.72	2,010.29	1,941.23	69.05	29.112		
9,100.00	7,161.33	6,800.00	6,635.51	55.38	29.74	-68.89	1,405.67	258.72	2,080.35	2,010.72	69.63	29.876		
9,200.00	7,161.35	6,800.00	6,635.51	57.54	29.74	-68.89	1,405.67	258.72	2,152.79	2,082.64	70.14	30.691		
9,300.00	7,161.37	6,800.00	6,635.51	59.72	29.74	-68.89	1,405.67	258.72	2,227.35	2,156.76	70.60	31.550		
9,400.00	7,161.39	6,800.00	6,635.51	61.92	29.74	-68.89	1,405.67	258.72	2,303.85	2,232.85	71.00	32.450		
9,500.00	7,161.41	6,800.00	6,635.51	64.13	29.74	-68.89	1,405.67	258.72	2,382.09	2,310.74	71.35	33.386		
9,600.00	7,161.43	6,800.00	6,635.51	66.36	29.74	-68.89	1,405.67	258.72	2,461.90	2,390.24	71.66	34.355		
9,700.00	7,161.45	6,800.00	6,635.51	68.61	29.74	-68.89	1,405.67	258.72	2,543.14	2,471.20	71.94	35.353		
9,800.00	7,161.48	6,780.27	6,616.45	70.87	29.66	-68.13	1,401.07	260.92	2,625.34	2,553.35	72.00	36.465		
9,900.00	7,161.50	6,778.19	6,614.44	73.14	29.65	-68.04	1,400.58	261.12	2,708.98	2,636.79	72.20	37.523		
10,000.00	7,161.52	6,776.25	6,612.56	75.42	29.64	-67.97	1,400.13	261.30	2,793.69	2,721.32	72.37	38.602		
10,100.00	7,161.54	6,774.42	6,610.79	77.71	29.63	-67.90	1,399.70	261.46	2,879.37	2,806.84	72.53	39.701		
10,200.00	7,161.56	6,772.71	6,609.14	80.01	29.62	-67.83	1,399.30	261.60	2,965.94	2,893.28	72.66	40.817		
10,300.00	7,161.58	6,771.11	6,607.58	82.32	29.62	-67.77	1,398.93	261.74	3,053.33	2,980.55	72.79	41.949		
10,400.00	7,161.60	6,750.00	6,587.10	84.63	29.52	-66.96	1,394.00	263.12	3,141.80	3,069.09	72.72	43.207		
10,500.00	7,161.62	6,750.00	6,587.10	86.95	29.52	-66.96	1,394.00	263.12	3,230.58	3,157.75	72.83	44.359		
10,600.00	7,161.64	6,750.00	6,587.10	89.28	29.52	-66.96	1,394.00	263.12	3,320.00	3,247.07	72.93	45.524		
10,700.00	7,161.66	6,750.00	6,587.10	91.61	29.52	-66.96	1,394.00	263.12	3,410.00	3,336.98	73.02	46.700		
10,800.00	7,161.69	6,750.00	6,587.10	93.95	29.52	-66.96	1,394.00	263.12	3,500.55	3,427.45	73.10	47.886		
10,900.00	7,161.71	6,750.00	6,587.10	96.29	29.52	-66.96	1,394.00	263.12	3,591.60	3,518.42	73.18	49.082		
11,000.00	7,161.73	6,750.00	6,587.10	98.64	29.52	-66.96	1,394.00	263.12	3,683.11	3,609.87	73.24	50.286		
11,100.00	7,161.75	6,750.00	6,587.10	100.99	29.52	-66.96	1,394.00	263.12	3,775.06	3,701.75	73.31	51.498		
11,200.00	7,161.77	6,750.00	6,587.10	103.35	29.52	-66.96	1,394.00	263.12	3,867.40	3,794.04	73.36	52.717		
11,300.00	7,161.79	6,750.00	6,587.10	105.71	29.52	-66.96	1,394.00	263.12	3,960.11	3,886.70	73.41	53.942		
11,400.00	7,161.81	6,750.00	6,587.10	108.07	29.52	-66.96	1,394.00	263.12	4,053.18	3,979.71	73.46	55.174		
11,500.00	7,161.83	6,750.00	6,587.10	110.44	29.52	-66.96	1,394.00	263.12	4,146.56	4,073.05	73.51	56.410		
11,600.00	7,161.85	6,750.00	6,587.10	112.80	29.52	-66.96	1,394.00	263.12	4,240.25	4,166.70	73.55	57.652		
11,700.00	7,161.87	6,750.00	6,587.10	115.18	29.52	-66.96	1,394.00	263.12	4,334.22	4,260.63	73.59	58.898		
11,800.00	7,161.90	6,750.00	6,587.10	117.55	29.52	-66.96	1,394.00	263.12	4,428.45	4,354.82	73.63	60.149		
11,900.00	7,161.92	6,750.00	6,587.10	119.93	29.52	-66.96	1,394.00	263.12	4,522.93	4,449.27	73.66	61.403		
12,000.00	7,161.94	6,750.00	6,587.10	122.31	29.52	-66.96	1,394.00	263.12	4,617.64	4,543.95	73.69	62.660		
12,100.00	7,161.96	6,750.00	6,587.10	124.69	29.52	-66.96	1,394.00	263.12	4,712.58	4,638.85	73.73	63.920		
12,200.00	7,161.98	6,750.00	6,587.10	127.07	29.52	-66.96	1,394.00	263.12	4,807.71	4,733.96	73.76	65.184		
12,300.00	7,162.00	6,750.00	6,587.10	129.46	29.52	-66.96	1,394.00	263.12	4,903.04	4,829.26	73.79	66.450		
12,400.00	7,162.02	6,750.00	6,587.10	131.85	29.52	-66.96	1,394.00	263.12	4,998.56	4,924.74	73.81	67.718		
12,500.00	7,162.04	6,750.00	6,587.10	134.24	29.52	-66.96	1,394.00	263.12	5,094.24	5,020.40	73.84	68.988		
12,600.00	7,162.06	6,750.00	6,587.10	136.63	29.52	-66.96	1,394.00	263.12	5,190.09	5,116.22	73.87	70.259		
12,700.00	7,162.09	6,750.00	6,587.10	139.02	29.52	-66.96	1,394.00	263.12	5,286.09	5,212.19	73.90	71.533		
12,800.00	7,162.11	6,750.00	6,587.10	141.42	29.52	-66.96	1,394.00	263.12	5,382.24	5,308.31	73.92	72.808		
12,900.00	7,162.13	6,750.00	6,587.10	143.81	29.52	-66.96	1,394.00	263.12	5,478.52	5,404.57	73.95	74.083		
13,000.00	7,162.15	6,750.00	6,587.10	146.21	29.52	-66.96	1,394.00	263.12	5,574.94	5,500.96	73.98	75.360		
13,100.00	7,162.17	6,750.00	6,587.10	148.61	29.52	-66.96	1,394.00	263.12	5,671.48	5,597.48	74.00	76.638		
13,200.00	7,162.19	6,750.00	6,587.10	151.01	29.52	-66.96	1,394.00	263.12	5,768.14	5,694.11	74.03	77.917		
13,300.00	7,162.21	6,750.00	6,587.10	153.41	29.52	-66.96	1,394.00	263.12	5,864.91	5,790.85	74.06	79.196		
13,400.00	7,162.23	6,750.00	6,587.10	155.81	29.52	-66.96	1,394.00	263.12	5,961.78	5,887.70	74.08	80.475		
13,500.00	7,162.25	6,750.00	6,587.10	158.21	29.52	-66.96	1,394.00	263.12	6,058.76	5,984.65	74.11	81.755		
13,600.00	7,162.27	6,750.00	6,587.10	160.62	29.52	-66.96	1,394.00	263.12	6,155.84	6,081.70	74.14	83.035		
13,700.00	7,162.30	6,750.00	6,587.10	163.02	29.52	-66.96	1,394.00	263.12	6,253.00	6,178.84	74.16	84.315		
13,800.00	7,162.32	6,750.00	6,587.10	165.43	29.52	-66.96	1,394.00	263.12	6,350.26	6,276.07	74.19	85.595		
13,900.00	7,162.34	6,750.00	6,587.10	167.84	29.52	-66.96	1,394.00	263.12	6,447.60	6,373.38	74.22	86.874		
14,000.00	7,162.36	6,750.00	6,587.10	170.24	29.52	-66.96	1,394.00	263.12	6,545.02	6,470.77	74.25	88.154		
14,100.00	7,162.38	6,750.00	6,587.10	172.65	29.52	-66.96	1,394.00	263.12	6,642.51	6,568.24	74.27	89.433		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - Plan #2											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		
14,200.00	7,162.40	6,750.00	6,587.10	175.06	29.52	-66.96	1,394.00	263.12	6,740.08	6,665.78	74.30	90.711			
14,300.00	7,162.42	6,750.00	6,587.10	177.47	29.52	-66.96	1,394.00	263.12	6,837.72	6,763.39	74.33	91.989			
14,400.00	7,162.44	6,750.00	6,587.10	179.88	29.52	-66.96	1,394.00	263.12	6,935.43	6,861.07	74.36	93.266			
14,500.00	7,162.46	6,750.00	6,587.10	182.29	29.52	-66.96	1,394.00	263.12	7,033.20	6,958.81	74.39	94.543			
14,600.00	7,162.49	6,750.00	6,587.10	184.71	29.52	-66.96	1,394.00	263.12	7,131.03	7,056.61	74.42	95.819			
14,700.00	7,162.51	6,750.00	6,587.10	187.12	29.52	-66.96	1,394.00	263.12	7,228.93	7,154.47	74.45	97.094			
14,800.00	7,162.53	6,750.00	6,587.10	189.53	29.52	-66.96	1,394.00	263.12	7,326.88	7,252.39	74.48	98.367			
14,900.00	7,162.55	6,750.00	6,587.10	191.95	29.52	-66.96	1,394.00	263.12	7,424.88	7,350.36	74.52	99.640			
15,000.00	7,162.57	6,750.00	6,587.10	194.36	29.52	-66.96	1,394.00	263.12	7,522.94	7,448.39	74.55	100.912			
15,100.00	7,162.59	6,750.00	6,587.10	196.78	29.52	-66.96	1,394.00	263.12	7,621.04	7,546.46	74.58	102.183			
15,200.00	7,162.61	6,750.00	6,587.10	199.19	29.52	-66.96	1,394.00	263.12	7,719.20	7,644.58	74.62	103.452			
15,300.00	7,162.63	6,750.00	6,587.10	201.61	29.52	-66.96	1,394.00	263.12	7,817.40	7,742.75	74.65	104.720			
15,400.00	7,162.65	6,750.00	6,587.10	204.03	29.52	-66.96	1,394.00	263.12	7,915.65	7,840.96	74.69	105.987			
15,500.00	7,162.67	6,750.00	6,587.10	206.44	29.52	-66.96	1,394.00	263.12	8,013.94	7,939.22	74.72	107.252			
15,600.00	7,162.70	6,750.00	6,587.10	208.86	29.52	-66.96	1,394.00	263.12	8,112.27	8,037.52	74.76	108.516			
15,700.00	7,162.72	6,750.00	6,587.10	211.28	29.52	-66.96	1,394.00	263.12	8,210.65	8,135.85	74.79	109.779			
15,800.00	7,162.74	6,750.00	6,587.10	213.70	29.52	-66.96	1,394.00	263.12	8,309.06	8,234.23	74.83	111.040			
15,900.00	7,162.76	6,750.00	6,587.10	216.12	29.52	-66.96	1,394.00	263.12	8,407.51	8,332.64	74.87	112.299			
16,000.00	7,162.78	6,750.00	6,587.10	218.54	29.52	-66.96	1,394.00	263.12	8,505.99	8,431.09	74.91	113.556			
16,100.00	7,162.80	6,750.00	6,587.10	220.96	29.52	-66.96	1,394.00	263.12	8,604.51	8,529.57	74.94	114.812			
16,200.00	7,162.82	6,750.00	6,587.10	223.38	29.52	-66.96	1,394.00	263.12	8,703.07	8,628.08	74.98	116.067			
16,300.00	7,162.84	6,750.00	6,587.10	225.80	29.52	-66.96	1,394.00	263.12	8,801.65	8,726.63	75.02	117.319			
16,400.00	7,162.86	6,750.00	6,587.10	228.22	29.52	-66.96	1,394.00	263.12	8,900.27	8,825.21	75.06	118.570			
16,500.00	7,162.88	6,750.00	6,587.10	230.64	29.52	-66.96	1,394.00	263.12	8,998.92	8,923.82	75.10	119.818			
16,600.00	7,162.91	6,750.00	6,587.10	233.06	29.52	-66.96	1,394.00	263.12	9,097.60	9,022.45	75.15	121.065			
16,700.00	7,162.93	6,750.00	6,587.10	235.49	29.52	-66.96	1,394.00	263.12	9,196.30	9,121.12	75.19	122.310			
16,800.00	7,162.95	6,750.00	6,587.10	237.91	29.52	-66.96	1,394.00	263.12	9,295.04	9,219.81	75.23	123.553			
16,879.97	7,162.96	6,750.00	6,587.10	239.84	29.52	-66.96	1,394.00	263.12	9,374.02	9,298.75	75.27	124.546			
16,900.00	7,162.97	6,750.00	6,587.10	240.33	29.52	-66.96	1,394.00	263.12	9,393.80	9,318.53	75.27	124.794			
17,000.00	7,162.99	6,750.00	6,587.10	242.75	29.52	-66.96	1,394.00	263.12	9,492.59	9,417.27	75.32	126.033			
17,056.99	7,163.00	6,750.00	6,587.10	244.13	29.52	-66.96	1,394.00	263.12	9,548.90	9,473.56	75.34	126.738			

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM												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	35.26	12.41	8.78	15.20				
100.00	100.00	100.00	100.00	0.25	0.25	35.26	12.41	8.78	15.20	14.70	0.50	30.294	
200.00	200.00	200.00	200.00	0.61	0.61	35.26	12.41	8.78	15.20	13.98	1.22	12.474	
300.00	300.00	300.00	300.00	0.97	0.97	35.26	12.41	8.78	15.20	13.27	1.94	7.854	
400.00	400.00	400.00	400.00	1.33	1.33	35.26	12.41	8.78	15.20	12.55	2.65	5.731	
500.00	500.00	500.00	500.00	1.68	1.68	35.26	12.41	8.78	15.20	11.83	3.37	4.512 CC, ES	
600.00	599.98	599.55	599.53	2.04	2.04	121.18	14.13	8.60	17.39	13.31	4.08	4.263	
700.00	699.84	698.82	698.66	2.39	2.40	123.37	19.27	8.05	23.95	19.17	4.78	5.007	
722.35	722.13	720.94	720.72	2.47	2.48	123.83	20.88	7.89	26.02	21.08	4.94	5.263	
800.00	799.54	797.57	797.04	2.74	2.76	123.85	27.77	7.16	34.32	28.83	5.49	6.247	
900.00	899.24	895.72	894.47	3.10	3.12	121.26	39.55	5.92	47.19	40.99	6.20	7.611	
1,000.00	998.94	993.05	990.62	3.47	3.49	117.76	54.51	4.35	62.69	55.78	6.90	9.079	
1,100.00	1,098.64	1,089.34	1,085.19	3.83	3.87	114.23	72.49	2.46	81.01	73.41	7.60	10.655	
1,200.00	1,198.34	1,186.80	1,180.50	4.20	4.26	111.30	92.74	0.33	101.30	92.98	8.32	12.171	
1,300.00	1,298.04	1,284.61	1,276.14	4.57	4.67	109.33	113.11	-1.82	121.79	112.74	9.05	13.453	
1,400.00	1,397.74	1,382.42	1,371.78	4.94	5.09	107.93	133.47	-3.96	142.38	132.59	9.79	14.545	
1,500.00	1,497.44	1,480.22	1,467.42	5.31	5.51	106.89	153.83	-6.10	163.04	152.51	10.53	15.487	
1,600.00	1,597.13	1,578.03	1,563.06	5.68	5.93	106.08	174.20	-8.24	183.73	172.46	11.27	16.305	
1,700.00	1,696.83	1,675.83	1,658.70	6.05	6.36	105.43	194.56	-10.38	204.45	192.44	12.01	17.022	
1,800.00	1,796.53	1,773.64	1,754.34	6.43	6.79	104.90	214.93	-12.53	225.19	212.44	12.76	17.654	
1,900.00	1,896.23	1,871.45	1,849.98	6.80	7.22	104.46	235.29	-14.67	245.95	232.45	13.50	18.216	
2,000.00	1,995.93	1,969.25	1,945.61	7.17	7.66	104.09	255.65	-16.81	266.72	252.47	14.25	18.718	
2,100.00	2,095.63	2,067.06	2,041.25	7.54	8.09	103.77	276.02	-18.95	287.50	272.50	15.00	19.170	
2,200.00	2,195.33	2,164.87	2,136.89	7.92	8.53	103.50	296.38	-21.10	308.28	292.54	15.75	19.578	
2,300.00	2,295.03	2,262.67	2,232.53	8.29	8.97	103.26	316.74	-23.24	329.07	312.58	16.50	19.949	
2,400.00	2,394.73	2,360.48	2,328.17	8.66	9.40	103.05	337.11	-25.38	349.87	332.62	17.25	20.287	
2,500.00	2,494.43	2,458.28	2,423.81	9.04	9.84	102.86	357.47	-27.52	370.67	352.67	18.00	20.596	
2,600.00	2,594.12	2,556.09	2,519.45	9.41	10.28	102.69	377.83	-29.66	391.47	372.73	18.75	20.880	
2,700.00	2,693.82	2,653.90	2,615.09	9.79	10.72	102.54	398.20	-31.81	412.28	392.78	19.50	21.142	
2,800.00	2,793.52	2,751.70	2,710.72	10.16	11.16	102.41	418.56	-33.95	433.09	412.84	20.25	21.384	
2,900.00	2,893.22	2,849.51	2,806.36	10.53	11.61	102.28	438.92	-36.09	453.90	432.89	21.01	21.608	
3,000.00	2,992.92	2,947.31	2,902.00	10.91	12.05	102.17	459.29	-38.23	474.71	452.95	21.76	21.817	
3,100.00	3,092.62	3,045.12	2,997.64	11.28	12.49	102.07	479.65	-40.37	495.53	473.02	22.51	22.012	
3,200.00	3,192.32	3,142.93	3,093.28	11.66	12.93	101.97	500.02	-42.52	516.34	493.08	23.27	22.193	
3,300.00	3,292.02	3,240.73	3,188.92	12.03	13.38	101.88	520.38	-44.66	537.16	513.14	24.02	22.363	
3,400.00	3,391.72	3,338.54	3,284.56	12.41	13.82	101.80	540.74	-46.80	557.98	533.21	24.77	22.523	
3,500.00	3,491.41	3,436.34	3,380.19	12.78	14.26	101.73	561.11	-48.94	578.80	553.27	25.53	22.673	
3,600.00	3,591.11	3,534.15	3,475.83	13.15	14.71	101.66	581.47	-51.09	599.62	573.34	26.28	22.814	
3,700.00	3,690.81	3,631.96	3,571.47	13.53	15.15	101.59	601.83	-53.23	620.44	593.40	27.04	22.948	
3,800.00	3,790.51	3,729.76	3,667.11	13.90	15.60	101.53	622.20	-55.37	641.26	613.47	27.79	23.074	
3,900.00	3,890.21	3,827.57	3,762.75	14.28	16.04	101.47	642.56	-57.51	662.08	633.54	28.55	23.193	
4,000.00	3,989.91	3,925.37	3,858.39	14.65	16.48	101.42	662.92	-59.65	682.91	653.60	29.30	23.306	
4,100.00	4,089.61	4,023.18	3,954.03	15.03	16.93	101.37	683.29	-61.80	703.73	673.67	30.06	23.413	
4,200.00	4,189.31	4,120.99	4,049.67	15.40	17.37	101.32	703.65	-63.94	724.55	693.74	30.81	23.515	
4,300.00	4,289.01	4,218.79	4,145.30	15.78	17.82	101.28	724.01	-66.08	745.38	713.81	31.57	23.612	
4,400.00	4,388.70	4,316.60	4,240.94	16.15	18.26	101.23	744.38	-68.22	766.20	733.88	32.32	23.704	
4,500.00	4,488.40	4,414.40	4,336.58	16.53	18.71	101.19	764.74	-70.37	787.03	753.95	33.08	23.792	
4,600.00	4,588.10	4,512.21	4,432.22	16.90	19.15	101.15	785.11	-72.51	807.85	774.02	33.84	23.876	
4,700.00	4,687.80	4,610.02	4,527.86	17.27	19.60	101.12	805.47	-74.65	828.68	794.09	34.59	23.956	
4,800.00	4,787.50	4,707.82	4,623.50	17.65	20.05	101.08	825.83	-76.79	849.51	814.16	35.35	24.033	
4,900.00	4,887.20	4,805.63	4,719.14	18.02	20.49	101.05	846.20	-78.93	870.33	834.23	36.10	24.107	
5,000.00	4,986.90	4,903.43	4,814.78	18.40	20.94	101.02	866.56	-81.08	891.16	854.30	36.86	24.177	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM												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)			
5,100.00	5,086.60	5,001.24	4,910.41	18.77	21.38	100.99	886.92	-83.22	911.99	874.37	37.62	24.245	
5,200.00	5,186.30	5,099.05	5,006.05	19.15	21.83	100.96	907.29	-85.36	932.81	894.44	38.37	24.309	
5,300.00	5,286.00	5,196.85	5,101.69	19.52	22.27	100.93	927.65	-87.50	953.64	914.51	39.13	24.372	
5,400.00	5,385.69	5,294.66	5,197.33	19.90	22.72	100.91	948.01	-89.64	974.47	934.58	39.89	24.431	
5,500.00	5,485.39	5,392.47	5,292.97	20.27	23.17	100.88	968.38	-91.79	995.30	954.65	40.64	24.489	
5,600.00	5,585.09	5,490.27	5,388.61	20.65	23.61	100.86	988.74	-93.93	1,016.12	974.72	41.40	24.544	
5,700.00	5,684.79	5,588.08	5,484.25	21.02	24.06	100.84	1,009.10	-96.07	1,036.95	994.80	42.16	24.598	
5,800.00	5,784.49	5,685.88	5,579.89	21.40	24.50	100.81	1,029.47	-98.21	1,057.78	1,014.87	42.91	24.649	
5,900.00	5,884.19	5,783.69	5,675.52	21.77	24.95	100.79	1,049.83	-100.36	1,078.61	1,034.94	43.67	24.699	
6,000.00	5,983.89	5,881.50	5,771.16	22.15	25.40	100.77	1,070.20	-102.50	1,099.44	1,055.01	44.43	24.747	
6,100.00	6,083.59	5,979.30	5,866.80	22.52	25.84	100.75	1,090.56	-104.64	1,120.27	1,075.08	45.18	24.793	
6,200.00	6,183.29	6,077.11	5,962.44	22.90	26.29	100.73	1,110.92	-106.78	1,141.09	1,095.15	45.94	24.838	
6,300.00	6,282.98	6,174.91	6,058.08	23.27	26.73	100.71	1,131.29	-108.92	1,161.92	1,115.22	46.70	24.881	
6,400.00	6,382.68	6,272.72	6,153.72	23.65	27.18	100.70	1,151.65	-111.07	1,182.75	1,135.30	47.46	24.923	
6,492.83	6,475.23	6,363.51	6,242.49	24.00	27.59	100.68	1,170.55	-113.05	1,202.09	1,153.93	48.16	24.960	
6,500.00	6,482.39	6,370.53	6,249.36	24.02	27.63	99.94	1,172.01	-113.21	1,203.57	1,155.36	48.21	24.963	
6,550.00	6,532.35	6,419.49	6,297.24	24.19	27.85	-44.38	1,182.21	-114.28	1,213.30	1,164.73	48.57	24.979	
6,600.00	6,582.27	6,468.32	6,344.98	24.34	28.07	-68.53	1,192.37	-115.35	1,221.94	1,173.04	48.91	24.986	
6,650.00	6,631.83	6,516.71	6,392.30	24.49	28.29	-70.34	1,202.45	-116.41	1,229.50	1,180.28	49.22	24.980	
6,700.00	6,680.73	6,564.36	6,438.90	24.62	28.51	-71.12	1,212.37	-117.45	1,236.02	1,186.51	49.52	24.962	
6,750.00	6,728.67	6,610.99	6,484.49	24.74	28.72	-71.77	1,222.08	-118.47	1,241.58	1,191.78	49.79	24.934	
6,800.00	6,775.35	6,656.30	6,528.79	24.86	28.93	-72.46	1,231.51	-119.47	1,246.28	1,196.23	50.06	24.898	
6,850.00	6,820.48	6,689.56	6,561.33	24.98	29.08	-72.97	1,238.44	-119.67	1,250.43	1,200.21	50.22	24.900	
6,900.00	6,863.78	6,720.92	6,591.97	25.09	29.22	-73.44	1,244.95	-118.31	1,254.37	1,204.00	50.36	24.906	
6,950.00	6,904.99	6,750.00	6,620.29	25.21	29.35	-73.87	1,250.96	-115.67	1,258.14	1,207.64	50.50	24.914	
7,000.00	6,943.86	6,784.90	6,654.09	25.33	29.50	-74.46	1,258.13	-110.76	1,261.76	1,211.07	50.69	24.891	
7,050.00	6,980.14	6,817.64	6,685.52	25.47	29.63	-75.03	1,264.78	-104.44	1,265.27	1,214.38	50.89	24.863	
7,100.00	7,013.60	6,850.00	6,716.22	25.62	29.76	-75.61	1,271.28	-96.58	1,268.70	1,217.59	51.11	24.821	
7,150.00	7,044.06	6,885.08	6,749.02	25.79	29.89	-76.28	1,278.20	-86.28	1,272.08	1,220.68	51.40	24.749	
7,200.00	7,071.31	6,919.98	6,781.06	26.00	30.02	-76.97	1,284.96	-74.20	1,275.43	1,223.71	51.72	24.658	
7,250.00	7,095.18	6,955.86	6,813.27	26.23	30.15	-77.70	1,291.74	-59.94	1,278.80	1,226.69	52.11	24.543	
7,300.00	7,115.54	6,992.88	6,845.63	26.50	30.27	-78.48	1,298.53	-43.30	1,282.20	1,229.66	52.54	24.402	
7,350.00	7,132.25	7,031.25	6,878.12	26.81	30.39	-79.31	1,305.35	-24.06	1,285.68	1,232.64	53.04	24.238	
7,400.00	7,145.22	7,071.24	6,910.70	27.16	30.51	-80.18	1,312.16	-1.92	1,289.25	1,235.65	53.60	24.053	
7,450.00	7,154.36	7,113.15	6,943.33	27.55	30.64	-81.11	1,318.97	23.48	1,292.93	1,238.72	54.21	23.851	
7,500.00	7,159.61	7,157.40	6,975.92	27.97	30.76	-82.11	1,325.75	52.61	1,296.73	1,241.87	54.86	23.637	
7,541.91	7,161.00	7,196.65	7,003.12	28.35	30.86	-83.00	1,331.40	80.34	1,300.02	1,244.58	55.44	23.450	
7,600.00	7,161.01	7,257.49	7,041.84	28.92	31.00	-84.74	1,339.39	126.55	1,304.92	1,248.62	56.30	23.177	
7,700.00	7,161.03	7,387.38	7,109.10	30.03	31.31	-87.73	1,353.12	236.55	1,313.59	1,255.54	58.05	22.628	
7,800.00	7,161.05	7,549.09	7,160.22	31.29	31.77	-89.96	1,363.19	389.18	1,319.82	1,259.52	60.30	21.888	
7,900.00	7,161.08	7,706.40	7,172.99	32.69	32.57	-90.52	1,365.08	545.62	1,321.10	1,258.08	63.02	20.964	
8,000.00	7,161.10	7,806.40	7,172.95	34.20	33.37	-90.51	1,364.55	645.62	1,320.79	1,255.14	65.65	20.118	
8,100.00	7,161.12	7,906.40	7,172.91	35.81	34.39	-90.51	1,364.01	745.62	1,320.48	1,251.95	68.53	19.268	
8,200.00	7,161.14	8,006.40	7,172.88	37.52	35.61	-90.51	1,363.47	845.62	1,320.18	1,248.55	71.63	18.431	
8,300.00	7,161.16	8,106.40	7,172.84	39.30	36.99	-90.51	1,362.94	945.62	1,319.87	1,244.96	74.91	17.618	
8,400.00	7,161.18	8,206.40	7,172.80	41.15	38.49	-90.50	1,362.40	1,045.61	1,319.57	1,241.20	78.37	16.838	
8,500.00	7,161.20	8,306.40	7,172.76	43.05	40.10	-90.50	1,361.87	1,145.61	1,319.26	1,237.30	81.97	16.095	
8,600.00	7,161.22	8,406.40	7,172.72	45.01	41.79	-90.50	1,361.33	1,245.61	1,318.96	1,233.26	85.69	15.392	
8,700.00	7,161.24	8,506.40	7,172.69	47.02	43.57	-90.50	1,360.79	1,345.61	1,318.65	1,229.12	89.53	14.729	
8,800.00	7,161.26	8,606.40	7,172.65	49.06	45.41	-90.49	1,360.26	1,445.61	1,318.34	1,224.88	93.46	14.106	
8,900.00	7,161.29	8,706.40	7,172.61	51.14	47.30	-90.49	1,359.72	1,545.60	1,318.04	1,220.56	97.48	13.521	
9,000.00	7,161.31	8,806.40	7,172.57	53.24	49.25	-90.49	1,359.18	1,645.60	1,317.73	1,216.16	101.58	12.973	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #2												Offset Site Error:	0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM												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)			
9,100.00	7,161.33	8,906.40	7,172.54	55.38	51.24	-90.49	1,358.65	1,745.60	1,317.43	1,211.69	105.74	12.459	
9,200.00	7,161.35	9,006.40	7,172.50	57.54	53.26	-90.48	1,358.11	1,845.60	1,317.12	1,207.16	109.96	11.978	
9,300.00	7,161.37	9,106.40	7,172.46	59.72	55.32	-90.48	1,357.57	1,945.60	1,316.82	1,202.58	114.23	11.528	
9,400.00	7,161.39	9,206.40	7,172.42	61.92	57.41	-90.48	1,357.04	2,045.59	1,316.51	1,197.96	118.55	11.105	
9,500.00	7,161.41	9,306.40	7,172.38	64.13	59.53	-90.48	1,356.50	2,145.59	1,316.20	1,193.29	122.91	10.708	
9,600.00	7,161.43	9,406.40	7,172.35	66.36	61.67	-90.48	1,355.96	2,245.59	1,315.90	1,188.58	127.31	10.336	
9,700.00	7,161.45	9,506.40	7,172.31	68.61	63.84	-90.47	1,355.43	2,345.59	1,315.59	1,183.85	131.75	9.986	
9,800.00	7,161.48	9,606.40	7,172.27	70.87	66.02	-90.47	1,354.89	2,445.59	1,315.29	1,179.08	136.21	9.656	
9,900.00	7,161.50	9,706.40	7,172.23	73.14	68.22	-90.47	1,354.35	2,545.58	1,314.98	1,174.28	140.70	9.346	
10,000.00	7,161.52	9,806.39	7,172.20	75.42	70.43	-90.47	1,353.82	2,645.58	1,314.68	1,169.46	145.22	9.053	
10,100.00	7,161.54	9,906.39	7,172.16	77.71	72.66	-90.46	1,353.28	2,745.58	1,314.37	1,164.61	149.76	8.777	
10,200.00	7,161.56	10,006.39	7,172.12	80.01	74.91	-90.46	1,352.75	2,845.58	1,314.06	1,159.75	154.32	8.515	
10,300.00	7,161.58	10,106.39	7,172.08	82.32	77.16	-90.46	1,352.21	2,945.58	1,313.76	1,154.87	158.89	8.268	
10,400.00	7,161.60	10,206.39	7,172.04	84.63	79.43	-90.46	1,351.67	3,045.58	1,313.45	1,149.96	163.49	8.034	
10,500.00	7,161.62	10,306.39	7,172.01	86.95	81.70	-90.45	1,351.14	3,145.57	1,313.15	1,145.05	168.10	7.812	
10,600.00	7,161.64	10,406.39	7,171.97	89.28	83.99	-90.45	1,350.60	3,245.57	1,312.84	1,140.12	172.73	7.601	
10,700.00	7,161.66	10,506.39	7,171.93	91.61	86.28	-90.45	1,350.06	3,345.57	1,312.54	1,135.17	177.36	7.400	
10,800.00	7,161.69	10,606.39	7,171.89	93.95	88.58	-90.45	1,349.53	3,445.57	1,312.23	1,130.21	182.02	7.209	
10,900.00	7,161.71	10,706.39	7,171.86	96.29	90.89	-90.44	1,348.99	3,545.57	1,311.93	1,125.25	186.68	7.028	
11,000.00	7,161.73	10,806.39	7,171.82	98.64	93.20	-90.44	1,348.45	3,645.56	1,311.62	1,120.27	191.35	6.854	
11,100.00	7,161.75	10,906.39	7,171.78	100.99	95.52	-90.44	1,347.92	3,745.56	1,311.31	1,115.28	196.04	6.689	
11,200.00	7,161.77	11,006.39	7,171.74	103.35	97.85	-90.44	1,347.38	3,845.56	1,311.01	1,110.28	200.73	6.531	
11,300.00	7,161.79	11,106.39	7,171.70	105.71	100.18	-90.43	1,346.84	3,945.56	1,310.70	1,105.27	205.43	6.380	
11,400.00	7,161.81	11,206.39	7,171.67	108.07	102.52	-90.43	1,346.31	4,045.56	1,310.40	1,100.26	210.14	6.236	
11,500.00	7,161.83	11,306.39	7,171.63	110.44	104.86	-90.43	1,345.77	4,145.55	1,310.09	1,095.23	214.86	6.098	
11,600.00	7,161.85	11,406.39	7,171.59	112.80	107.21	-90.43	1,345.23	4,245.55	1,309.79	1,090.21	219.58	5.965	
11,700.00	7,161.87	11,506.39	7,171.55	115.18	109.56	-90.42	1,344.70	4,345.55	1,309.48	1,085.17	224.31	5.838	
11,800.00	7,161.90	11,606.39	7,171.52	117.55	111.91	-90.42	1,344.16	4,445.55	1,309.17	1,080.13	229.05	5.716	
11,900.00	7,161.92	11,706.39	7,171.48	119.93	114.27	-90.42	1,343.62	4,545.55	1,308.87	1,075.08	233.79	5.599	
12,000.00	7,161.94	11,806.38	7,171.44	122.31	116.63	-90.42	1,343.09	4,645.54	1,308.56	1,070.03	238.54	5.486	
12,100.00	7,161.96	11,906.38	7,171.40	124.69	118.99	-90.41	1,342.55	4,745.54	1,308.26	1,064.97	243.29	5.377	
12,200.00	7,161.98	12,006.38	7,171.36	127.07	121.36	-90.41	1,342.02	4,845.54	1,307.95	1,059.91	248.05	5.273	
12,300.00	7,162.00	12,106.38	7,171.33	129.46	123.73	-90.41	1,341.48	4,945.54	1,307.65	1,054.84	252.81	5.172	
12,400.00	7,162.02	12,206.38	7,171.29	131.85	126.10	-90.41	1,340.94	5,045.54	1,307.34	1,049.77	257.57	5.076	
12,500.00	7,162.04	12,306.38	7,171.25	134.24	128.47	-90.40	1,340.41	5,145.53	1,307.04	1,044.69	262.34	4.982	
12,600.00	7,162.06	12,406.38	7,171.21	136.63	130.85	-90.40	1,339.87	5,245.53	1,306.73	1,039.61	267.12	4.892	
12,700.00	7,162.09	12,506.38	7,171.17	139.02	133.23	-90.40	1,339.33	5,345.53	1,306.42	1,034.53	271.90	4.805	
12,800.00	7,162.11	12,606.38	7,171.14	141.42	135.61	-90.40	1,338.80	5,445.53	1,306.12	1,029.44	276.68	4.721	
12,900.00	7,162.13	12,706.38	7,171.10	143.81	137.99	-90.39	1,338.26	5,545.53	1,305.81	1,024.35	281.46	4.639	
13,000.00	7,162.15	12,806.38	7,171.06	146.21	140.38	-90.39	1,337.72	5,645.53	1,305.51	1,019.26	286.25	4.561	
13,100.00	7,162.17	12,906.38	7,171.02	148.61	142.76	-90.39	1,337.19	5,745.52	1,305.20	1,014.16	291.04	4.485	
13,200.00	7,162.19	13,006.38	7,170.99	151.01	145.15	-90.39	1,336.65	5,845.52	1,304.90	1,009.07	295.83	4.411	
13,300.00	7,162.21	13,106.38	7,170.95	153.41	147.54	-90.38	1,336.11	5,945.52	1,304.59	1,003.96	300.63	4.340	
13,400.00	7,162.23	13,206.38	7,170.91	155.81	149.93	-90.38	1,335.58	6,045.52	1,304.29	998.86	305.42	4.270	
13,500.00	7,162.25	13,306.38	7,170.87	158.21	152.32	-90.38	1,335.04	6,145.52	1,303.98	993.75	310.23	4.203	
13,600.00	7,162.27	13,406.38	7,170.83	160.62	154.72	-90.38	1,334.50	6,245.51	1,303.67	988.65	315.03	4.138	
13,700.00	7,162.30	13,506.38	7,170.80	163.02	157.11	-90.37	1,333.97	6,345.51	1,303.37	983.54	319.83	4.075	
13,800.00	7,162.32	13,606.38	7,170.76	165.43	159.51	-90.37	1,333.43	6,445.51	1,303.06	978.42	324.64	4.014	
13,900.00	7,162.34	13,706.38	7,170.72	167.84	161.91	-90.37	1,332.90	6,545.51	1,302.76	973.31	329.45	3.954	
14,000.00	7,162.36	13,806.38	7,170.68	170.24	164.31	-90.37	1,332.36	6,645.51	1,302.45	968.19	334.26	3.897	
14,100.00	7,162.38	13,906.37	7,170.65	172.65	166.71	-90.36	1,331.82	6,745.50	1,302.15	963.07	339.07	3.840	
14,200.00	7,162.40	14,006.37	7,170.61	175.06	169.11	-90.36	1,331.29	6,845.50	1,301.84	957.95	343.89	3.786	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #2													Offset Site Error: 0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM							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
14,300.00	7,162.42	14,106.37	7,170.57	177.47	171.51	-90.36	1,330.75	6,945.50	1,301.54	952.83	348.70	3.732	
14,400.00	7,162.44	14,206.37	7,170.53	179.88	173.92	-90.36	1,330.21	7,045.50	1,301.23	947.71	353.52	3.681	
14,500.00	7,162.46	14,306.37	7,170.49	182.29	176.32	-90.35	1,329.68	7,145.50	1,300.92	942.58	358.34	3.630	
14,600.00	7,162.49	14,406.37	7,170.46	184.71	178.73	-90.35	1,329.14	7,245.49	1,300.62	937.45	363.16	3.581	
14,700.00	7,162.51	14,506.37	7,170.42	187.12	181.13	-90.35	1,328.60	7,345.49	1,300.31	932.33	367.99	3.534	
14,800.00	7,162.53	14,606.37	7,170.38	189.53	183.54	-90.35	1,328.07	7,445.49	1,300.01	927.20	372.81	3.487	
14,900.00	7,162.55	14,706.37	7,170.34	191.95	185.95	-90.34	1,327.53	7,545.49	1,299.70	922.07	377.64	3.442	
15,000.00	7,162.57	14,806.37	7,170.31	194.36	188.36	-90.34	1,326.99	7,645.49	1,299.40	916.93	382.46	3.397	
15,100.00	7,162.59	14,906.37	7,170.27	196.78	190.77	-90.34	1,326.46	7,745.48	1,299.09	911.80	387.29	3.354	
15,200.00	7,162.61	15,006.37	7,170.23	199.19	193.18	-90.34	1,325.92	7,845.48	1,298.79	906.67	392.12	3.312	
15,300.00	7,162.63	15,106.37	7,170.19	201.61	195.59	-90.33	1,325.38	7,945.48	1,298.48	901.53	396.95	3.271	
15,400.00	7,162.65	15,206.37	7,170.15	204.03	198.00	-90.33	1,324.85	8,045.48	1,298.17	896.39	401.78	3.231	
15,500.00	7,162.67	15,306.37	7,170.12	206.44	200.41	-90.33	1,324.31	8,145.48	1,297.87	891.26	406.61	3.192	
15,600.00	7,162.70	15,406.37	7,170.08	208.86	202.82	-90.33	1,323.77	8,245.48	1,297.56	886.12	411.45	3.154	
15,700.00	7,162.72	15,506.37	7,170.04	211.28	205.24	-90.32	1,323.24	8,345.47	1,297.26	880.98	416.28	3.116	
15,800.00	7,162.74	15,606.37	7,170.00	213.70	207.65	-90.32	1,322.70	8,445.47	1,296.95	875.84	421.11	3.080	
15,900.00	7,162.76	15,706.37	7,169.97	216.12	210.07	-90.32	1,322.17	8,545.47	1,296.65	870.70	425.95	3.044	
16,000.00	7,162.78	15,806.37	7,169.93	218.54	212.48	-90.32	1,321.63	8,645.47	1,296.34	865.55	430.79	3.009	
16,100.00	7,162.80	15,906.37	7,169.89	220.96	214.90	-90.31	1,321.09	8,745.47	1,296.04	860.41	435.63	2.975	
16,200.00	7,162.82	16,006.36	7,169.85	223.38	217.31	-90.31	1,320.56	8,845.46	1,295.73	855.27	440.46	2.942	
16,300.00	7,162.84	16,106.36	7,169.81	225.80	219.73	-90.31	1,320.02	8,945.46	1,295.42	850.12	445.30	2.909	
16,400.00	7,162.86	16,206.36	7,169.78	228.22	222.15	-90.31	1,319.48	9,045.46	1,295.12	844.98	450.14	2.877	
16,500.00	7,162.88	16,306.36	7,169.74	230.64	224.56	-90.30	1,318.95	9,145.46	1,294.81	839.83	454.99	2.846	
16,600.00	7,162.91	16,406.36	7,169.70	233.06	226.98	-90.30	1,318.41	9,245.46	1,294.51	834.68	459.83	2.815	
16,700.00	7,162.93	16,506.36	7,169.66	235.49	229.40	-90.30	1,317.87	9,345.45	1,294.20	829.53	464.67	2.785	
16,800.00	7,162.95	16,606.36	7,169.62	237.91	231.82	-90.30	1,317.34	9,445.45	1,293.90	824.38	469.51	2.756	
16,879.97	7,162.96	16,686.34	7,169.59	239.84	233.75	-90.29	1,316.91	9,525.42	1,293.65	820.27	473.39	2.733	
16,900.00	7,162.97	16,706.36	7,169.59	240.33	234.24	-90.29	1,316.80	9,545.45	1,293.59	819.24	474.36	2.727	
17,000.00	7,162.99	16,806.36	7,169.55	242.75	236.66	-90.29	1,316.26	9,645.45	1,293.29	814.09	479.20	2.699	
17,056.99	7,163.00	16,863.35	7,169.53	244.13	238.04	-90.29	1,315.96	9,702.44	1,293.11	811.15	481.96	2.683 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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #3												Offset Site Error:	0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		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	-145.57	-12.38	-8.48	15.01				
100.00	100.00	100.00	100.00	0.25	0.25	-145.57	-12.38	-8.48	15.01	14.50	0.50	29.902	
200.00	200.00	200.00	200.00	0.61	0.61	-145.57	-12.38	-8.48	15.01	13.79	1.22	12.313	
300.00	300.00	300.00	300.00	0.97	0.97	-145.57	-12.38	-8.48	15.01	13.07	1.94	7.752	
400.00	400.00	400.00	400.00	1.33	1.33	-145.57	-12.38	-8.48	15.01	12.35	2.65	5.657	
500.00	500.00	500.00	500.00	1.68	1.68	-145.57	-12.38	-8.48	15.01	11.64	3.37	4.453 CC, ES	
600.00	599.98	599.45	599.43	2.04	2.03	-67.45	-13.96	-9.16	15.97	11.91	4.06	3.932	
700.00	699.84	698.65	698.49	2.39	2.36	-82.59	-18.70	-11.20	19.85	15.11	4.74	4.189	
722.35	722.13	720.76	720.54	2.47	2.44	-86.11	-20.19	-11.84	21.29	16.39	4.89	4.351	
800.00	799.54	797.41	796.87	2.74	2.70	-94.82	-26.55	-14.57	28.01	22.59	5.43	5.161	
900.00	899.24	895.62	894.37	3.10	3.05	-99.10	-37.44	-19.25	39.90	33.78	6.12	6.518	
1,000.00	998.94	993.07	990.64	3.47	3.42	-99.65	-51.27	-25.19	54.87	48.05	6.81	8.051	
1,100.00	1,098.64	1,090.05	1,085.91	3.83	3.80	-98.76	-67.93	-32.34	72.72	65.21	7.51	9.681	
1,200.00	1,198.34	1,188.28	1,182.21	4.20	4.20	-97.93	-85.68	-39.97	91.45	83.22	8.23	11.106	
1,300.00	1,298.04	1,286.50	1,278.52	4.57	4.61	-97.38	-103.43	-47.59	110.19	101.23	8.96	12.295	
1,400.00	1,397.74	1,384.72	1,374.82	4.94	5.03	-96.99	-121.18	-55.21	128.95	119.25	9.70	13.298	
1,500.00	1,497.44	1,482.95	1,471.13	5.31	5.45	-96.70	-138.93	-62.84	147.70	137.27	10.43	14.155	
1,600.00	1,597.13	1,581.17	1,567.43	5.68	5.88	-96.48	-156.68	-70.46	166.46	155.28	11.17	14.896	
1,700.00	1,696.83	1,679.39	1,663.74	6.05	6.31	-96.30	-174.43	-78.09	185.22	173.30	11.92	15.542	
1,800.00	1,796.53	1,777.62	1,760.04	6.43	6.75	-96.15	-192.18	-85.71	203.98	191.32	12.66	16.110	
1,900.00	1,896.23	1,875.84	1,856.35	6.80	7.18	-96.03	-209.93	-93.33	222.74	209.33	13.41	16.613	
2,000.00	1,995.93	1,974.06	1,952.65	7.17	7.62	-95.93	-227.68	-100.96	241.50	227.35	14.16	17.061	
2,100.00	2,095.63	2,072.29	2,048.96	7.54	8.06	-95.84	-245.43	-108.58	260.27	245.36	14.90	17.463	
2,200.00	2,195.33	2,170.51	2,145.26	7.92	8.50	-95.76	-263.18	-116.20	279.03	263.38	15.65	17.825	
2,300.00	2,295.03	2,268.73	2,241.57	8.29	8.94	-95.70	-280.93	-123.83	297.80	281.39	16.40	18.154	
2,400.00	2,394.73	2,366.95	2,337.87	8.66	9.38	-95.64	-298.68	-131.45	316.56	299.41	17.16	18.453	
2,500.00	2,494.43	2,465.18	2,434.18	9.04	9.82	-95.59	-316.44	-139.07	335.33	317.42	17.91	18.726	
2,600.00	2,594.12	2,563.40	2,530.48	9.41	10.27	-95.54	-334.19	-146.70	354.09	335.43	18.66	18.976	
2,700.00	2,693.82	2,661.62	2,626.78	9.79	10.71	-95.50	-351.94	-154.32	372.86	353.44	19.41	19.207	
2,800.00	2,793.52	2,759.85	2,723.09	10.16	11.16	-95.46	-369.69	-161.94	391.62	371.46	20.17	19.420	
2,900.00	2,893.22	2,858.07	2,819.39	10.53	11.60	-95.43	-387.44	-169.57	410.39	389.47	20.92	19.617	
3,000.00	2,992.92	2,956.29	2,915.70	10.91	12.05	-95.39	-405.19	-177.19	429.16	407.48	21.67	19.800	
3,100.00	3,092.62	3,054.52	3,012.00	11.28	12.49	-95.37	-422.94	-184.82	447.92	425.49	22.43	19.971	
3,200.00	3,192.32	3,152.74	3,108.31	11.66	12.94	-95.34	-440.69	-192.44	466.69	443.50	23.18	20.130	
3,300.00	3,292.02	3,250.96	3,204.61	12.03	13.39	-95.31	-458.44	-200.06	485.45	461.52	23.94	20.279	
3,400.00	3,391.72	3,349.19	3,300.92	12.41	13.83	-95.29	-476.19	-207.69	504.22	479.53	24.69	20.419	
3,500.00	3,491.41	3,447.41	3,397.22	12.78	14.28	-95.27	-493.94	-215.31	522.99	497.54	25.45	20.550	
3,600.00	3,591.11	3,545.63	3,493.53	13.15	14.73	-95.25	-511.69	-222.93	541.75	515.55	26.21	20.674	
3,700.00	3,690.81	3,643.86	3,589.83	13.53	15.18	-95.23	-529.44	-230.56	560.52	533.56	26.96	20.790	
3,800.00	3,790.51	3,742.08	3,686.14	13.90	15.63	-95.22	-547.19	-238.18	579.29	551.57	27.72	20.900	
3,900.00	3,890.21	3,840.30	3,782.44	14.28	16.07	-95.20	-564.94	-245.80	598.05	569.58	28.47	21.004	
4,000.00	3,989.91	3,938.52	3,878.75	14.65	16.52	-95.19	-582.69	-253.43	616.82	587.59	29.23	21.102	
4,100.00	4,089.61	4,036.75	3,975.05	15.03	16.97	-95.17	-600.44	-261.05	635.59	605.60	29.99	21.195	
4,200.00	4,189.31	4,134.97	4,071.36	15.40	17.42	-95.16	-618.19	-268.67	654.35	623.61	30.74	21.284	
4,300.00	4,289.01	4,233.19	4,167.66	15.78	17.87	-95.15	-635.94	-276.30	673.12	641.62	31.50	21.368	
4,400.00	4,388.70	4,331.42	4,263.96	16.15	18.32	-95.13	-653.69	-283.92	691.89	659.63	32.26	21.449	
4,500.00	4,488.40	4,429.64	4,360.27	16.53	18.77	-95.12	-671.44	-291.55	710.66	677.64	33.01	21.525	
4,600.00	4,588.10	4,527.86	4,456.57	16.90	19.21	-95.11	-689.19	-299.17	729.42	695.65	33.77	21.598	
4,700.00	4,687.80	4,626.09	4,552.88	17.27	19.66	-95.10	-706.94	-306.79	748.19	713.66	34.53	21.668	
4,800.00	4,787.50	4,724.31	4,649.18	17.65	20.11	-95.09	-724.69	-314.42	766.96	731.67	35.29	21.735	
4,900.00	4,887.20	4,822.53	4,745.49	18.02	20.56	-95.08	-742.44	-322.04	785.72	749.68	36.04	21.798	
5,000.00	4,986.90	4,920.76	4,841.79	18.40	21.01	-95.07	-760.19	-329.66	804.49	767.69	36.80	21.860	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #3													Offset Site Error:	0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM													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)				
5,100.00	5,086.60	5,018.98	4,938.10	18.77	21.46	-95.07	-777.94	-337.29	823.26	785.70	37.56	21.918		
5,200.00	5,186.30	5,117.20	5,034.40	19.15	21.91	-95.06	-795.69	-344.91	842.02	803.71	38.32	21.974		
5,300.00	5,286.00	5,215.43	5,130.71	19.52	22.36	-95.05	-813.44	-352.53	860.79	821.71	39.08	22.028		
5,400.00	5,385.69	5,313.65	5,227.01	19.90	22.81	-95.04	-831.19	-360.16	879.56	839.72	39.83	22.080		
5,500.00	5,485.39	5,411.87	5,323.32	20.27	23.26	-95.04	-848.94	-367.78	898.33	857.73	40.59	22.130		
5,600.00	5,585.09	5,510.10	5,419.62	20.65	23.71	-95.03	-866.69	-375.40	917.09	875.74	41.35	22.178		
5,700.00	5,684.79	5,608.32	5,515.93	21.02	24.16	-95.02	-884.44	-383.03	935.86	893.75	42.11	22.224		
5,800.00	5,784.49	5,706.54	5,612.23	21.40	24.61	-95.02	-902.19	-390.65	954.63	911.76	42.87	22.269		
5,900.00	5,884.19	5,804.76	5,708.54	21.77	25.06	-95.01	-919.94	-398.28	973.39	929.77	43.63	22.312		
6,000.00	5,983.89	5,902.99	5,804.84	22.15	25.51	-95.01	-937.69	-405.90	992.16	947.78	44.39	22.354		
6,100.00	6,083.59	6,001.21	5,901.14	22.52	25.96	-95.00	-955.44	-413.52	1,010.93	965.79	45.14	22.394		
6,200.00	6,183.29	6,099.43	5,997.45	22.90	26.41	-94.99	-973.19	-421.15	1,029.70	983.79	45.90	22.432		
6,300.00	6,282.98	6,197.66	6,093.75	23.27	26.86	-94.99	-990.94	-428.77	1,048.46	1,001.80	46.66	22.470		
6,400.00	6,382.68	6,295.88	6,190.06	23.65	27.31	-94.98	-1,008.69	-436.39	1,067.23	1,019.81	47.42	22.506		
6,492.83	6,475.23	6,387.06	6,279.45	24.00	27.73	-94.98	-1,025.17	-443.47	1,084.65	1,036.53	48.12	22.538		
6,500.00	6,482.39	6,394.10	6,286.36	24.02	27.76	-95.97	-1,026.44	-444.02	1,086.00	1,037.82	48.18	22.541		
6,550.00	6,532.35	6,443.14	6,334.44	24.19	27.98	118.25	-1,035.30	-447.82	1,095.38	1,046.84	48.53	22.569		
6,600.00	6,582.27	6,491.82	6,382.17	24.34	28.21	93.13	-1,044.10	-451.60	1,104.73	1,055.87	48.86	22.610		
6,650.00	6,631.83	6,539.85	6,429.26	24.49	28.43	90.79	-1,052.78	-455.33	1,114.07	1,064.90	49.16	22.661		
6,700.00	6,680.73	6,586.93	6,475.43	24.62	28.64	89.90	-1,061.29	-458.98	1,123.43	1,073.99	49.44	22.722		
6,750.00	6,728.67	6,634.49	6,522.14	24.74	28.85	89.45	-1,069.92	-460.95	1,132.87	1,083.16	49.71	22.789		
6,800.00	6,775.35	6,683.28	6,570.07	24.86	29.05	89.16	-1,078.83	-459.28	1,142.34	1,092.37	49.98	22.858		
6,850.00	6,820.48	6,733.43	6,619.04	24.98	29.24	88.97	-1,088.00	-453.68	1,151.79	1,101.55	50.24	22.927		
6,900.00	6,863.78	6,785.07	6,668.84	25.09	29.41	88.85	-1,097.37	-443.83	1,161.15	1,110.65	50.50	22.993		
6,950.00	6,904.99	6,838.34	6,719.21	25.21	29.57	88.77	-1,106.92	-429.41	1,170.36	1,119.60	50.77	23.054		
7,000.00	6,943.86	6,893.37	6,769.80	25.33	29.72	88.73	-1,116.58	-410.06	1,179.35	1,128.31	51.04	23.106		
7,050.00	6,980.14	6,950.30	6,820.19	25.47	29.86	88.73	-1,126.27	-385.45	1,188.05	1,136.72	51.33	23.146		
7,100.00	7,013.60	7,009.26	6,869.86	25.62	29.97	88.75	-1,135.92	-355.24	1,196.36	1,144.73	51.63	23.170		
7,150.00	7,044.06	7,070.33	6,918.18	25.79	30.07	88.81	-1,145.39	-319.14	1,204.22	1,152.25	51.97	23.172		
7,200.00	7,071.31	7,133.60	6,964.40	26.00	30.16	88.89	-1,154.57	-276.96	1,211.52	1,159.18	52.34	23.146		
7,250.00	7,095.18	7,199.07	7,007.64	26.23	30.22	88.98	-1,163.28	-228.61	1,218.20	1,165.42	52.77	23.084		
7,300.00	7,115.54	7,266.73	7,046.93	26.50	30.26	89.08	-1,171.34	-174.17	1,224.14	1,170.86	53.28	22.974		
7,350.00	7,132.25	7,336.44	7,081.23	26.81	30.29	89.18	-1,178.56	-113.95	1,229.28	1,175.39	53.89	22.811		
7,400.00	7,145.22	7,408.02	7,109.49	27.16	30.30	89.28	-1,184.74	-48.52	1,233.52	1,178.91	54.61	22.589		
7,450.00	7,154.36	7,481.18	7,130.72	27.55	30.30	89.36	-1,189.67	21.28	1,236.80	1,181.34	55.46	22.303		
7,500.00	7,159.61	7,555.56	7,144.08	27.97	30.30	89.41	-1,193.19	94.32	1,239.06	1,182.63	56.43	21.959		
7,541.91	7,161.00	7,618.50	7,148.78	28.35	30.33	89.44	-1,194.96	157.03	1,240.13	1,182.80	57.33	21.631		
7,600.00	7,161.01	7,682.24	7,149.01	28.92	30.46	89.45	-1,195.91	220.76	1,240.85	1,182.35	58.50	21.211		
7,700.00	7,161.03	7,782.23	7,149.03	30.03	31.15	89.45	-1,197.35	320.74	1,242.06	1,181.37	60.69	20.467		
7,800.00	7,161.05	7,882.22	7,149.05	31.29	32.29	89.45	-1,198.78	420.72	1,243.26	1,180.09	63.17	19.681		
7,900.00	7,161.08	7,982.21	7,149.07	32.69	33.63	89.45	-1,200.21	520.71	1,244.46	1,178.54	65.92	18.878		
8,000.00	7,161.10	8,082.21	7,149.09	34.20	35.11	89.45	-1,201.64	620.69	1,245.66	1,176.75	68.91	18.077		
8,100.00	7,161.12	8,182.20	7,149.12	35.81	36.69	89.45	-1,203.08	720.67	1,246.86	1,174.76	72.10	17.293		
8,200.00	7,161.14	8,282.19	7,149.14	37.52	38.35	89.45	-1,204.51	820.65	1,248.06	1,172.59	75.48	16.536		
8,300.00	7,161.16	8,382.18	7,149.16	39.30	40.10	89.45	-1,205.94	920.64	1,249.26	1,170.26	79.01	15.812		
8,400.00	7,161.18	8,482.18	7,149.18	41.15	41.92	89.45	-1,207.37	1,020.62	1,250.46	1,167.79	82.67	15.125		
8,500.00	7,161.20	8,582.17	7,149.20	43.05	43.79	89.45	-1,208.81	1,120.60	1,251.67	1,165.21	86.46	14.477		
8,600.00	7,161.22	8,682.16	7,149.22	45.01	45.72	89.45	-1,210.24	1,220.58	1,252.87	1,162.51	90.35	13.866		
8,700.00	7,161.24	8,782.16	7,149.24	47.02	47.69	89.45	-1,211.67	1,320.57	1,254.07	1,159.73	94.34	13.294		
8,800.00	7,161.26	8,882.15	7,149.26	49.06	49.71	89.45	-1,213.10	1,420.55	1,255.27	1,156.87	98.40	12.757		
8,900.00	7,161.29	8,982.14	7,149.28	51.14	51.76	89.45	-1,214.54	1,520.53	1,256.47	1,153.94	102.53	12.254		
9,000.00	7,161.31	9,082.13	7,149.30	53.24	53.84	89.45	-1,215.97	1,620.51	1,257.67	1,150.94	106.73	11.783		

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #3												Offset Site Error:	0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM												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)			
9,100.00	7,161.33	9,182.13	7,149.33	55.38	55.95	89.45	-1,217.40	1,720.50	1,258.87	1,147.89	110.98	11.343	
9,200.00	7,161.35	9,282.12	7,149.35	57.54	58.09	89.45	-1,218.83	1,820.48	1,260.08	1,144.79	115.29	10.930	
9,300.00	7,161.37	9,382.11	7,149.37	59.72	60.25	89.45	-1,220.27	1,920.46	1,261.28	1,141.64	119.63	10.543	
9,400.00	7,161.39	9,482.11	7,149.39	61.92	62.43	89.46	-1,221.70	2,020.44	1,262.48	1,138.46	124.02	10.180	
9,500.00	7,161.41	9,582.10	7,149.41	64.13	64.62	89.46	-1,223.13	2,120.43	1,263.68	1,135.24	128.44	9.839	
9,600.00	7,161.43	9,682.09	7,149.43	66.36	66.84	89.46	-1,224.56	2,220.41	1,264.88	1,131.99	132.89	9.518	
9,700.00	7,161.45	9,782.08	7,149.45	68.61	69.07	89.46	-1,226.00	2,320.39	1,266.08	1,128.71	137.38	9.216	
9,800.00	7,161.48	9,882.08	7,149.47	70.87	71.31	89.46	-1,227.43	2,420.37	1,267.28	1,125.40	141.88	8.932	
9,900.00	7,161.50	9,982.07	7,149.49	73.14	73.56	89.46	-1,228.86	2,520.36	1,268.49	1,122.07	146.41	8.664	
10,000.00	7,161.52	10,082.06	7,149.51	75.42	75.83	89.46	-1,230.29	2,620.34	1,269.69	1,118.72	150.97	8.410	
10,100.00	7,161.54	10,182.05	7,149.54	77.71	78.11	89.46	-1,231.73	2,720.32	1,270.89	1,115.35	155.54	8.171	
10,200.00	7,161.56	10,282.05	7,149.56	80.01	80.39	89.46	-1,233.16	2,820.30	1,272.09	1,111.96	160.13	7.944	
10,300.00	7,161.58	10,382.04	7,149.58	82.32	82.69	89.46	-1,234.59	2,920.29	1,273.29	1,108.55	164.74	7.729	
10,400.00	7,161.60	10,482.03	7,149.60	84.63	84.99	89.46	-1,236.03	3,020.27	1,274.49	1,105.13	169.36	7.525	
10,500.00	7,161.62	10,582.03	7,149.62	86.95	87.30	89.46	-1,237.46	3,120.25	1,275.69	1,101.70	174.00	7.332	
10,600.00	7,161.64	10,682.02	7,149.64	89.28	89.62	89.46	-1,238.89	3,220.23	1,276.89	1,098.25	178.64	7.148	
10,700.00	7,161.66	10,782.01	7,149.66	91.61	91.94	89.46	-1,240.32	3,320.22	1,278.10	1,094.79	183.31	6.973	
10,800.00	7,161.69	10,882.00	7,149.68	93.95	94.27	89.46	-1,241.76	3,420.20	1,279.30	1,091.32	187.98	6.806	
10,900.00	7,161.71	10,982.00	7,149.70	96.29	96.60	89.46	-1,243.19	3,520.18	1,280.50	1,087.84	192.66	6.646	
11,000.00	7,161.73	11,081.99	7,149.72	98.64	98.94	89.46	-1,244.62	3,620.16	1,281.70	1,084.35	197.35	6.495	
11,100.00	7,161.75	11,181.98	7,149.75	100.99	101.29	89.46	-1,246.05	3,720.15	1,282.90	1,080.85	202.05	6.349	
11,200.00	7,161.77	11,281.98	7,149.77	103.35	103.64	89.46	-1,247.49	3,820.13	1,284.10	1,077.35	206.76	6.211	
11,300.00	7,161.79	11,381.97	7,149.79	105.71	105.99	89.47	-1,248.92	3,920.11	1,285.30	1,073.83	211.47	6.078	
11,400.00	7,161.81	11,481.96	7,149.81	108.07	108.35	89.47	-1,250.35	4,020.09	1,286.51	1,070.31	216.20	5.951	
11,500.00	7,161.83	11,581.95	7,149.83	110.44	110.71	89.47	-1,251.78	4,120.08	1,287.71	1,066.78	220.93	5.829	
11,600.00	7,161.85	11,681.95	7,149.85	112.80	113.07	89.47	-1,253.22	4,220.06	1,288.91	1,063.25	225.66	5.712	
11,700.00	7,161.87	11,781.94	7,149.87	115.18	115.43	89.47	-1,254.65	4,320.04	1,290.11	1,059.71	230.40	5.599	
11,800.00	7,161.90	11,881.93	7,149.89	117.55	117.80	89.47	-1,256.08	4,420.02	1,291.31	1,056.16	235.15	5.491	
11,900.00	7,161.92	11,981.93	7,149.91	119.93	120.18	89.47	-1,257.51	4,520.01	1,292.51	1,052.61	239.90	5.388	
12,000.00	7,161.94	12,081.92	7,149.93	122.31	122.55	89.47	-1,258.95	4,619.99	1,293.71	1,049.05	244.66	5.288	
12,100.00	7,161.96	12,181.91	7,149.96	124.69	124.93	89.47	-1,260.38	4,719.97	1,294.92	1,045.49	249.42	5.192	
12,200.00	7,161.98	12,281.90	7,149.98	127.07	127.31	89.47	-1,261.81	4,819.95	1,296.12	1,041.93	254.19	5.099	
12,300.00	7,162.00	12,381.90	7,150.00	129.46	129.69	89.47	-1,263.24	4,919.94	1,297.32	1,038.36	258.96	5.010	
12,400.00	7,162.02	12,481.89	7,150.02	131.85	132.07	89.47	-1,264.68	5,019.92	1,298.52	1,034.79	263.73	4.924	
12,500.00	7,162.04	12,581.88	7,150.04	134.24	134.46	89.47	-1,266.11	5,119.90	1,299.72	1,031.21	268.51	4.840	
12,600.00	7,162.06	12,681.87	7,150.06	136.63	136.85	89.47	-1,267.54	5,219.88	1,300.92	1,027.63	273.29	4.760	
12,700.00	7,162.09	12,781.87	7,150.08	139.02	139.24	89.47	-1,268.97	5,319.87	1,302.12	1,024.05	278.08	4.683	
12,800.00	7,162.11	12,881.86	7,150.10	141.42	141.63	89.47	-1,270.41	5,419.85	1,303.32	1,020.46	282.86	4.608	
12,900.00	7,162.13	12,981.85	7,150.12	143.81	144.02	89.47	-1,271.84	5,519.83	1,304.53	1,016.87	287.66	4.535	
13,000.00	7,162.15	13,081.85	7,150.14	146.21	146.42	89.47	-1,273.27	5,619.81	1,305.73	1,013.28	292.45	4.465	
13,100.00	7,162.17	13,181.84	7,150.17	148.61	148.81	89.47	-1,274.71	5,719.80	1,306.93	1,009.68	297.25	4.397	
13,200.00	7,162.19	13,281.83	7,150.19	151.01	151.21	89.47	-1,276.14	5,819.78	1,308.13	1,006.09	302.04	4.331	
13,300.00	7,162.21	13,381.82	7,150.21	153.41	153.61	89.47	-1,277.57	5,919.76	1,309.33	1,002.49	306.85	4.267	
13,400.00	7,162.23	13,481.82	7,150.23	155.81	156.01	89.48	-1,279.00	6,019.74	1,310.53	998.88	311.65	4.205	
13,500.00	7,162.25	13,581.81	7,150.25	158.21	158.41	89.48	-1,280.44	6,119.73	1,311.73	995.28	316.45	4.145	
13,600.00	7,162.27	13,681.80	7,150.27	160.62	160.81	89.48	-1,281.87	6,219.71	1,312.94	991.67	321.26	4.087	
13,700.00	7,162.30	13,781.80	7,150.29	163.02	163.21	89.48	-1,283.30	6,319.69	1,314.14	988.06	326.07	4.030	
13,800.00	7,162.32	13,881.79	7,150.31	165.43	165.62	89.48	-1,284.73	6,419.67	1,315.34	984.45	330.88	3.975	
13,900.00	7,162.34	13,981.78	7,150.33	167.84	168.02	89.48	-1,286.17	6,519.66	1,316.54	980.84	335.70	3.922	
14,000.00	7,162.36	14,081.77	7,150.35	170.24	170.43	89.48	-1,287.60	6,619.64	1,317.74	977.23	340.51	3.870	
14,100.00	7,162.38	14,181.77	7,150.38	172.65	172.84	89.48	-1,289.03	6,719.62	1,318.94	973.61	345.33	3.819	
14,200.00	7,162.40	14,281.76	7,150.40	175.06	175.25	89.48	-1,290.46	6,819.60	1,320.14	969.99	350.15	3.770	

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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #3													Offset Site Error: 0.00 usft
Survey Program: 0-B001Mb_MWD+HRGM							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
14,300.00	7,162.42	14,381.75	7,150.42	177.47	177.65	89.48	-1,291.90	6,919.59	1,321.34	966.37	354.97	3.722	
14,400.00	7,162.44	14,481.74	7,150.44	179.88	180.06	89.48	-1,293.33	7,019.57	1,322.55	962.75	359.79	3.676	
14,500.00	7,162.46	14,581.74	7,150.46	182.29	182.47	89.48	-1,294.76	7,119.55	1,323.75	959.13	364.62	3.631	
14,600.00	7,162.49	14,681.73	7,150.48	184.71	184.89	89.48	-1,296.19	7,219.53	1,324.95	955.51	369.44	3.586	
14,700.00	7,162.51	14,781.72	7,150.50	187.12	187.30	89.48	-1,297.63	7,319.52	1,326.15	951.88	374.27	3.543	
14,800.00	7,162.53	14,881.72	7,150.52	189.53	189.71	89.48	-1,299.06	7,419.50	1,327.35	948.26	379.10	3.501	
14,900.00	7,162.55	14,981.71	7,150.54	191.95	192.12	89.48	-1,300.49	7,519.48	1,328.55	944.63	383.92	3.460	
15,000.00	7,162.57	15,081.70	7,150.56	194.36	194.54	89.48	-1,301.92	7,619.46	1,329.75	941.00	388.75	3.421	
15,100.00	7,162.59	15,181.69	7,150.59	196.78	196.95	89.48	-1,303.36	7,719.45	1,330.96	937.37	393.59	3.382	
15,200.00	7,162.61	15,281.69	7,150.61	199.19	199.37	89.48	-1,304.79	7,819.43	1,332.16	933.74	398.42	3.344	
15,300.00	7,162.63	15,381.68	7,150.63	201.61	201.78	89.48	-1,306.22	7,919.41	1,333.36	930.11	403.25	3.307	
15,400.00	7,162.65	15,481.67	7,150.65	204.03	204.20	89.48	-1,307.65	8,019.39	1,334.56	926.47	408.09	3.270	
15,500.00	7,162.67	15,581.67	7,150.67	206.44	206.62	89.49	-1,309.09	8,119.38	1,335.76	922.84	412.92	3.235	
15,600.00	7,162.70	15,681.66	7,150.69	208.86	209.04	89.49	-1,310.52	8,219.36	1,336.96	919.21	417.76	3.200	
15,700.00	7,162.72	15,781.65	7,150.71	211.28	211.45	89.49	-1,311.95	8,319.34	1,338.16	915.57	422.59	3.167	
15,800.00	7,162.74	15,881.64	7,150.73	213.70	213.87	89.49	-1,313.39	8,419.32	1,339.37	911.93	427.43	3.134	
15,900.00	7,162.76	15,981.64	7,150.75	216.12	216.29	89.49	-1,314.82	8,519.31	1,340.57	908.30	432.27	3.101	
16,000.00	7,162.78	16,081.63	7,150.77	218.54	218.71	89.49	-1,316.25	8,619.29	1,341.77	904.66	437.11	3.070	
16,100.00	7,162.80	16,181.62	7,150.80	220.96	221.13	89.49	-1,317.68	8,719.27	1,342.97	901.02	441.95	3.039	
16,200.00	7,162.82	16,281.61	7,150.82	223.38	223.55	89.49	-1,319.12	8,819.25	1,344.17	897.38	446.79	3.008	
16,300.00	7,162.84	16,381.61	7,150.84	225.80	225.97	89.49	-1,320.55	8,919.24	1,345.37	893.74	451.64	2.979	
16,400.00	7,162.86	16,481.60	7,150.86	228.22	228.39	89.49	-1,321.98	9,019.22	1,346.57	890.10	456.48	2.950	
16,500.00	7,162.88	16,581.59	7,150.88	230.64	230.81	89.49	-1,323.41	9,119.20	1,347.77	886.45	461.32	2.922	
16,600.00	7,162.91	16,681.59	7,150.90	233.06	233.24	89.49	-1,324.85	9,219.19	1,348.98	882.81	466.17	2.894	
16,700.00	7,162.93	16,781.58	7,150.92	235.49	235.66	89.49	-1,326.28	9,319.17	1,350.18	879.17	471.01	2.867	
16,800.00	7,162.95	16,881.57	7,150.94	237.91	238.08	89.49	-1,327.71	9,419.15	1,351.38	875.52	475.86	2.840	
16,879.97	7,162.96	16,961.54	7,150.96	239.84	240.02	89.49	-1,328.86	9,499.11	1,352.34	872.61	479.73	2.819	
16,900.00	7,162.97	16,981.56	7,150.96	240.33	240.50	89.49	-1,329.14	9,519.13	1,352.58	871.88	480.70	2.814	
17,000.00	7,162.99	17,081.56	7,150.98	242.75	242.93	89.49	-1,330.58	9,619.12	1,353.78	868.23	485.55	2.788	
17,056.99	7,163.00	17,138.55	7,151.00	244.13	244.31	89.49	-1,331.39	9,676.10	1,354.47	866.15	488.31	2.774 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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6563+30 @ 6593.00usft (H&P 530)

Offset Depths are relative to Offset Datum

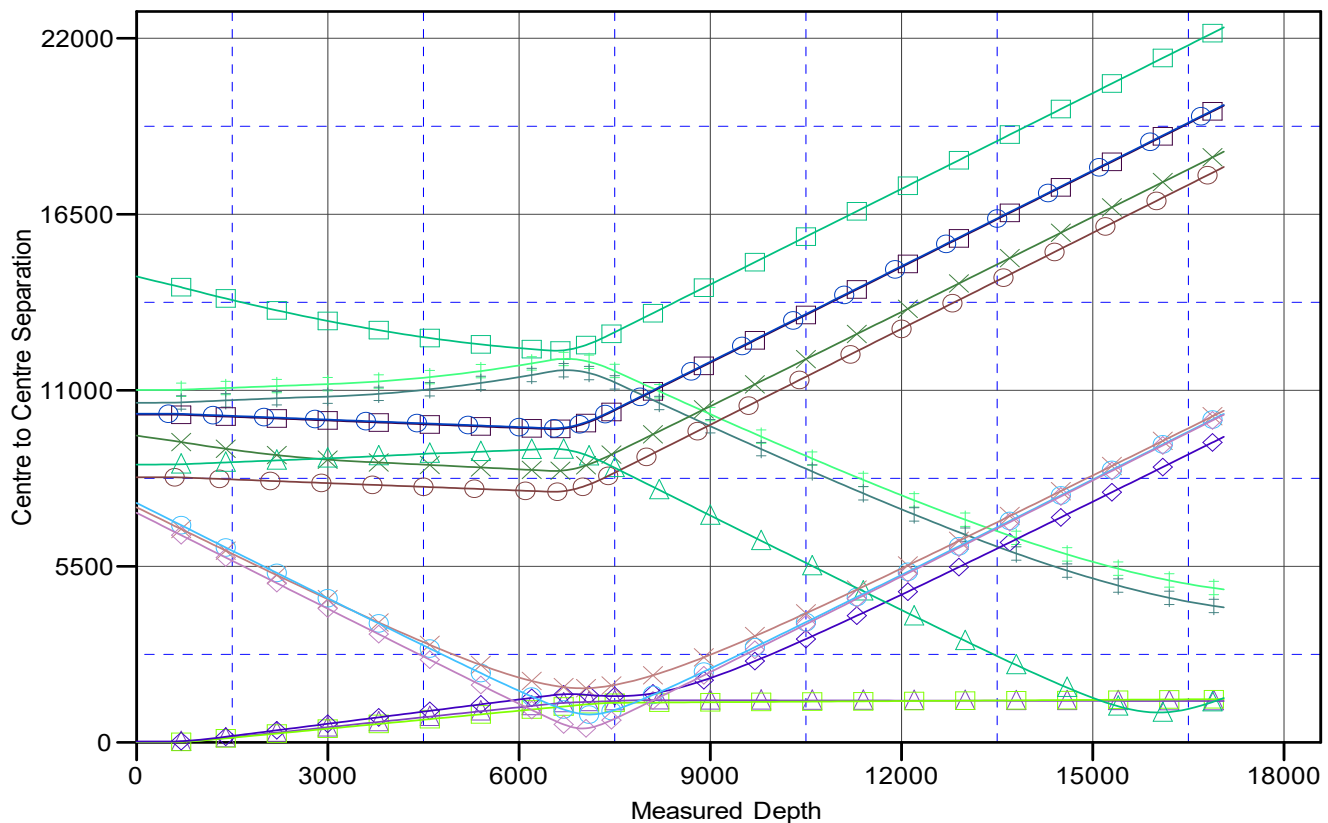
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit 836H

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

Grid Convergence at Surface is: 0.31°

Ladder Plot



LEGEND

Rosa Unit #864H, OH, OH V0	(C) Rosa Unit #184C, OH, OH-INC V0	(C) Rosa Unit #112Y, OH, OH-INC V0
Rosa Unit 832H, OH, Plan #2 V0	Rosa Unit 830H, OH, Plan #2 V0	Rosa Unit #748H, OH, OH V0
(C) Schak 32 #003H, OH, OH-SVY V0	(C) Pre-Ordng Well #112, OH, OH-TD V0	Rosa Unit #745H, OH, OH V0
(C) Schak 32 #001A, OH, OH-SVY V0	(C) Rosa Unit #008C, OH, OH-SVY V0	Rosa Unit #744H, OH, OH V0
Rosa Unit 834H, OH, Plan #3 V0	(C) Rosa Unit #601, 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 836H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 836H	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:	Plan #3	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6563+30 @ 6593.00usft (H&P 530)

Offset Depths are relative to Offset Datum

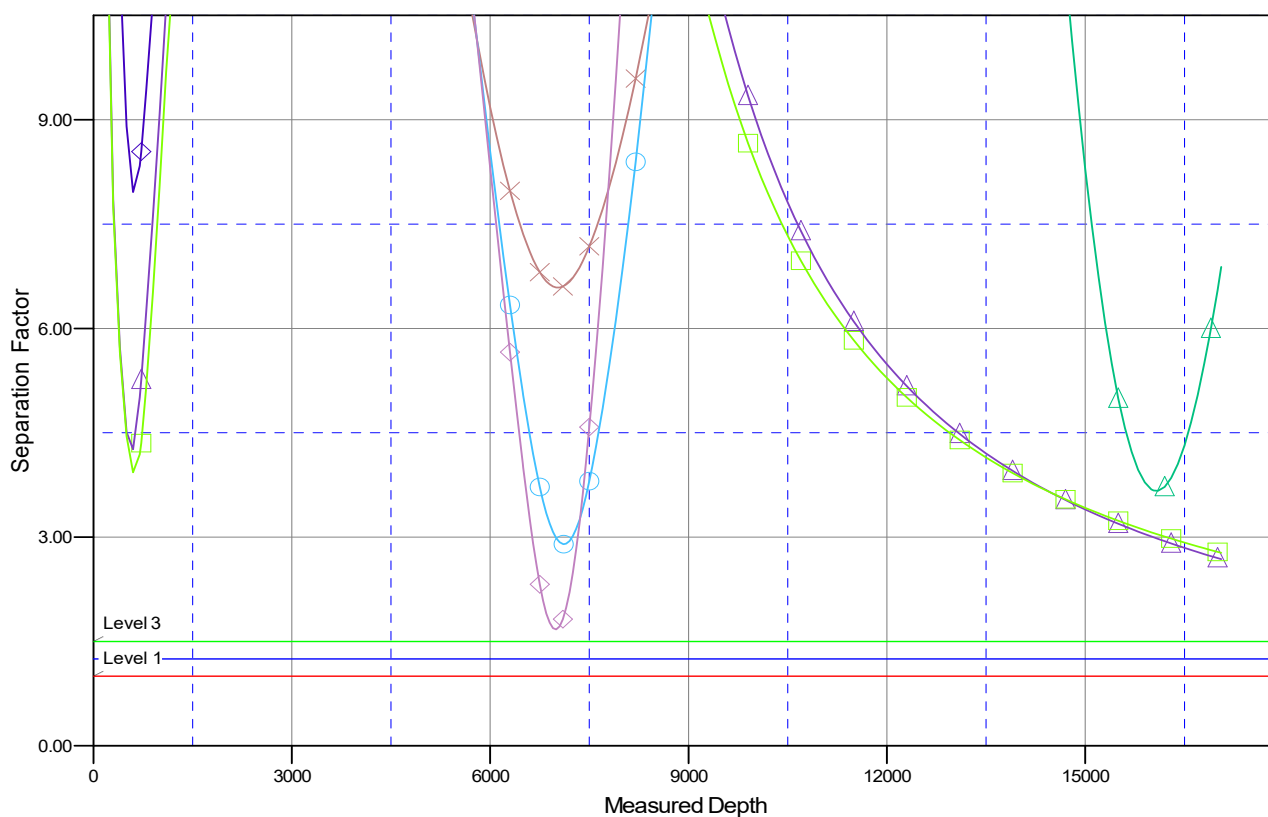
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit 836H

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

Grid Convergence at Surface is: 0.31°

Separation Factor Plot



LEGEND

Rosa Unit #864H, OH, OH V0	(C) Rosa Unit #184C, OH, OH-INC V0	(C) Rosa Unit #112Y, OH, OH-INC V0
Rosa Unit 832H, OH, Plan #2 V0	Rosa Unit 830H, OH, Plan #2 V0	Rosa Unit #748H, OH, OH V0
(C) Schak 32 #003H, OH, OH-SVY V0	(C) Pre-Ordard Well #112, OH, OH-TD V0	Rosa Unit #745H, OH, OH V0
(C) Schak 32 #001A, OH, OH-SVY V0	(C) Rosa Unit #006C, OH, OH-SVY V0	Rosa Unit #744H, OH, OH V0
Rosa Unit 834H, OH, Plan #3 V0	(C) Rosa Unit #801, OH, OH-SVY V0	

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

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

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

CONDITIONS

Action 263658

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 263658
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	Original COA's still apply.	9/14/2023