

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Artec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1820 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, NM 87505

AS DRILLED PLAT

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-043-21202		*Pool Code 98067	*Pool Name WC 22N5W7; GALLUP (O)	
*Property Code 311963	*Property Name LOGOS		OIL CONS. DIV DIST. 3 JUL 15 2014	*Well Number 701H
*OGRID No. 289408	*Operator Name LOGOS OPERATING, LLC			*Elevation 6961'

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	8	22-N	5-W		450	NORTH	510	WEST	SANDOVAL

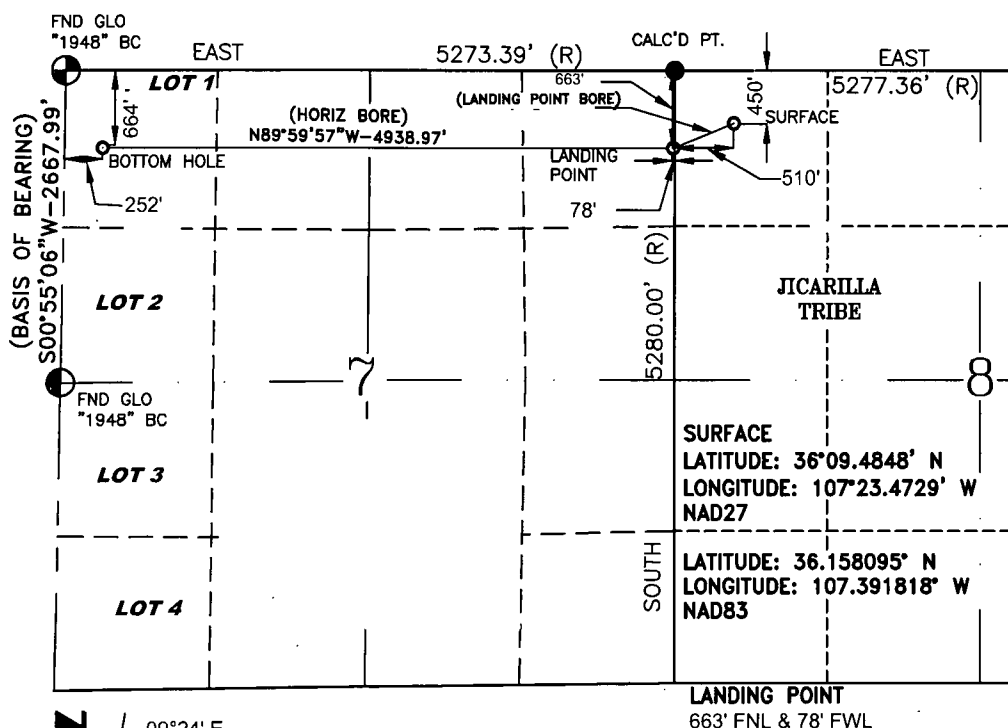
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	7	22-N	5-W		664	NORTH	252	WEST	SANDOVAL

¹³ Dedicated Acres 159.79	¹⁴ Joint or Infill	¹⁵ Consolidation Code	¹⁶ Order No. NSL-7069-A. CTB-711-0
---	-------------------------------	----------------------------------	--

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

16



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 a working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Tan Session 7-10-14

Signature	Date
Tamra Sessions	
Printed Name	
tamra@gobrainstorm.net	
E-mail Address	

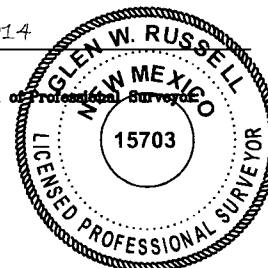
18 SURVEYOR CERTIFICATION

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

JUNE 6, 2014

Date of Survey _____

Signature and Seal of Professional Surveyor



GLEN W. RUSSELL

Certificate Number

15703

BASIS OF BEARING:
BETWEEN FOUND MONUMENTS AT THE NORTHWEST CORNER AND THE WEST
QUARTER CORNER OF SECTION 7, TOWNSHIP 22 NORTH, RANGE 5 WEST,
N.M.P.M. SANDOVAL COUNTY, NEW MEXICO.

LINE BEARS: S 00°55'06" W A DISTANCE OF 2667.99 FEET AS MEASURED
BY G.P.S. LOCAL GRID NAD83.

2

16



145133

May 16, 2014

Logos Resources, LLC.

Jay Paul McWilliams

4001 N. Butler Avenue

Farmington, NM 87401

OIL CONS. DIV DIST. 3

JUL 15 2014

CATHEDRAL ENERGY SERVICES
The Trinity Building
Suite 300, 1801 Broadway Street
Denver, Colorado, United States
80202

303.825.1001 Office
877.825.1002 Toll-Free
303.825.1991 Fax

CathedralEnergyServices.com

Drilling + Completions

Re: Certified Final Directional Survey

Dear Sir,

Please find enclosed Cathedral Energy Services Certified Final Survey for Logos Resources, LLC.

Rig: Aztec #222

Well: LOGOS NM (Sec 8) #701H

API # 30-043-21202

County: Sandoval County, NM

The data and calculations included in this survey have been reviewed and conform to the operational procedures set forth by Cathedral Energy Services. Should you have any questions please do not hesitate to contact Cathedral Energy Services.

Sincerely,

Cathedral Energy Services

SCOTT CROSLEY

Well Planner Print Name

Well Planner Signature

Date



Project: Sandoval County, NM
 Site: S8-T22N-R5W
 Well: LOGOS #701H
 Wellbore: HZ
 Design: FINAL

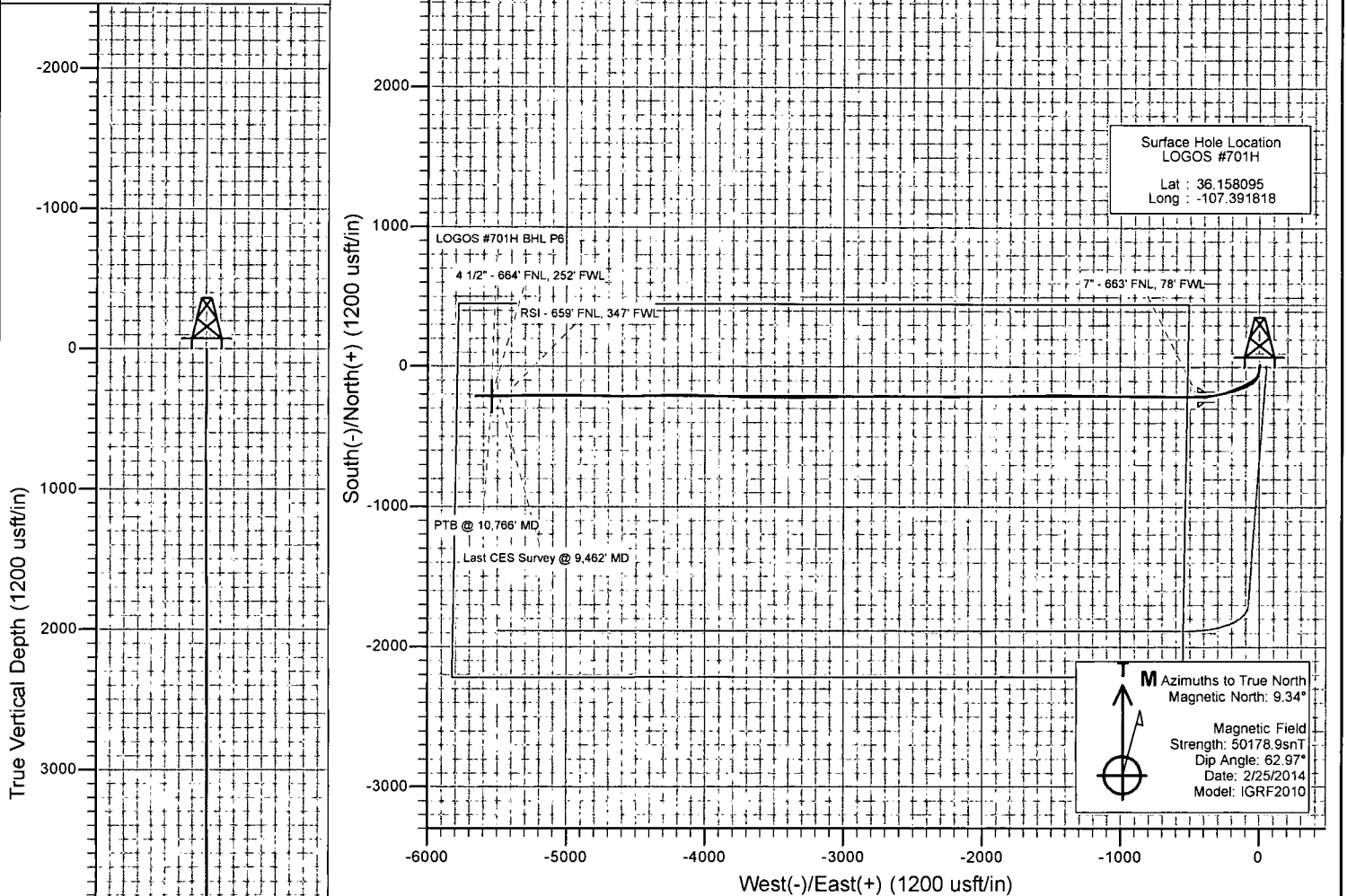


FINAL
 LOGOS #701H
 145XXX, SC
 KB=14.5 @ 6975.5usft (Original Well Elev)
 Ground Elevation @ 6961.0
 North American Datum 1983
 Well LOGOS #701H, True North

OIL CONS. DIV DIST. 3

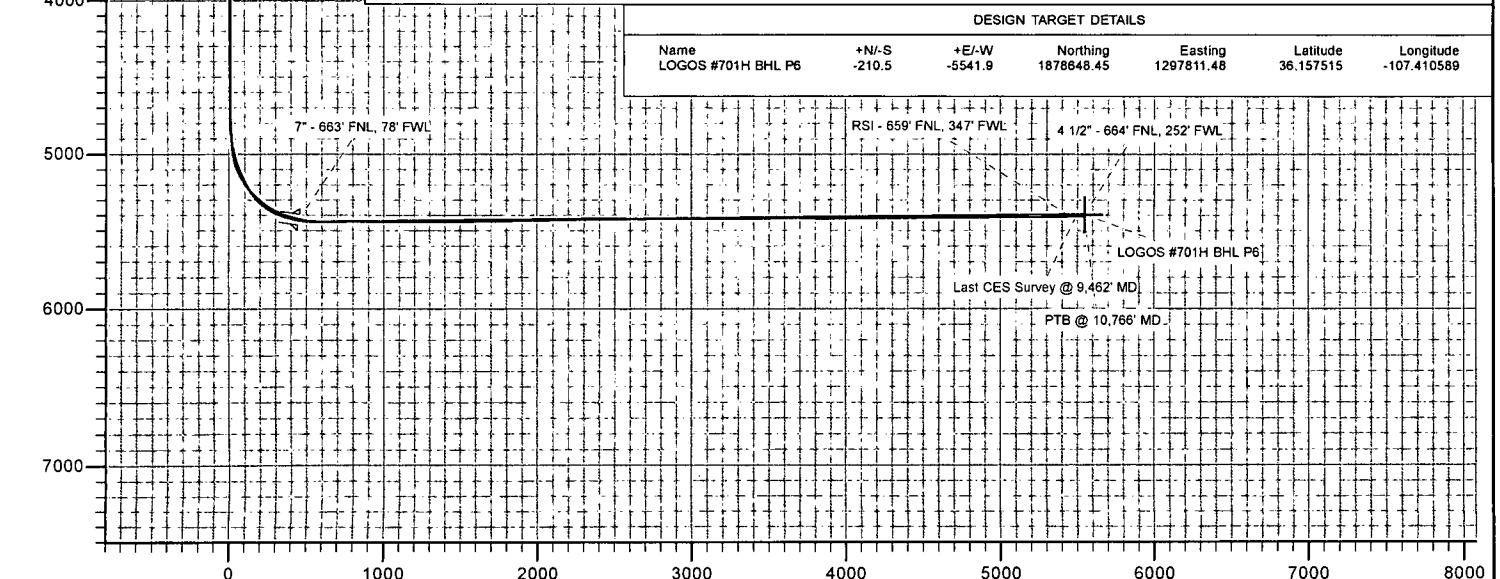
JUL 15 2014

Surface Hole Location
 LOGOS #701H
 Lat : 36.158095
 Long : -107.391818



M Azimuths to True North
 Magnetic North: 9.34°
 Magnetic Field
 Strength: 50178.9snT
 Dip Angle: 62.97°
 Date: 2/25/2014
 Model: IGRF2010

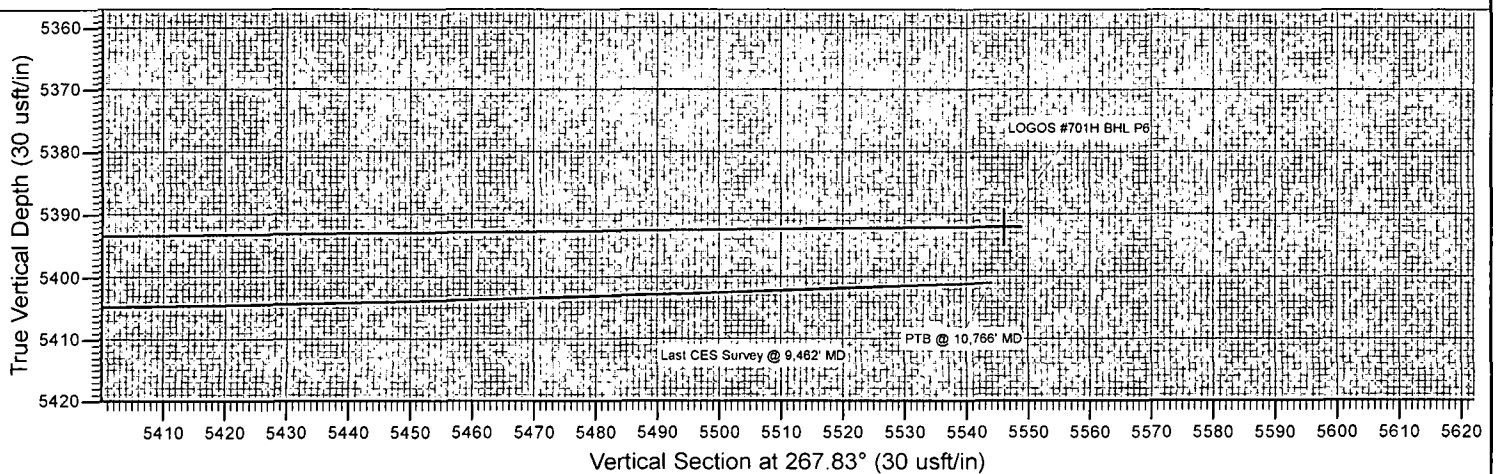
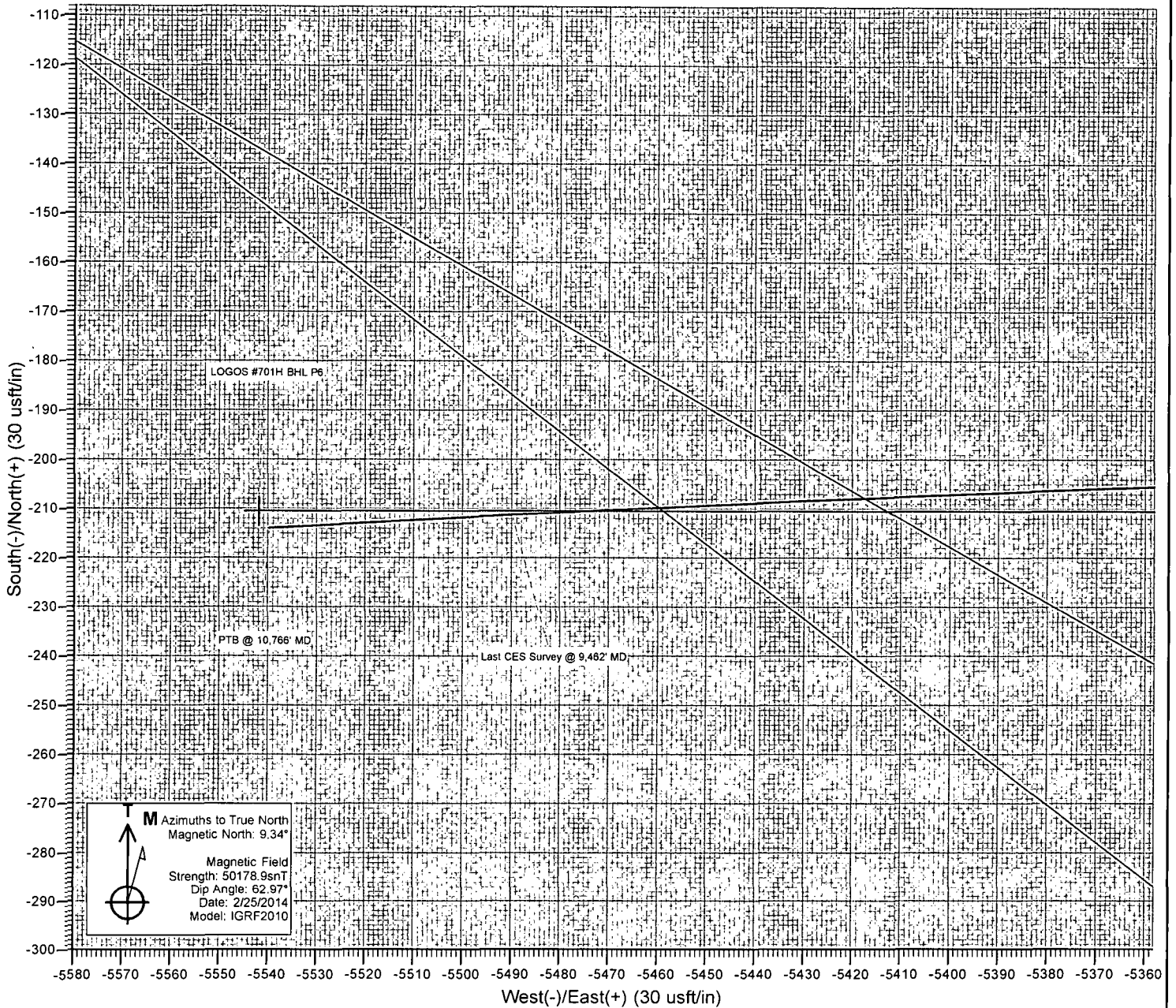
DESIGN TARGET DETAILS						
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LOGOS #701H BHL P6	-210.5	-5541.9	1878848.45	1297811.48	36.157515	-107.410589



Vertical Section at 267.83° (1200 usft/in)



Project: Sandoval County, NM
Site: S8-T22N-R5W
Well: LOGOS #701H
Wellbore: HZ
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Sandoval County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site:	S8-T22N-R5W				
Site Position:		Northing:	1,878,793.72 usft	Latitude:	36.158095
From:	Lat/Long	Easting:	1,303,355.47 usft	Longitude:	-107.391818
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.67 °

Well	LOGOS #701H					
Well Position	+N/-S	0.0 usft	Northing:	1,878,793.72 usft	Latitude:	36.158095
	+E/-W	0.0 usft	Easting:	1,303,355.47 usft	Longitude:	-107.391818
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	6,961.0 usft	

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/25/2014	9.34	62.97	50,179

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	267.83	

Survey Program		Date	5/16/2014	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
620.0	10,766.0	Survey #1 (HZ)	Geolink MWD	Geolink MWD

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
620.0	2.10	15.20	619.9	11.0	3.0	-3.4	0.34	0.34	
681.0	2.90	1.40	680.8	13.6	3.3	-3.8	1.63	1.31	
742.0	4.10	346.60	741.7	17.2	2.8	-3.5	2.45	1.97	
803.0	2.90	347.70	802.6	20.9	2.0	-2.8	1.97	-1.97	
864.0	1.00	337.60	863.5	22.9	1.5	-2.3	3.15	-3.11	
926.0	0.80	339.80	925.5	23.8	1.1	-2.0	0.33	-0.32	
988.0	0.50	288.60	987.5	24.3	0.7	-1.6	1.01	-0.48	
1,049.0	0.30	226.00	1,048.5	24.3	0.3	-1.3	0.74	-0.33	
1,109.0	0.50	233.60	1,108.5	24.0	0.0	-0.9	0.34	0.33	
1,171.0	0.80	182.60	1,170.5	23.4	-0.2	-0.7	1.00	0.48	
1,232.0	0.90	168.80	1,231.5	22.5	-0.1	-0.7	0.37	0.16	
1,293.0	0.80	189.40	1,292.5	21.6	-0.1	-0.7	0.52	-0.16	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,355.0	0.80	186.00	1,354.5	20.8	-0.2	-0.6	0.08	0.00	
1,416.0	0.70	186.70	1,415.5	20.0	-0.3	-0.4	0.16	-0.16	
1,477.0	0.80	208.30	1,476.5	19.2	-0.6	-0.2	0.49	0.16	
1,541.0	0.80	206.20	1,540.5	18.4	-1.0	0.3	0.05	0.00	
1,604.0	1.00	206.20	1,603.5	17.5	-1.4	0.7	0.32	0.32	
1,667.0	1.10	210.30	1,666.5	16.5	-2.0	1.3	0.20	0.16	
1,730.0	1.00	204.60	1,729.5	15.5	-2.5	1.9	0.23	-0.16	
1,794.0	0.50	205.20	1,793.4	14.7	-2.8	2.3	0.78	-0.78	
1,857.0	0.70	202.70	1,856.4	14.1	-3.1	2.6	0.32	0.32	
1,920.0	0.70	174.90	1,919.4	13.4	-3.2	2.7	0.53	0.00	
1,983.0	0.50	200.10	1,982.4	12.7	-3.3	2.8	0.52	-0.32	
2,047.0	0.90	186.70	2,046.4	12.0	-3.4	3.0	0.67	0.62	
2,110.0	0.90	193.70	2,109.4	11.0	-3.6	3.2	0.17	0.00	
2,173.0	1.10	176.30	2,172.4	9.9	-3.7	3.3	0.57	0.32	
2,236.0	0.30	186.80	2,235.4	9.2	-3.7	3.3	1.28	-1.27	
2,299.0	0.20	84.90	2,298.4	9.0	-3.6	3.2	0.62	-0.16	
2,362.0	0.40	329.00	2,361.4	9.2	-3.6	3.2	0.82	0.32	
2,425.0	0.40	346.00	2,424.4	9.6	-3.8	3.4	0.19	0.00	
2,488.0	0.20	303.10	2,487.4	9.9	-3.9	3.5	0.46	-0.32	
2,552.0	0.20	99.30	2,551.4	9.9	-3.9	3.5	0.61	0.00	
2,614.0	0.20	52.70	2,613.4	10.0	-3.7	3.3	0.26	0.00	
2,677.0	0.20	26.20	2,676.4	10.1	-3.6	3.2	0.15	0.00	
2,740.0	0.20	81.70	2,739.4	10.3	-3.4	3.0	0.30	0.00	
2,803.0	0.10	350.80	2,802.4	10.3	-3.3	2.9	0.36	-0.16	
2,865.0	0.00	279.30	2,864.4	10.4	-3.3	2.9	0.16	-0.16	
2,928.0	0.30	178.00	2,927.4	10.2	-3.3	2.9	0.48	0.47	
2,991.0	0.60	174.70	2,990.4	9.7	-3.3	2.9	0.48	0.48	
3,054.0	0.80	176.80	3,053.4	9.0	-3.2	2.9	0.32	0.32	
3,116.0	0.80	177.60	3,115.4	8.1	-3.2	2.9	0.02	0.00	
3,179.0	0.80	179.40	3,178.4	7.2	-3.1	2.9	0.04	0.00	
3,242.0	0.60	192.10	3,241.4	6.4	-3.2	3.0	0.40	-0.32	
3,305.0	0.80	199.50	3,304.4	5.7	-3.4	3.2	0.35	0.32	
3,367.0	0.90	189.80	3,366.4	4.8	-3.7	3.5	0.28	0.16	
3,430.0	0.70	201.90	3,429.4	4.0	-3.9	3.7	0.41	-0.32	
3,493.0	0.60	177.90	3,492.4	3.3	-4.0	3.9	0.46	-0.16	
3,556.0	0.60	186.10	3,555.4	2.6	-4.0	3.9	0.14	0.00	
3,619.0	0.60	195.00	3,618.4	2.0	-4.2	4.1	0.15	0.00	
3,682.0	0.80	179.90	3,681.3	1.2	-4.2	4.2	0.43	0.32	
3,745.0	0.80	192.30	3,744.3	0.4	-4.3	4.3	0.27	0.00	
3,807.0	0.90	191.50	3,806.3	-0.5	-4.5	4.5	0.16	0.16	
3,870.0	0.80	194.20	3,869.3	-1.5	-4.7	4.8	0.17	-0.16	
3,933.0	0.70	197.10	3,932.3	-2.2	-4.9	5.0	0.17	-0.16	
3,996.0	0.80	178.30	3,995.3	-3.1	-5.0	5.2	0.42	0.16	
4,059.0	0.70	176.90	4,058.3	-3.9	-5.0	5.2	0.16	-0.16	
4,122.0	0.70	168.30	4,121.3	-4.6	-4.9	5.1	0.17	0.00	
4,185.0	0.80	176.90	4,184.3	-5.5	-4.8	5.0	0.24	0.16	
4,247.0	0.70	180.70	4,246.3	-6.3	-4.8	5.0	0.18	-0.16	
4,309.0	0.70	174.90	4,308.3	-7.0	-4.8	5.0	0.11	0.00	
4,372.0	0.40	173.20	4,371.3	-7.6	-4.7	5.0	0.48	-0.48	
4,435.0	0.20	279.30	4,434.3	-7.8	-4.8	5.1	0.78	-0.32	
4,498.0	0.40	352.30	4,497.3	-7.6	-4.9	5.2	0.62	0.32	
4,561.0	0.20	28.10	4,560.3	-7.3	-4.9	5.2	0.42	-0.32	
4,623.0	0.00	279.30	4,622.3	-7.2	-4.9	5.1	0.32	-0.32	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
4,666.0	0.30	176.70	4,665.3	-7.3	-4.8	5.1	0.70	0.70	
4,698.0	3.00	181.20	4,697.3	-8.2	-4.9	5.2	8.44	8.44	
4,729.0	6.40	185.60	4,728.2	-10.7	-5.0	5.4	11.02	10.97	
4,761.0	8.20	182.60	4,759.9	-14.8	-5.3	5.9	5.75	5.63	
4,791.0	10.10	185.50	4,789.5	-19.6	-5.7	6.4	6.52	6.33	
4,822.0	12.00	193.10	4,819.9	-25.4	-6.7	7.6	7.71	6.13	
4,854.0	13.80	196.70	4,851.1	-32.3	-8.5	9.7	6.16	5.63	
4,885.0	15.50	198.40	4,881.1	-39.8	-10.9	12.4	5.66	5.48	
4,916.0	17.30	199.70	4,910.9	-48.0	-13.7	15.6	5.93	5.81	
4,948.0	17.00	209.20	4,941.4	-56.6	-17.6	19.8	8.79	-0.94	
4,979.0	17.50	219.70	4,971.1	-64.1	-22.8	25.2	10.16	1.61	
5,011.0	18.90	227.10	5,001.5	-71.4	-29.7	32.4	8.44	4.38	
5,043.0	20.60	231.00	5,031.6	-78.5	-37.9	40.8	6.72	5.31	
5,074.0	22.40	233.30	5,060.4	-85.4	-46.8	50.0	6.41	5.81	
5,106.0	24.10	236.00	5,089.8	-92.7	-57.1	60.6	6.27	5.31	
5,137.0	25.50	238.10	5,118.0	-99.8	-68.1	71.8	5.34	4.52	
5,169.0	27.60	240.90	5,146.6	-107.0	-80.4	84.4	7.64	6.56	
5,201.0	29.60	241.90	5,174.7	-114.4	-93.8	98.1	6.43	6.25	
5,233.0	31.60	239.10	5,202.2	-122.4	-108.0	112.6	7.67	6.25	
5,264.0	34.80	241.00	5,228.2	-130.8	-122.7	127.6	10.85	10.32	
5,295.0	38.50	242.80	5,253.0	-139.5	-139.0	144.2	12.43	11.94	
5,326.0	42.10	245.00	5,276.7	-148.4	-157.1	162.6	12.49	11.61	
5,358.0	44.70	248.50	5,299.9	-157.0	-177.2	183.1	11.07	8.12	
5,389.0	48.10	251.60	5,321.3	-164.7	-198.3	204.5	13.14	10.97	
5,420.0	52.30	252.20	5,341.1	-172.0	-221.0	227.4	13.63	13.55	
5,451.0	57.00	252.40	5,359.1	-179.7	-245.1	251.7	15.17	15.16	
5,483.0	61.40	253.40	5,375.5	-187.8	-271.3	278.3	14.01	13.75	
5,514.0	65.70	255.90	5,389.3	-195.1	-298.1	305.3	15.64	13.87	
5,545.0	69.60	258.30	5,401.0	-201.5	-326.0	333.4	14.47	12.58	
5,577.0	73.50	260.90	5,411.2	-207.0	-355.9	363.5	14.42	12.19	
5,608.0	76.90	263.90	5,419.1	-211.0	-385.6	393.3	14.42	10.97	
5,640.0	79.60	268.20	5,425.6	-213.1	-416.8	424.6	15.63	8.44	
5,693.0	83.30	271.40	5,433.5	-213.3	-469.2	477.0	9.19	6.98	
5,724.0	83.70	271.40	5,437.0	-212.5	-500.0	507.7	1.29	1.29	
5,756.0	85.80	270.00	5,439.9	-212.1	-531.9	539.5	7.88	6.56	
5,787.0	89.90	270.70	5,441.1	-212.0	-562.8	570.5	13.42	13.23	
5,849.0	91.10	270.50	5,440.6	-211.3	-624.8	632.4	1.96	1.94	
5,910.0	92.80	270.40	5,438.5	-210.8	-685.8	693.3	2.79	2.79	
5,971.0	90.70	270.90	5,436.6	-210.1	-746.8	754.2	3.54	-3.44	
6,032.0	89.60	270.40	5,436.5	-209.4	-807.8	815.1	1.98	-1.80	
6,093.0	90.00	270.30	5,436.7	-209.1	-868.8	876.1	0.68	0.66	
6,154.0	89.00	271.10	5,437.2	-208.3	-929.7	937.0	2.10	-1.64	
6,215.0	88.20	270.90	5,438.7	-207.3	-990.7	997.9	1.35	-1.31	
6,276.0	88.70	271.10	5,440.3	-206.2	-1,051.7	1,058.8	0.88	0.82	
6,338.0	89.10	270.10	5,441.5	-205.5	-1,113.7	1,120.7	1.74	0.65	
6,400.0	90.30	270.60	5,441.9	-205.2	-1,175.7	1,182.6	2.10	1.94	
6,461.0	90.70	271.30	5,441.3	-204.2	-1,236.7	1,243.5	1.32	0.66	
6,521.0	90.30	271.20	5,440.8	-202.8	-1,296.6	1,303.4	0.69	-0.67	
6,583.0	91.00	271.30	5,440.1	-201.5	-1,358.6	1,365.3	1.14	1.13	
6,644.0	90.80	271.10	5,439.1	-200.2	-1,419.6	1,426.2	0.46	-0.33	
6,705.0	90.40	269.60	5,438.5	-199.8	-1,480.6	1,487.1	2.54	-0.66	
6,767.0	90.90	269.00	5,437.8	-200.6	-1,542.6	1,549.1	1.26	0.81	
6,828.0	91.50	268.40	5,436.5	-202.0	-1,603.6	1,610.1	1.39	0.98	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,889.0	91.30	268.40	5,435.0	-203.7	-1,664.5	1,671.0	0.33	-0.33	
6,950.0	90.50	268.30	5,434.1	-205.4	-1,725.5	1,732.0	1.32	-1.31	
7,011.0	91.10	267.70	5,433.2	-207.6	-1,786.4	1,793.0	1.39	0.98	
7,072.0	91.00	268.70	5,432.1	-209.5	-1,847.4	1,854.0	1.65	-0.16	
7,133.0	90.90	269.70	5,431.1	-210.3	-1,908.4	1,915.0	1.65	-0.16	
7,195.0	90.20	270.70	5,430.5	-210.1	-1,970.4	1,976.9	1.97	-1.13	
7,258.0	90.60	270.00	5,430.1	-209.7	-2,033.4	2,039.9	1.28	0.63	
7,321.0	91.30	269.10	5,429.0	-210.2	-2,096.4	2,102.8	1.81	1.11	
7,384.0	90.60	269.80	5,428.0	-210.8	-2,159.3	2,165.8	1.57	-1.11	
7,447.0	90.90	268.80	5,427.1	-211.6	-2,222.3	2,228.8	1.66	0.48	
7,510.0	90.40	269.40	5,426.4	-212.6	-2,285.3	2,291.7	1.24	-0.79	
7,573.0	90.50	270.50	5,425.9	-212.7	-2,348.3	2,354.7	1.75	0.16	
7,636.0	91.10	270.20	5,425.0	-212.3	-2,411.3	2,417.6	1.06	0.95	
7,699.0	91.10	271.10	5,423.8	-211.6	-2,474.3	2,480.5	1.43	0.00	
7,762.0	90.50	271.30	5,423.0	-210.2	-2,537.3	2,543.4	1.00	-0.95	
7,825.0	90.80	270.70	5,422.2	-209.1	-2,600.3	2,606.3	1.06	0.48	
7,887.0	91.40	269.40	5,421.1	-209.1	-2,662.2	2,668.3	2.31	0.97	
7,950.0	90.40	269.90	5,420.1	-209.5	-2,725.2	2,731.2	1.77	-1.59	
8,013.0	90.70	269.50	5,419.5	-209.8	-2,788.2	2,794.2	0.79	0.48	
8,076.0	89.80	269.50	5,419.2	-210.3	-2,851.2	2,857.2	1.43	-1.43	
8,140.0	88.70	269.80	5,420.0	-210.7	-2,915.2	2,921.1	1.78	-1.72	
8,203.0	89.20	269.20	5,421.2	-211.3	-2,978.2	2,984.1	1.24	0.79	
8,266.0	89.70	267.70	5,421.8	-213.0	-3,041.2	3,047.1	2.51	0.79	
8,329.0	90.00	269.20	5,421.9	-214.7	-3,104.2	3,110.1	2.43	0.48	
8,392.0	90.90	268.80	5,421.5	-215.8	-3,167.1	3,173.1	1.56	1.43	
8,455.0	91.00	269.80	5,420.4	-216.6	-3,230.1	3,236.0	1.60	0.16	
8,518.0	89.60	270.20	5,420.1	-216.6	-3,293.1	3,299.0	2.31	-2.22	
8,581.0	90.80	269.80	5,419.9	-216.6	-3,356.1	3,361.9	2.01	1.90	
8,644.0	92.40	268.60	5,418.1	-217.4	-3,419.1	3,424.9	3.17	2.54	
8,707.0	91.90	268.60	5,415.7	-219.0	-3,482.0	3,487.8	0.79	-0.79	
8,771.0	88.70	270.40	5,415.4	-219.5	-3,546.0	3,551.8	5.74	-5.00	
8,834.0	89.70	270.40	5,416.3	-219.1	-3,609.0	3,614.7	1.59	1.59	
8,897.0	91.20	269.90	5,415.8	-218.9	-3,672.0	3,677.7	2.51	2.38	
8,960.0	90.80	271.60	5,414.7	-218.1	-3,735.0	3,740.6	2.77	-0.63	
9,023.0	89.10	272.50	5,414.7	-215.9	-3,797.9	3,803.4	3.05	-2.70	
9,086.0	88.00	273.10	5,416.3	-212.8	-3,860.8	3,866.1	1.99	-1.75	
9,149.0	88.90	272.20	5,418.0	-209.9	-3,923.8	3,928.9	2.02	1.43	
9,211.0	90.40	272.00	5,418.4	-207.6	-3,985.7	3,990.7	2.44	2.42	
9,275.0	91.90	272.50	5,417.1	-205.1	-4,049.6	4,054.5	2.47	2.34	
9,337.0	91.70	271.70	5,415.2	-202.8	-4,111.6	4,116.3	1.33	-0.32	
9,399.0	90.40	270.40	5,414.0	-201.7	-4,173.5	4,178.2	2.97	-2.10	
9,462.0	91.20	270.30	5,413.2	-201.3	-4,236.5	4,241.1	1.28	1.27	
9,525.0	90.80	269.40	5,412.1	-201.5	-4,299.5	4,304.1	1.56	-0.63	
9,588.0	90.00	268.10	5,411.6	-202.8	-4,362.5	4,367.1	2.42	-1.27	
9,651.0	91.10	267.50	5,411.0	-205.3	-4,425.5	4,430.1	1.99	1.75	
9,715.0	90.40	267.10	5,410.2	-208.3	-4,489.4	4,494.1	1.26	-1.09	
9,778.0	90.20	268.30	5,409.9	-210.8	-4,552.3	4,557.1	1.93	-0.32	
9,841.0	90.30	270.20	5,409.6	-211.6	-4,615.3	4,620.0	3.02	0.16	
9,904.0	90.20	271.40	5,409.3	-210.7	-4,678.3	4,682.9	1.91	-0.16	
9,967.0	91.40	271.70	5,408.4	-209.0	-4,741.3	4,745.8	1.96	1.90	
10,030.0	90.70	271.60	5,407.3	-207.2	-4,804.2	4,808.7	1.12	-1.11	
10,093.0	89.70	271.80	5,407.1	-205.4	-4,867.2	4,871.5	1.62	-1.59	
10,155.0	89.40	271.50	5,407.5	-203.6	-4,929.2	4,933.4	0.68	-0.48	

Cathedral Energy Services

Survey Report

Company: LOGOS Operating LLC
 Project: Sandoval County, NM
 Site: S8-T22N-R5W
 Well: LOGOS #701H
 Wellbore: HZ
 Design: FINAL

Local Co-ordinate Reference: Well LOGOS #701H
 TVD Reference: KB=14.5 @ 6975.5usft (Original Well Elev)
 MD Reference: KB=14.5 @ 6975.5usft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,218.0	90.30	271.90	5,407.7	-201.7	-4,992.2	4,996.2	1.56	1.43	
10,281.0	90.00	270.30	5,407.5	-200.5	-5,055.1	5,059.1	2.58	-0.48	
10,407.0	90.70	269.70	5,406.8	-200.5	-5,181.1	5,185.0	0.73	0.56	
10,470.0	90.00	268.10	5,406.4	-201.7	-5,244.1	5,248.0	2.77	-1.11	
10,533.0	91.10	268.30	5,405.8	-203.7	-5,307.1	5,311.0	1.77	1.75	
10,596.0	90.30	267.80	5,405.0	-205.8	-5,370.1	5,374.0	1.50	-1.27	
10,658.0	91.10	267.50	5,404.3	-208.4	-5,432.0	5,436.0	1.38	1.29	
10,671.0	91.30	267.37	5,404.0	-208.9	-5,445.0	5,449.0	1.86	1.55	RSI - 659' FNL, 347' FWL
10,716.0	92.00	266.90	5,402.7	-211.2	-5,489.9	5,494.0	1.86	1.55	Last CES Survey @ 9,462' MD
10,766.0	92.00	266.90	5,400.9	-213.9	-5,539.8	5,543.9	0.00	0.00	4 1/2" - 664' FNL, 252' FWL - PTB @ 10,766' MD

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets

Target Name	- hit/miss target	- Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LOGOS #701H 7"/85°			0.00	0.00	5,435.7	-210.5	-581.0	1,878,590.12	1,302,772.04	36.157517	-107.393786
- actual wellpath misses target center by 5.5usft at 5805.2usft MD (5441.1 TVD, -211.7 N, -581.1 E)											
- Point											
LOGOS #701H VP			0.00	0.00	4,764.9	-210.5	-100.0	1,878,584.46	1,303,253.00	36.157517	-107.392157
- actual wellpath misses target center by 214.0usft at 4805.9usft MD (4804.1 TVD, -22.2 N, -6.0 E)											
- Point											
LOGOS #701H BHL test			0.00	0.00	5,392.0	-220.5	-5,539.9	1,878,638.38	1,297,813.36	36.157488	-107.410583
- actual wellpath misses target center by 11.1usft at 10766.0usft MD (5400.9 TVD, -213.9 N, -5539.8 E)											
- Point											
LOGOS #701H 7"/85° (F			0.00	0.00	5,435.7	-210.5	-511.0	1,878,589.29	1,302,842.03	36.157517	-107.393549
- actual wellpath misses target center by 3.1usft at 5734.8usft MD (5438.1 TVD, -212.3 N, -510.8 E)											
- Point											
LOGOS #701H POE			0.00	0.00	5,435.7	-210.5	-882.0	1,878,593.65	1,302,471.06	36.157517	-107.394805
- actual wellpath misses target center by 1.8usft at 6106.2usft MD (5436.7 TVD, -209.0 N, -882.0 E)											
- Point											
LOGOS #701H BHL P5			0.00	0.00	5,392.0	-210.5	-5,731.9	1,878,650.69	1,297,621.53	36.157515	-107.411233
- actual wellpath misses target center by 192.3usft at 10766.0usft MD (5400.9 TVD, -213.9 N, -5539.8 E)											
- Point											
LOGOS #701H BHL P6			0.00	0.00	5,392.0	-210.5	-5,541.9	1,878,648.45	1,297,811.48	36.157515	-107.410589
- actual wellpath misses target center by 9.8usft at 10766.0usft MD (5400.9 TVD, -213.9 N, -5539.8 E)											
- Point											
LOGOS #701H 7"/85° (2			0.00	0.00	5,435.7	-210.5	-521.0	1,878,589.41	1,302,832.03	36.157517	-107.393583
- actual wellpath misses target center by 3.8usft at 5744.8usft MD (5439.0 TVD, -212.2 N, -520.7 E)											
- Point											
LOGOS #701H BHL			0.00	0.00	5,392.0	-210.5	-5,460.3	1,878,647.49	1,297,893.08	36.157516	-107.410313
- actual wellpath misses target center by 11.6usft at 10686.7usft MD (5403.6 TVD, -209.7 N, -5460.7 E)											
- Point											

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
5,666.0	5,429.9	7" - 663' FNL, 78' FWL	0	0

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,671.0	5,404.0	-208.9	-5,445.0	RSI - 659' FNL, 347' FWL
10,716.0	5,402.7	-211.2	-5,489.9	Last CES Survey @ 9,462' MD
10,766.0	5,400.9	-213.9	-5,539.8	PTB @ 10,766' MD
10,766.0	5,400.9	-213.9	-5,539.8	4 1/2" - 664' FNL, 252' FWL

Checked By: _____ Approved By: _____ Date: _____

LOGOS Operating LLC

Sandoval County, NM

S8-T22N-R5W

LOGOS #701H

HZ

Design: FINAL

Survey Report - Geographic

16 May, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Sandoval County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site		S8-T22N-R5W						
Site Position:		Northing:	1,878,793.72	usft	Latitude:	36.158095		
From:	Lat/Long	Easting:	1,303,355.47	usft	Longitude:	-107.391818		
Position Uncertainty:	0.0	usft	Slot Radius:	13-3/16	"	Grid Convergence:	-0.67	°

Well	LOGOS #701H					
Well Position	+N/-S	0.0 usft	Northing:	1,878,793.72 usft	Latitude:	36.158095
	+E/-W	0.0 usft	Easting:	1,303,355.47 usft	Longitude:	-107.391818
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	6,961.0 usft	

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2/25/2014	9.34	62.97	50,179

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	267.83	

Survey Program	Date 5/16/2014			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
620.0	10,766.0	Survey #1 (HZ)	Geolink MWD	Geolink MWD

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Map Northing	Map Easting	Latitude	Longitude
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	1,878,793.72	1,303,355.47	36.158095	-107.391818
620.0	2.10	15.20	619.9	11.0	3.0	1,878,804.65	1,303,358.58	36.158125	-107.391808
681.0	2.90	1.40	680.8	13.6	3.3	1,878,807.26	1,303,358.94	36.158132	-107.391807
742.0	4.10	346.60	741.7	17.2	2.8	1,878,810.93	1,303,358.52	36.158142	-107.391809
803.0	2.90	347.70	802.6	20.9	2.0	1,878,814.57	1,303,357.72	36.158152	-107.391811
864.0	1.00	337.60	863.5	22.9	1.5	1,878,816.58	1,303,357.22	36.158158	-107.391813
926.0	0.80	339.80	925.5	23.8	1.1	1,878,817.49	1,303,356.87	36.158160	-107.391814
988.0	0.50	288.60	987.5	24.3	0.7	1,878,817.99	1,303,356.47	36.158162	-107.391816
1,049.0	0.30	226.00	1,048.5	24.3	0.3	1,878,817.97	1,303,356.10	36.158162	-107.391817
1,109.0	0.50	233.60	1,108.5	24.0	0.0	1,878,817.70	1,303,355.78	36.158161	-107.391818
1,171.0	0.80	182.60	1,170.5	23.4	-0.2	1,878,817.11	1,303,355.53	36.158159	-107.391819
1,232.0	0.90	168.80	1,231.5	22.5	-0.1	1,878,816.22	1,303,355.60	36.158157	-107.391819

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
1,293.0	0.80	189.40	1,292.5	21.6	-0.1	1,878,815.33	1,303,355.61	36.158154	-107.391819	
1,355.0	0.80	186.00	1,354.5	20.8	-0.2	1,878,814.47	1,303,355.48	36.158152	-107.391819	
1,416.0	0.70	186.70	1,415.5	20.0	-0.3	1,878,813.68	1,303,355.39	36.158150	-107.391819	
1,477.0	0.80	208.30	1,476.5	19.2	-0.6	1,878,812.94	1,303,355.13	36.158148	-107.391820	
1,541.0	0.80	206.20	1,540.5	18.4	-1.0	1,878,812.15	1,303,354.71	36.158146	-107.391822	
1,604.0	1.00	206.20	1,603.5	17.5	-1.4	1,878,811.27	1,303,354.27	36.158143	-107.391823	
1,667.0	1.10	210.30	1,666.5	16.5	-2.0	1,878,810.26	1,303,353.71	36.158140	-107.391825	
1,730.0	1.00	204.60	1,729.5	15.5	-2.5	1,878,809.24	1,303,353.16	36.158138	-107.391827	
1,794.0	0.50	205.20	1,793.4	14.7	-2.8	1,878,808.48	1,303,352.80	36.158136	-107.391828	
1,857.0	0.70	202.70	1,856.4	14.1	-3.1	1,878,807.88	1,303,352.53	36.158134	-107.391829	
1,920.0	0.70	174.90	1,919.4	13.4	-3.2	1,878,807.15	1,303,352.40	36.158132	-107.391829	
1,983.0	0.50	200.10	1,982.4	12.7	-3.3	1,878,806.51	1,303,352.34	36.158130	-107.391829	
2,047.0	0.90	186.70	2,046.4	12.0	-3.4	1,878,805.75	1,303,352.17	36.158128	-107.391830	
2,110.0	0.90	193.70	2,109.4	11.0	-3.6	1,878,804.78	1,303,351.99	36.158125	-107.391831	
2,173.0	1.10	176.30	2,172.4	9.9	-3.7	1,878,803.69	1,303,351.90	36.158122	-107.391831	
2,236.0	0.30	186.80	2,235.4	9.2	-3.7	1,878,802.93	1,303,351.91	36.158120	-107.391831	
2,299.0	0.20	84.90	2,298.4	9.0	-3.6	1,878,802.77	1,303,351.99	36.158120	-107.391830	
2,362.0	0.40	329.00	2,361.4	9.2	-3.6	1,878,802.97	1,303,351.99	36.158120	-107.391830	
2,425.0	0.40	346.00	2,424.4	9.6	-3.8	1,878,803.37	1,303,351.83	36.158121	-107.391831	
2,488.0	0.20	303.10	2,487.4	9.9	-3.9	1,878,803.65	1,303,351.69	36.158122	-107.391831	
2,552.0	0.20	99.30	2,551.4	9.9	-3.9	1,878,803.69	1,303,351.71	36.158122	-107.391831	
2,614.0	0.20	52.70	2,613.4	10.0	-3.7	1,878,803.74	1,303,351.90	36.158122	-107.391831	
2,677.0	0.20	26.20	2,676.4	10.1	-3.6	1,878,803.90	1,303,352.04	36.158123	-107.391830	
2,740.0	0.20	81.70	2,739.4	10.3	-3.4	1,878,804.01	1,303,352.20	36.158123	-107.391830	
2,803.0	0.10	350.80	2,802.4	10.3	-3.3	1,878,804.08	1,303,352.30	36.158123	-107.391829	
2,865.0	0.00	279.30	2,864.4	10.4	-3.3	1,878,804.14	1,303,352.29	36.158124	-107.391829	
2,928.0	0.30	178.00	2,927.4	10.2	-3.3	1,878,803.97	1,303,352.29	36.158123	-107.391829	
2,991.0	0.60	174.70	2,990.4	9.7	-3.3	1,878,803.48	1,303,352.32	36.158122	-107.391829	
3,054.0	0.80	176.80	3,053.4	9.0	-3.2	1,878,802.71	1,303,352.37	36.158120	-107.391829	
3,116.0	0.80	177.60	3,115.4	8.1	-3.2	1,878,801.84	1,303,352.40	36.158117	-107.391829	
3,179.0	0.80	179.40	3,178.4	7.2	-3.1	1,878,800.96	1,303,352.41	36.158115	-107.391829	
3,242.0	0.60	192.10	3,241.4	6.4	-3.2	1,878,800.20	1,303,352.34	36.158113	-107.391829	
3,305.0	0.80	199.50	3,304.4	5.7	-3.4	1,878,799.47	1,303,352.12	36.158111	-107.391830	
3,367.0	0.90	189.80	3,366.4	4.8	-3.7	1,878,798.58	1,303,351.88	36.158108	-107.391831	
3,430.0	0.70	201.90	3,429.4	4.0	-3.9	1,878,797.74	1,303,351.64	36.158106	-107.391831	
3,493.0	0.60	177.90	3,492.4	3.3	-4.0	1,878,797.06	1,303,351.50	36.158104	-107.391832	
3,556.0	0.60	186.10	3,555.4	2.6	-4.0	1,878,796.40	1,303,351.47	36.158102	-107.391832	
3,619.0	0.60	195.00	3,618.4	2.0	-4.2	1,878,795.75	1,303,351.34	36.158101	-107.391832	
3,682.0	0.80	179.90	3,681.3	1.2	-4.2	1,878,795.00	1,303,351.25	36.158098	-107.391833	
3,745.0	0.80	192.30	3,744.3	0.4	-4.3	1,878,794.13	1,303,351.14	36.158096	-107.391833	
3,807.0	0.90	191.50	3,806.3	-0.5	-4.5	1,878,793.23	1,303,350.94	36.158094	-107.391834	
3,870.0	0.80	194.20	3,869.3	-1.5	-4.7	1,878,792.32	1,303,350.73	36.158091	-107.391834	
3,933.0	0.70	197.10	3,932.3	-2.2	-4.9	1,878,791.53	1,303,350.50	36.158089	-107.391835	
3,996.0	0.80	178.30	3,995.3	-3.1	-5.0	1,878,790.72	1,303,350.39	36.158087	-107.391835	
4,059.0	0.70	176.90	4,058.3	-3.9	-5.0	1,878,789.90	1,303,350.41	36.158084	-107.391835	
4,122.0	0.70	168.30	4,121.3	-4.6	-4.9	1,878,789.14	1,303,350.50	36.158082	-107.391835	
4,185.0	0.80	176.90	4,184.3	-5.5	-4.8	1,878,788.32	1,303,350.59	36.158080	-107.391835	
4,247.0	0.70	180.70	4,246.3	-6.3	-4.8	1,878,787.51	1,303,350.60	36.158078	-107.391835	
4,309.0	0.70	174.90	4,308.3	-7.0	-4.8	1,878,786.75	1,303,350.62	36.158076	-107.391834	
4,372.0	0.40	173.20	4,371.3	-7.6	-4.7	1,878,786.15	1,303,350.68	36.158074	-107.391834	
4,435.0	0.20	279.30	4,434.3	-7.8	-4.8	1,878,785.95	1,303,350.59	36.158074	-107.391834	
4,498.0	0.40	352.30	4,497.3	-7.6	-4.9	1,878,786.19	1,303,350.46	36.158074	-107.391835	
4,561.0	0.20	28.10	4,560.3	-7.3	-4.9	1,878,786.50	1,303,350.48	36.158075	-107.391835	
4,623.0	0.00	279.30	4,622.3	-7.2	-4.9	1,878,786.60	1,303,350.53	36.158075	-107.391835	
4,666.0	0.30	176.70	4,665.3	-7.3	-4.8	1,878,786.49	1,303,350.54	36.158075	-107.391835	

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,698.0	3.00	181.20	4,697.3	-8.2	-4.9	1,878,785.56	1,303,350.52	36.158073	-107.391835	
4,729.0	6.40	185.60	4,728.2	-10.7	-5.0	1,878,783.04	1,303,350.30	36.158066	-107.391835	
4,761.0	8.20	182.60	4,759.9	-14.8	-5.3	1,878,778.99	1,303,349.97	36.158054	-107.391836	
4,791.0	10.10	185.50	4,789.5	-19.6	-5.7	1,878,774.23	1,303,349.57	36.158041	-107.391837	
4,822.0	12.00	193.10	4,819.9	-25.4	-6.7	1,878,768.40	1,303,348.51	36.158025	-107.391841	
4,854.0	13.80	196.70	4,851.1	-32.3	-8.5	1,878,761.53	1,303,346.58	36.158006	-107.391847	
4,885.0	15.50	198.40	4,881.1	-39.8	-10.9	1,878,754.08	1,303,344.12	36.157986	-107.391855	
4,916.0	17.30	199.70	4,910.9	-48.0	-13.7	1,878,745.85	1,303,341.16	36.157963	-107.391865	
4,948.0	17.00	209.20	4,941.4	-56.6	-17.6	1,878,737.33	1,303,337.17	36.157940	-107.391878	
4,979.0	17.50	219.70	4,971.1	-64.1	-22.8	1,878,729.85	1,303,331.90	36.157919	-107.391896	
5,011.0	18.90	227.10	5,001.5	-71.4	-29.7	1,878,722.70	1,303,324.94	36.157899	-107.391919	
5,043.0	20.60	231.00	5,031.6	-78.5	-37.9	1,878,715.72	1,303,316.69	36.157880	-107.391947	
5,074.0	22.40	233.30	5,060.4	-85.4	-46.8	1,878,708.86	1,303,307.63	36.157860	-107.391977	
5,106.0	24.10	236.00	5,089.8	-92.7	-57.1	1,878,701.69	1,303,297.24	36.157840	-107.392012	
5,137.0	25.50	238.10	5,118.0	-99.8	-68.1	1,878,694.75	1,303,286.24	36.157821	-107.392049	
5,169.0	27.60	240.90	5,146.6	-107.0	-80.4	1,878,687.65	1,303,273.83	36.157801	-107.392091	
5,201.0	29.60	241.90	5,174.7	-114.4	-93.8	1,878,680.48	1,303,260.30	36.157781	-107.392136	
5,233.0	31.60	239.10	5,202.2	-122.4	-108.0	1,878,672.62	1,303,246.03	36.157759	-107.392184	
5,264.0	34.80	241.00	5,228.2	-130.8	-122.7	1,878,664.33	1,303,231.22	36.157736	-107.392234	
5,295.0	38.50	242.80	5,253.0	-139.5	-139.0	1,878,655.82	1,303,214.80	36.157712	-107.392289	
5,326.0	42.10	245.00	5,276.7	-148.4	-157.1	1,878,647.22	1,303,196.69	36.157688	-107.392350	
5,358.0	44.70	248.50	5,299.9	-157.0	-177.2	1,878,638.80	1,303,176.39	36.157664	-107.392419	
5,389.0	48.10	251.60	5,321.3	-164.7	-198.3	1,878,631.41	1,303,155.20	36.157643	-107.392490	
5,420.0	52.30	252.20	5,341.1	-172.0	-221.0	1,878,624.28	1,303,132.48	36.157623	-107.392567	
5,451.0	57.00	252.40	5,359.1	-179.7	-245.1	1,878,616.88	1,303,108.31	36.157601	-107.392648	
5,483.0	61.40	253.40	5,375.5	-187.8	-271.3	1,878,609.12	1,303,081.95	36.157579	-107.392737	
5,514.0	65.70	255.90	5,389.3	-195.1	-298.1	1,878,602.10	1,303,055.11	36.157559	-107.392828	
5,545.0	69.60	258.30	5,401.0	-201.5	-326.0	1,878,596.04	1,303,027.09	36.157542	-107.392923	
5,577.0	73.50	260.90	5,411.2	-207.0	-355.9	1,878,590.92	1,302,997.18	36.157526	-107.393024	
5,608.0	76.90	263.90	5,419.1	-211.0	-385.6	1,878,587.31	1,302,967.44	36.157516	-107.393124	
5,640.0	79.60	268.20	5,425.6	-213.1	-416.8	1,878,585.53	1,302,936.17	36.157510	-107.393230	
5,693.0	83.30	271.40	5,433.5	-213.3	-469.2	1,878,585.97	1,302,883.78	36.157509	-107.393408	
5,724.0	83.70	271.40	5,437.0	-212.5	-500.0	1,878,587.08	1,302,852.99	36.157511	-107.393512	
5,756.0	85.80	270.00	5,439.9	-212.1	-531.9	1,878,587.84	1,302,821.14	36.157512	-107.393620	
5,787.0	89.90	270.70	5,441.1	-212.0	-562.8	1,878,588.40	1,302,790.17	36.157513	-107.393725	
5,849.0	91.10	270.50	5,440.6	-211.3	-624.8	1,878,589.78	1,302,728.19	36.157515	-107.393935	
5,910.0	92.80	270.40	5,438.5	-210.8	-685.8	1,878,590.97	1,302,667.24	36.157516	-107.394141	
5,971.0	90.70	270.90	5,436.6	-210.1	-746.8	1,878,592.38	1,302,606.29	36.157518	-107.394348	
6,032.0	89.60	270.40	5,436.5	-209.4	-807.8	1,878,593.79	1,302,545.31	36.157520	-107.394554	
6,093.0	90.00	270.30	5,436.7	-209.1	-868.8	1,878,594.88	1,302,484.32	36.157521	-107.394761	
6,154.0	89.00	271.10	5,437.2	-208.3	-929.7	1,878,596.34	1,302,423.34	36.157523	-107.394967	
6,215.0	88.20	270.90	5,438.7	-207.3	-990.7	1,878,598.12	1,302,362.38	36.157526	-107.395174	
6,276.0	88.70	271.10	5,440.3	-206.2	-1,051.7	1,878,599.90	1,302,301.43	36.157529	-107.395381	
6,338.0	89.10	270.10	5,441.5	-205.5	-1,113.7	1,878,601.28	1,302,239.46	36.157530	-107.395590	
6,400.0	90.30	270.60	5,441.9	-205.2	-1,175.7	1,878,602.39	1,302,177.47	36.157531	-107.395800	
6,461.0	90.70	271.30	5,441.3	-204.2	-1,236.7	1,878,604.12	1,302,116.50	36.157534	-107.396007	
6,521.0	90.30	271.20	5,440.8	-202.8	-1,296.6	1,878,606.13	1,302,056.54	36.157538	-107.396210	
6,583.0	91.00	271.30	5,440.1	-201.5	-1,358.6	1,878,608.21	1,301,994.58	36.157542	-107.396420	
6,644.0	90.80	271.10	5,439.1	-200.2	-1,419.6	1,878,610.21	1,301,933.62	36.157545	-107.396627	
6,705.0	90.40	269.60	5,438.5	-199.8	-1,480.6	1,878,611.30	1,301,872.63	36.157546	-107.396833	
6,767.0	90.90	269.00	5,437.8	-200.6	-1,542.6	1,878,611.27	1,301,810.64	36.157544	-107.397043	
6,828.0	91.50	268.40	5,436.5	-202.0	-1,603.6	1,878,610.60	1,301,749.65	36.157540	-107.397250	
6,889.0	91.30	268.40	5,435.0	-203.7	-1,664.5	1,878,609.62	1,301,688.68	36.157535	-107.397456	
6,950.0	90.50	268.30	5,434.1	-205.4	-1,725.5	1,878,608.58	1,301,627.70	36.157531	-107.397663	
7,011.0	91.10	267.70	5,433.2	-207.6	-1,786.4	1,878,607.17	1,301,566.72	36.157525	-107.397869	

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,072.0	91.00	268.70	5,432.1	-209.5	-1,847.4	1,878,605.97	1,301,505.74	36.157519	-107.398076
7,133.0	90.90	269.70	5,431.1	-210.3	-1,908.4	1,878,605.83	1,301,444.75	36.157517	-107.398282
7,195.0	90.20	270.70	5,430.5	-210.1	-1,970.4	1,878,606.78	1,301,382.76	36.157518	-107.398492
7,258.0	90.60	270.00	5,430.1	-209.7	-2,033.4	1,878,607.90	1,301,319.77	36.157519	-107.398706
7,321.0	91.30	269.10	5,429.0	-210.2	-2,096.4	1,878,608.15	1,301,256.78	36.157517	-107.398919
7,384.0	90.60	269.80	5,428.0	-210.8	-2,159.3	1,878,608.29	1,301,193.79	36.157516	-107.399132
7,447.0	90.90	268.80	5,427.1	-211.6	-2,222.3	1,878,608.26	1,301,130.80	36.157514	-107.399346
7,510.0	90.40	269.40	5,426.4	-212.6	-2,285.3	1,878,608.01	1,301,067.81	36.157511	-107.399559
7,573.0	90.50	270.50	5,425.9	-212.7	-2,348.3	1,878,608.70	1,301,004.81	36.157511	-107.399772
7,636.0	91.10	270.20	5,425.0	-212.3	-2,411.3	1,878,609.82	1,300,941.83	36.157512	-107.399986
7,699.0	91.10	271.10	5,423.8	-211.6	-2,474.3	1,878,611.28	1,300,878.86	36.157514	-107.400199
7,762.0	90.50	271.30	5,423.0	-210.2	-2,537.3	1,878,613.34	1,300,815.90	36.157517	-107.400412
7,825.0	90.80	270.70	5,422.2	-209.1	-2,600.3	1,878,615.18	1,300,752.93	36.157520	-107.400626
7,887.0	91.40	269.40	5,421.1	-209.1	-2,662.2	1,878,615.96	1,300,690.95	36.157520	-107.400836
7,950.0	90.40	269.90	5,420.1	-209.5	-2,725.2	1,878,616.32	1,300,627.96	36.157519	-107.401049
8,013.0	90.70	269.50	5,419.5	-209.8	-2,788.2	1,878,616.73	1,300,564.96	36.157518	-107.401262
8,076.0	89.80	269.50	5,419.2	-210.3	-2,851.2	1,878,616.92	1,300,501.96	36.157517	-107.401476
8,140.0	88.70	269.80	5,420.0	-210.7	-2,915.2	1,878,617.28	1,300,437.97	36.157516	-107.401693
8,203.0	89.20	269.20	5,421.2	-211.3	-2,978.2	1,878,617.47	1,300,374.98	36.157514	-107.401906
8,266.0	89.70	267.70	5,421.8	-213.0	-3,041.2	1,878,616.51	1,300,311.99	36.157510	-107.402119
8,329.0	90.00	269.20	5,421.9	-214.7	-3,104.2	1,878,615.54	1,300,249.00	36.157505	-107.402333
8,392.0	90.90	268.80	5,421.5	-215.8	-3,167.1	1,878,615.18	1,300,186.01	36.157502	-107.402546
8,455.0	91.00	269.80	5,420.4	-216.6	-3,230.1	1,878,615.16	1,300,123.02	36.157500	-107.402759
8,518.0	89.60	270.20	5,420.1	-216.6	-3,293.1	1,878,615.90	1,300,060.02	36.157500	-107.402973
8,581.0	90.80	269.80	5,419.9	-216.6	-3,356.1	1,878,616.64	1,299,997.03	36.157500	-107.403186
8,644.0	92.40	268.60	5,418.1	-217.4	-3,419.1	1,878,616.50	1,299,934.06	36.157497	-107.403399
8,707.0	91.90	268.60	5,415.7	-219.0	-3,482.0	1,878,615.70	1,299,871.11	36.157493	-107.403612
8,771.0	88.70	270.40	5,415.4	-219.5	-3,546.0	1,878,615.90	1,299,807.12	36.157491	-107.403829
8,834.0	89.70	270.40	5,416.3	-219.1	-3,609.0	1,878,617.08	1,299,744.14	36.157493	-107.404043
8,897.0	91.20	269.90	5,415.8	-218.9	-3,672.0	1,878,617.98	1,299,681.15	36.157493	-107.404256
8,960.0	90.80	271.60	5,414.7	-218.1	-3,735.0	1,878,619.55	1,299,618.18	36.157495	-107.404469
9,023.0	89.10	272.50	5,414.7	-215.9	-3,797.9	1,878,622.54	1,299,555.25	36.157501	-107.404683
9,086.0	88.00	273.10	5,416.3	-212.8	-3,860.8	1,878,626.36	1,299,492.39	36.157510	-107.404896
9,149.0	88.90	272.20	5,418.0	-209.9	-3,923.8	1,878,630.01	1,299,429.52	36.157518	-107.405109
9,211.0	90.40	272.00	5,418.4	-207.6	-3,986.7	1,878,633.01	1,299,367.60	36.157524	-107.405319
9,275.0	91.90	272.50	5,417.1	-205.1	-4,049.6	1,878,636.27	1,299,303.69	36.157531	-107.405535
9,337.0	91.70	271.70	5,415.2	-202.8	-4,111.6	1,878,639.27	1,299,241.80	36.157537	-107.405745
9,399.0	90.40	270.40	5,414.0	-201.7	-4,173.5	1,878,641.13	1,299,179.84	36.157540	-107.405955
9,462.0	91.20	270.30	5,413.2	-201.3	-4,236.5	1,878,642.26	1,299,116.86	36.157541	-107.406168
9,525.0	90.80	269.40	5,412.1	-201.5	-4,299.5	1,878,642.84	1,299,053.87	36.157541	-107.406382
9,588.0	90.00	268.10	5,411.6	-202.8	-4,362.5	1,878,642.20	1,298,990.88	36.157537	-107.406595
9,651.0	91.10	267.50	5,411.0	-205.3	-4,425.5	1,878,640.52	1,298,927.90	36.157530	-107.406808
9,715.0	90.40	267.10	5,410.2	-208.3	-4,489.4	1,878,638.26	1,298,863.95	36.157522	-107.407025
9,778.0	90.20	268.30	5,409.9	-210.8	-4,552.3	1,878,636.47	1,298,800.98	36.157515	-107.407238
9,841.0	90.30	270.20	5,409.6	-211.6	-4,615.3	1,878,636.39	1,298,737.98	36.157513	-107.407451
9,904.0	90.20	271.40	5,409.3	-210.7	-4,678.3	1,878,638.01	1,298,675.00	36.157515	-107.407665
9,967.0	91.40	271.70	5,408.4	-209.0	-4,741.3	1,878,640.45	1,298,612.06	36.157520	-107.407878
10,030.0	90.70	271.60	5,407.3	-207.2	-4,804.2	1,878,643.01	1,298,549.12	36.157525	-107.408091
10,093.0	89.70	271.80	5,407.1	-205.4	-4,867.2	1,878,645.62	1,298,486.17	36.157530	-107.408304
10,155.0	89.40	271.50	5,407.5	-203.6	-4,929.2	1,878,648.13	1,298,424.23	36.157535	-107.408514
10,218.0	90.30	271.90	5,407.7	-201.7	-4,992.2	1,878,650.74	1,298,361.28	36.157540	-107.408728
10,281.0	90.00	270.30	5,407.5	-200.5	-5,055.1	1,878,652.69	1,298,298.32	36.157543	-107.408941
10,407.0	90.70	269.70	5,406.8	-200.5	-5,118.1	1,878,654.17	1,298,172.33	36.157543	-107.409368
10,470.0	90.00	268.10	5,406.4	-201.7	-5,244.1	1,878,653.70	1,298,109.33	36.157540	-107.409581
10,533.0	91.10	268.30	5,405.8	-203.7	-5,307.1	1,878,652.47	1,298,046.35	36.157534	-107.409794

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #701H
Project:	Sandoval County, NM	TVD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Site:	S8-T22N-R5W	MD Reference:	KB=14.5 @ 6975.5usft (Original Well Elev)
Well:	LOGOS #701H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,596.0	90.30	267.80	5,405.0	-205.8	-5,370.1	1,878,651.06	1,297,983.37	36.157528	-107.410008
10,658.0	91.10	267.50	5,404.3	-208.4	-5,432.0	1,878,649.25	1,297,921.40	36.157521	-107.410217
10,671.0	91.30	267.37	5,404.0	-208.9	-5,445.0	1,878,648.82	1,297,908.41	36.157520	-107.410261
RSI - 659' FNL, 347' FWL									
10,716.0	92.00	266.90	5,402.7	-211.2	-5,489.9	1,878,647.10	1,297,863.46	36.157514	-107.410413
Last CES Survey @ 9,462' MD									
10,766.0	92.00	266.90	5,400.9	-213.9	-5,539.8	1,878,644.98	1,297,813.54	36.157506	-107.410582
4 1/2" - 664' FNL, 252' FWL - PTB @ 10,766' MD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
LOGOS #701H BHL P6	0.00	0.00	5,392.0	-210.4	-5,541.9	1,878,648.46	1,297,811.48	36.157516	-107.410590
- actual wellpath misses target center by 9.8usft at 10766.0usft MD (5400.9 TVD, -213.9 N, -5539.8 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
5,666.0	5,429.9	7" - 663' FNL, 78' FWL	0	0	

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,671.0	5,404.0	-208.9	-5,445.0	RSI - 659' FNL, 347' FWL
10,716.0	5,402.7	-211.2	-5,489.9	Last CES Survey @ 9,462' MD
10,766.0	5,400.9	-213.9	-5,539.8	4 1/2" - 664' FNL, 252' FWL
10,766.0	5,400.9	-213.9	-5,539.8	PTB @ 10,766' MD

Checked By: _____ Approved By: _____ Date: _____