

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

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

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3400 Fax: (505) 476-3482

State of New Mexico
Geology, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

AS DRILLED PLAT

☐ AMENDED REPORT

OIL CONS. DIV DIST. 3

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-043-21219		² Pool Code 98067	³ Pool Name WC 22N5W7; GALLUP (O)	JUL 14 2014
⁴ Property Code 311963	⁵ Property Name LOGOS			⁶ Well Number 702H
⁷ OGRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC			⁹ 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		440	NORTH	561	WEST	SANDOVAL

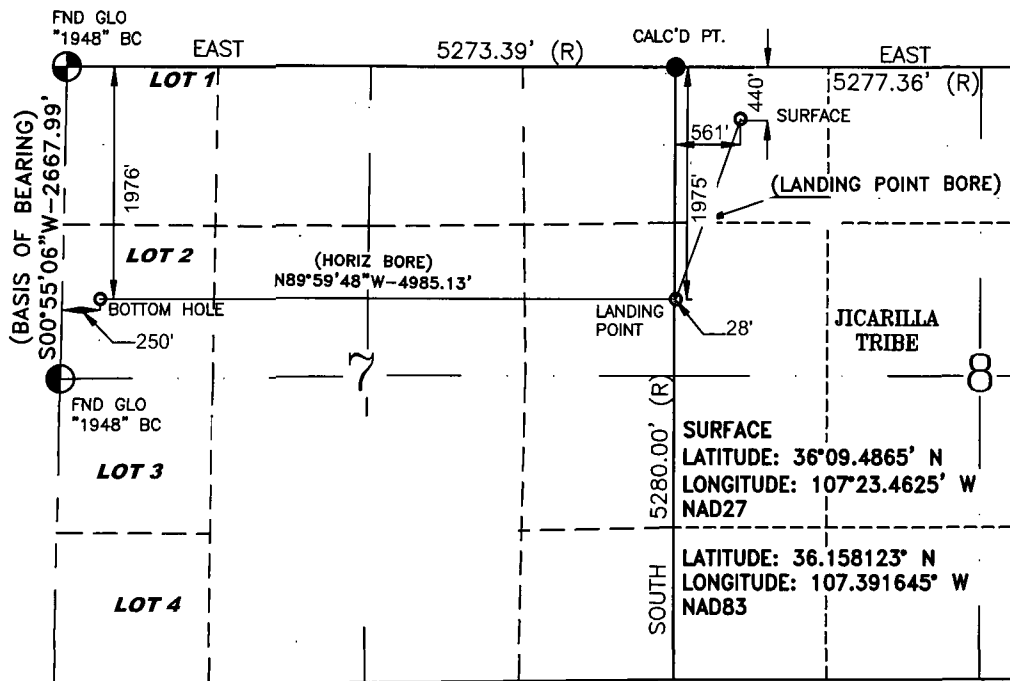
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	7	22-N	5-W	2	1976	NORTH	250	WEST	SANDOVAL

¹³ Dedicated Acres 159.78 S2/N2 Sec 7	¹⁴ Joint or Infill	¹⁵ Consolidation Code	¹⁶ Order No. NSL-7075-A, CTB-711-0
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

18



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 or an agreement of assignment or a working interest or a voluntary pooling agreement or a compulsory pooling order heretofore entered by the Division.

Signature: Jan Sessier Date: 7-11-14

Signature _____ Date _____
Tamra Sessions

Printed Name
tsessions@logosresourcesllc.com

E-mail Address

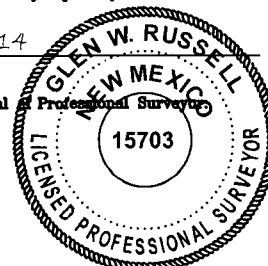
18 SURVEYOR CERTIFICATION

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

MAY 7, 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.

LANDING POINT
1975' FNL 28' FWL SEC 8

A

19



145154

June 19, 2014

Logos Resources, LLC.

Jay Paul McWilliams

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

4001 N. Butler Avenue

Farmington, NM 87401

OIL CONS. DIV DIST. 3

JUL 14 2014

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) #702H

API # 30-043-21219

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

19 JUNE 14

Date



Project: Sandoval County, NM
 Site: S8-T22N-R5W
 Well: LOGOS #702H
 Wellbore: HZ
 Design: FINAL

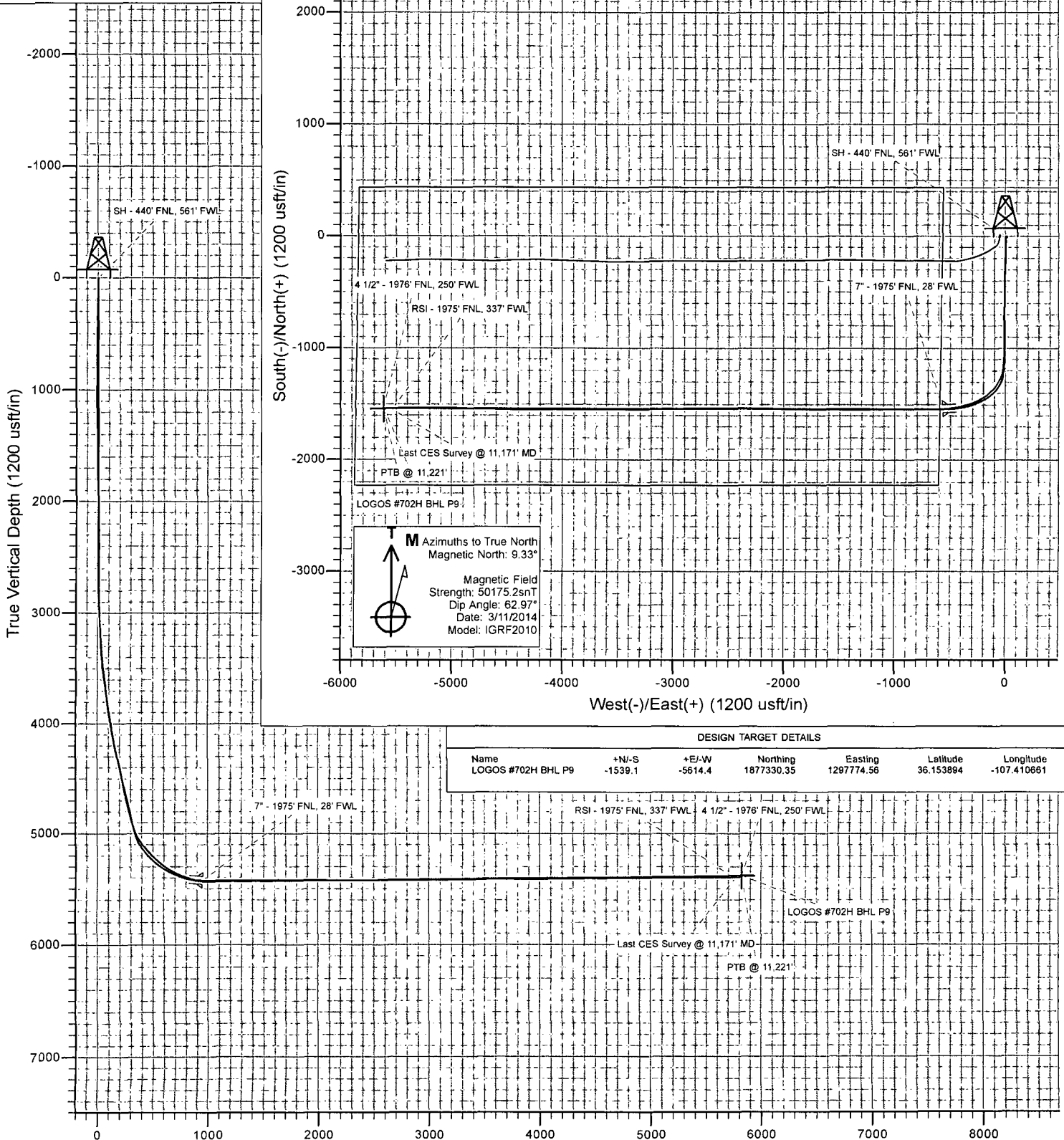
OIL CONS. DIV DIST. 3



FINAL
 LOGOS #702H
 KB=14.5' @ 6975.5usft (Original Well Elev)
 Ground Elevation @ 6961.0
 North American Datum 1983
 Well LOGOS #702H, True North

JUL 14 2014

Surface Hole Location
 LOGOS #702H
 Lat : 36.158123
 Long : -107.391645



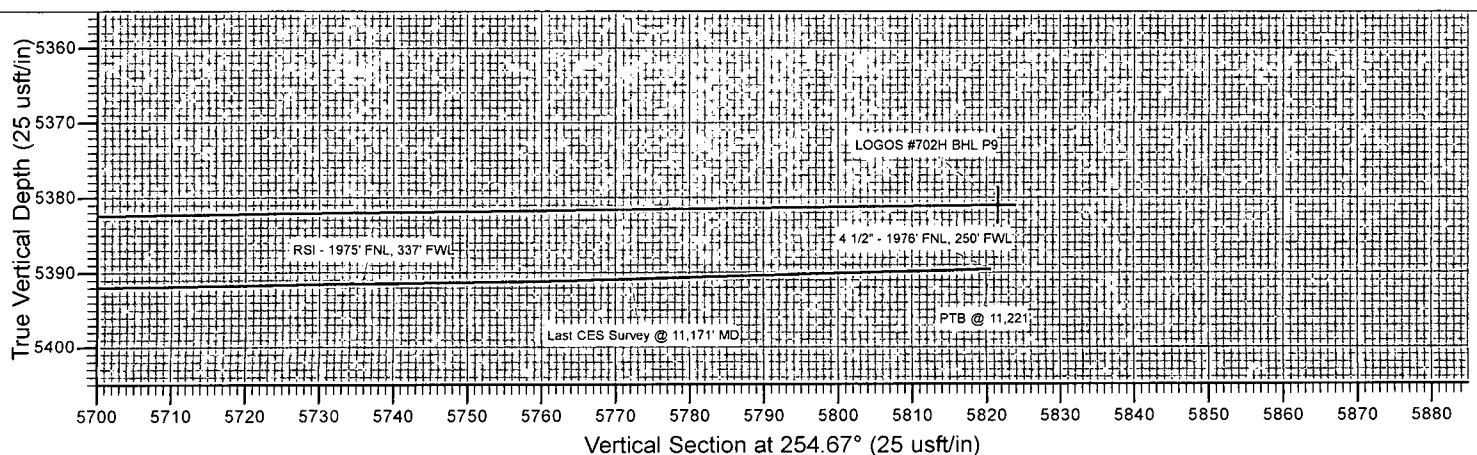
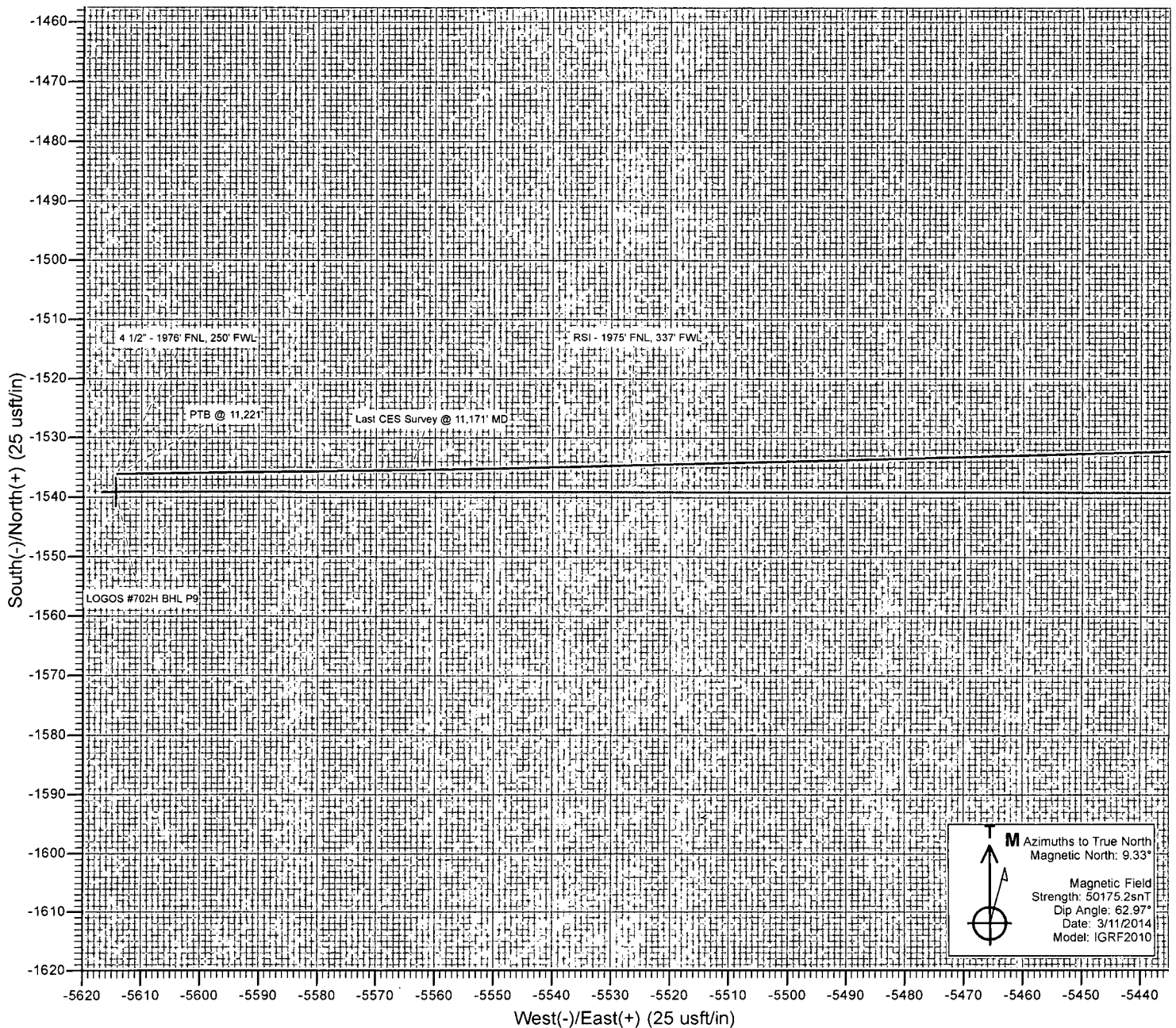
DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LOGOS #702H BHL P9	-1539.1	-5614.4	1877330.35	1297774.56	36.153894	-107.410661

Vertical Section at 254.67° (1200 usft/in)



Project: Sandoval County, NM
Site: S8-T22N-R5W
Well: LOGOS #702H
Wellbore: HZ
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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
From:	Lat/Long	Easting:	1,303,355.47 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	36.158095
		Longitude:	-107.391818
		Grid Convergence:	-0.67 °

Well	LOGOS #702H		
Well Position	+N/-S	0.0 usft	Northing: 1,878,803.31 usft
	+E/-W	0.0 usft	Easting: 1,303,406.66 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	36.158123
		Longitude:	-107.391645
		Ground Level:	6,961.0 usft

Wellbore	HZ		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	3/11/2014	9.33
			Dip Angle
			(°)
			62.97
			Field Strength
			(nT)
			50,175

Design	FINAL		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			254.67

Survey Program	Date 6/19/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
80.0	11,221.0	Survey #1 (HZ)	Geolink MWD
			Description
			Geolink MWD

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Formations /
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Comments
(usft)			(usft)			(usft)	(°/100usf	(°/100u	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
80.0	1.30	56.60	80.0	0.5	0.8	-0.9	1.62	1.62	
138.0	1.40	61.30	138.0	1.2	1.9	-2.2	0.26	0.17	
196.0	1.50	65.70	196.0	1.9	3.2	-3.6	0.26	0.17	
254.0	2.00	70.80	253.9	2.5	4.9	-5.4	0.90	0.86	
313.0	1.80	75.30	312.9	3.1	6.8	-7.3	0.42	-0.34	
341.0	1.50	81.60	340.9	3.2	7.5	-8.1	1.25	-1.07	
370.0	1.70	86.00	369.9	3.3	8.4	-8.9	0.81	0.69	
403.0	1.10	97.70	402.9	3.3	9.2	-9.7	2.00	-1.82	
435.0	1.20	109.60	434.9	3.2	9.8	-10.3	0.81	0.31	
466.0	1.20	118.70	465.9	2.9	10.4	-10.8	0.61	0.00	
475.0	1.10	134.50	474.9	2.8	10.5	-10.9	3.68	-1.11	
584.0	0.70	196.90	583.8	1.4	11.1	-11.0	0.91	-0.37	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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
615.0	0.90	182.80	614.8	1.0	11.0	-10.9	0.90	0.65	
676.0	0.70	165.00	675.8	0.2	11.1	-10.7	0.52	-0.33	
737.0	1.10	183.70	736.8	-0.8	11.1	-10.5	0.81	0.66	
799.0	0.70	191.50	798.8	-1.8	11.0	-10.2	0.67	-0.65	
860.0	1.10	166.20	859.8	-2.7	11.1	-10.0	0.91	0.66	
920.0	0.90	137.90	919.8	-3.6	11.5	-10.2	0.88	-0.33	
981.0	0.80	132.80	980.8	-4.2	12.2	-10.6	0.21	-0.16	
1,043.0	0.90	156.20	1,042.8	-5.0	12.7	-10.9	0.58	0.16	
1,103.0	1.00	150.60	1,102.8	-5.9	13.1	-11.1	0.23	0.17	
1,164.0	1.00	146.20	1,163.8	-6.8	13.7	-11.4	0.13	0.00	
1,225.0	0.40	257.80	1,224.8	-7.3	13.8	-11.4	1.98	-0.98	
1,287.0	0.60	295.20	1,286.8	-7.2	13.3	-10.9	0.60	0.32	
1,349.0	0.80	255.05	1,348.8	-7.1	12.6	-10.2	0.83	0.32	
1,411.0	0.60	203.10	1,410.8	-7.5	12.0	-9.6	1.03	-0.32	
1,472.0	1.10	220.60	1,471.7	-8.3	11.5	-8.9	0.91	0.82	
1,535.0	1.10	223.90	1,534.7	-9.2	10.7	-7.9	0.10	0.00	
1,598.0	1.00	239.80	1,597.7	-9.9	9.8	-6.8	0.49	-0.16	
1,661.0	1.40	255.10	1,660.7	-10.4	8.6	-5.5	0.81	0.63	
1,724.0	1.20	249.20	1,723.7	-10.8	7.2	-4.1	0.38	-0.32	
1,787.0	1.30	228.30	1,786.7	-11.5	6.1	-2.8	0.74	0.16	
1,850.0	1.00	241.20	1,849.7	-12.3	5.0	-1.6	0.63	-0.48	
1,913.0	1.60	243.60	1,912.7	-12.9	3.8	-0.2	0.96	0.95	
1,976.0	1.40	241.90	1,975.6	-13.7	2.3	1.4	0.33	-0.32	
2,039.0	1.40	236.50	2,038.6	-14.4	1.0	2.9	0.21	0.00	
2,103.0	1.40	223.40	2,102.6	-15.4	-0.2	4.3	0.50	0.00	
2,166.0	1.80	226.20	2,165.6	-16.7	-1.4	5.8	0.65	0.63	
2,229.0	0.90	252.00	2,228.6	-17.5	-2.6	7.2	1.69	-1.43	
2,292.0	0.20	256.90	2,291.5	-17.7	-3.2	7.8	1.11	-1.11	
2,355.0	0.10	201.60	2,354.5	-17.8	-3.3	7.9	0.26	-0.16	
2,417.0	0.10	11.80	2,416.5	-17.8	-3.3	7.9	0.32	0.00	
2,479.0	0.40	117.30	2,478.5	-17.8	-3.1	7.7	0.71	0.48	
2,543.0	1.50	173.70	2,542.5	-18.8	-2.8	7.7	2.06	1.72	
2,606.0	2.00	173.00	2,605.5	-20.7	-2.6	8.0	0.79	0.79	
2,669.0	2.40	161.50	2,668.5	-23.0	-2.1	8.1	0.94	0.63	
2,732.0	3.60	163.80	2,731.4	-26.2	-1.1	8.0	1.91	1.90	
2,795.0	4.60	163.70	2,794.2	-30.5	0.2	7.9	1.59	1.59	
2,858.0	5.70	169.70	2,857.0	-36.0	1.4	8.1	1.94	1.75	
2,920.0	6.70	181.90	2,918.6	-42.6	1.9	9.5	2.66	1.61	
2,983.0	7.90	182.60	2,981.1	-50.6	1.5	11.9	1.91	1.90	
3,047.0	8.70	182.40	3,044.4	-59.9	1.1	14.7	1.25	1.25	
3,110.0	9.50	182.70	3,106.6	-69.8	0.7	17.8	1.27	1.27	
3,173.0	10.40	182.70	3,168.7	-80.7	0.2	21.2	1.43	1.43	
3,236.0	11.70	181.10	3,230.5	-92.8	-0.2	24.7	2.12	2.06	
3,298.0	12.80	180.70	3,291.1	-105.9	-0.4	28.4	1.78	1.77	
3,361.0	14.00	180.80	3,352.4	-120.5	-0.6	32.4	1.91	1.90	
3,424.0	14.80	181.20	3,413.4	-136.2	-0.9	36.8	1.28	1.27	
3,487.0	15.70	184.00	3,474.2	-152.7	-1.6	42.0	1.85	1.43	
3,549.0	18.70	182.60	3,533.4	-171.0	-2.7	47.8	4.88	4.84	
3,612.0	23.30	183.40	3,592.2	-193.6	-3.9	54.9	7.32	7.30	
3,675.0	27.20	183.50	3,649.2	-220.4	-5.5	63.6	6.19	6.19	
3,738.0	27.80	181.10	3,705.0	-249.4	-6.7	72.4	2.00	0.95	
3,801.0	29.40	183.10	3,760.4	-279.6	-7.8	81.4	2.96	2.54	
3,864.0	30.00	183.60	3,815.1	-310.7	-9.6	91.4	1.03	0.95	

Cathedral Energy Services

Survey Report

Company: LOGOS Operating LLC
Project: Sandoval County, NM
Site: S8-T22N-R5W
Well: LOGOS #702H
Wellbore: HZ
Design: FINAL

Local Co-ordinate Reference: Well LOGOS #702H
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 (°/100usft)	Build Rate (°/100u)	Formations / Comments
3,928.0	30.00	180.00	3,870.5	-342.7	-10.6	100.8	2.81	0.00	
3,991.0	29.50	179.80	3,925.2	-374.0	-10.5	109.0	0.81	-0.79	
4,054.0	30.20	180.00	3,979.9	-405.3	-10.5	117.3	1.12	1.11	
4,117.0	31.30	179.30	4,034.0	-437.5	-10.3	125.6	1.84	1.75	
4,180.0	33.20	177.60	4,087.3	-471.1	-9.4	133.6	3.34	3.02	
4,243.0	35.00	179.60	4,139.4	-506.4	-8.5	142.1	3.37	2.86	
4,306.0	36.70	179.90	4,190.5	-543.3	-8.4	151.7	2.71	2.70	
4,369.0	39.00	181.20	4,240.2	-582.0	-8.7	162.3	3.86	3.65	
4,432.0	39.00	180.80	4,289.2	-621.6	-9.4	173.4	0.40	0.00	
4,495.0	37.90	182.00	4,338.5	-660.8	-10.4	184.7	2.11	-1.75	
4,558.0	37.80	181.90	4,388.3	-699.4	-11.7	196.2	0.19	-0.16	
4,620.0	38.30	180.00	4,437.1	-737.6	-12.3	206.9	2.05	0.81	
4,683.0	38.10	180.20	4,486.6	-776.6	-12.4	217.3	0.37	-0.32	
4,746.0	37.60	179.20	4,536.4	-815.2	-12.2	227.3	1.26	-0.79	
4,809.0	37.70	179.20	4,586.3	-853.7	-11.7	237.0	0.16	0.16	
4,873.0	37.20	181.60	4,637.1	-892.6	-11.9	247.5	2.41	-0.78	
4,905.0	37.90	181.10	4,662.4	-912.1	-12.4	253.1	2.39	2.19	
4,936.0	38.80	181.80	4,686.7	-931.4	-12.9	258.7	3.22	2.90	
4,968.0	39.60	180.90	4,711.5	-951.6	-13.4	264.5	3.07	2.50	
5,031.0	41.10	180.40	4,759.6	-992.4	-13.8	275.7	2.44	2.38	
5,093.0	42.30	182.10	4,805.8	-1,033.6	-14.7	287.5	2.66	1.94	
5,157.0	42.10	181.90	4,853.3	-1,076.6	-16.2	300.3	0.38	-0.31	
5,219.0	42.80	183.70	4,899.0	-1,118.3	-18.3	313.3	2.26	1.13	
5,251.0	42.80	183.40	4,922.5	-1,140.0	-19.6	320.3	0.64	0.00	
5,282.0	42.60	183.50	4,945.3	-1,161.0	-20.9	327.1	0.68	-0.65	
5,313.0	42.30	187.60	4,968.1	-1,181.8	-22.9	334.5	8.98	-0.97	
5,344.0	43.50	191.60	4,990.9	-1,202.6	-26.4	343.4	9.60	3.87	
5,376.0	45.00	195.10	5,013.8	-1,224.4	-31.6	354.2	8.96	4.69	
5,408.0	46.10	198.70	5,036.2	-1,246.2	-38.2	366.3	8.73	3.44	
5,438.0	46.20	203.50	5,057.0	-1,266.4	-46.0	379.2	11.54	0.33	
5,470.0	45.60	207.70	5,079.3	-1,287.1	-55.9	394.2	9.61	-1.87	
5,501.0	45.60	212.70	5,101.0	-1,306.2	-67.1	410.0	11.52	0.00	
5,533.0	45.70	217.30	5,123.3	-1,325.0	-80.2	427.6	10.28	0.31	
5,564.0	46.20	219.70	5,144.9	-1,342.4	-94.1	445.6	5.79	1.61	
5,595.0	46.60	223.10	5,166.3	-1,359.2	-108.9	464.4	8.05	1.29	
5,627.0	47.20	227.30	5,188.1	-1,375.7	-125.5	484.7	9.76	1.87	
5,658.0	48.60	228.40	5,208.9	-1,391.1	-142.5	505.2	5.23	4.52	
5,690.0	49.10	231.70	5,230.0	-1,406.6	-161.0	527.1	7.92	1.56	
5,721.0	50.40	234.40	5,250.0	-1,420.8	-179.9	549.1	7.86	4.19	
5,753.0	52.30	238.60	5,270.0	-1,434.6	-200.7	572.9	11.84	5.94	
5,785.0	53.80	241.60	5,289.2	-1,447.3	-222.9	597.6	8.84	4.69	
5,816.0	55.50	244.10	5,307.2	-1,458.8	-245.4	622.4	8.56	5.48	
5,847.0	59.10	246.40	5,323.9	-1,469.8	-269.1	648.1	13.18	11.61	
5,879.0	62.70	248.30	5,339.5	-1,480.5	-294.9	675.8	12.39	11.25	
5,910.0	65.80	250.60	5,353.0	-1,490.3	-321.0	703.6	12.03	10.00	
5,961.0	67.20	254.90	5,373.3	-1,504.2	-365.7	750.4	8.20	2.75	
5,993.0	69.00	255.90	5,385.2	-1,511.6	-394.4	780.0	6.33	5.62	
6,024.0	70.80	258.70	5,395.9	-1,518.0	-422.8	809.1	10.28	5.81	
6,055.0	74.40	259.40	5,405.2	-1,523.7	-451.9	838.6	11.81	11.61	
6,087.0	78.30	262.40	5,412.7	-1,528.6	-482.6	869.5	15.21	12.19	
6,119.0	82.40	264.70	5,418.1	-1,532.1	-513.9	900.7	14.64	12.81	
6,150.0	84.90	267.40	5,421.5	-1,534.2	-544.6	930.9	11.83	8.06	
6,182.0	86.50	268.00	5,423.9	-1,535.5	-576.5	962.0	5.34	5.00	

Cathedral Energy Services

Survey Report

Company: LOGOS Operating LLC
Project: Sandoval County, NM
Site: S8-T22N-R5W
Well: LOGOS #702H
Wellbore: HZ
Design: FINAL

Local Co-ordinate Reference: Well LOGOS #702H
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
6,221.0	90.40	269.10	5,425.0	-1,536.5	-615.5	999.8	10.39	10.00	
6,284.0	91.10	269.80	5,424.1	-1,537.1	-678.5	1,060.7	1.57	1.11	
6,345.0	91.10	269.80	5,423.0	-1,537.3	-739.5	1,119.6	0.00	0.00	
6,406.0	90.30	269.70	5,422.2	-1,537.6	-800.5	1,178.5	1.32	-1.31	
6,468.0	90.90	269.70	5,421.6	-1,537.9	-862.4	1,238.3	0.97	0.97	
6,529.0	90.30	270.30	5,420.9	-1,537.9	-923.4	1,297.2	1.39	-0.98	
6,589.0	89.70	269.80	5,420.9	-1,537.8	-983.4	1,355.0	1.30	-1.00	
6,650.0	90.30	269.30	5,420.9	-1,538.3	-1,044.4	1,414.0	1.28	0.98	
6,711.0	91.10	269.20	5,420.2	-1,539.1	-1,105.4	1,473.0	1.32	1.31	
6,772.0	90.60	268.90	5,419.3	-1,540.1	-1,166.4	1,532.1	0.96	-0.82	
6,833.0	89.90	268.60	5,419.0	-1,541.5	-1,227.4	1,591.3	1.25	-1.15	
6,894.0	90.60	268.30	5,418.7	-1,543.1	-1,288.4	1,650.5	1.25	1.15	
6,956.0	90.10	268.90	5,418.4	-1,544.6	-1,350.4	1,710.7	1.26	-0.81	
7,018.0	90.60	269.60	5,418.0	-1,545.4	-1,412.4	1,770.7	1.39	0.81	
7,080.0	90.70	270.30	5,417.3	-1,545.5	-1,474.3	1,830.5	1.14	0.16	
7,141.0	90.00	270.30	5,416.9	-1,545.2	-1,535.3	1,889.2	1.15	-1.15	
7,202.0	89.40	270.00	5,417.2	-1,545.0	-1,596.3	1,948.0	1.10	-0.98	
7,263.0	90.30	270.00	5,417.4	-1,545.0	-1,657.3	2,006.8	1.48	1.48	
7,324.0	89.90	270.20	5,417.3	-1,544.9	-1,718.3	2,065.6	0.73	-0.66	
7,386.0	89.40	271.10	5,417.7	-1,544.2	-1,780.3	2,125.2	1.66	-0.81	
7,447.0	89.00	271.70	5,418.5	-1,542.7	-1,841.3	2,183.7	1.18	-0.66	
7,510.0	90.00	271.50	5,419.1	-1,541.0	-1,904.3	2,243.9	1.62	1.59	
7,573.0	89.70	271.40	5,419.2	-1,539.4	-1,967.3	2,304.2	0.50	-0.48	
7,635.0	90.40	271.10	5,419.2	-1,538.0	-2,029.2	2,363.7	1.23	1.13	
7,699.0	91.00	272.00	5,418.4	-1,536.3	-2,093.2	2,424.9	1.69	0.94	
7,761.0	90.30	271.90	5,417.7	-1,534.2	-2,155.2	2,484.1	1.14	-1.13	
7,823.0	89.50	272.00	5,417.8	-1,532.1	-2,217.1	2,543.3	1.30	-1.29	
7,886.0	89.00	272.30	5,418.6	-1,529.7	-2,280.1	2,603.4	0.93	-0.79	
7,949.0	89.50	270.70	5,419.5	-1,528.0	-2,343.1	2,663.7	2.66	0.79	
8,012.0	90.50	269.50	5,419.5	-1,527.9	-2,406.1	2,724.4	2.48	1.59	
8,074.0	90.90	269.30	5,418.7	-1,528.6	-2,468.1	2,784.4	0.72	0.65	
8,137.0	90.80	269.60	5,417.8	-1,529.2	-2,531.0	2,845.3	0.50	-0.16	
8,200.0	90.80	269.60	5,416.9	-1,529.6	-2,594.0	2,906.1	0.00	0.00	
8,263.0	90.60	269.80	5,416.1	-1,530.0	-2,657.0	2,967.0	0.45	-0.32	
8,325.0	90.40	269.80	5,415.6	-1,530.2	-2,719.0	3,026.8	0.32	-0.32	
8,387.0	90.40	269.30	5,415.1	-1,530.7	-2,781.0	3,086.7	0.81	0.00	
8,450.0	90.00	268.80	5,414.9	-1,531.7	-2,844.0	3,147.8	1.02	-0.63	
8,513.0	91.50	268.80	5,414.1	-1,533.0	-2,907.0	3,208.9	2.38	2.38	
8,577.0	90.90	268.90	5,412.7	-1,534.3	-2,971.0	3,270.9	0.95	-0.94	
8,640.0	90.30	269.00	5,412.1	-1,535.5	-3,034.0	3,331.9	0.97	-0.95	
8,703.0	89.90	268.80	5,412.0	-1,536.7	-3,096.9	3,393.0	0.71	-0.63	
8,765.0	91.20	267.10	5,411.4	-1,538.9	-3,158.9	3,453.3	3.45	2.10	
8,828.0	90.80	267.40	5,410.3	-1,541.9	-3,221.8	3,514.8	0.79	-0.63	
8,890.0	91.00	268.70	5,409.3	-1,544.0	-3,283.8	3,575.1	2.12	0.32	
8,954.0	90.30	270.20	5,408.6	-1,544.6	-3,347.8	3,637.0	2.59	-1.09	
9,017.0	89.70	270.40	5,408.6	-1,544.3	-3,410.8	3,697.7	1.00	-0.95	
9,080.0	89.60	270.80	5,409.0	-1,543.6	-3,473.8	3,758.3	0.65	-0.16	
9,142.0	90.70	270.60	5,408.8	-1,542.9	-3,535.7	3,817.8	1.80	1.77	
9,206.0	90.00	270.20	5,408.4	-1,542.4	-3,599.7	3,879.4	1.26	-1.09	
9,269.0	89.80	269.60	5,408.5	-1,542.6	-3,662.7	3,940.2	1.00	-0.32	
9,332.0	89.80	268.50	5,408.7	-1,543.6	-3,725.7	4,001.3	1.75	0.00	
9,395.0	91.50	269.50	5,408.0	-1,544.7	-3,788.7	4,062.3	3.13	2.70	
9,458.0	91.10	270.70	5,406.6	-1,544.6	-3,851.7	4,123.0	2.01	-0.63	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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 (°/100usft)	Build Rate (°/100u)	Formations / Comments	
9,521.0	90.00	270.80	5,406.0	-1,543.8	-3,914.7	4,183.5	1.75	-1.75		
9,583.0	90.40	270.00	5,405.8	-1,543.3	-3,976.7	4,243.2	1.44	0.65		
9,646.0	91.40	270.20	5,404.8	-1,543.2	-4,039.7	4,303.9	1.62	1.59		
9,709.0	90.50	270.10	5,403.7	-1,543.1	-4,102.7	4,364.6	1.44	-1.43		
9,772.0	90.20	269.90	5,403.4	-1,543.1	-4,165.7	4,425.4	0.57	-0.48		
9,835.0	91.10	269.40	5,402.6	-1,543.4	-4,228.7	4,486.3	1.63	1.43		
9,898.0	90.90	269.40	5,401.5	-1,544.1	-4,291.6	4,547.2	0.32	-0.32		
9,960.0	90.10	269.60	5,401.0	-1,544.6	-4,353.6	4,607.1	1.33	-1.29		
10,023.0	90.10	270.40	5,400.9	-1,544.6	-4,416.6	4,667.9	1.27	0.00		
10,086.0	90.40	270.60	5,400.6	-1,544.1	-4,479.6	4,728.5	0.57	0.48		
10,149.0	90.50	270.40	5,400.1	-1,543.5	-4,542.6	4,789.1	0.35	0.16		
10,212.0	90.00	270.60	5,399.9	-1,543.0	-4,605.6	4,849.7	0.85	-0.79		
10,276.0	90.00	270.80	5,399.9	-1,542.2	-4,669.6	4,911.2	0.31	0.00		
10,338.0	90.40	271.60	5,399.6	-1,540.9	-4,731.6	4,970.6	1.44	0.65		
10,402.0	90.80	272.50	5,399.0	-1,538.6	-4,795.6	5,031.7	1.54	0.62		
10,465.0	90.80	272.40	5,398.1	-1,535.9	-4,858.5	5,091.7	0.16	0.00		
10,527.0	90.20	272.40	5,397.5	-1,533.3	-4,920.4	5,150.8	0.97	-0.97		
10,590.0	91.10	272.40	5,396.8	-1,530.7	-4,983.4	5,210.8	1.43	1.43		
10,653.0	90.00	270.80	5,396.2	-1,528.9	-5,046.4	5,271.0	3.08	-1.75		
10,716.0	90.60	269.60	5,395.9	-1,528.7	-5,109.4	5,331.7	2.13	0.95		
10,779.0	91.50	270.40	5,394.7	-1,528.7	-5,172.3	5,392.5	1.91	1.43		
10,842.0	90.30	269.50	5,393.8	-1,528.8	-5,235.3	5,453.2	2.38	-1.90		
10,903.0	90.70	269.60	5,393.2	-1,529.3	-5,296.3	5,512.2	0.68	0.66		
10,966.0	89.90	268.70	5,392.9	-1,530.2	-5,359.3	5,573.2	1.91	-1.27		
11,029.0	90.70	268.40	5,392.6	-1,531.8	-5,422.3	5,634.3	1.36	1.27		
11,093.0	90.40	268.40	5,391.9	-1,533.6	-5,486.3	5,696.5	0.47	-0.47		
11,133.4	90.78	268.66	5,391.5	-1,534.6	-5,526.7	5,735.7	1.14	0.95	RSI - 1975' FNL, 337' FWL	
11,156.0	91.00	268.80	5,391.2	-1,535.1	-5,549.2	5,757.6	1.14	0.95		
11,171.0	91.50	269.20	5,390.8	-1,535.4	-5,564.2	5,772.2	4.27	3.33	Last CES Survey @ 11,171' MD	
11,221.0	91.50	269.20	5,389.5	-1,536.1	-5,614.2	5,820.6	0.00	0.00	4 1/2" - 1976' FNL, 250' FWL - PTB @ 11,221'	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	
- Shape		(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	
									Latitude Longitude
LOGOS #702H BHL P2		0.00	0.00	5,381.0	-1,896.4	-5,545.9	1,876,972.28	1,297,838.84	36.152913 -107.410429
- actual wellpath misses target center by 361.4usft at 11159.2usft MD (5391.1 TVD, -1535.2 N, -5552.4 E)									
- Point									
LOGOS #702H BHL P7		0.00	0.00	5,381.0	-1,539.1	-5,534.4	1,877,329.41	1,297,854.57	36.153894 -107.410390
- actual wellpath misses target center by 11.3usft at 11141.4usft MD (5391.4 TVD, -1534.8 N, -5534.6 E)									
- Point									
LOGOS #702H POE		0.00	0.00	5,418.7	-1,896.4	-960.1	1,876,918.34	1,302,424.35	36.152914 -107.394897
- actual wellpath misses target center by 358.6usft at 6565.3usft MD (5420.9 TVD, -1537.8 N, -959.8 E)									
- Point									
LOGOS #702H 7/85°		0.00	0.00	5,418.7	-1,896.4	-660.0	1,876,914.81	1,302,724.43	36.152914 -107.393880
- actual wellpath misses target center by 359.4usft at 6269.0usft MD (5424.4 TVD, -1537.0 N, -663.5 E)									
- Point									
LOGOS #702H 7/85° P:		0.00	0.00	5,418.7	-1,539.6	-550.6	1,877,270.29	1,302,837.97	36.153894 -107.393510
- actual wellpath misses target center by 6.1usft at 6156.0usft MD (5422.0 TVD, -1534.5 N, -550.6 E)									
- Point									
LOGOS #702H BHL P4		0.00	0.00	5,381.0	-1,896.4	-5,810.0	1,876,975.38	1,297,574.79	36.152912 -107.411323
- actual wellpath misses target center by 410.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									
LOGOS #702H BHL		0.00	0.00	5,392.0	-1,896.4	-5,545.9	1,876,972.28	1,297,838.84	36.152913 -107.410429
- actual wellpath misses target center by 361.3usft at 11159.0usft MD (5391.1 TVD, -1535.2 N, -5552.2 E)									
- Point									
LOGOS #702H 7/85° P:		0.00	0.00	5,431.7	-1,539.6	-550.6	1,877,270.29	1,302,837.97	36.153894 -107.393510
- actual wellpath misses target center by 10.9usft at 6157.0usft MD (5422.1 TVD, -1534.5 N, -551.6 E)									
- Point									
LOGOS #702H BHL P5		0.00	0.00	5,381.0	-1,895.1	-5,540.1	1,876,973.45	1,297,844.71	36.152916 -107.410409
- actual wellpath misses target center by 360.3usft at 11155.0usft MD (5391.2 TVD, -1535.1 N, -5548.2 E)									
- Point									
LOGOS #702H VP		0.00	0.00	4,764.9	-1,896.4	-700.1	1,876,915.29	1,302,684.34	36.152914 -107.394016
- actual wellpath misses target center by 750.3usft at 6319.5usft MD (5423.5 TVD, -1537.2 N, -714.0 E)									
- Point									
LOGOS #702H 7/85° P:		0.00	0.00	5,418.7	-1,895.3	-570.7	1,876,914.87	1,302,813.71	36.152917 -107.393578
- actual wellpath misses target center by 359.8usft at 6185.2usft MD (5424.1 TVD, -1535.6 N, -579.7 E)									
- Point									
LOGOS #702H BHL P9		0.00	0.00	5,381.0	-1,539.1	-5,614.4	1,877,330.35	1,297,774.56	36.153894 -107.410661
- actual wellpath misses target center by 9.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,171.0	5,423.2	7" - 1975' FNL, 28' FWL	0	0

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
LOGOS #702H BHL P2	0.00	0.00	5,381.0	-1,896.4	-5,545.9	1,876,972.28	1,297,838.84	36.152913	-107.410429
- actual wellpath misses target center by 361.4usft at 11159.2usft MD (5391.1 TVD, -1535.2 N, -5552.4 E)									
- Point									
LOGOS #702H BHL P7	0.00	0.00	5,381.0	-1,539.1	-5,534.4	1,877,329.41	1,297,854.57	36.153894	-107.410390
- actual wellpath misses target center by 11.3usft at 11141.4usft MD (5391.4 TVD, -1534.8 N, -5534.6 E)									
- Point									
LOGOS #702H POE	0.00	0.00	5,418.7	-1,896.4	-960.1	1,876,918.34	1,302,424.35	36.152914	-107.394897
- actual wellpath misses target center by 358.6usft at 6565.3usft MD (5420.9 TVD, -1537.8 N, -959.8 E)									
- Point									
LOGOS #702H 7'/85°	0.00	0.00	5,418.7	-1,896.4	-660.0	1,876,914.81	1,302,724.43	36.152914	-107.393880
- actual wellpath misses target center by 359.4usft at 6269.0usft MD (5424.4 TVD, -1537.0 N, -663.5 E)									
- Point									
LOGOS #702H 7'/85° P:	0.00	0.00	5,418.7	-1,539.6	-550.6	1,877,270.29	1,302,837.97	36.153894	-107.393510
- actual wellpath misses target center by 6.1usft at 6156.0usft MD (5422.0 TVD, -1534.5 N, -550.6 E)									
- Point									
LOGOS #702H BHL P4	0.00	0.00	5,381.0	-1,896.4	-5,810.0	1,876,975.38	1,297,574.79	36.152912	-107.411323
- actual wellpath misses target center by 410.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									
LOGOS #702H BHL	0.00	0.00	5,392.0	-1,896.4	-5,545.9	1,876,972.28	1,297,838.84	36.152913	-107.410429
- actual wellpath misses target center by 361.3usft at 11159.0usft MD (5391.1 TVD, -1535.2 N, -5552.2 E)									
- Point									
LOGOS #702H 7'/85° P:	0.00	0.00	5,431.7	-1,539.6	-550.6	1,877,270.29	1,302,837.97	36.153894	-107.393510
- actual wellpath misses target center by 10.9usft at 6157.0usft MD (5422.1 TVD, -1534.5 N, -551.6 E)									
- Point									
LOGOS #702H BHL P5	0.00	0.00	5,381.0	-1,895.1	-5,540.1	1,876,973.45	1,297,844.71	36.152916	-107.410409
- actual wellpath misses target center by 360.3usft at 11155.0usft MD (5391.2 TVD, -1535.1 N, -5548.2 E)									
- Point									
LOGOS #702H VP	0.00	0.00	4,764.9	-1,896.4	-700.1	1,876,915.29	1,302,684.34	36.152914	-107.394016
- actual wellpath misses target center by 750.3usft at 6319.5usft MD (5423.5 TVD, -1537.2 N, -714.0 E)									
- Point									
LOGOS #702H 7'/85° P:	0.00	0.00	5,418.7	-1,895.3	-570.7	1,876,914.87	1,302,813.71	36.152917	-107.393578
- actual wellpath misses target center by 359.8usft at 6185.2usft MD (5424.1 TVD, -1535.6 N, -579.7 E)									
- Point									
LOGOS #702H BHL P9	0.00	0.00	5,381.0	-1,539.1	-5,614.4	1,877,330.35	1,297,774.56	36.153894	-107.410661
- actual wellpath misses target center by 9.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,171.0	5,423.2	7" - 1975' FNL, 28' FWL	0	0

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
11,133.4	5,391.5	-1,534.6	-5,526.7	RSI - 1975' FNL, 337' FWL
11,171.0	5,390.8	-1,535.4	-5,564.2	Last CES Survey @ 11,171' MD
11,221.0	5,389.5	-1,536.1	-5,614.2	4 1/2" - 1976' FNL, 250' FWL

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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	Dip/Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	
- Shape		(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	Latitude Longitude
LOGOS #702H BHL P2		0.00	0.00	5,381.0	-1,896.4	-5,545.9	1,876,972.28	1,297,838.84	36.152913 -107.410429
- actual wellpath misses target center by 361.4usft at 11159.2usft MD (5391.1 TVD, -1535.2 N, -5552.4 E)									
- Point									
LOGOS #702H BHL P7		0.00	0.00	5,381.0	-1,539.1	-5,534.4	1,877,329.41	1,297,854.57	36.153894 -107.410390
- actual wellpath misses target center by 11.3usft at 11141.4usft MD (5391.4 TVD, -1534.8 N, -5534.6 E)									
- Point									
LOGOS #702H POE		0.00	0.00	5,418.7	-1,896.4	-960.1	1,876,918.34	1,302,424.35	36.152914 -107.394897
- actual wellpath misses target center by 358.6usft at 6565.3usft MD (5420.9 TVD, -1537.8 N, -959.8 E)									
- Point									
LOGOS #702H 7/85°		0.00	0.00	5,418.7	-1,896.4	-660.0	1,876,914.81	1,302,724.43	36.152914 -107.393880
- actual wellpath misses target center by 359.4usft at 6269.0usft MD (5424.4 TVD, -1537.0 N, -663.5 E)									
- Point									
LOGOS #702H 7/85° P!		0.00	0.00	5,418.7	-1,539.6	-550.6	1,877,270.29	1,302,837.97	36.153894 -107.393510
- actual wellpath misses target center by 6.1usft at 6156.0usft MD (5422.0 TVD, -1534.5 N, -550.6 E)									
- Point									
LOGOS #702H BHL P4		0.00	0.00	5,381.0	-1,896.4	-5,810.0	1,876,975.38	1,297,574.79	36.152912 -107.411323
- actual wellpath misses target center by 410.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									
LOGOS #702H BHL		0.00	0.00	5,392.0	-1,896.4	-5,545.9	1,876,972.28	1,297,838.84	36.152913 -107.410429
- actual wellpath misses target center by 361.3usft at 11159.0usft MD (5391.1 TVD, -1535.2 N, -5552.2 E)									
- Point									
LOGOS #702H 7/85° P!		0.00	0.00	5,431.7	-1,539.6	-550.6	1,877,270.29	1,302,837.97	36.153894 -107.393510
- actual wellpath misses target center by 10.9usft at 6157.0usft MD (5422.1 TVD, -1534.5 N, -551.6 E)									
- Point									
LOGOS #702H BHL P5		0.00	0.00	5,381.0	-1,895.1	-5,540.1	1,876,973.45	1,297,844.71	36.152916 -107.410409
- actual wellpath misses target center by 360.3usft at 11155.0usft MD (5391.2 TVD, -1535.1 N, -5548.2 E)									
- Point									
LOGOS #702H VP		0.00	0.00	4,764.9	-1,896.4	-700.1	1,876,915.29	1,302,684.34	36.152914 -107.394016
- actual wellpath misses target center by 750.3usft at 6319.5usft MD (5423.5 TVD, -1537.2 N, -714.0 E)									
- Point									
LOGOS #702H 7/85° P!		0.00	0.00	5,418.7	-1,895.3	-570.7	1,876,914.87	1,302,813.71	36.152917 -107.393578
- actual wellpath misses target center by 359.8usft at 6185.2usft MD (5424.1 TVD, -1535.6 N, -579.7 E)									
- Point									
LOGOS #702H BHL P9		0.00	0.00	5,381.0	-1,539.1	-5,614.4	1,877,330.35	1,297,774.56	36.153894 -107.410661
- actual wellpath misses target center by 9.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
6,171.0	5,423.2	7" - 1975' FNL, 28' FWL	0	0	
11,221.0	5,389.5	-1,536.1 -5,614.2 PTB @ 11,221'			

Checked By: _____ Approved By: _____ Date: _____

LOGOS Operating LLC

Sandoval County, NM

S8-T22N-R5W

LOGOS #702H

HZ

OIL CONS. DIV DIST. 3

Design: FINAL

JUL 14 2014

Survey Report - Geographic

19 June, 2014

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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 #702H					
Well Position	+N/-S	0.0 usft	Northing:	1,878,803.31 usft	Latitude:	36.158123
	+E/-W	0.0 usft	Easting:	1,303,406.66 usft	Longitude:	-107.391645
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	3/11/2014	9.33	62.97	50,175

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	254.67

Survey Program		Date	6/19/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
80.0	11,221.0	Survey #1 (HZ)	Geolink MWD	Geolink MWD	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,878,803.31	1,303,406.66	36.158123	-107.391645
80.0	1.30	56.60	80.0	0.5	0.8	1,878,803.80	1,303,407.43	36.158124	-107.391643
138.0	1.40	61.30	138.0	1.2	1.9	1,878,804.49	1,303,408.60	36.158126	-107.391639
196.0	1.50	65.70	196.0	1.9	3.2	1,878,805.13	1,303,409.93	36.158128	-107.391634
254.0	2.00	70.80	253.9	2.5	4.9	1,878,805.75	1,303,411.58	36.158130	-107.391629
313.0	1.80	75.30	312.9	3.1	6.8	1,878,806.31	1,303,413.46	36.158132	-107.391622
341.0	1.50	81.60	340.9	3.2	7.5	1,878,806.46	1,303,414.25	36.158132	-107.391620
370.0	1.70	86.00	369.9	3.3	8.4	1,878,806.54	1,303,415.05	36.158132	-107.391617
403.0	1.10	97.70	402.9	3.3	9.2	1,878,806.52	1,303,415.85	36.158132	-107.391614
435.0	1.20	109.60	434.9	3.2	9.8	1,878,806.36	1,303,416.47	36.158132	-107.391612
466.0	1.20	118.70	465.9	2.9	10.4	1,878,806.09	1,303,417.06	36.158131	-107.391610
475.0	1.10	134.50	474.9	2.8	10.5	1,878,805.98	1,303,417.20	36.158131	-107.391610

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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
584.0	0.70	196.90	583.8	1.4	11.1	1,878,804.60	1,303,417.74	36.158127	-107.391608
615.0	0.90	182.80	614.8	1.0	11.0	1,878,804.18	1,303,417.67	36.158126	-107.391608
676.0	0.70	165.00	675.8	0.2	11.1	1,878,803.34	1,303,417.73	36.158124	-107.391608
737.0	1.10	183.70	736.8	-0.8	11.1	1,878,802.40	1,303,417.78	36.158121	-107.391608
799.0	0.70	191.50	798.8	-1.8	11.0	1,878,801.43	1,303,417.65	36.158118	-107.391608
860.0	1.10	166.20	859.8	-2.7	11.1	1,878,800.50	1,303,417.71	36.158116	-107.391608
920.0	0.90	137.90	919.8	-3.6	11.5	1,878,799.58	1,303,418.15	36.158113	-107.391606
981.0	0.80	132.80	980.8	-4.2	12.2	1,878,798.93	1,303,418.78	36.158111	-107.391604
1,043.0	0.90	156.20	1,042.8	-5.0	12.7	1,878,798.19	1,303,419.28	36.158109	-107.391602
1,103.0	1.00	150.60	1,102.8	-5.9	13.1	1,878,797.29	1,303,419.72	36.158107	-107.391601
1,164.0	1.00	146.20	1,163.8	-6.8	13.7	1,878,796.38	1,303,420.26	36.158104	-107.391599
1,225.0	0.40	257.80	1,224.8	-7.3	13.8	1,878,795.89	1,303,420.35	36.158103	-107.391599
1,287.0	0.60	295.20	1,286.8	-7.2	13.3	1,878,795.99	1,303,419.84	36.158103	-107.391600
1,349.0	0.80	255.05	1,348.8	-7.1	12.6	1,878,796.03	1,303,419.13	36.158103	-107.391603
1,411.0	0.60	203.10	1,410.8	-7.5	12.0	1,878,795.62	1,303,418.58	36.158102	-107.391605
1,472.0	1.10	220.60	1,471.7	-8.3	11.5	1,878,794.89	1,303,418.07	36.158100	-107.391606
1,535.0	1.10	223.90	1,534.7	-9.2	10.7	1,878,794.00	1,303,417.24	36.158098	-107.391609
1,598.0	1.00	239.80	1,597.7	-9.9	9.8	1,878,793.30	1,303,416.34	36.158096	-107.391612
1,661.0	1.40	255.10	1,660.7	-10.4	8.6	1,878,792.84	1,303,415.11	36.158095	-107.391616
1,724.0	1.20	249.20	1,723.7	-10.8	7.2	1,878,792.43	1,303,413.75	36.158093	-107.391621
1,787.0	1.30	228.30	1,786.7	-11.5	6.1	1,878,791.73	1,303,412.59	36.158091	-107.391625
1,850.0	1.00	241.20	1,849.7	-12.3	5.0	1,878,791.00	1,303,411.57	36.158089	-107.391628
1,913.0	1.60	243.60	1,912.7	-12.9	3.8	1,878,790.36	1,303,410.29	36.158088	-107.391632
1,976.0	1.40	241.90	1,975.6	-13.7	2.3	1,878,789.63	1,303,408.81	36.158086	-107.391637
2,039.0	1.40	236.50	2,038.6	-14.4	1.0	1,878,788.85	1,303,407.48	36.158083	-107.391642
2,103.0	1.40	223.40	2,102.6	-15.4	-0.2	1,878,787.87	1,303,406.28	36.158081	-107.391646
2,166.0	1.80	226.20	2,165.6	-16.7	-1.4	1,878,786.64	1,303,405.03	36.158077	-107.391650
2,229.0	0.90	252.00	2,228.6	-17.5	-2.6	1,878,785.81	1,303,403.83	36.158075	-107.391654
2,292.0	0.20	256.90	2,291.5	-17.7	-3.2	1,878,785.64	1,303,403.25	36.158074	-107.391656
2,355.0	0.10	201.60	2,354.5	-17.8	-3.3	1,878,785.57	1,303,403.12	36.158074	-107.391657
2,417.0	0.10	11.80	2,416.5	-17.8	-3.3	1,878,785.57	1,303,403.11	36.158074	-107.391657
2,479.0	0.40	117.30	2,478.5	-17.8	-3.1	1,878,785.52	1,303,403.32	36.158074	-107.391656
2,543.0	1.50	173.70	2,542.5	-18.8	-2.8	1,878,784.58	1,303,403.60	36.158072	-107.391655
2,606.0	2.00	173.00	2,605.5	-20.7	-2.6	1,878,782.67	1,303,403.80	36.158066	-107.391654
2,669.0	2.40	161.50	2,668.5	-23.0	-2.1	1,878,780.32	1,303,404.32	36.158060	-107.391652
2,732.0	3.60	163.80	2,731.4	-26.2	-1.1	1,878,777.16	1,303,405.26	36.158051	-107.391649
2,795.0	4.60	163.70	2,794.2	-30.5	0.2	1,878,772.82	1,303,406.47	36.158039	-107.391645
2,858.0	5.70	169.70	2,857.0	-36.0	1.4	1,878,767.31	1,303,407.67	36.158024	-107.391640
2,920.0	6.70	181.90	2,918.6	-42.6	1.9	1,878,760.66	1,303,408.02	36.158006	-107.391639
2,983.0	7.90	182.60	2,981.1	-50.6	1.5	1,878,752.66	1,303,407.61	36.157984	-107.391640
3,047.0	8.70	182.40	3,044.4	-59.9	1.1	1,878,743.44	1,303,407.10	36.157959	-107.391641
3,110.0	9.50	182.70	3,106.6	-69.8	0.7	1,878,733.49	1,303,406.54	36.157931	-107.391643
3,173.0	10.40	182.70	3,168.7	-80.7	0.2	1,878,722.62	1,303,405.90	36.157901	-107.391645
3,236.0	11.70	181.10	3,230.5	-92.8	-0.2	1,878,710.56	1,303,405.37	36.157868	-107.391646
3,298.0	12.80	180.70	3,291.1	-105.9	-0.4	1,878,697.41	1,303,405.01	36.157832	-107.391647
3,361.0	14.00	180.80	3,352.4	-120.5	-0.6	1,878,682.82	1,303,404.64	36.157792	-107.391647
3,424.0	14.80	181.20	3,413.4	-136.2	-0.9	1,878,667.16	1,303,404.18	36.157749	-107.391648
3,487.0	15.70	184.00	3,474.2	-152.7	-1.6	1,878,650.62	1,303,403.23	36.157704	-107.391651
3,549.0	18.70	182.60	3,533.4	-171.0	-2.7	1,878,632.33	1,303,401.98	36.157653	-107.391654
3,612.0	23.30	183.40	3,592.2	-193.6	-3.9	1,878,609.81	1,303,400.51	36.157591	-107.391658
3,675.0	27.20	183.50	3,649.2	-220.4	-5.5	1,878,583.01	1,303,398.58	36.157518	-107.391664
3,738.0	27.80	181.10	3,705.0	-249.4	-6.7	1,878,553.96	1,303,397.08	36.157438	-107.391668
3,801.0	29.40	183.10	3,760.4	-279.6	-7.8	1,878,523.84	1,303,395.60	36.157355	-107.391672
3,864.0	30.00	183.60	3,815.1	-310.7	-9.6	1,878,492.71	1,303,393.41	36.157270	-107.391678
3,928.0	30.00	180.00	3,870.5	-342.7	-10.6	1,878,460.75	1,303,392.03	36.157182	-107.391681

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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
3,991.0	29.50	179.80	3,925.2	-374.0	-10.5	1,878,429.49	1,303,391.72	36.157096	-107.391681
4,054.0	30.20	180.00	3,979.9	-405.3	-10.5	1,878,398.14	1,303,391.40	36.157010	-107.391681
4,117.0	31.30	179.30	4,034.0	-437.5	-10.3	1,878,365.93	1,303,391.22	36.156921	-107.391680
4,180.0	33.20	177.60	4,087.3	-471.1	-9.4	1,878,332.32	1,303,391.75	36.156829	-107.391677
4,243.0	35.00	179.60	4,139.4	-506.4	-8.5	1,878,297.00	1,303,392.19	36.156732	-107.391674
4,306.0	36.70	179.90	4,190.5	-543.3	-8.4	1,878,260.11	1,303,391.91	36.156631	-107.391674
4,369.0	39.00	181.20	4,240.2	-582.0	-8.7	1,878,221.47	1,303,391.07	36.156524	-107.391675
4,432.0	39.00	180.80	4,289.2	-621.6	-9.4	1,878,181.84	1,303,389.92	36.156416	-107.391677
4,495.0	37.90	182.00	4,338.5	-660.8	-10.4	1,878,142.69	1,303,388.50	36.156308	-107.391680
4,558.0	37.80	181.90	4,388.3	-699.4	-11.7	1,878,104.07	1,303,386.73	36.156202	-107.391685
4,620.0	38.30	180.00	4,437.1	-737.6	-12.3	1,878,065.88	1,303,385.65	36.156097	-107.391687
4,683.0	38.10	180.20	4,486.6	-776.6	-12.4	1,878,026.92	1,303,385.13	36.155990	-107.391687
4,746.0	37.60	179.20	4,536.4	-815.2	-12.2	1,877,988.27	1,303,384.87	36.155884	-107.391687
4,809.0	37.70	179.20	4,586.3	-853.7	-11.7	1,877,949.79	1,303,384.96	36.155778	-107.391685
4,873.0	37.20	181.60	4,637.1	-892.6	-11.9	1,877,910.88	1,303,384.23	36.155671	-107.391686
4,905.0	37.90	181.10	4,662.4	-912.1	-12.4	1,877,891.39	1,303,383.55	36.155618	-107.391687
4,936.0	38.80	181.80	4,686.7	-931.4	-12.9	1,877,872.17	1,303,382.83	36.155565	-107.391689
4,968.0	39.60	180.90	4,711.5	-951.6	-13.4	1,877,851.96	1,303,382.12	36.155509	-107.391691
5,031.0	41.10	180.40	4,759.6	-992.4	-13.8	1,877,811.18	1,303,381.18	36.155397	-107.391692
5,093.0	42.30	182.10	4,805.8	-1,033.6	-14.7	1,877,769.97	1,303,379.79	36.155284	-107.391695
5,157.0	42.10	181.90	4,853.3	-1,076.6	-16.2	1,877,727.02	1,303,377.78	36.155166	-107.391700
5,219.0	42.80	183.70	4,899.0	-1,118.3	-18.3	1,877,685.26	1,303,375.24	36.155051	-107.391707
5,251.0	42.80	183.40	4,922.5	-1,140.0	-19.6	1,877,663.57	1,303,373.64	36.154992	-107.391712
5,282.0	42.60	183.50	4,945.3	-1,161.0	-20.9	1,877,642.61	1,303,372.13	36.154934	-107.391716
5,313.0	42.30	187.60	4,968.1	-1,181.8	-22.9	1,877,621.81	1,303,369.87	36.154877	-107.391723
5,344.0	43.50	191.60	4,990.9	-1,202.6	-26.4	1,877,601.06	1,303,366.10	36.154820	-107.391735
5,376.0	45.00	195.10	5,013.8	-1,224.4	-31.6	1,877,579.41	1,303,360.68	36.154760	-107.391752
5,408.0	46.10	198.70	5,036.2	-1,246.2	-38.2	1,877,557.64	1,303,353.78	36.154700	-107.391775
5,438.0	46.20	203.50	5,057.0	-1,266.4	-46.0	1,877,537.56	1,303,345.76	36.154645	-107.391801
5,470.0	45.60	207.70	5,079.3	-1,287.1	-55.9	1,877,516.96	1,303,335.59	36.154588	-107.391835
5,501.0	45.60	212.70	5,101.0	-1,306.2	-67.1	1,877,497.96	1,303,324.23	36.154535	-107.391872
5,533.0	45.70	217.30	5,123.3	-1,325.0	-80.2	1,877,479.38	1,303,310.89	36.154484	-107.391917
5,564.0	46.20	219.70	5,144.9	-1,342.4	-94.1	1,877,462.12	1,303,296.82	36.154436	-107.391964
5,595.0	46.60	223.10	5,166.3	-1,359.2	-108.9	1,877,445.46	1,303,281.78	36.154390	-107.392014
5,627.0	47.20	227.30	5,188.1	-1,375.7	-125.5	1,877,429.20	1,303,265.01	36.154344	-107.392070
5,658.0	48.60	228.40	5,208.9	-1,391.1	-142.5	1,877,413.97	1,303,247.78	36.154302	-107.392128
5,690.0	49.10	231.70	5,230.0	-1,406.6	-161.0	1,877,398.72	1,303,229.13	36.154259	-107.392191
5,721.0	50.40	234.40	5,250.0	-1,420.8	-179.9	1,877,384.73	1,303,210.06	36.154220	-107.392255
5,753.0	52.30	238.60	5,270.0	-1,434.6	-200.7	1,877,371.20	1,303,189.06	36.154183	-107.392325
5,785.0	53.80	241.60	5,289.2	-1,447.3	-222.9	1,877,358.72	1,303,166.74	36.154148	-107.392400
5,816.0	55.50	244.10	5,307.2	-1,458.8	-245.4	1,877,347.45	1,303,144.11	36.154116	-107.392477
5,847.0	59.10	246.40	5,323.9	-1,469.8	-269.1	1,877,336.82	1,303,120.30	36.154086	-107.392557
5,879.0	62.70	248.30	5,339.5	-1,480.5	-294.9	1,877,326.37	1,303,094.37	36.154056	-107.392644
5,910.0	65.80	250.60	5,353.0	-1,490.3	-321.0	1,877,316.89	1,303,068.12	36.154030	-107.392733
5,961.0	67.20	254.90	5,373.3	-1,504.2	-365.7	1,877,303.56	1,303,023.30	36.153991	-107.392884
5,993.0	69.00	255.90	5,385.2	-1,511.6	-394.4	1,877,296.41	1,302,994.48	36.153971	-107.392981
6,024.0	70.80	258.70	5,395.9	-1,518.0	-422.8	1,877,290.35	1,302,966.02	36.153953	-107.393077
6,055.0	74.40	259.40	5,405.2	-1,523.7	-451.9	1,877,285.08	1,302,936.91	36.153938	-107.393176
6,087.0	78.30	262.40	5,412.7	-1,528.6	-482.6	1,877,280.53	1,302,906.16	36.153924	-107.393280
6,119.0	82.40	264.70	5,418.1	-1,532.1	-513.9	1,877,277.36	1,302,874.78	36.153915	-107.393386
6,150.0	84.90	267.40	5,421.5	-1,534.2	-544.6	1,877,275.60	1,302,844.03	36.153909	-107.393490
6,182.0	86.50	268.00	5,423.9	-1,535.5	-576.5	1,877,274.69	1,302,812.13	36.153905	-107.393598
6,221.0	90.40	269.10	5,425.0	-1,536.5	-615.5	1,877,274.17	1,302,773.16	36.153903	-107.393730
6,284.0	91.10	269.80	5,424.1	-1,537.1	-678.5	1,877,274.30	1,302,710.16	36.153901	-107.393943
6,345.0	91.10	269.80	5,423.0	-1,537.3	-739.5	1,877,274.81	1,302,649.18	36.153900	-107.394150

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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	
6,406.0	90.30	269.70	5,422.2	-1,537.6	-800.5	1,877,275.26	1,302,588.18	36.153900	-107.394356	
6,468.0	90.90	269.70	5,421.6	-1,537.9	-862.4	1,877,275.66	1,302,526.19	36.153899	-107.394566	
6,529.0	90.30	270.30	5,420.9	-1,537.9	-923.4	1,877,276.38	1,302,465.20	36.153899	-107.394773	
6,589.0	89.70	269.80	5,420.9	-1,537.8	-983.4	1,877,277.14	1,302,405.20	36.153899	-107.394976	
6,650.0	90.30	269.30	5,420.9	-1,538.3	-1,044.4	1,877,277.38	1,302,344.20	36.153898	-107.395183	
6,711.0	91.10	269.20	5,420.2	-1,539.1	-1,105.4	1,877,277.29	1,302,283.21	36.153895	-107.395389	
6,772.0	90.60	268.90	5,419.3	-1,540.1	-1,166.4	1,877,277.00	1,302,222.22	36.153893	-107.395596	
6,833.0	89.90	268.60	5,419.0	-1,541.5	-1,227.4	1,877,276.39	1,302,161.22	36.153889	-107.395803	
6,894.0	90.60	268.30	5,418.7	-1,543.1	-1,288.4	1,877,275.45	1,302,100.23	36.153884	-107.396009	
6,956.0	90.10	268.90	5,418.4	-1,544.6	-1,350.4	1,877,274.67	1,302,038.24	36.153880	-107.396219	
7,018.0	90.60	269.60	5,418.0	-1,545.4	-1,412.4	1,877,274.59	1,301,976.24	36.153878	-107.396429	
7,080.0	90.70	270.30	5,417.3	-1,545.5	-1,474.3	1,877,275.26	1,301,914.25	36.153878	-107.396639	
7,141.0	90.00	270.30	5,416.9	-1,545.2	-1,535.3	1,877,276.30	1,301,853.26	36.153879	-107.396846	
7,202.0	89.40	270.00	5,417.2	-1,545.0	-1,596.3	1,877,277.17	1,301,792.26	36.153879	-107.397052	
7,263.0	90.30	270.00	5,417.4	-1,545.0	-1,657.3	1,877,277.89	1,301,731.27	36.153879	-107.397259	
7,324.0	89.90	270.20	5,417.3	-1,544.9	-1,718.3	1,877,278.71	1,301,670.27	36.153879	-107.397465	
7,386.0	89.40	271.10	5,417.7	-1,544.2	-1,780.3	1,877,280.15	1,301,608.29	36.153881	-107.397675	
7,447.0	89.00	271.70	5,418.5	-1,542.7	-1,841.3	1,877,282.35	1,301,547.34	36.153885	-107.397882	
7,510.0	90.00	271.50	5,419.1	-1,541.0	-1,904.3	1,877,284.85	1,301,484.39	36.153890	-107.398095	
7,573.0	89.70	271.40	5,419.2	-1,539.4	-1,967.3	1,877,287.19	1,301,421.44	36.153895	-107.398308	
7,635.0	90.40	271.10	5,419.2	-1,538.0	-2,029.2	1,877,289.27	1,301,359.47	36.153898	-107.398518	
7,699.0	91.00	272.00	5,418.4	-1,536.3	-2,093.2	1,877,291.75	1,301,295.53	36.153903	-107.398735	
7,761.0	90.30	271.90	5,417.7	-1,534.2	-2,155.2	1,877,294.59	1,301,233.59	36.153909	-107.398945	
7,823.0	89.50	272.00	5,417.8	-1,532.1	-2,217.1	1,877,297.43	1,301,171.66	36.153915	-107.399155	
7,886.0	89.00	272.30	5,418.6	-1,529.7	-2,280.1	1,877,300.53	1,301,108.74	36.153921	-107.399368	
7,949.0	89.50	270.70	5,419.4	-1,528.0	-2,343.1	1,877,302.92	1,301,045.80	36.153926	-107.399581	
8,012.0	90.50	269.50	5,419.4	-1,527.9	-2,406.1	1,877,303.77	1,300,982.80	36.153926	-107.399795	
8,074.0	90.90	269.30	5,418.7	-1,528.6	-2,468.1	1,877,303.85	1,300,920.81	36.153924	-107.400005	
8,137.0	90.80	269.60	5,417.8	-1,529.2	-2,531.0	1,877,303.99	1,300,857.81	36.153922	-107.400218	
8,200.0	90.80	269.60	5,416.9	-1,529.6	-2,594.0	1,877,304.29	1,300,794.82	36.153921	-107.400431	
8,263.0	90.60	269.80	5,416.1	-1,530.0	-2,657.0	1,877,304.70	1,300,731.83	36.153920	-107.400645	
8,325.0	90.40	269.80	5,415.6	-1,530.2	-2,719.0	1,877,305.21	1,300,669.83	36.153920	-107.400855	
8,387.0	90.40	269.30	5,415.1	-1,530.7	-2,781.0	1,877,305.45	1,300,607.83	36.153918	-107.401065	
8,450.0	90.00	268.80	5,414.9	-1,531.7	-2,844.0	1,877,305.15	1,300,544.84	36.153915	-107.401278	
8,513.0	91.50	268.80	5,414.1	-1,533.0	-2,907.0	1,877,304.57	1,300,481.85	36.153912	-107.401491	
8,577.0	90.90	268.90	5,412.7	-1,534.3	-2,971.0	1,877,304.04	1,300,417.86	36.153908	-107.401708	
8,640.0	90.30	269.00	5,412.1	-1,535.5	-3,034.0	1,877,303.62	1,300,354.87	36.153905	-107.401921	
8,703.0	89.90	268.80	5,412.0	-1,536.7	-3,096.9	1,877,303.16	1,300,291.87	36.153902	-107.402135	
8,765.0	91.20	267.10	5,411.4	-1,538.9	-3,158.9	1,877,301.67	1,300,229.89	36.153896	-107.402344	
8,828.0	90.80	267.40	5,410.3	-1,541.9	-3,221.8	1,877,299.39	1,300,166.94	36.153887	-107.402558	
8,890.0	91.00	268.70	5,409.3	-1,544.0	-3,283.8	1,877,298.00	1,300,104.97	36.153881	-107.402767	
8,954.0	90.30	270.20	5,408.6	-1,544.6	-3,347.8	1,877,298.14	1,300,040.98	36.153880	-107.402984	
9,017.0	89.70	270.40	5,408.6	-1,544.3	-3,410.8	1,877,299.21	1,299,977.99	36.153881	-107.403198	
9,080.0	89.60	270.80	5,409.0	-1,543.6	-3,473.8	1,877,300.61	1,299,915.00	36.153882	-107.403411	
9,142.0	90.70	270.60	5,408.8	-1,542.9	-3,535.7	1,877,302.10	1,299,853.02	36.153884	-107.403621	
9,206.0	90.00	270.20	5,408.4	-1,542.4	-3,599.7	1,877,303.30	1,299,789.03	36.153886	-107.403838	
9,269.0	89.80	269.60	5,408.5	-1,542.6	-3,662.7	1,877,303.93	1,299,726.04	36.153885	-107.404051	
9,332.0	89.80	268.50	5,408.7	-1,543.6	-3,725.7	1,877,303.63	1,299,663.04	36.153882	-107.404264	
9,395.0	91.50	269.50	5,408.0	-1,544.7	-3,788.7	1,877,303.27	1,299,600.05	36.153879	-107.404478	
9,458.0	91.10	270.70	5,406.6	-1,544.6	-3,851.7	1,877,304.12	1,299,537.07	36.153880	-107.404691	
9,521.0	90.00	270.80	5,406.0	-1,543.8	-3,914.7	1,877,305.68	1,299,474.09	36.153882	-107.404904	
9,583.0	90.40	270.00	5,405.8	-1,543.3	-3,976.7	1,877,306.84	1,299,412.11	36.153883	-107.405114	
9,646.0	91.40	270.20	5,404.8	-1,543.2	-4,039.7	1,877,307.70	1,299,349.12	36.153883	-107.405328	
9,709.0	90.50	270.10	5,403.7	-1,543.1	-4,102.7	1,877,308.60	1,299,286.14	36.153884	-107.405541	
9,772.0	90.20	269.90	5,403.4	-1,543.1	-4,165.7	1,877,309.34	1,299,223.14	36.153884	-107.405754	

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	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
9,835.0	91.10	269.40	5,402.6	-1,543.4	-4,228.7	1,877,309.70	1,299,160.15	36.153883	-107.405968
9,898.0	90.90	269.40	5,401.5	-1,544.1	-4,291.6	1,877,309.78	1,299,097.16	36.153881	-107.406181
9,960.0	90.10	269.60	5,401.0	-1,544.6	-4,353.6	1,877,309.97	1,299,035.16	36.153879	-107.406391
10,023.0	90.10	270.40	5,400.9	-1,544.6	-4,416.6	1,877,310.71	1,298,972.17	36.153879	-107.406604
10,086.0	90.40	270.60	5,400.6	-1,544.1	-4,479.6	1,877,312.00	1,298,909.18	36.153881	-107.406818
10,149.0	90.50	270.40	5,400.1	-1,543.5	-4,542.6	1,877,313.29	1,298,846.19	36.153882	-107.407031
10,212.0	90.00	270.60	5,399.9	-1,543.0	-4,605.6	1,877,314.58	1,298,783.21	36.153884	-107.407245
10,276.0	90.00	270.80	5,399.9	-1,542.2	-4,669.6	1,877,316.11	1,298,719.23	36.153886	-107.407461
10,338.0	90.40	271.60	5,399.6	-1,540.9	-4,731.6	1,877,318.14	1,298,657.26	36.153889	-107.407671
10,402.0	90.80	272.50	5,399.0	-1,538.6	-4,795.6	1,877,321.18	1,298,593.34	36.153896	-107.407888
10,465.0	90.80	272.40	5,398.1	-1,535.9	-4,858.5	1,877,324.61	1,298,530.44	36.153903	-107.408101
10,527.0	90.20	272.40	5,397.5	-1,533.3	-4,920.4	1,877,327.94	1,298,468.53	36.153910	-107.408311
10,590.0	91.10	272.40	5,396.8	-1,530.7	-4,983.4	1,877,331.32	1,298,405.63	36.153917	-107.408524
10,653.0	90.00	270.80	5,396.2	-1,528.9	-5,046.4	1,877,333.81	1,298,342.68	36.153922	-107.408737
10,716.0	90.60	269.60	5,395.9	-1,528.7	-5,109.4	1,877,334.78	1,298,279.69	36.153923	-107.408951
10,779.0	91.50	270.40	5,394.7	-1,528.7	-5,172.3	1,877,335.52	1,298,216.71	36.153923	-107.409164
10,842.0	90.30	269.50	5,393.8	-1,528.8	-5,235.3	1,877,336.20	1,298,153.72	36.153923	-107.409377
10,903.0	90.70	269.60	5,393.2	-1,529.3	-5,296.3	1,877,336.44	1,298,092.72	36.153921	-107.409584
10,966.0	89.90	268.70	5,392.9	-1,530.2	-5,359.3	1,877,336.25	1,298,029.72	36.153919	-107.409797
11,029.0	90.70	268.40	5,392.6	-1,531.8	-5,422.3	1,877,335.39	1,297,966.73	36.153914	-107.410011
11,093.0	90.40	268.40	5,391.9	-1,533.6	-5,486.3	1,877,334.36	1,297,902.74	36.153909	-107.410227
11,133.4	90.78	268.66	5,391.5	-1,534.6	-5,526.7	1,877,333.79	1,297,862.35	36.153906	-107.410364
RSI - 1975' FNL, 337' FWL									
11,156.0	91.00	268.80	5,391.2	-1,535.1	-5,549.2	1,877,333.56	1,297,839.75	36.153905	-107.410441
11,171.0	91.50	269.20	5,390.8	-1,535.4	-5,564.2	1,877,333.47	1,297,824.76	36.153904	-107.410491
Last CES Survey @ 11,171' MD									
11,221.0	91.50	269.20	5,389.5	-1,536.1	-5,614.2	1,877,333.36	1,297,774.77	36.153902	-107.410661
4 1/2" - 1976' FNL, 250' FWL - PTB @ 11,221'									

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	Latitude	Longitude
LOGOS #702H BHL P9	0.00	0.00	5,381.0	-1,539.1	-5,614.4	1,877,330.35	1,297,774.55	36.153894	-107.410661
- actual wellpath misses target center by 9.1usft at 11221.0usft MD (5389.5 TVD, -1536.1 N, -5614.2 E)									
- Point									

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")		
6,171.0	5,423.2	7" - 1975' FNL, 28' FWL	0	0		

Cathedral Energy Services

Survey Report - Geographic

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #702H
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 #702H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,133.4	5,391.5	-1,534.6	-5,526.7	RSI - 1975' FNL, 337' FWL
11,171.0	5,390.8	-1,535.4	-5,564.2	Last CES Survey @ 11,171' MD
11,221.0	5,389.5	-1,536.1	-5,614.2	4 1/2" - 1976' FNL, 250' FWL
11,221.0	5,389.5	-1,536.1	-5,614.2	PTB @ 11,221'

Checked By: _____ Approved By: _____ Date: _____