



Company: B.P.
Project: La Plata County, CO NAD83
Site: Tiffany Pad 4
Well: Tiffany 4-2
Wellbore: Pilot
Design: Plan #1

PROJECT DETAILS:La Plata County, CO NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
System Datum: Mean Sea Level
Local North: Grid



Plan: Plan #1 (Tiffany 4-2/Pilot)

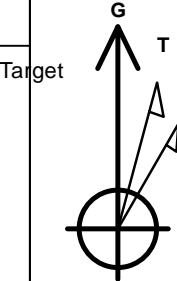
Created By: Janie Collins Date: 18:36, March 09 2017

WELL DETAILS: Tiffany 4-2

		GL 6460' & RKB 11' @ 6471.00usft (Aztec 507)		6460.00	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1159751.08	2402837.05	37.0874222	-107.5473006

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2180.90	0.00	0.00	2180.90	0.00	0.00	0.00	0.00	0.00
2993.40	65.00	262.81	2830.00	-51.76	-410.27	8.00	262.81	413.52
3638.00	65.00	262.81	3102.41	-124.88	-989.88	0.00	0.00	997.73



Azimuths to Grid North
True North: 1.26°
Magnetic North: 10.44°

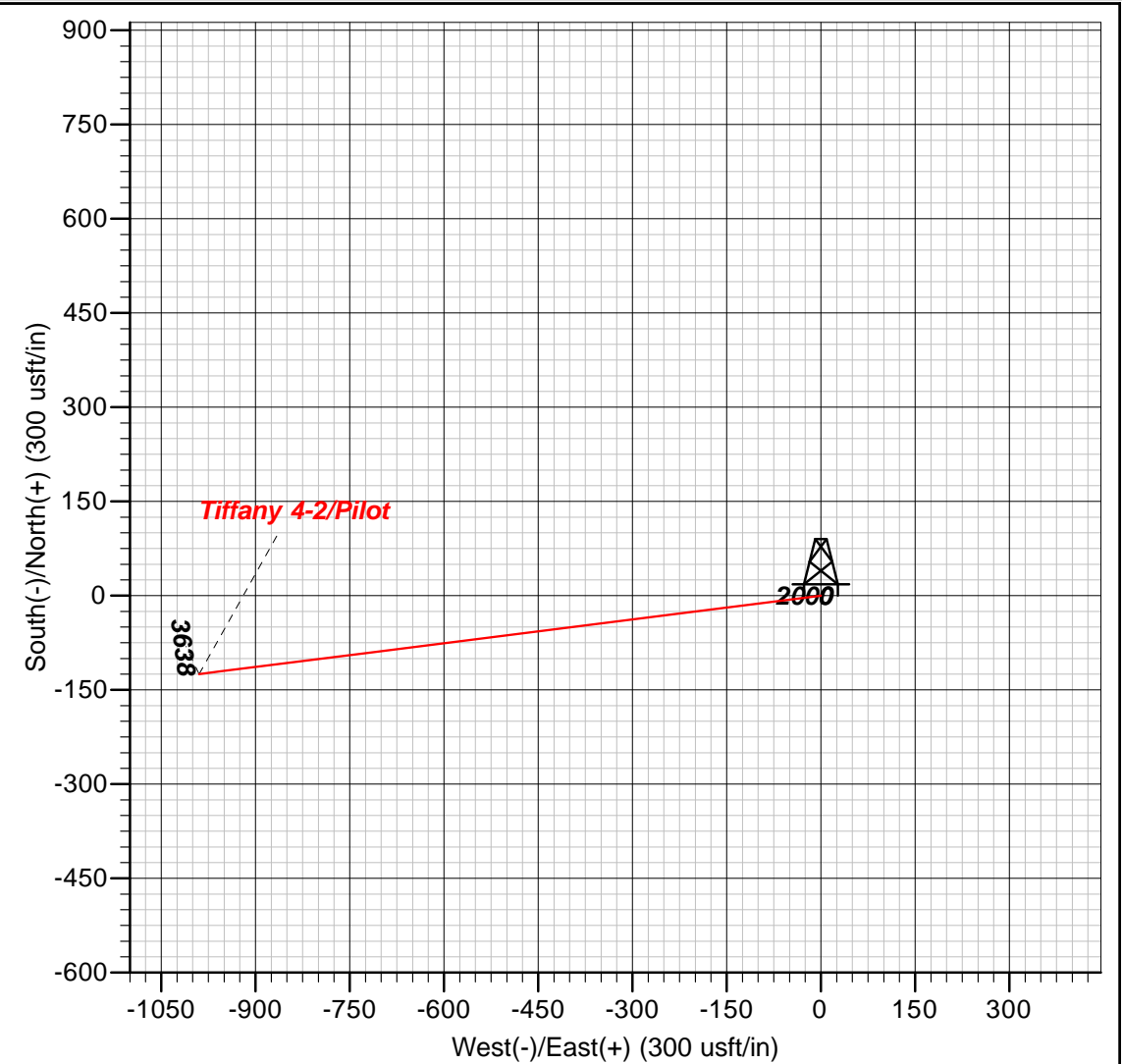
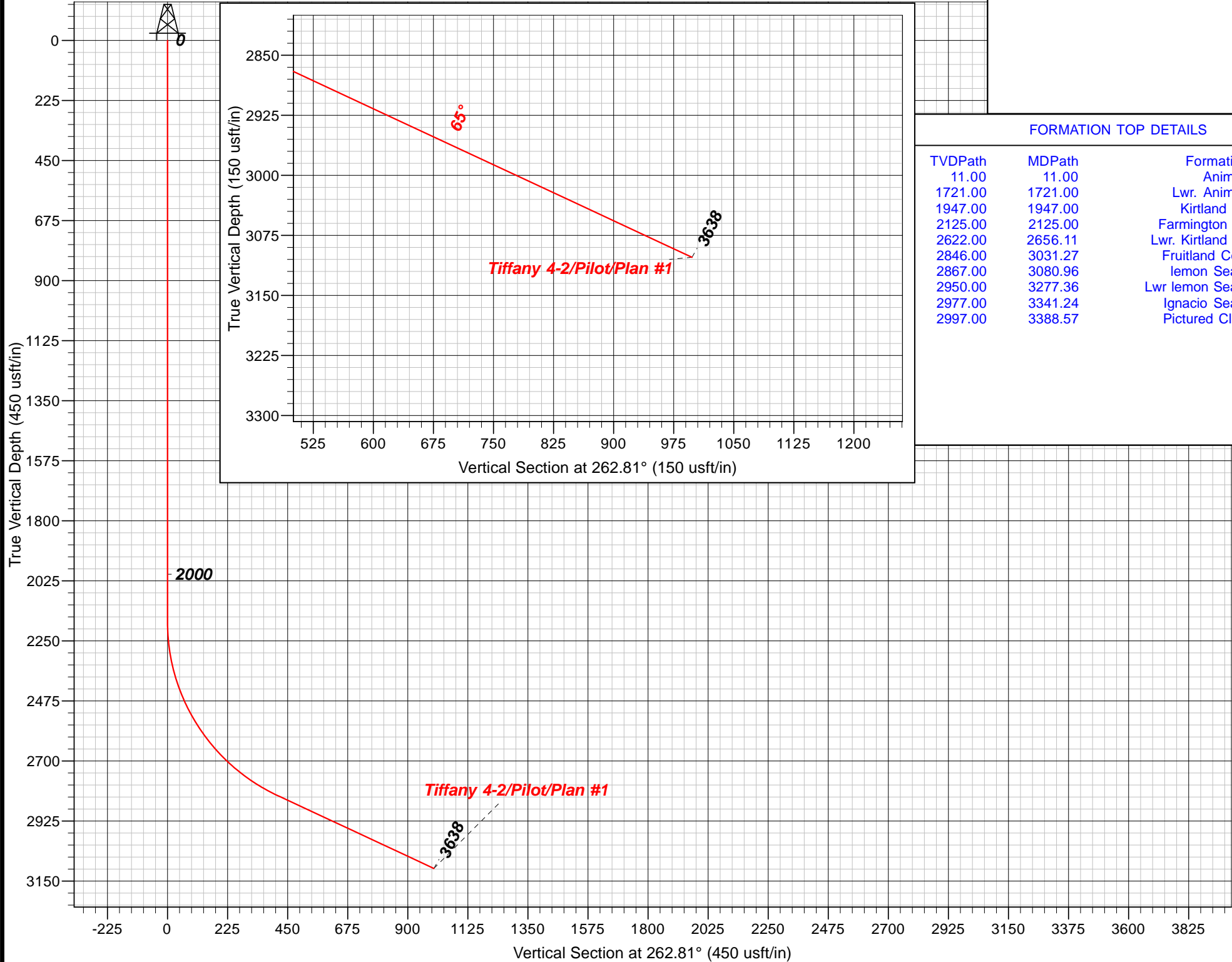
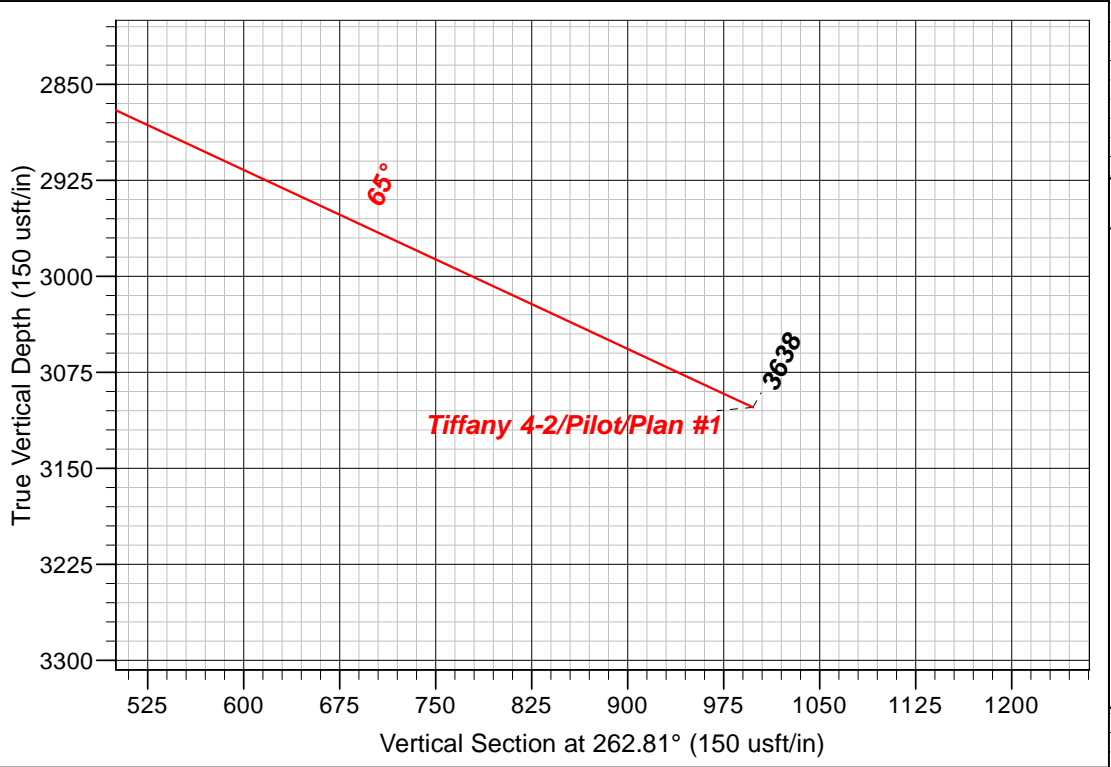
Magnetic Field
Strength: 50146.7snT
Dip Angle: 63.65°
Date: 3/6/2017
Model: HDGM

FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
11.00	11.00	Animas
1721.00	1721.00	Lwr. Animas
1947.00	1947.00	Kirtland Sh
2125.00	2125.00	Farmington Sh
2622.00	2656.11	Lwr. Kirtland Sh
2846.00	3031.27	Fruitland Coal
2867.00	3080.96	lemon Sear
2950.00	3277.36	Lwr lemon Sear
2977.00	3341.24	Ignacio Sear
2997.00	3388.57	Pictured Cliff

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Tiff 4-2 Lat 2 PBHL	2809.00	-507.07	-5604.12	1159244.01	2397232.93	37.0856910	-107.5664689
Tiff 4-2 Lat 2 ST1 PBHL	2821.00	1556.95	-5566.37	1161308.03	2397270.68	37.0913605	-107.5664960
Tiff 4-2 Lat 1 PBHL	2851.00	-707.03	-5607.87	1159044.05	2397229.18	37.0851418	-107.5664666
Tiff 4-2 Lat 1 ST1 PBHL	2866.00	1372.39	-5569.19	1161123.47	2397267.86	37.0908536	-107.5664977





B.P.

La Plata County, CO NAD83

Tiffany Pad 4

Tiffany 4-2

Pilot

Plan: Plan #1

Standard Planning Report

09 March, 2017





Database:	Grand Junction District	Local Co-ordinate Reference:	Well Tiffany 4-2
Company:	B.P.	TVD Reference:	GL 6460' & RKB 11' @ 6471.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6460' & RKB 11' @ 6471.00usft (Aztec 507)
Site:	Tiffany Pad 4	North Reference:	Grid
Well:	Tiffany 4-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #1		

Project	La Plata County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site		Tiffany Pad 4			
Site Position:		Northing:	1,159,793.57 usft	Latitude:	37.0875389
From:	Map	Easting:	2,402,838.16 usft	Longitude:	-107.5473000
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.26 °

Well	Tiffany 4-2					
Well Position	+N/-S	-42.49 usft	Northing:	1,159,751.08 usft	Latitude:	37.0874221
	+E/-W	-1.11 usft	Easting:	2,402,837.05 usft	Longitude:	-107.5473006
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,460.00 usft

Wellbore	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/6/2017	9.18	63.65	50,147

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	262.81

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,180.90	0.00	0.00	2,180.90	0.00	0.00	0.00	0.00	0.00	0.00	
2,993.40	65.00	262.81	2,830.00	-51.76	-410.27	8.00	8.00	0.00	262.81	
3,638.00	65.00	262.81	3,102.41	-124.88	-989.88	0.00	0.00	0.00	0.00	



Database:	Grand Junction District	Local Co-ordinate Reference:	Well Tiffany 4-2
Company:	B.P.	TVD Reference:	GL 6460' & RKB 11' @ 6471.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6460' & RKB 11' @ 6471.00usft (Aztec 507)
Site:	Tiffany Pad 4	North Reference:	Grid
Well:	Tiffany 4-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.00	0.00	0.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00
Animas									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,721.00	0.00	0.00	1,721.00	0.00	0.00	0.00	0.00	0.00	0.00
Lwr. Animas									
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,947.00	0.00	0.00	1,947.00	0.00	0.00	0.00	0.00	0.00	0.00
Kirtland Sh									
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,125.00	0.00	0.00	2,125.00	0.00	0.00	0.00	0.00	0.00	0.00
Farmington Ss									
2,180.90	0.00	0.00	2,180.90	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	1.53	262.81	2,200.00	-0.03	-0.25	0.25	8.00	8.00	0.00
2,300.00	9.53	262.81	2,299.45	-1.24	-9.80	9.88	8.00	8.00	0.00
2,400.00	17.53	262.81	2,396.60	-4.16	-32.99	33.25	8.00	8.00	0.00
2,500.00	25.53	262.81	2,489.55	-8.75	-69.37	69.92	8.00	8.00	0.00
2,600.00	33.53	262.81	2,576.49	-14.91	-118.23	119.16	8.00	8.00	0.00
2,656.11	38.02	262.81	2,622.00	-19.02	-150.76	151.96	8.00	8.00	0.00
Lwr. Kirtland Sh									
2,700.00	41.53	262.81	2,655.73	-22.53	-178.61	180.03	8.00	8.00	0.00
2,800.00	49.53	262.81	2,725.73	-31.46	-249.35	251.33	8.00	8.00	0.00
2,900.00	57.53	262.81	2,785.12	-41.51	-329.07	331.68	8.00	8.00	0.00
2,993.40	65.00	262.81	2,830.00	-51.76	-410.27	413.52	8.00	8.00	0.00
3,000.00	65.00	262.81	2,832.78	-52.50	-416.20	419.50	0.00	0.00	0.00
3,031.27	65.00	262.81	2,846.00	-56.05	-444.32	447.84	0.00	0.00	0.00
Fruitland Coal									
3,080.96	65.00	262.81	2,867.00	-61.69	-489.00	492.88	0.00	0.00	0.00
lemon Seam									
3,100.00	65.00	262.81	2,875.05	-63.85	-506.12	510.13	0.00	0.00	0.00
3,200.00	65.00	262.81	2,917.31	-75.19	-596.04	600.76	0.00	0.00	0.00
3,277.36	65.00	262.81	2,950.00	-83.97	-665.60	670.87	0.00	0.00	0.00
Lwr lemon Seam									



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Project:	La Plata County, CO NAD83	MD Reference:	GL 6460' & RKB 11' @ 6471.00usft (Aztec 507)
Site:	Tiffany Pad 4	North Reference:	Grid
Well:	Tiffany 4-2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,300.00	65.00	262.81	2,959.57	-86.53	-685.96	691.39	0.00	0.00	0.00
3,341.24	65.00	262.81	2,977.00	-91.21	-723.04	728.77	0.00	0.00	0.00
Ignacio Seam									
3,388.57	65.00	262.81	2,997.00	-96.58	-765.59	771.66	0.00	0.00	0.00
Pictured Cliffs									
3,400.00	65.00	262.81	3,001.83	-97.88	-775.87	782.02	0.00	0.00	0.00
3,500.00	65.00	262.81	3,044.09	-109.22	-865.79	872.65	0.00	0.00	0.00
3,600.00	65.00	262.81	3,086.36	-120.56	-955.71	963.29	0.00	0.00	0.00
3,638.00	65.00	262.81	3,102.41	-124.88	-989.88	997.73	0.00	0.00	0.00
Tiff 4-2 Lat 2 ST1 PBHL - Tiff 4-2 Lat 1 PBHL - Tiff 4-2 Lat 2 PBHL - Tiff 4-2 Lat 1 ST1 PBHL									

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									
Tiff 4-2 Lat 2 PBHL	0.00	360.00	2,809.00	-507.07	-5,604.12	1,159,244.01	2,397,232.93	37.0856910	-107.5664689
- plan misses target center by 4639.33usft at 3638.00usft MD (3102.41 TVD, -124.88 N, -989.88 E)									
- Point									
Tiff 4-2 Lat 2 ST1 PBHL	0.00	0.00	2,821.00	1,556.95	-5,566.37	1,161,308.03	2,397,270.68	37.0913605	-107.5664961
- plan misses target center by 4883.85usft at 3638.00usft MD (3102.41 TVD, -124.88 N, -989.88 E)									
- Point									
Tiff 4-2 Lat 1 PBHL	0.00	360.00	2,851.00	-707.03	-5,607.87	1,159,044.05	2,397,229.18	37.0851417	-107.5664666
- plan misses target center by 4661.32usft at 3638.00usft MD (3102.41 TVD, -124.88 N, -989.88 E)									
- Point									
Tiff 4-2 Lat 1 ST1 PBHL	0.00	360.00	2,866.00	1,372.39	-5,569.19	1,161,123.47	2,397,267.86	37.0908536	-107.5664918
- plan misses target center by 4823.67usft at 3638.00usft MD (3102.41 TVD, -124.88 N, -989.88 E)									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
11.00	11.00	Animas		0.00	0.00	
1,721.00	1,721.00	Lwr. Animas		0.00	0.00	
1,947.00	1,947.00	Kirtland Sh		0.00	0.00	
2,125.00	2,125.00	Farmington Ss		0.00	0.00	
2,656.11	2,622.00	Lwr. Kirtland Sh		0.00	0.00	
3,031.27	2,846.00	Fruitland Coal		0.00	0.00	
3,080.96	2,867.00	lemon Seam		0.00	0.00	
3,277.36	2,950.00	Lwr lemon Seam		0.00	0.00	
3,341.24	2,977.00	Ignacio Seam		0.00	0.00	
3,388.57	2,997.00	Pictured Cliffs		0.00	0.00	