



Energen Resources

Carson Nat'l Forest-S22, T32N, R5W

Middle Mesa

Carracas 22A #13 30-039-24412

Wellbore #1

RCVD NOV 2 '07

OIL CONS. DIV.

DIST. 3

Survey: EOW Survey

End of Well Survey

25 October, 2007

Surface	620/S	540/W	
Lateral TOC	864/S	615/W	MD 3821 TVL 3701
BHL	2544/S	1828/W	MD 5905 TVL 3654

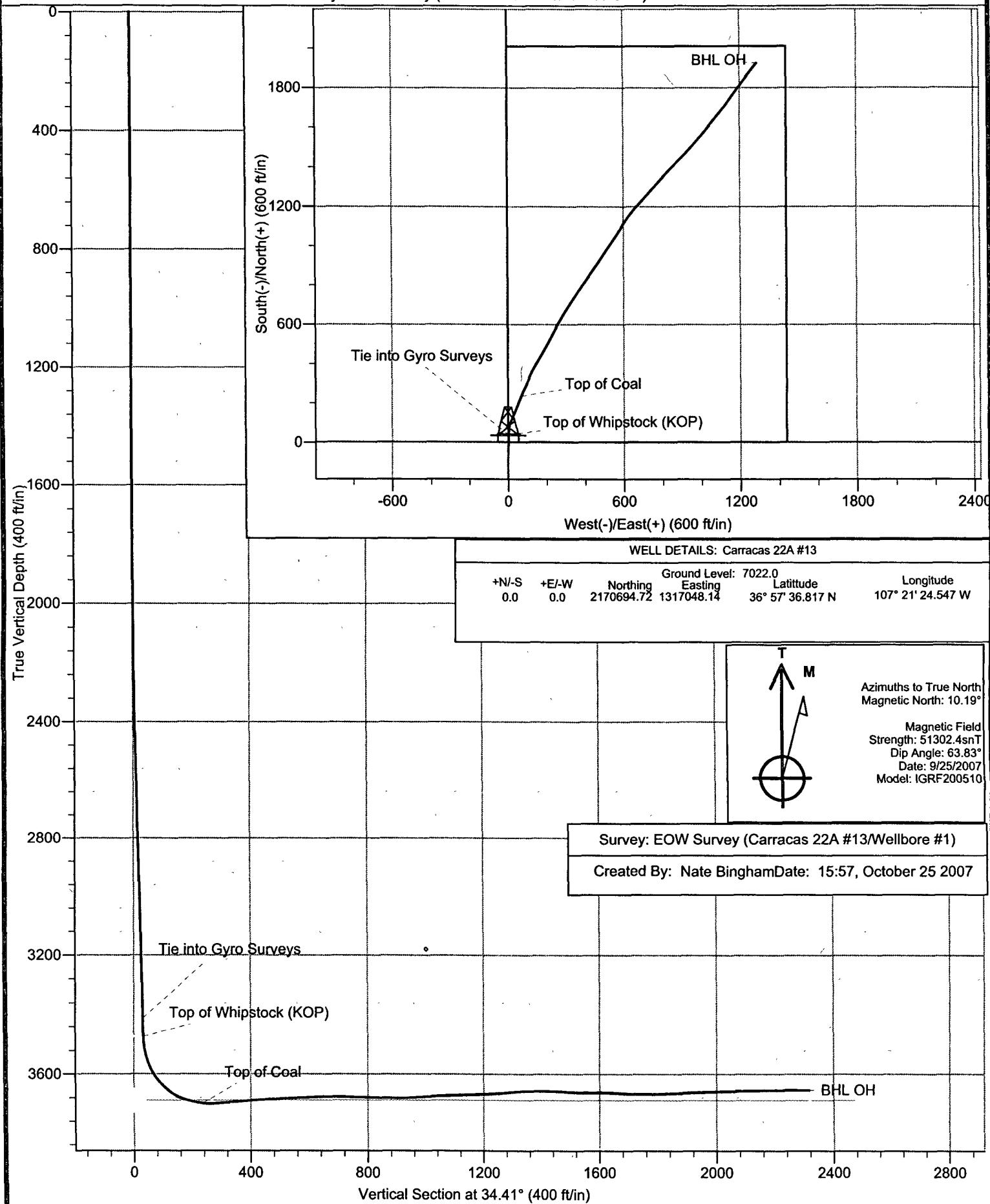
HOLD C104 FOR NSI

PATHFINDER
ENERGY SERVICES

"As Drilled" plat attached

AS

Survey: EOW Survey (Carracas 22A #13/Wellbore #1)



Company:	Energen Resources	Local Co-ordinate Reference:	Well Carracas 22A #13
Project:	Carson Nat'l Forest-S22, T32N, R5W	TVD Reference:	Well @ 7034.0ft (AWS #580 RKB 12')
Site:	Middle Mesa	MD Reference:	Well @ 7034.0ft (AWS #580 RKB 12')
Well:	Carracas 22A #13	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 2003.16 Single User Db

Project:	Carson Nat'l Forest-S22, T32N, R5W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site:	Middle Mesa					
Site Position:		Northing:	2,170,694.72	ft	Latitude:	36° 57' 36.817 N
From:	Lat/Long	Easting:	1,317,048.14	ft	Longitude:	107° 21' 24.547 W
Position Uncertainty:	0.0 ft	Spot Radius:	"		Grid Convergence:	-0.67

Well:	Carracas 22A #13							
Well Position	+N/-S	0.0	ft	Northing:	2,170,694.72	ft	Latitude:	36° 57' 36.817 N
	+E/-W	0.0	ft	Easting:	1,317,048.14	ft	Longitude:	107° 21' 24.547 W
Position Uncertainty	0.0	ft		Wellhead Elevation:	7,022.0	ft	Ground Level:	7,022.0 ft

Wellbore:	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF200510	9/25/2007	(°)	(°)	(nT)
			10.19	63.83	51,302

Design:	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	34.41

Survey Program	Date 10/25/2007			
From	To	Survey (Wellbore)	Tool Name	Description
(ft)	(ft)			
212.0	3,412.0	GYRODATA (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s
3,473.0	5,905.0	EOW Survey (Wellbore #1)	Pathfinder	Pathfinder MWD

Survey						
MD	Inc	Azi	TVD	N/S	E/W	DLeg
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)
3,412.0	1.76	346.17	3,411.4	37.5	2.9	0.00
Tie into Gyro Surveys						
3,473.0	1.72	347.97	3,472.4	39.3	2.4	0.11
Top of Whipstock (KOP)						
3,556.0	21.02	8.18	3,553.4	55.4	4.3	23.39
3,588.0	29.02	9.90	3,582.4	68.8	6.5	25.10
3,619.0	36.05	16.56	3,608.5	85.0	10.4	25.42
3,651.0	43.26	21.99	3,633.1	104.2	17.2	24.98
3,679.0	50.03	22.98	3,652.3	123.0	25.0	24.31
3,727.0	64.63	22.30	3,678.2	160.2	40.5	30.44
3,757.0	74.83	22.03	3,688.6	186.2	51.1	34.01

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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Carracas 22A #13
TVD Reference: Well @ 7034.0ft (AWS #580 RKB 12')
MD Reference: Well @ 7034.0ft (AWS #580 RKB 12')
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
3,789.0	78.96	21.98	3,695.8	215.1	62.7	12.91	212.9
3,812.0	82.19	22.37	3,699.6	236.1	71.3	14.13	235.1
Top of Coal							
3,821.0	83.45	22.52	3,700.7	244.4	74.7	14.13	243.8
3,852.0	95.58	26.52	3,701.0	272.5	87.5	41.19	274.3
3,884.0	94.88	23.88	3,698.1	301.3	101.1	8.50	305.8
3,915.0	91.63	22.76	3,696.3	329.8	113.4	11.09	336.1
3,947.0	95.41	27.71	3,694.3	358.6	127.0	19.44	367.6
3,978.0	96.20	31.03	3,691.2	385.5	142.1	10.96	398.4
4,010.0	93.83	30.24	3,688.4	412.9	158.3	7.80	430.2
4,041.0	93.56	30.41	3,686.4	439.6	174.0	1.03	461.0
4,073.0	92.51	29.78	3,684.7	467.3	190.0	3.83	492.9
4,104.0	92.42	28.25	3,683.4	494.4	205.0	4.94	523.7
4,136.0	92.68	27.87	3,682.0	522.6	220.0	1.44	555.5
4,167.0	93.39	28.02	3,680.3	549.9	234.5	2.34	586.2
4,199.0	92.68	28.11	3,678.6	578.1	249.6	2.24	618.0
4,230.0	91.45	28.92	3,677.5	605.3	264.4	4.75	648.8
4,262.0	89.25	30.57	3,677.3	633.1	280.2	8.59	680.7
4,293.0	88.55	31.87	3,677.9	659.6	296.3	4.76	711.7
4,325.0	89.08	32.24	3,678.6	686.7	313.3	2.02	743.6
4,356.0	88.81	32.75	3,679.1	712.9	329.9	1.86	774.6
4,387.0	88.20	33.98	3,679.9	738.8	347.0	4.43	805.6
4,419.0	89.16	34.06	3,680.7	765.3	364.9	3.01	837.6
4,450.0	88.64	35.46	3,681.3	790.8	382.6	4.82	868.6
4,482.0	89.25	35.87	3,681.9	816.7	401.2	2.30	900.6
4,514.0	92.59	34.93	3,681.3	842.8	419.7	10.84	932.5
4,544.0	93.83	34.89	3,679.7	867.4	436.9	4.14	962.5
4,574.0	93.83	34.50	3,677.7	892.0	453.9	1.30	992.4
4,607.0	93.21	34.16	3,675.6	919.2	472.5	2.14	1,025.4
4,639.0	92.24	33.87	3,674.1	945.7	490.4	3.16	1,057.3
4,670.0	91.36	34.18	3,673.1	971.4	507.7	3.01	1,088.3
4,701.0	92.33	34.41	3,672.1	997.0	525.2	3.22	1,119.3
4,733.0	92.07	33.83	3,670.9	1,023.4	543.1	1.99	1,151.3
4,764.0	92.59	33.54	3,669.7	1,049.2	560.3	1.92	1,182.2
4,796.0	92.95	32.26	3,668.1	1,076.0	577.6	4.15	1,214.2
4,827.0	93.47	32.82	3,666.4	1,102.1	594.3	2.46	1,245.1
4,859.0	95.50	35.40	3,663.9	1,128.5	612.2	10.24	1,277.0
4,890.0	94.97	38.07	3,661.0	1,153.3	630.6	8.75	1,307.9
4,909.0	93.91	38.13	3,659.6	1,168.2	642.3	5.59	1,326.8
4,941.0	91.54	40.09	3,658.1	1,193.0	662.5	9.61	1,358.6
4,972.0	89.34	42.28	3,657.8	1,216.3	682.9	10.01	1,389.4
5,004.0	88.81	42.41	3,658.3	1,240.0	704.5	1.71	1,421.1
5,034.0	88.46	42.20	3,659.0	1,262.1	724.6	1.36	1,450.8
5,067.0	87.14	42.64	3,660.3	1,286.5	746.9	4.22	1,483.4



Pathfinder Energy Services
End of Well Survey



Company: Energen Resources
Project: Carson Nat'l Forest-S22, T32N, R5W
Site: Middle Mesa
Well: Carracas 22A #13
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Carracas 22A #13
TVD Reference: Well @ 7034.0ft (AWS #580 RKB 12')
MD Reference: Well @ 7034.0ft (AWS #580 RKB 12')
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.16 Single User Db

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	DLeg (°/100ft)	V. Sec (ft)
5,097.0	87.14	41.94	3,661.8	1,308.7	767.0	2.33	1,513.1
5,129.0	88.81	40.86	3,662.9	1,332.6	788.2	6.21	1,544.9
5,160.0	90.13	43.40	3,663.2	1,355.6	809.0	9.23	1,575.6
5,192.0	90.48	44.44	3,663.1	1,378.7	831.2	3.43	1,607.1
5,223.0	87.58	44.87	3,663.6	1,400.7	853.0	9.46	1,637.6
5,255.0	86.97	44.71	3,665.1	1,423.4	875.5	1.97	1,669.1
5,286.0	88.02	44.93	3,666.5	1,445.4	897.3	3.46	1,699.5
5,318.0	88.72	43.36	3,667.4	1,468.3	919.6	5.37	1,731.1
5,349.0	89.52	42.68	3,667.8	1,491.0	940.7	3.39	1,761.7
5,380.0	91.01	41.74	3,667.7	1,514.0	961.6	5.68	1,792.4
5,411.0	92.42	41.44	3,666.8	1,537.1	982.1	4.65	1,823.2
5,443.0	92.24	39.69	3,665.5	1,561.4	1,002.9	5.49	1,855.0
5,474.0	92.59	39.61	3,664.2	1,585.3	1,022.7	1.16	1,885.8
5,506.0	92.95	39.49	3,662.6	1,609.9	1,043.0	1.19	1,917.6
5,537.0	92.68	39.32	3,661.1	1,633.8	1,062.7	1.03	1,948.5
5,568.0	91.63	39.51	3,659.9	1,657.8	1,082.4	3.44	1,979.3
5,600.0	91.80	39.16	3,659.0	1,682.5	1,102.6	1.22	2,011.2
5,631.0	91.63	38.76	3,658.0	1,706.6	1,122.1	1.40	2,042.1
5,663.0	91.63	37.02	3,657.1	1,731.8	1,141.8	5.44	2,074.0
5,694.0	90.75	36.17	3,656.5	1,756.7	1,160.2	3.95	2,105.0
5,724.0	91.01	36.59	3,656.0	1,780.9	1,178.0	1.65	2,135.0
5,756.0	91.10	37.02	3,655.4	1,806.5	1,197.2	1.37	2,166.9
5,789.0	91.89	37.78	3,654.6	1,832.7	1,217.2	3.32	2,199.9
5,819.0	90.40	37.45	3,654.0	1,856.5	1,235.5	5.09	2,229.8
5,853.0	89.69	38.14	3,654.0	1,883.3	1,256.4	2.91	2,263.8
5,905.0	89.69	38.14	3,654.2	1,924.2	1,288.5	0.00	2,315.7

BHL OH



Pathfinder Energy Services
End of Well Survey



Company: Energen Resources
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Site: Middle Mesa
Well: Carracas 22A #13
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Carracas 22A #13
TVD Reference: Well @ 7034.0ft (AWS #580 RKB 12')
MD Reference: Well @ 7034.0ft (AWS #580 RKB 12')
North Reference: True
Survey Calculation Method: Minimum Curvature
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Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Drill Window - survey misses by 117.2ft at 3628.3ft MD (3615.9 TVD, 90.3 N, 12.0 E) - Rectangle (sides W2,010.0 H1,438.0 D0.0)	0.00	0.00	3,689.7	0.0	0.0	2,170,694.72	1,317,048.14	36° 57' 36.817 N	107° 21' 24.547 W
Top of Whipstock - survey hits target - Point	0.00	0.00	3,473.0	39.4	2.4	2,170,734.09	1,317,051.00	36° 57' 37.207 N	107° 21' 24.517 W
Land Curve - survey misses by 57.1ft at 3833.9ft MD (3701.6 TVD, 256.2 N, 79.8 E) - Point	0.00	0.00	3,700.0	232.5	131.7	2,170,925.68	1,317,182.54	36° 57' 39.116 N	107° 21' 22.924 W
PBHL Lat - survey misses by 51.8ft at 5905.0ft MD (3654.2 TVD, 1924.2 N, 1288.5 E) - Point	0.00	0.00	3,700.0	1,911.9	1,309.3	2,172,591.29	1,318,379.56	36° 57' 55.720 N	107° 21' 8.414 W

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,412.0	3,411.4	37.5	2.9	Tie into Gyro Surveys
3,473.0	3,472.4	39.3	2.4	Top of Whipstock (KOP)
3,812.0	3,699.6	236.1	71.3	Top of Coal
5,905.0	3,654.2	1,924.2	1,288.5	BHL OH

Checked By: _____ Approved By: _____ Date: _____

As Drilled

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources

Form C-102
Revised October 12, 2005

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

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies
RCUP NOV 2 '07
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-24412		² Pool Code 71629		³ Pool Name Basin Fruitland Coal		OIL CONSERVATION DIVISION DIST. 3	
⁴ Property Code		⁵ Property Name Carracas 22A				⁶ Well Number 13	
⁷ OGRID No. 162928		⁸ Operator Name Energen Resources Corporation				⁹ Elevation 7022	

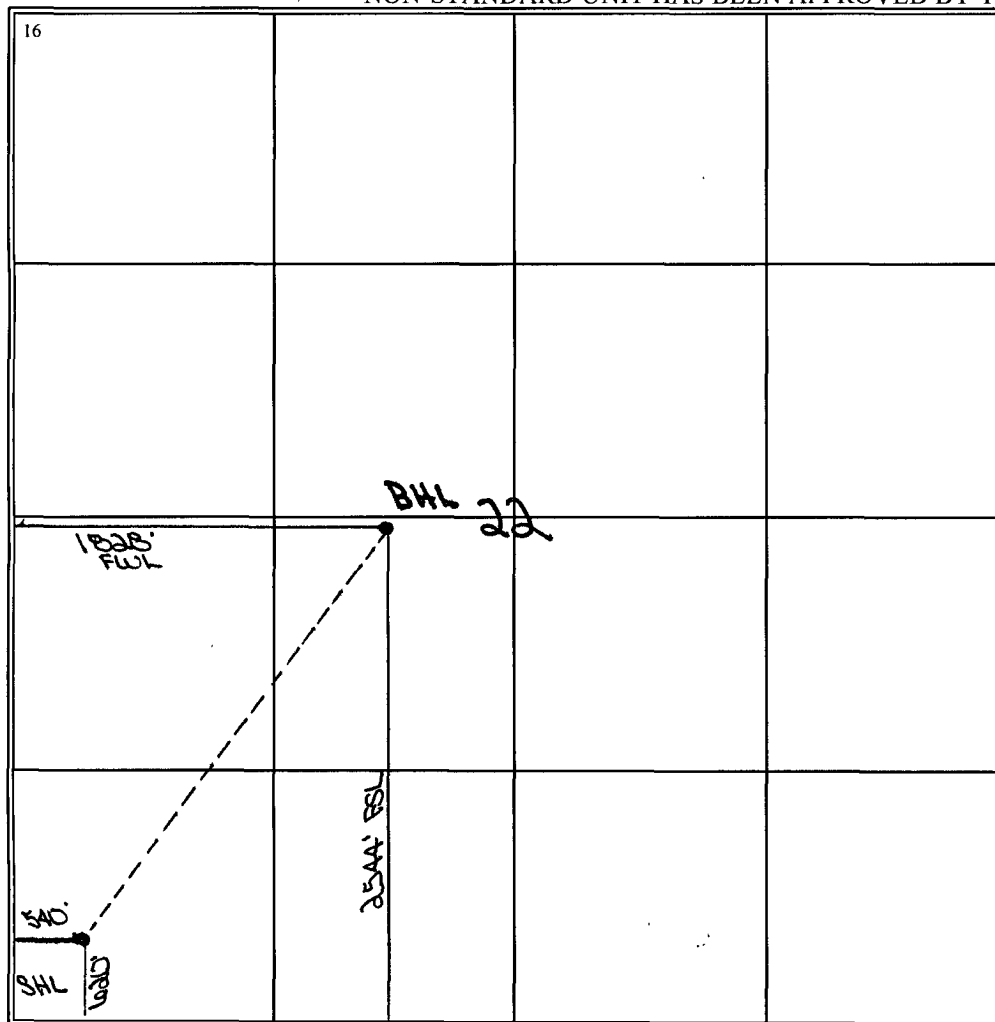
¹⁰ Surface Location

UL or lot no	Section	Township	Range	Lot. Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	22	32N	05W		620	South	540	West	Rio Arriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot. Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	22	32N	05W		2544	South	1828	West	Rio Arriba
¹² Dedicated Acres 319.26 W/2		¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.			

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 working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: Vicki Donaghey Date: 10/26/07 Printed Name: Vicki Donaghey
	¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Date of Survey: June 23, 1988 Signature and Seal of Professional Surveyer: Original survey conducted by Edgar L. Risenhaver Certificate Number: 5979