

30-025-30579

FOR

PENNZOIL COMPANY

132G0389011/132M0389017

STATE 21 #3

21-16-37

LEA COUNTY, NEW MEXICO

03/22/89

DOUG JEFFERS & G. MOODY

THE RADIUS OF CURVATURE

MULTISHOT SURVEY 4470'--8918'

SINGLE SHOT SURVEYS AND
STEERING TOOL READINGS 9512-9925
MULTI SHOT SURVEY 10301-11930

 * THIS SURVEY IS CORRECT TO THE BEST OF MY *
 * KNOWLEDGE AND IS SUPPORTED BY ACTUAL FIELD DATA. *
 *
 * *David Cook* *****
 *
 * COMPANY REPRESENTATIVE *
 *
 * *****

SCIENTIFIC DRILLING INTERNATIONAL
MIDLAND, TEXAS

JOB NUMBER: 132G0389011/132M0389017

DATE: 03/22/89

INRUN SURVEY

BY

THE RADIUS OF CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE BEARING
100.00	100.00	.43	.45	0-31	N 39-29 E	.35 N .29 E	.52	.45 AT N 39-29 E
200.00	200.00	1.16	.78	0-23	N 20-4 W	1.09 N .41 E	.46	1.16 AT N 20-49 E
300.00	299.99	1.25	.66	0-22	S 80-13 W	1.39 N .11 W	.48	1.39 AT N 4-31 W
400.00	399.99	.86	.61	0-20	S 61-37 W	1.19 N .69 W	.12	1.37 AT N 30-4 W
500.00	499.99	.26	.67	0-26	S 30-30 W	.73 N 1.16 W	.23	1.37 AT N 57-55 W
600.00	599.99	-.47	.74	0-25	S 3-49 W	.03 N 1.38 W	.20	1.38 AT N 88-41 W
700.00	699.98	-1.06	.66	0-20	S 11-12 E	.62 S 1.34 W	.13	1.48 AT S 65-6 W
800.00	799.98	-1.79	.75	0-32	S 36-28 W	1.34 S 1.50 W	.40	2.01 AT S 48-16 W
900.00	899.98	-2.64	1.02	0-38	S 70-22 W	1.93 S 2.30 W	.35	3.01 AT S 49-59 W
1000.00	999.97	-3.22	.97	0-29	S 79-2 W	2.19 S 3.24 W	.17	3.91 AT S 55-57 W
1100.00	1099.96	-3.79	1.22	0-55	S 87-45 W	2.33 S 4.46 W	.44	5.03 AT S 62-23 W
1200.00	1199.95	-4.19	1.86	1-13	N 70-4 W	2.05 S 6.28 W	.51	6.61 AT S 71-5 W
1300.00	1299.93	-3.85	1.92	0-59	N 46-40 W	1.05 S 7.91 W	.50	7.98 AT S 82-27 W
1400.00	1399.91	-3.19	1.80	1-5	N 47-32 W	.18 N 9.23 W	.10	9.23 AT N 88-53 W
1500.00	1499.89	-2.27	2.27	1-31	N 42-3 W	1.79 N 10.83 W	.45	10.97 AT N 80-37 W

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING		COORDINATES		D-LEG PER 100	STATION DISPLACEMENT	
					D	M	LATITUDE	DEPARTURE		DISTANCE	BEARING
1600.00	1599.85	- .79	2.57	1-26	N	25- 7	W	3.93 N	12.24 W	.44	12.86 AT N 72-13 W
1700.00	1699.82	.89	2.37	1-17	N	22- 6	W	6.10 N	13.19 W	.17	14.54 AT N 65-11 W
1800.00	1799.80	2.42	2.37	1-26	N	34-52	W	8.18 N	14.32 W	.34	16.50 AT N 60-16 W
1900.00	1899.76	4.01	2.50	1-27	N	23-21	W	10.36 N	15.54 W	.29	18.68 AT N 56-18 W
2000.00	1999.74	5.40	2.06	0-55	N	28-56	W	12.21 N	16.45 W	.55	20.49 AT N 53-24 W
2100.00	2099.73	6.49	1.79	1- 8	N	33-13	W	13.74 N	17.37 W	.23	22.15 AT N 51-39 W
2200.00	2199.72	7.18	1.51	0-36	N	49-35	W	14.88 N	18.37 W	.58	23.63 AT N 51- 0 W
2300.00	2299.71	7.61	.95	0-29	N	34-18	W	15.58 N	19.00 W	.18	24.57 AT N 50-39 W
2400.00	2399.71	7.85	.54	0- 8	N	50-28	W	15.97 N	19.36 W	.36	25.10 AT N 50-28 W
2500.00	2499.71	8.07	.51	0-27	N	35-27	W	16.35 N	19.70 W	.32	25.60 AT N 50-19 W
2600.00	2599.71	8.52	.55	0-11	N	10- 1	E	16.87 N	19.82 W	.35	26.03 AT N 49-36 W
2700.00	2699.71	8.92	.52	0-25	N	40-48	W	17.36 N	19.96 W	.33	26.45 AT N 48-50 W
2800.00	2799.70	9.57	.78	0-29	N	26- 1	E	18.09 N	20.05 W	.50	27.01 AT N 47-57 W
2900.00	2899.70	10.32	.75	0-23	N	16-44	E	18.79 N	19.78 W	.12	27.28 AT N 46-28 W
3000.00	2999.69	11.36	1.05	0-49	N	23-16	E	19.77 N	19.42 W	.44	27.71 AT N 44-29 W

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE	BEARING
3100.00	3099.68	12.81	1.53	0-56	N 53-16 E	20.96 N 18.49 W	.47	27.94	AT N 41-25 W
3200.00	3199.67	14.25	1.69	1- 0	N 52-28 E	21.98 N 17.14 W	.07	27.87	AT N 37-57 W
3300.00	3299.65	15.92	1.84	1- 7	N 39- 0 E	23.26 N 15.82 W	.27	28.13	AT N 34-13 W
3400.00	3399.63	17.87	2.08	1-16	N 44-49 E	24.81 N 14.43 W	.19	28.70	AT N 30-11 W
3500.00	3499.61	19.53	2.02	1- 3	N 66-34 E	25.94 N 12.77 W	.49	28.91	AT N 26-13 W
3600.00	3599.59	20.76	1.61	0-48	N 56-51 E	26.71 N 11.35 W	.29	29.02	AT N 23- 2 W
3700.00	3699.59	21.93	1.37	0-46	N 48-18 E	27.54 N 10.26 W	.12	29.39	AT N 20-26 W
3800.00	3799.58	23.20	1.43	0-52	N 48-18 E	28.49 N 9.20 W	.10	29.94	AT N 17-53 W
3900.00	3899.57	24.16	1.43	0-46	N 88- 0 E	29.01 N 7.90 W	.56	30.07	AT N 15-14 W
4000.00	3999.56	24.68	1.21	0-37	N 83- 6 E	29.10 N 6.70 W	.16	29.86	AT N 12-57 W
4100.00	4099.55	25.11	1.02	0-33	S 89-45 E	29.16 N 5.67 W	.10	29.71	AT N 11- 0 W
4200.00	4199.55	25.54	.98	0-34	N 79-48 E	29.25 N 4.69 W	.10	29.62	AT N 9- 7 W
4300.00	4299.54	26.11	.90	0-28	N 64-41 E	29.52 N 3.84 W	.17	29.77	AT N 7-24 W
4470.00	4469.54	26.68	1.06	0-15	S 88- 0 E	29.73 N 2.81 W	.16	29.87	AT N 5-24 W
4564.00	4563.54	26.78	.41	0-15	S 76- 0 E	29.68 N 2.40 W	.06	29.77	AT N 4-38 W

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE	BEARING
4658.00	4657.54	26.74	.61	0-30	S 55- 0 E	29.42 N	1.85 W	29.48 AT N	3-36 W
4752.00	4751.54	26.59	.61	0-15	S 53- 0 E	29.06 N	1.35 W	29.10 AT N	2-40 W
4846.00	4845.54	26.32	.41	0-15	S 00-00 E	28.71 N	1.17 W	28.73 AT N	2-21 W
4940.00	4939.54	25.95	.41	0-15	S 4- 0 E	28.30 N	1.16 W	28.32 AT N	2-21 W
5034.00	5033.53	25.60	.41	0-15	S 17- 0 E	27.90 N	1.09 W	27.92 AT N	2-14 W
5128.00	5127.53	25.14	.61	0-30	S 24- 0 E	27.32 N	.87 W	27.34 AT N	1-50 W
5222.00	5221.53	24.67	.82	0-30	S 43- 0 E	26.64 N	.42 W	26.64 AT N	0-54 W
5316.00	5315.52	24.23	.82	0-30	S 30- 0 E	25.98 N	.07 E	25.98 AT N	0- 9 E
5410.00	5409.52	23.61	1.03	0-45	S 32- 0 E	25.10 N	.60 E	25.11 AT N	1-22 E
5504.00	5503.51	22.64	1.44	1- 0	S 21- 0 E	23.82 N	1.24 E	23.85 AT N	2-58 E
5598.00	5597.50	21.61	1.44	0-45	S 24- 0 E	22.49 N	1.78 E	22.56 AT N	4-32 E
5692.00	5691.48	20.48	1.64	1-15	S 26- 0 E	21.01 N	2.48 E	21.15 AT N	6-4 E
5786.00	5785.46	19.05	2.05	1-15	S 23- 0 E	19.14 N	3.33 E	19.43 AT N	9-52 E
5880.00	5879.44	17.54	2.05	1-15	S 20- 0 E	17.23 N	4.08 E	17.71 AT N	13-19 E
5974.00	5973.42	16.14	1.84	1- 0	S 18- 0 E	15.49 N	4.68 E	16.18 AT N	16-49 E

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6068.00	6067.40	14.93	1.64	1- 0	S 25- 0 E	13.97 N	5.28 E	.13	14.93	AT N 20-43 E
6162.00	6161.39	13.68	1.64	1- 0	S 13- 0 E	12.42 N	5.81 E	.22	13.71	AT N 25- 5 E
6256.00	6255.38	12.32	1.64	1- 0	S 12- 0 E	10.82 N	6.17 E	.02	12.45	AT N 29-42 E
6350.00	6349.36	10.92	1.64	1- 0	S 8- 0 E	9.20 N	6.45 E	.07	11.24	AT N 35- 3 E
6444.00	6443.34	9.36	1.84	1-15	S 14- 0 E	7.39 N	6.81 E	.29	10.05	AT N 42-38 E
6538.00	6537.32	7.92	1.84	1- 0	S 20- 0 E	5.63 N	7.34 E	.29	9.25	AT N 52-32 E
6632.00	6631.31	6.76	1.64	1- 0	S 28- 0 E	4.13 N	8.01 E	.15	9.01	AT N 62-43 E
6726.00	6725.29	5.60	1.84	1-15	S 31- 0 E	2.53 N	8.92 E	.27	9.27	AT N 74-11 E
6820.00	6819.26	3.98	2.26	1-30	S 14- 0 E	.45 N	9.78 E	.51	9.79	AT N 87-23 E
6914.00	6913.24	2.09	2.26	1-15	S 10- 0 E	1.76 S	10.25 E	.28	10.40	AT S 80-15 E
7008.00	7007.21	.09	2.26	1-30	S 3- 0 E	4.00 S	10.50 E	.32	11.24	AT S 69- 9 E
7102.00	7101.18	-1.95	2.26	1-15	S 5- 0 E	6.25 S	10.66 E	.27	12.36	AT S 59-36 E
7196.00	7195.16	-3.63	1.84	1- 0	S 00-00 E	8.09 S	10.74 E	.29	13.45	AT S 53- 0 E
7290.00	7289.15	-5.18	1.64	1- 0	S 4- 0 W	9.73 S	10.68 E	.07	14.45	AT S 47-40 E
7384.00	7383.13	-7.15	2.05	1-30	S 6- 0 W	11.78 S	10.51 E	.53	15.78	AT S 41-44 E

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE	BEARING
7478.00	7477.09	-9.54	2.46	1-30	S 10- 0 W	14.21 S	10.16 E	17.47	AT S 35-34 E
7572.00	7571.06	-11.93	2.46	1-30	S 4- 0 W	16.65 S	9.86 E	19.36	AT S 30-38 E
7666.00	7665.03	-14.30	2.46	1-30	S 8- 0 W	19.10 S	9.61 E	21.38	AT S 26-42 E
7760.00	7758.99	-16.88	2.67	1-45	S 6- 0 W	21.75 S	9.28 E	23.65	AT S 23- 7 E
7854.00	7852.95	-19.67	2.87	1-45	S 9- 0 W	24.59 S	8.91 E	26.16	AT S 19-55 E
7948.00	7946.91	-22.22	2.67	1-30	S 00-00 E	27.25 S	8.70 E	28.60	AT S 17-42 E
8042.00	8040.87	-24.63	2.67	1-45	S 8- 0 E	29.90 S	8.88 E	31.20	AT S 16-33 E
8136.00	8134.83	-27.05	2.87	1-45	S 14- 0 E	32.72 S	9.43 E	34.05	AT S 16- 5 E
8230.00	8228.78	-29.69	3.07	2- 0	S 5- 0 E	35.75 S	9.94 E	37.11	AT S 15-32 E
8324.00	8322.71	-32.88	3.48	2-15	S 00-00 E	39.23 S	10.09 E	40.51	AT S 14-25 E
8418.00	8416.65	-36.16	3.48	2- 0	S 3- 0 W	42.71 S	10.00 E	43.87	AT S 13-11 E
8512.00	8510.58	-39.49	3.48	2-15	S 6- 0 W	46.19 S	9.73 E	47.20	AT S 11-57 E
8606.00	8604.51	-43.07	3.69	2-15	S 8- 0 W	49.85 S	9.28 E	50.71	AT S 10-32 E
8700.00	8698.45	-46.53	3.48	2- 0	S 23- 0 W	53.20 S	8.35 E	53.85	AT S 8-55 E
8794.00	8792.37	-50.21	3.69	2-30	S 27- 0 W	56.54 S	6.79 E	56.95	AT S 6-51 E

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING		COORDINATES		D-LEG PER 100	STATION DISPLACEMENT	
					D	M	LATITUDE	DEPARTURE		DISTANCE	BEARING
8825.00	8823.34	-51.56	1.35	2-30	S	25-	57.76	S	6.20	E	58.09 AT S 6-7 E
8918.00	8916.26	-55.58	4.06	2-30	S	32-	61.32	S	4.26	E	61.47 AT S 3-58 E
9512.00	9509.75	-79.31	24.62	2-15	S	41-	81.09	S	10.37	W	81.75 AT S 7-17 W
9627.00	9624.71	-81.93	2.76	0-30	S	38-	83.22	S	12.12	W	84.10 AT S 8-17 W
9691.00	9688.69	-81.85	1.40	2-	0	N 14-	82.78	S	13.02	W	83.80 AT S 8-56 W
9722.00	9719.66	-80.51	1.35	3-	0	N 16-	81.47	S	12.67	W	82.45 AT S 8-51 W
9925.00	9922.22	-67.34	13.28	4-30	N	12-	68.59	S	9.46	W	69.24 AT S 7-51 W
10301.00	10297.19	-39.81	27.86	4-	0	N 13-	41.39	S	3.43	W	41.53 AT S 4-44 W
10395.00	10390.96	-33.33	6.56	4-	0	N 12-	34.99	S	2.01	W	35.05 AT S 3-18 W
10489.00	10484.73	-26.83	6.56	4-	0	N 15-	28.61	S	.48	W	28.62 AT S 0-58 W
10583.00	10578.47	-19.94	6.97	4-30	N	11-	21.83	S	1.08	E	21.86 AT S 2-51 E
10677.00	10672.20	-12.86	7.17	4-15	N	14-	14.83	S	2.64	E	15.06 AT S 10-51 E
10771.00	10765.93	-5.76	7.17	4-30	N	12-	7.84	S	4.25	E	8.92 AT S 28-27 E
10865.00	10859.64	1.51	7.38	4-30	N	11-	.62	S	5.72	E	5.75 AT S 83-52 E
10959.00	10953.36	8.47	7.17	4-15	N	4-	6.49	N	6.65	E	9.29 AT N 45-43 E

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE BEARING
11053.00	11047.12	14.88	6.76	4- 0	N 2- 0 E	13.24 N	7.01 E	14.98 AT N 27-53 E
11147.00	11140.92	20.70	6.15	3-30	N 3- 0 E	19.38 N	7.28 E	20.70 AT N 20-35 E
11241.00	11234.77	25.72	5.33	3- 0	N 00-00 E	24.71 N	7.42 E	25.80 AT N 16-42 E
11272.00	11265.72	27.23	1.62	3- 0	N 1- 0 E	26.33 N	7.43 E	27.36 AT N 15-45 E
11303.00	11296.69	28.65	1.49	2-30	N 5- 0 E	27.82 N	7.51 E	28.81 AT N 15- 6 E
11397.00	11390.62	32.14	3.69	2- 0	N 00-00 E	31.50 N	7.67 E	32.42 AT N 13-41 E
11491.00	11484.57	34.92	2.87	1-30	N 16- 0 E	34.34 N	8.07 E	35.27 AT N 13-13 E
11585.00	11578.53	37.59	2.67	1-45	N 24- 0 E	36.84 N	8.98 E	37.92 AT N 13-42 E
11679.00	11672.47	40.94	3.48	2-30	N 47- 0 E	39.66 N	10.99 E	41.15 AT N 15-29 E
11773.00	11766.39	44.48	3.90	2-15	N 45- 0 E	42.36 N	13.79 E	44.55 AT N 18- 2 E
11867.00	11860.32	47.85	3.69	2-15	N 46- 0 E	44.95 N	16.42 E	47.86 AT N 20- 4 E

SCIENTIFIC DRILLING INTERNATIONAL
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JOB NUMBER: 132G0389011/132M0389017

DATE: 03/22/89

INRUN SURVEY

BY

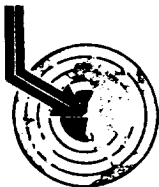
THE RADIUS OF CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE	STATION DISPLACEMENT BEARING
11930.00	11923.27	50.10	2.47	2-15	N 46- 0 E	46.67 N	18.20 E	50.09	AT N 21-18 E

THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF

11930.00 FEET EQUALS 50.09 FEET AT N 21-18 E.

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE	D-LEG PER 100	STATION DISPLACEMENT DISTANCE	STATION DISPLACEMENT BEARING
11429.00	11422.60	33.47		1-49	N 06-00E	32.57 N	7.73 E	33.47	AT N13-21E
11455.00	11448.59	34.26		1-41	N 10-00E	33.36 N	7.84 E	34.27	AT N13-13E



SCIENTIFIC DRILLING INTERNATIONAL

2024 Trade Dr., Midland, TX 79703
P.O. Box 9699 915/563-1339

SURVEY CERTIFICATION

COMPANY Pennzoil Company WELL NAME & NO. State "21" #3
DATE of CERTIFICATION 4/18/89 LOCATION Lea County, New Mexico
TYPE of SURVEY Gyroscopic Survey FROM 00' TO 4470'
JOB NUMBER 132G0389011 WORK ORDER NUMBER _____

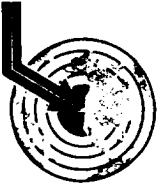
THE ABOVE SURVEY WAS PERFORMED BY ME ON March 22, 1989
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED
STANDARDS AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

Douglas Jelfe
SURVEYOR

I HAVE EXAMINED THE ABOVE SURVEY AND FOUND THE DATA AND RESULTS
ACCEPTABLE ACCORDING TO CURRENT SCIENTIFIC DRILLING INTERNATIONAL
STANDARDS.

SURVEY CONFIRMATION BY: _____

Geord M. Jelfe
SCIENTIFIC DRILLING INTERNATIONAL
REPRESENTATIVE



SCIENTIFIC DRILLING INTERNATIONAL

2024 Trade Dr., Midland, TX 79703
P.O. Box 9699 915/563-1339

SURVEY CERTIFICATION

COMPANY Pennzoil Company WELL NAME & NO. State "21" #3
DATE of CERTIFICATION 4/18/89 LOCATION Lea County, New Mexico
TYPE of SURVEY Multishot & single shot FROM 4470' TO 11930'
JOB NUMBER 132M0389017 WORK ORDER NUMBER _____

THE ABOVE SURVEY WAS PERFORMED BY ME ON 4/01, 4/05, & 4/13 19 89
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED
STANDARDS AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

Good Body
SURVEYOR

I HAVE EXAMINED THE ABOVE SURVEY AND FOUND THE DATA AND RESULTS
ACCEPTABLE ACCORDING TO CURRENT SCIENTIFIC DRILLING INTERNATIONAL
STANDARDS.

SURVEY CONFIRMATION BY: _____

Wayne J. Jell
SCIENTIFIC DRILLING INTERNATIONAL
REPRESENTATIVE