Ferrellgas, Inc. (Buckeye Gas Products)
NW/NW Sec 8-T18N-R24E, Apache Cty 671

COUNTY Apache AREA Adamana LEASE NO. Fee

WELL NAME Buckeye Gas Products ~~Williams Energy Co. Storage~~ Well No. 10 Fee

LOCATION NW/NW SEC 8 TWP 18N RANGE 24E FOOTAGE 600' FWL & 300' FNL

ELEV 5346.1 GR 5361 KB SPUD DATE 10-7-76 STATUS COMP. DATE 10-23-76 TOTAL DEPTH 1156

CONTRACTOR Signal Oilfield Services, Inc

CASING SIZE	DEPTH	CEMENT	LINER SIZE & DEPTH
13 3/4	167	150 sks	
9 5/8	942	370 sks	
7"	984	—	Hung
4 1/2	1132	—	Hung

DRILLED BY ROTARY —
DRILLED BY CABLE TOOL
PRODUCTIVE RESERVOIR
INITIAL PRODUCTION NA

FORMATION TOPS	DEPTHS	SOURCE L.L.	SOURCE E.L.	REMARKS
Surface	0	39		Soil
	39	65		Red clay
	65	149		Clay & shells
	149	375		Shale with sand stringers
Coconino	375	798		Sand
	798	828		Shaley sand
	828	851		Sandy shale
	851	863		Shaley anhydrite
	863	882		Anhydrite
	882	891		Shale
Top Salt	891	1134		Salt with shale stringers
	1134	1150		Shale

ELECTRIC LOGS	PERFORATED INTERVALS	PROD. INTERVALS
Sonic-GR		

SAMPLE LOG —
SAMPLE DESCRP. —
SAMPLE NO. —
CORE ANALYSIS NONE
DSTs NONE

REMARKS Samples Not Required

APP. TO PLUG
PLUGGING REP.
COMP. REPORT ✓

WATER WELL ACCEPTED BY

BOND CO. ~~The Aetna Casualty & Surety~~ ~~Federal Insurance Co.~~ St. Paul Fire & Marine Ins. Co. Filed in P/N 778 BOND NO. ~~8047-02-65~~ S40-32083
DATE 1-15-80

BOND AMT. $ 25,000. ✓ CANCELLED ORGANIZATION REPORT 11-21-72

FILING RECEIPT 715 LOC. PLAT X WELL BOOK X PLAT BOOK X

API NO. 02-001-20223 DATE ISSUED 10-22-76 DEDICATION NA

PERMIT NUMBER 671

(over)

RECEIVED
JUN 22 1982
O & G CONS. COMM.

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

New Well [X] Work-Over [ ] Deepen [ ] Plug Back [ ] Same Reservoir [ ] Different Reservoir [ ] Oil [ ] Gas [ ] Dry [ ]

DESCRIPTION OF WELL AND LEASE

Operator: BUCKEYE GAS PRODUCTS CO.	Address: P.O. BOX 3478 TULSA, OK. 74101
Federal, State or Indian Lease Number or name of lessor if free lease: BUCKEYE GAS PRODUCTS CO.	Well Number: C10 / Field & Reservoir: ADAMANA, AZ.
Location: 336.00 FSL - 600.00 FWL	County: APACHE
Sec. TWP-Range or Block & Survey: SEC. 8, T-18N R-24E G. & S.R. B. & M.	

Date spudded	Date total depth reached	Date completed, ready to produce	Elevation (DF, RKB, RT or Gr.)	Elevation of casing hd. flange
10-7-76	10-13-76	10-23-76	5349 feet	5354 feet

Total depth	P.B.T.D.	Single, dual or triple completion?	If this is a dual or triple completion, furnish separate report for each completion.
1150	-	SALT SOLUTION	

Producing interval (s) for this completion	Rotary tools used (interval)	Cable tools used (interval)
942 TO 1131	G.L. TO T.D.	-

Was this well directionally drilled?	Was directional survey made?	Was copy of directional survey filed?	Date filed
NO	NO	NO	-

Type of electrical or other logs run (check logs filed with the commission): COMPENSATED SONIC LOG WITH GAMMA RAY CALIPER - CEMENT BOND — Date filed:

CASING RECORD

Casing (report all strings set in well — conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amt. pulled
SURFACE	17½	13 3/8	40 lbs.	167	150	0
PROTECTION	12¼	9 5/8	32.3	942	370	0
INTERMEDIATE	12¼	7	20	983	HUNG-UNCEMENTED	
SOLUTION	12¼	4½	10.79	1131	HUNG-UNCEMENTED	

TUBING RECORD

Size	Depth set	Packer set at
in.	ft.	ft.

LINER RECORD

Size	Top	Bottom	Sacks cement	Screen (ft)
in.	ft.	ft.		

PERFORATION RECORD

Number per ft.	Size & type	Depth Interval

ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD

Am't. & kind of material used	Depth Interval

INITIAL PRODUCTION

Date of first production: | Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:)

Date of test	Hrs. tested	Choke size	Oil prod. during test	Gas prod. during test	Water prod. during test	Oil gravity
			bbls.	MCF	bbls.	°API (Corr)

Tubing pressure	Casing pressure	Cal'ted rate of Production per 24 hrs.	Oil	Gas	Water	Gas—oil ratio
			bbls.	MCF	bbls.	

Disposition of gas (state whether vented, used for fuel or sold):

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Mgr. of the Buckeye (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

6-28-82
Date

Signature

Permit No. 671

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Well Completion or Recompletion Report and Well Log
File One Copy
Form No. 4

DETAIL OF FORMATIONS PENETRATED

FORMATION	TOP	BOTTOM	DESCRIPTION*
SURFACE SOIL	0	20	SAND
	20	53	RED CLAY
	53	134	CLAY AND SAND SHELLS
	134	178	SAND SHELLS AND CLAY
	178	193	SAND
	193	221	SANDY SHALE
	221	276	SHALEY SAND
	276	334	SAND SHALE
COCONINO	334	791	COCONINO
	791	803	SHALE
	803	809	ANHYDRITE
	809	822	SHALE
	822	843	ANHYDRITE
	843	855	SHALE
	855	869	ANHYDRITE
	869	887	SAND
	887	895	SHALE
	895	902	POTASH
	902	1109	SANDY SHALE
	1109	1128	SALT
	1128	1150	SHALE

* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS:

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the State of Arizona Oil & Gas Conservation Commission not later than thirty days after project completion.

Form No. 4

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

New Well [X] Work-Over [ ] Deepen [ ] Plug Back [ ] Same Reservoir [ ] Different Reservoir [ ] Oil [ ] Gas [ ] Dry [ ]

DESCRIPTION OF WELL AND LEASE

Operator: Williams Energy Company	Address: P. O. Box 3478 Tulsa OK 74101
Federal, State or Indian Lease Number or name of lessor if fee lease: Williams Energy Company	Well Number: 10 / Field & Reservoir: Adamana
Location: 600' FWL & 300' FNL	County: Apache
Sec. TWP-Range or Block & Survey: Section 8, T 18N, R 24E	

Date spudded	Date total depth reached	Date completed, ready to produce	Elevation (DF, RKB, RT or Gr.) feet	Elevation of casing hd. flange feet
10-7-76	10-13-76	10-23-76	5349'	KB 5361'

Total depth	P.B.T.D.	Single, dual or triple completion?	If this is a dual or triple completion, furnish separate report for each completion.
1150		LPG Storage	

Producing interval (s) for this completion	Rotary tools used (interval)	Cable tools used (interval)
	0 - 1150'	No

Was this well directionally drilled?	Was directional survey made?	Was copy of directional survey filed?	Date filed
No	No	---	---

Type of electrical or other logs run (check logs filed with the commission)	Date filed
Sonic-Gamma Ray	

CASING RECORD

Casing (report all strings set in well—conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amt. pulled
Surface	17½"	13-3/8"	48.00	167' KB	150	0
Protection	12¼"	9-5/8"	32.30	942' KB	370	0
Solution		7"	20.00	984' KB	Hung	0
Solution		4½"	11.60	1132' KB	Hung	0

TUBING RECORD			LINER RECORD				
Size in.	Depth set ft.	Packer set at ft.	Size in.	Top ft.	Bottom ft.	Sacks cement	Screen (ft.)

PERFORATION RECORD			ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD	
Number per ft.	Size & type	Depth Interval	Am't. & kind of material used	Depth Interval

INITIAL PRODUCTION

Date of first production	Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:)

Date of test	Hrs. tested	Choke size	Oil prod. during test bbls.	Gas prod. during test MCF	Water prod. during test bbls.	Oil gravity °API (Corr)

Tubing pressure	Casing pressure	Cal'ted rate of Production per 24 hrs.	Oil bbls.	Gas MCF	Water bbls.	Gas—oil ratio

Disposition of gas (state whether vented, used for fuel or sold):

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Manager of Storage Terminals of the Williams Energy Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date December 7, 1976

Signature Dan J. Dougherty
Dan. J. Dougherty

RECEIVED
DEC 10 1976
D & G CONS. COMM.

Permit No. 671

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Well Completion or Recompletion Report and Well Log
File One Copy
Form No. 4

(Complete Reverse Side)

DETAIL OF FORMATIONS PENETRATED

Formation	Top	Bottom	Description*
Surface	0	39	Soil
	39	65	Red clay
	65	149	Clay & shells
	149	375	Shale with sand stringers
Coconino	375	796	Sand
	796	828	Shaley sand
	828	851	Sandy shale
	851	863	Shaley anhydrite
	863	880	Anhydrite
	880	891	Shale
Top Salt	898	1134	Salt with shale stringers
	1134	1150	Shale
TD		1150	

RECEIVED
DEC 10 1976
O & G CONS. COMM.

671

* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS.

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the State of Arizona Oil & Gas Conservation Commission not later than thirty days after project completion.

Form No. 4

DOWELL SONAR CALIPER SURVEY

TREATMENT NO: 11-42-0273 JOB NO: 323

WELL DATA

ZERO @ 12 FT AGL

T.D. DOWELL 1054 FT OPERATOR 1054 FT

CASING SIZE 9-5/8 IN DEPTH 942 FT

LINER - FT

INTERMEDIATE 7 IN DEPTH OUT FT

TUBING 4-1/2 IN DEPTH OUT FT

WILLIAMS ENERGY COMPANY

WELL NO: 10

ADAMANA STORAGE TERMINAL

APRIL 13,1979

PRODUCTION: STORAGE

GENERAL COMMENTS

MAILING ADDRESS

STREET/BOX: P.O. BOX 849

CITY: HOLBROOK STATE: ARIZONA

ZIP: 86025

ATTN: MR. ARMANDO PADILLA

MR. ARMANDO PADILLA
COMPANY REPRESENTATIVE

HL VAN METRE
DOWELL ENGINEER

DOWELL SONAR CALIPER SURVEY

WILLIAMS ENERGY COMPANY ADAMANA STORAGE TERMINAL APRIL 13,1979

WELL NO. 10 JOB NO. 323

RADII IN FT

DEPTH	N	S	E	W	NE	SW	SE	NW
942	0.4	0.6	0.5	0.5	0.5	0.6	0.6	0.5
960	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5
970	0.8	0.8	1.0	0.8	0.8	0.7	1.0	0.9
980	0.9	1.0	1.0	1.0	0.8	0.9	1.2	0.9
981	0.9	1.0	1.1	1.0	0.8	0.8	1.2	0.9
982	35.0	37.0	43.0	29.0	43.0	31.0	36.0	38.0
983	6.0	35.0	6.0	7.0	6.0	12.0	35.0	5.0
984	2.0	3.0	2.7	2.9	2.4	3.8	3.0	2.3
985	1.6	2.2	2.2	1.8	1.8	2.3	2.3	1.8
986	0.7	0.9	1.2	0.5	0.9	0.6	1.0	0.5
987	6.3	5.5	5.3	6.0	5.4	5.5	5.3	5.8
988	73.0	85.0	79.0	70.0	73.0	74.0	85.0	73.0
990	72.0	80.0	81.0	68.0	75.0	72.0	85.0	69.0
995	71.0	83.0	81.0	67.0	74.0	72.0	84.0	71.0
1000	72.0	78.0	79.0	67.0	74.0	71.0	80.0	67.0
1005	70.0	75.0	75.0	67.0	76.0	61.0	76.0	67.0
1010	68.0	75.0	78.0	63.0	71.0	69.0	77.0	66.0
1015	73.0	68.0	70.0	68.0	75.0	70.0	67.0	69.0

RADII IN FT

DEPTH	N	S	E	W	NE	SW	SE	NW
1020	69.0	64.0	63.0	67.0	67.0	64.0	63.0	68.0
1025	56.0	52.0	55.0	59.0	57.0	56.0	54.0	57.0
1030	50.0	48.0	49.0	51.0	53.0	49.0	53.0	49.0
1035	44.0	40.0	43.0	42.0	46.0	42.0	45.0	42.0
1040	35.0	34.0	38.0	35.0	40.0	33.0	39.0	37.0
1045	30.0	23.0	30.0	30.0	31.0	27.0	29.0	30.0
1048	23.7	17.5	26.3	23.9	25.5	19.4	18.2	23.5
1050	6.0	6.3	5.7	6.2	6.1	6.2	5.6	6.4
1051	5.7	5.4	4.3	5.0	4.9	5.0	5.0	5.2
1052	4.2	4.6	3.0	4.0	3.8	4.5	4.4	3.9
1053	3.5	3.6	1.6	3.3	2.5	3.5	3.5	3.2
1054	2.4	2.8	0.5	2.2	0.5	2.5	0.4	2.3

DOWELL SONAR CALIPER SURVEY

WILLIAMS ENERGY COMPANY ADAMANA STORAGE TERMINAL APRIL 13,1979

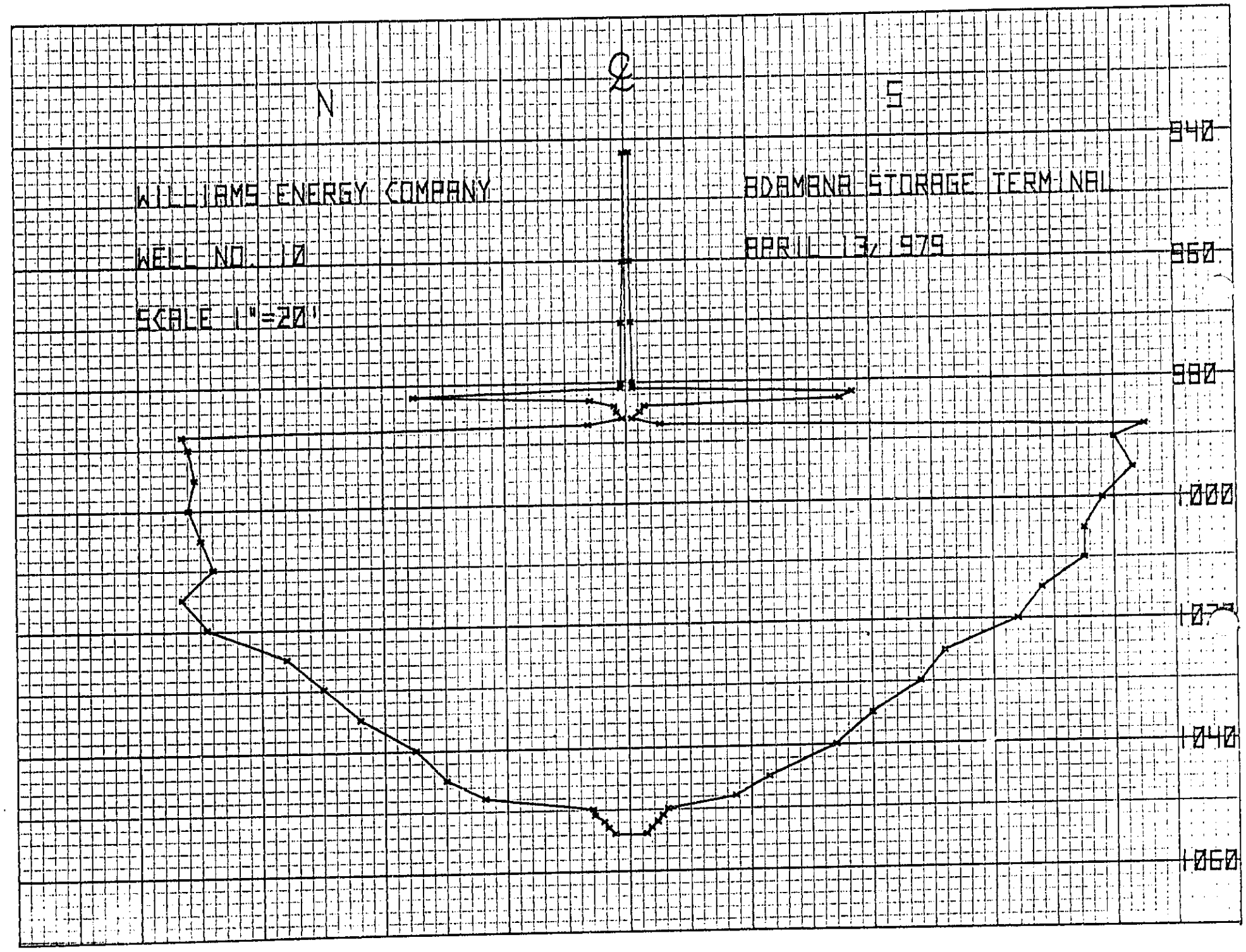
WELL NO: 10 JOB NO: 323

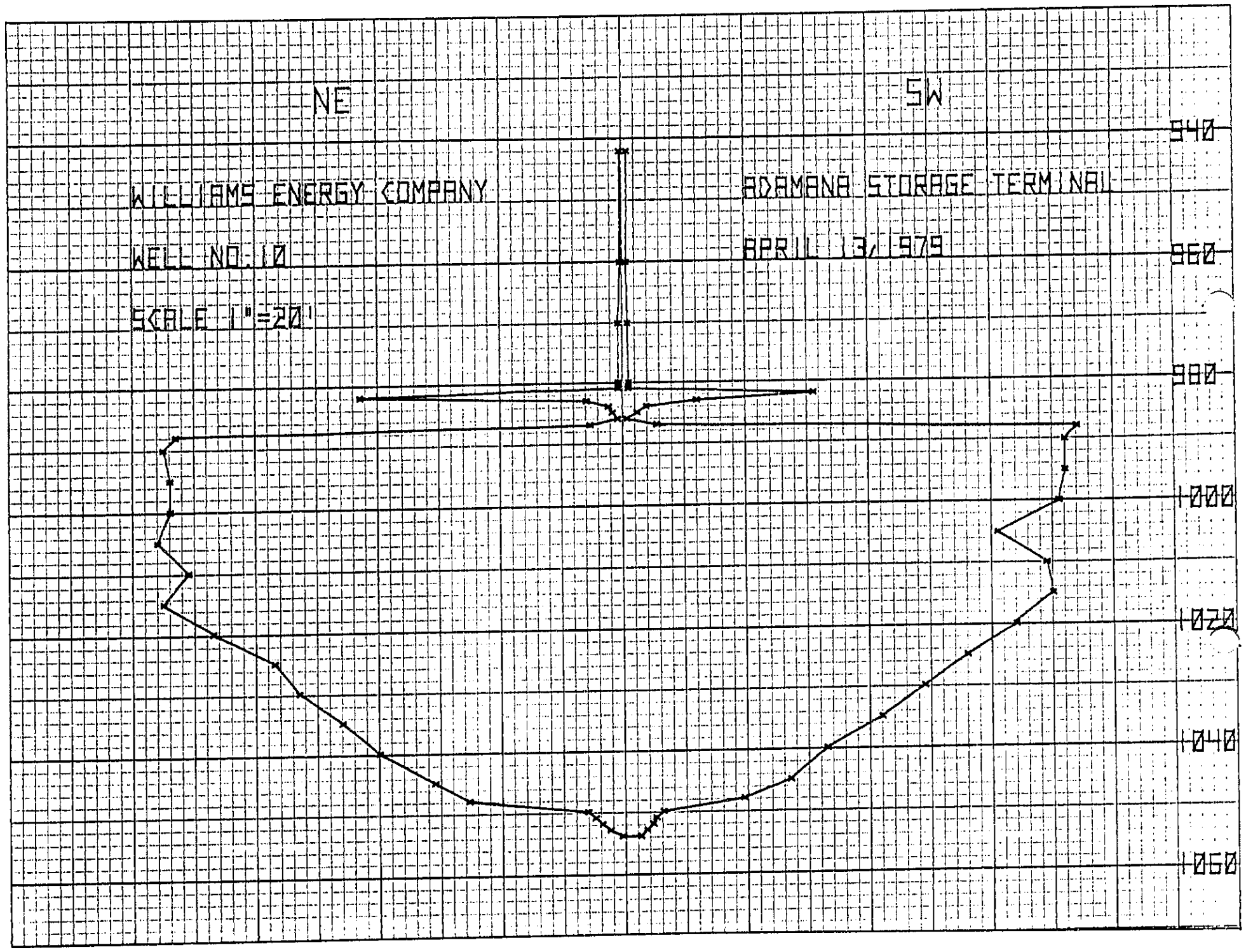
VOLUME CALCULATIONS

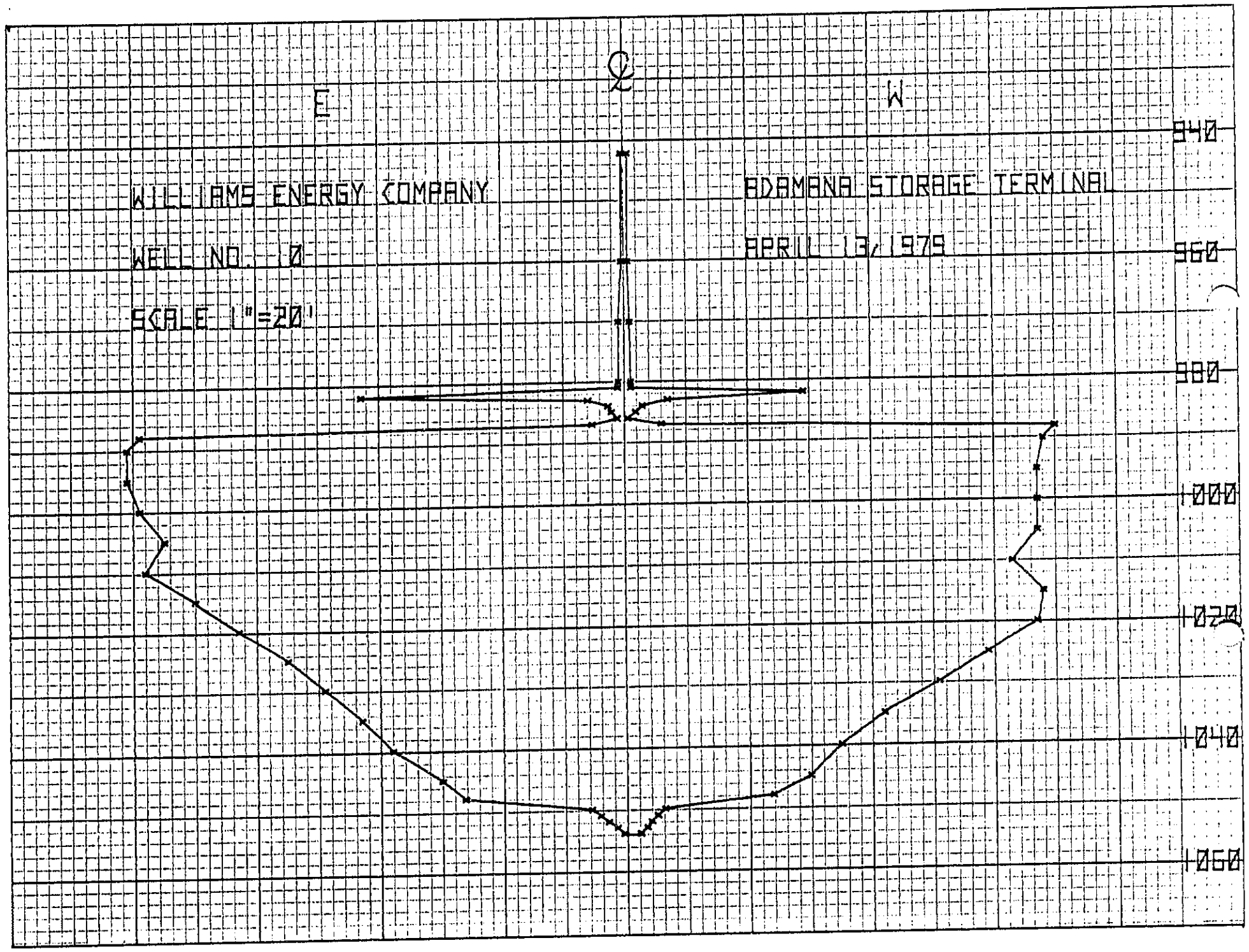
DEPTH	INCR CU FT	TOTAL CU FT	INCR BBLS	BBLS
942	0	0	0	0
960	15	15	3	3
970	15	30	3	5
980	26	57	5	10
981	3	60	1	11
982	1406	1466	250	261
983	2302	3768	410	671
984	352	4120	63	734
985	18	4138	3	737
986	7	4145	1	738
987	39	4184	7	745
988	6578	10762	1172	1917
990	36265	47027	6458	8375
995	90032	137059	16034	24409
1000	87010	224068	15496	39904
1005	81727	305795	14555	54459
1010	79663	385458	14187	68646
1015	78111	463569	13911	82557

VOLUME CALCULATIONS

DEPTH	INCR CU FT	TOTAL CU FT	INCR BBLS	BBLS
1020	72060	535628	12833	95390
1025	58055	593683	10339	105729
1030	44191	637874	7870	113599
1035	34252	672125	6100	119699
1040	24901	697026	4435	124134
1045	16788	713813	2990	127123
1048	6285	720097	1119	128242
1050	1451	721547	258	128501
1051	97	721644	17	128518
1052	66	721710	12	128530
1053	43	721752	8	128538
1054	21	721772	4	128541


N
℄
S
940
960
980
1000
1020
1040
1060
WILLIAMS ENERGY COMPANY
WELL NO. 10
SCALE 1"=20'
BDAMBNA STORAGE TERMINAL
APRIL 13, 1979


NE
SW
WILLIAMS ENERGY COMPANY
ADAMANA STORAGE TERMINAL
WELL NO. 10
APRIL 13, 1979
SCALE 1"=20'
940
960
980
1000
1020
1040
1060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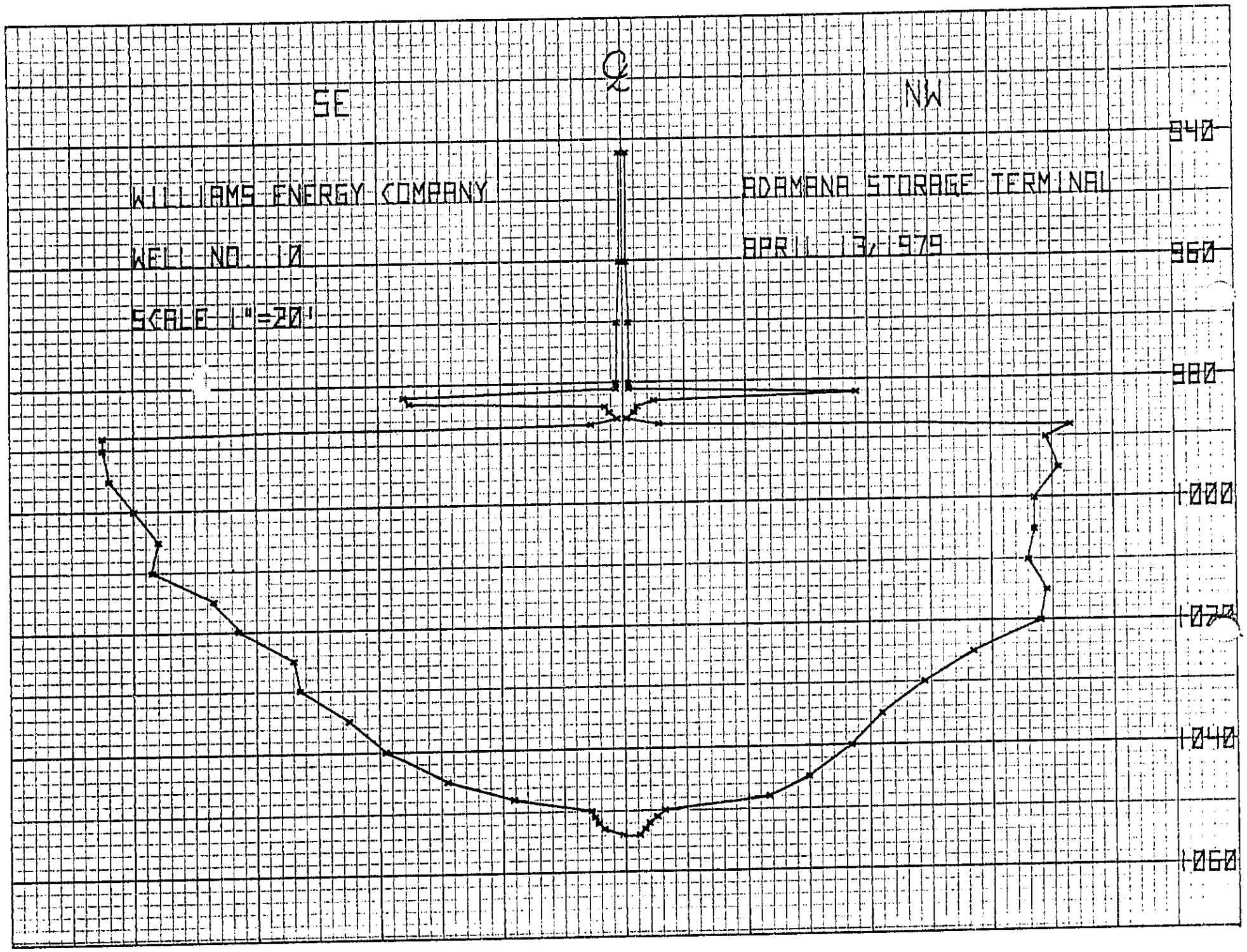
WILLIAMS ENERGY COMPANY
ADAMANA STORAGE TERMINAL
WELL NO. 10
APRIL 13, 1979
SCALE 1"=20'
940
960
980
1000
1020
1040
1060


SE
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NW
WILLIAMS ENERGY COMPANY
ADAMANA STORAGE TERMINAL
WELL NO. 10
APRIL 13, 1979
SCALE 1"=20'
940
960
980
1000
1020
1040
1060

APPLICATION FOR PERMIT TO DRILL OR RE-ENTER

APPLICATION TO DRILL ☒ RE-ENTER OLD WELL ☐

Williams Energy Company
NAME OF COMPANY OR OPERATOR

P. O. Box 3478 — Address
Tulsa — City
Oklahoma 74101 — State

Signal Oilfield Service, Inc.
Drilling Contractor

1200 Security Life Building, Denver, Colorado 80202
Address

DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor: Williams Energy Company	Well number: 10	Elevation (ground): 5346.17'
Nearest distance from proposed location to property or lease line: 350 feet	Distance from proposed location to nearest drilling, completed or applied—for well on the same lease: 400 feet	
Number of acres in lease: 114	Number of wells on lease, including this well, completed in or drilling to this reservoir: 11	
If lease, purchased with one or more wells drilled, from whom purchased: Name N/A	Address	
Well location (give footage from section lines): 600' E of W bndry & 300' S of NW corner	Section—township—range or block and survey: Sec.8,T18N,R24E,G&SRB&M	Dedication (Comply with Rule 105): N A
Field and reservoir (if wildcat, so state): Unnamed	County:	
Distance, in miles, and direction from nearest town or post office: 16 miles west to Holbrook, ARizona		
Proposed depth: 1100	Rotary or cable tools: Rotary	Approx. date work will start: October 8, 1975
Bond Status / Amount	Organization Report: On file Yes Or attached	Filing Fee of $25.00: Attached Yes

Remarks: Request that commission grant an exception to Rule 105 describing minimum distances since these wells are a part of a liquified petroleum gas storage cavern complex in a salt strata.

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Manager of Storage Terminals of the Williams Energy (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Dan J Dougherty
Signature Dan J. Dougherty

10-15-1976
Date

Permit Number: 671
Approval Date: 10-22-76
Approved By: W. E. Allen

Notice: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Application to Drill or Re-enter
File Two Copies

Form No. 3

(Complete Reverse Side)

1. Operator shall outline the dedicated acreage for *both* oil and gas wells on the plat.

2. A registered professional engineer or land surveyor registered in the State of Arizona or approved by the Commission shall show on the plat the location of the well and certify this information in the space provided.

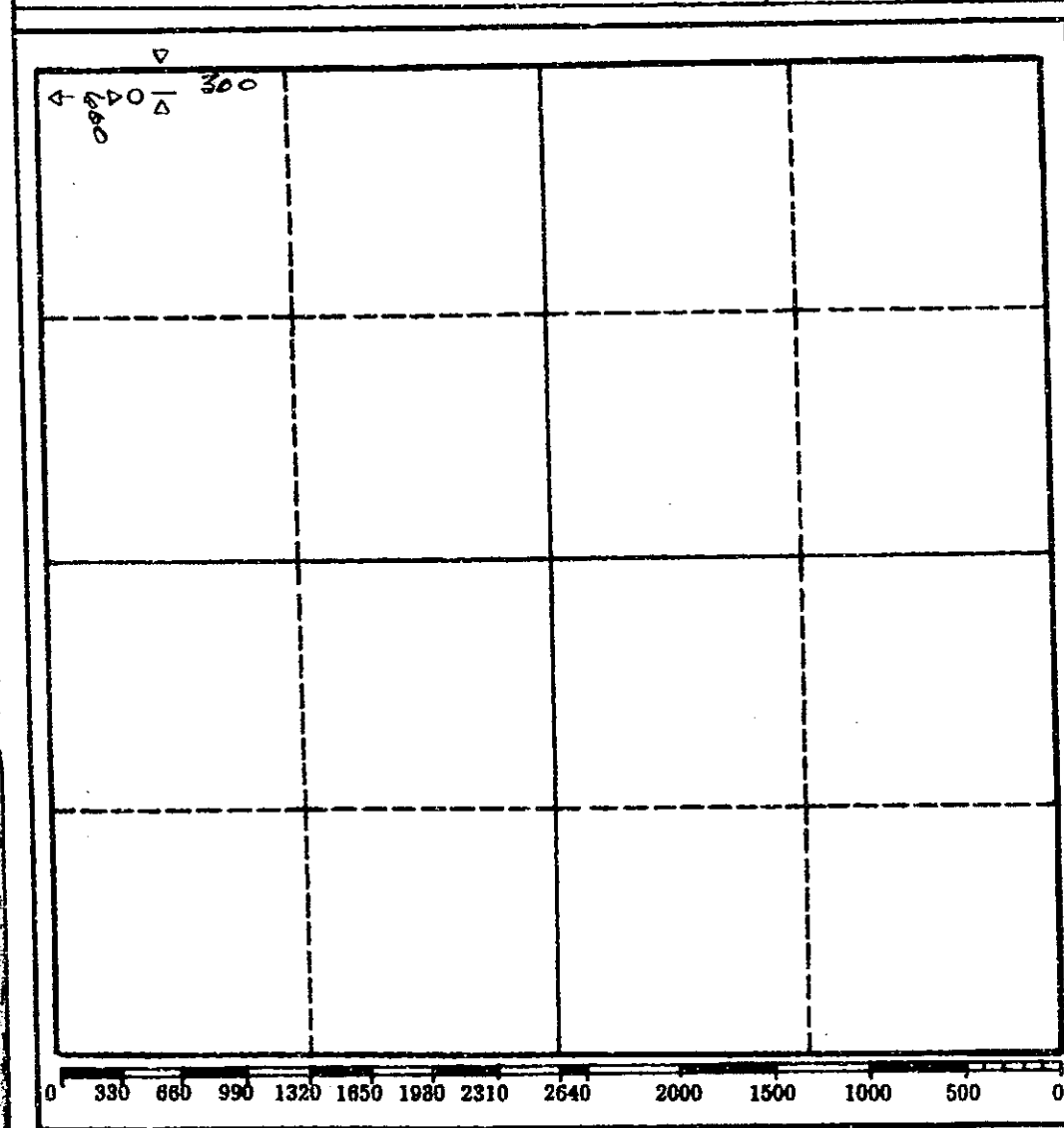
3. All distances shown on the plat must be from the outer boundaries of the Section.

4. Is the Operator the only owner in the dedicated acreage outlined on the plat below? YES_____ NO_____.

5. If the answer to question four is "no," have the interests of all the owners been consolidated by communitization agreement or otherwise? YES_____ NO_____. If answer is "yes," Type of Consolidation_____

6. If the answer to question four is "no," list all the owners and their respective interests below:

Owner	Land Description



CERTIFICATION

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on the 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 knowledge and belief.

Date Surveyed

Registered Professional Engineer and/or Land Surveyor

Certificate No.

PROPOSED CASING PROGRAM

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement
13 3/8"	48	H-40	GL	150'	Top to bottom	
9 5/8"	32.3	H-40	GL	900'	Top to bottom	

PERMIT TO DRILL

This constitutes the permission and authority from the

OIL AND GAS CONSERVATION COMMISSION,
STATE OF ARIZONA,

To: Williams Energy Company
(OPERATOR)

to drill a well to be known as

Storage Well No. 10
(WELL NAME)

located 600' FWL & 300' FNL Sec. 8, T18N, R24E Apache County NW/NW 1/4.

Section 8 Township 18N Range 24 E, Maricopa County, Arizona.

The NA of said Section, Township and Range is dedicated to this well.

Said well is to be drilled substantially as outlined in the attached Application and must be drilled in full compliance with all applicable laws, statutes, rules and regulations of the State of Arizona.

Issued this 22 day of October, 19 76.

OIL AND GAS CONSERVATION COMMISSION

By W. E. Allen
EXECUTIVE SECRETARY

PERMIT Nº 671

RECEIPT NO. 715

API No. 02-001-20223

State of Arizona
Oil & Gas Conservation Commission
Permit to Drill

FORM NO. 27

SONARWIRE

INC.

SONARWIRE, INC.
P. O. BOX 576
ABITA SPRINGS, LA. 70420

(504) 893-9221

Survey conducted by: Gary McCool

Permit
671

FERRELLGAS

HOLBROOK, AZ.

STORAGE WELL NO. 10

FEBRUARY 28, 1995

SONAR-THRU-PIPE SURVEY

MAR 1995
ARIZONA GEOLOGICAL SURVEY

Sonar from 978 ft. to 1042 ft.
Sonar T.D. at 1044 ft.
9 5/8 inch cemented casing at 938 ft.
7 inch intermediate pipe at 983 ft.
4 1/2 inch tubing at 1040 ft.
Zero sonar tool at B.H.F.
Site personnel: Mr. Dale Thompson

VOLUME (in Barrels) VERSUS DEPTH (in feet)

Sonarwire, Inc.
FERRELLGAS
STORAGE WELL NO. 10 \HOLBROOK, AZ.
Tue, Feb 28, 1995 8:54

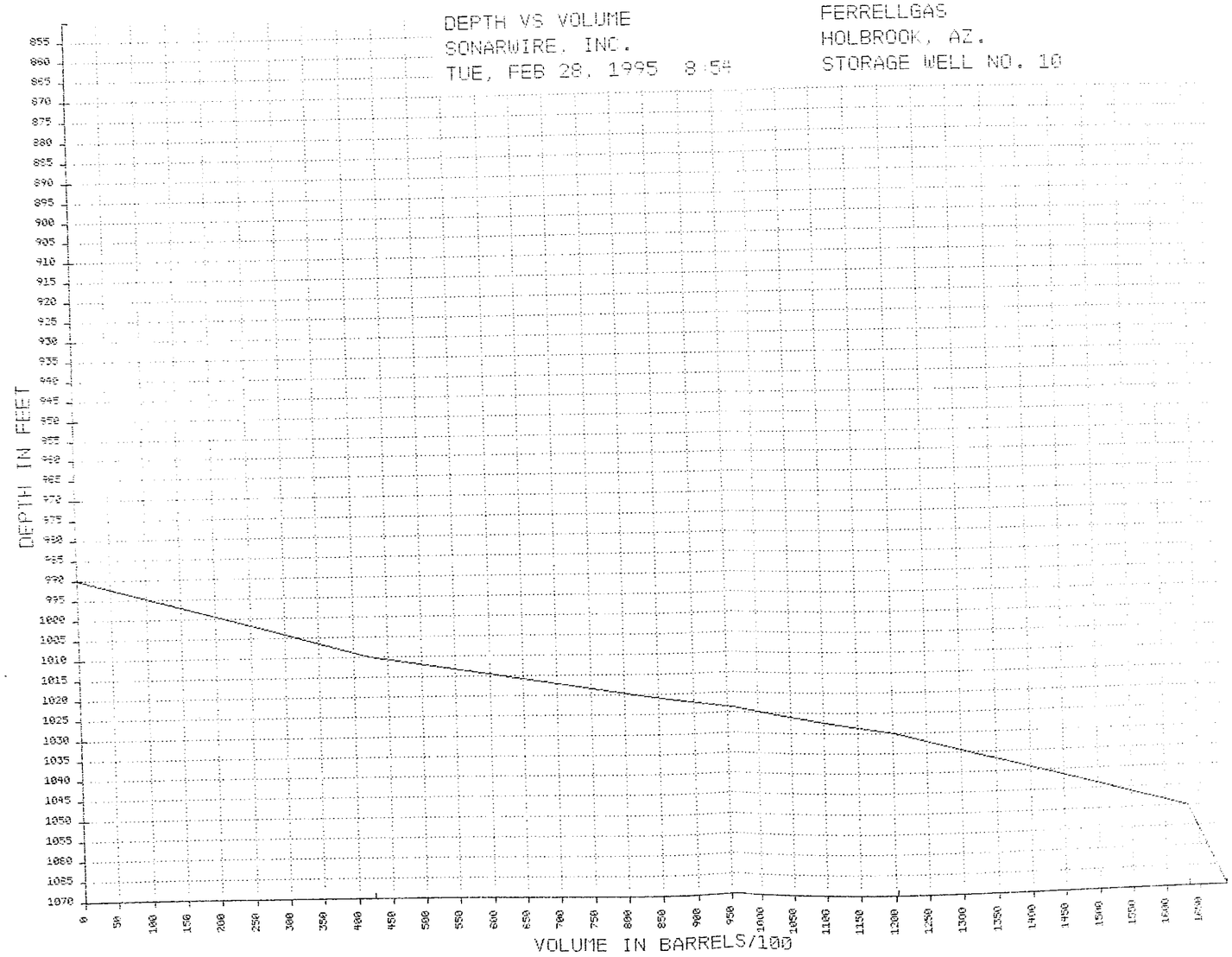
Depth	Volume/foot	Total Volume
939	0.2	0.2
940	0.3	0.5
941	0.3	0.8
942	0.3	1.1
943	0.3	1.4
944	0.4	1.7
945	0.4	2.1
946	0.4	2.5
947	0.5	3.0
948	0.5	3.5
949	0.5	4.0
950	0.5	4.5
951	0.6	5.1
952	0.6	5.6
953	0.6	6.2
954	0.6	6.8
955	0.6	7.4
956	0.6	8.0
957	0.6	8.6
958	0.6	9.2
959	0.6	9.8
960	0.6	10.5
961	0.6	11.1
962	0.7	11.8
963	0.7	12.4
964	0.7	13.1
965	0.7	13.8
966	0.7	14.5
967	0.7	15.2
968	0.7	15.9
969	0.7	16.6
970	0.7	17.4
971	0.8	18.1
972	0.8	18.9
973	0.8	19.7
974	0.8	20.5
975	0.8	21.3
976	0.8	22.1
977	110.0	132.0
978	706.4	838.4

Depth	Volume/foot	Total Volume
979	1356.7	2195.1
980	1974.7	4169.8
981	2557.0	6726.8
982	2720.1	9446.9
983	3121.1	12568.0
984	3897.1	16465.1
985	4352.6	20817.7
986	4335.6	25153.3
987	4320.7	29474.0
988	4307.2	33781.2
989	4286.1	38067.3
990	4257.7	42325.0
991	4227.4	46552.4
992	4195.3	50747.6
993	4103.8	54851.4
994	3954.3	58805.7
995	3812.0	62617.7
996	3676.8	66294.4
997	3675.9	69970.3
998	3810.8	73781.2
999	3954.6	77735.8
1000	4112.1	81847.9
1001	4139.7	85987.6
1002	4030.5	90018.1
1003	3979.9	93998.0
1004	3996.9	97994.9
1005	3974.8	101969.8
1006	3905.3	105875.0
1007	3804.8	109679.9
1008	3674.0	113353.9
1009	3553.9	116907.8
1010	3443.4	120351.1
1011	3319.2	123670.3
1012	3182.1	126852.4
1013	3033.8	129886.2
1014	2875.2	132761.4
1015	2733.5	135494.9
1016	2608.7	138103.5
1017	2400.2	140503.8
1018	2118.1	142621.9
1019	1959.8	144581.7
1020	1914.2	146495.9
1021	1940.0	148435.9
1022	2037.9	150473.8
1023	2030.1	152503.9
1024	1916.6	154420.4
1025	1797.1	156217.5
1026	1673.2	157890.8
1027	1547.2	159438.0
1028	1420.4	160858.5

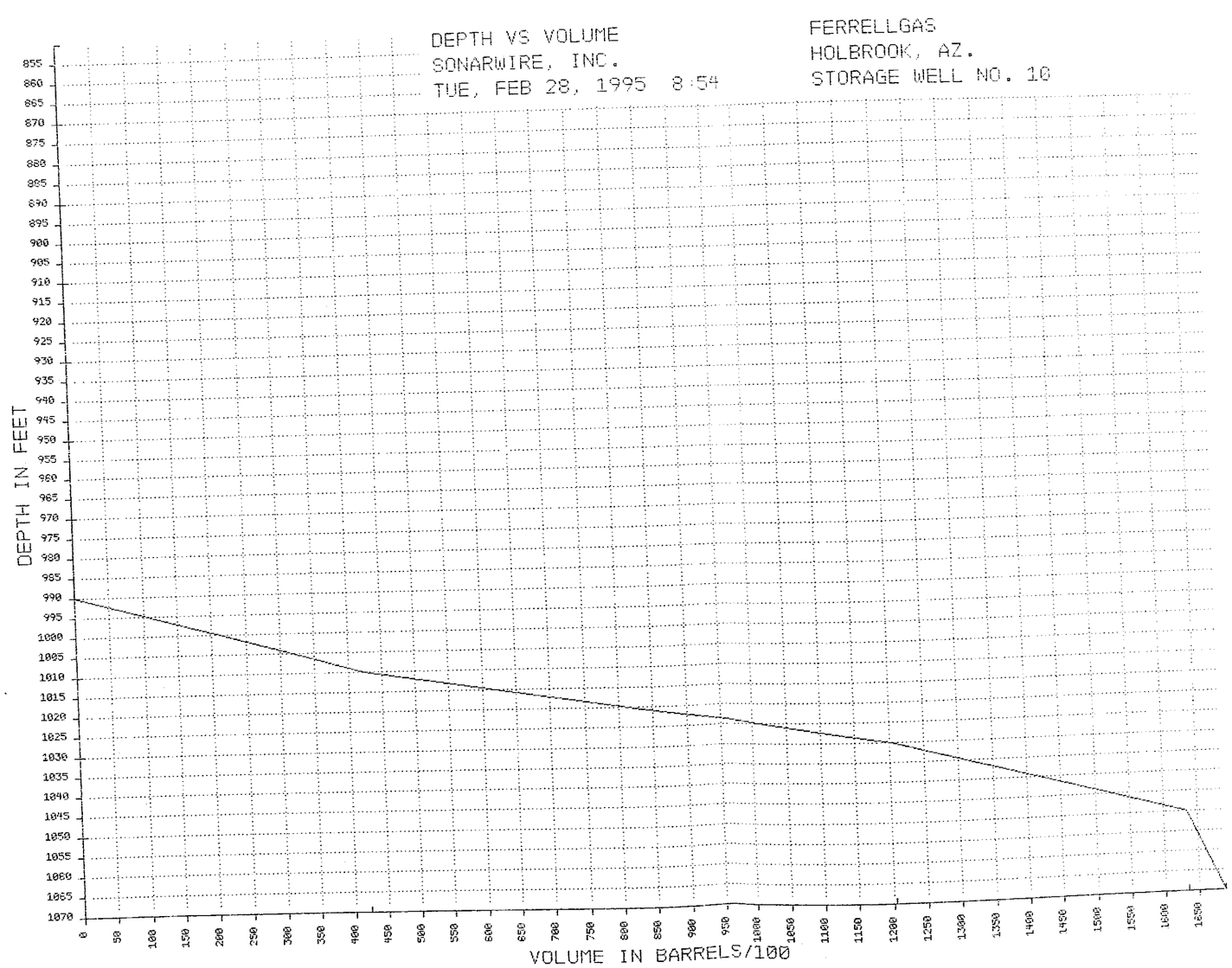
Depth	Volume/foot	Total Volume
1029	1291.0	162149.5
1030	1159.1	163308.6
1031	1055.8	164364.5
1032	978.9	165343.3
1033	815.0	166158.3
1034	587.2	166745.5
1035	478.1	167223.6
1036	461.8	167685.5
1037	377.7	168063.2
1038	256.7	168319.9
1039	193.4	168513.3
1040	160.2	168673.5
1041	92.9	168766.3
1042	22.2	168788.5
1043	2.8	168791.3
1044	0.8	168792.1
1045	0.0	168792.1

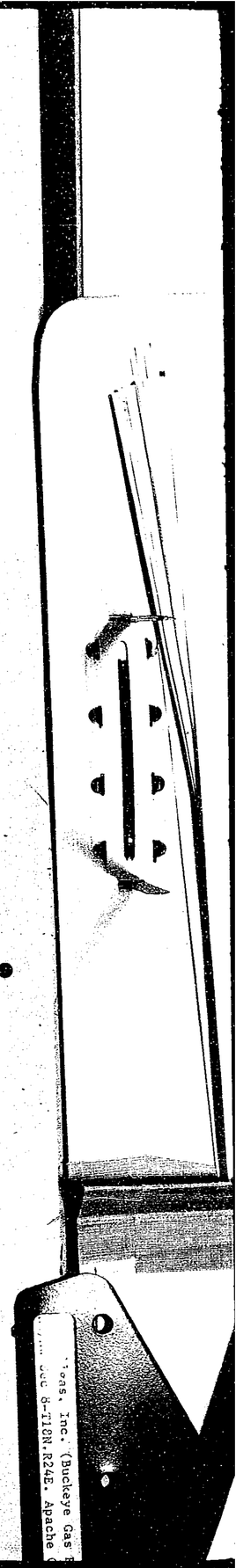
DEPTH VS VOLUME
SONARWIRE, INC.
TUE, FEB 28, 1995 8:54

FERRELLGAS
HOLBROOK, AZ.
STORAGE WELL NO. 10



Gas, Inc. (Buckeye Gas
Sec 8-21ON.R24E. Apache


DEPTH VS VOLUME
SONARWIRE, INC.
TUE, FEB 28, 1995 8:54
FERRELLGAS
HOLBROOK, AZ.
STORAGE WELL NO. 10
DEPTH IN FEET
855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070
VOLUME IN BARRELS/100
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450 1500 1550 1600 1650


Gas, Inc. (Buckeye Gas
8-T18N.R24E. Apache

VOLUME (in Cubic Feet) VERSUS DEPTH (in feet)

Sonarwire, Inc.
FERRELLGAS
STORAGE WELL NO. 10 \HOLBROOK, AZ.
Tue, Feb 28, 1995 8:54

Depth	Volume/foot	Total Volume
939	1.3	1.3
940	1.4	2.7
941	1.5	4.2
942	1.7	5.9
943	1.8	7.7
944	2.0	9.7
945	2.2	11.9
946	2.3	14.2
947	2.5	16.7
948	2.7	19.5
949	2.9	22.3
950	3.0	25.3
951	3.1	28.5
952	3.2	31.6
953	3.2	34.8
954	3.3	38.1
955	3.3	41.4
956	3.4	44.7
957	3.4	48.1
958	3.5	51.6
959	3.5	55.1
960	3.6	58.7
961	3.6	62.3
962	3.7	66.0
963	3.7	69.7
964	3.8	73.5
965	3.9	77.4
966	3.9	81.3
967	4.0	85.3
968	4.0	89.3
969	4.1	93.4
970	4.2	97.6
971	4.2	101.8
972	4.3	106.1
973	4.4	110.5
974	4.4	114.9
975	4.5	119.4
976	4.6	123.9
977	617.3	741.3
978	3966.1	4707.4

Depth	Volume/foot	Total Volume
979	7617.2	12324.6
980	11087.0	23411.6
981	14356.4	37768.0
982	15272.1	53040.2
983	17523.9	70564.1
984	21880.4	92444.5
985	24438.0	116882.5
986	24342.8	141225.3
987	24258.9	165484.2
988	24182.9	189667.2
989	24064.6	213731.8
990	23905.3	237637.1
991	23734.8	261371.9
992	23554.7	284926.6
993	23041.1	307967.7
994	22201.6	330169.3
995	21402.7	351572.0
996	20643.5	372215.4
997	20638.6	392854.0
998	21396.3	414250.3
999	22203.3	436453.6
1000	23087.8	459541.3
1001	23242.7	482784.1
1002	22629.8	505413.9
1003	22345.6	527759.5
1004	22440.7	550200.3
1005	22317.1	572517.4
1006	21926.4	594443.8
1007	21362.6	615806.4
1008	20627.9	636434.4
1009	19953.7	656388.1
1010	19333.1	675721.2
1011	18635.9	694357.1
1012	17866.1	712223.1
1013	17033.6	729256.7
1014	16142.9	745399.6
1015	15347.3	760746.9
1016	14646.6	775393.5
1017	13476.4	788869.9
1018	11892.2	800762.1
1019	11003.6	811765.8
1020	10747.5	822513.2
1021	10892.0	833405.2
1022	11441.9	844847.1
1023	11398.2	856245.3
1024	10760.8	867006.1
1025	10090.0	877096.0
1026	9394.6	886490.6
1027	8687.1	895177.7
1028	7975.1	903152.8

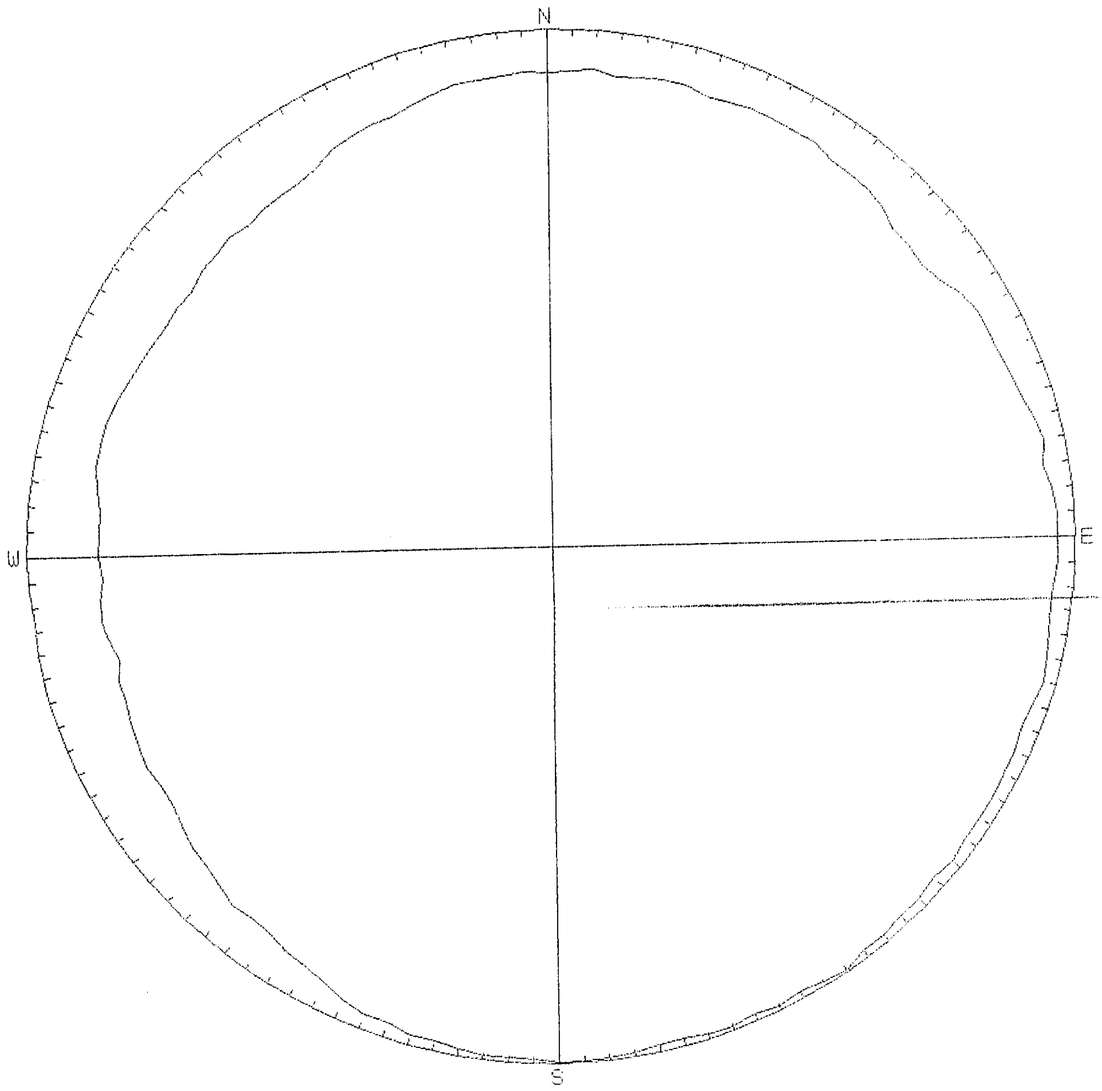
Depth	Volume/foot	Total Volume
1029	7248.5	910401.3
1030	6508.1	916909.4
1031	5927.9	922837.4
1032	5495.9	928333.3
1033	4575.9	932909.2
1034	3297.1	936206.3
1035	2684.3	938890.6
1036	2592.9	941483.4
1037	2120.6	943604.1
1038	1441.3	945045.4
1039	1085.9	946131.3
1040	899.5	947030.8
1041	521.3	947552.1
1042	124.6	947676.6
1043	15.8	947692.4
1044	4.4	947696.8
1045	0.2	947696.9

MAX RANGE VS BEARING

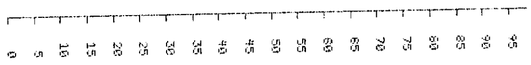
FERRELLGAS

MAX RANGE VS BEARING
SONARWIRE, INC.
TUE, FEB 28, 1995 8:54

FERRELLGAS
HOLBROOK, AZ.
STORAGE WELL NO. 10



SCALE (FEET)



MAXIMUM RADIUS and DEPTH VS BEARING SONARWIRE, INC.
FERRELLGAS Tue, Feb 28, 1995 8:54
STORAGE WELL NO. 10 HOLBROOK, AZ.

This table lists the maximum radius (in feet) found at each of the 128 bearings at which soundings were taken. Also listed, after each radius, (separated by ':'), is the depth (in feet) at which that maximum radius was found. Bearings are shown, (in degrees), for each row of four 'radius : depth' pairs.

Bearing	+0.0	+2.8	+5.6	+8.4
0.0	90 : 1000	91 : 1000	91 : 1000	90 : 1000
11.3	91 : 1000	91 : 1000	91 : 1000	90 : 1000
22.5	91 : 1000	91 : 1000	91 : 1000	91 : 1000
33.8	91 : 1000	90 : 1000	90 : 1000	90 : 1000
45.0	90 : 1000	88 : 1000	88 : 1000	88 : 1000
56.3	89 : 1000	91 : 1000	92 : 1000	92 : 1000
67.5	92 : 1000	92 : 1000	93 : 982	94 : 982
78.8	95 : 982	94 : 982	95 : 982	95 : 982
90.0	95 : 982	95 : 980	95 : 980	95 : 980
101.3	95 : 980	96 : 980	96 : 980	96 : 980
112.5	95 : 984	96 : 980	96 : 984	96 : 982
123.8	96 : 982	96 : 982	97 : 984	96 : 982
135.0	97 : 982	97 : 982	97 : 982	97 : 990
146.3	98 : 990	98 : 984	97 : 984	98 : 984
157.5	97 : 984	98 : 984	98 : 984	97 : 988
168.8	97 : 984	98 : 988	98 : 988	98 : 988
180.0	98 : 988	98 : 988	98 : 988	98 : 988
191.3	97 : 988	97 : 988	97 : 992	96 : 986
202.5	96 : 986	95 : 986	93 : 986	92 : 986
213.8	92 : 990	91 : 984	90 : 984	91 : 986
225.0	90 : 986	89 : 990	88 : 984	87 : 986
236.3	86 : 984	86 : 984	87 : 988	86 : 1006
247.5	86 : 1006	85 : 986	85 : 1006	84 : 1004
258.8	85 : 1004	86 : 1004	86 : 1004	85 : 1004
270.0	85 : 1004	85 : 1004	85 : 1004	86 : 1004
281.3	87 : 1004	87 : 1004	87 : 1004	87 : 1004
292.5	86 : 1004	85 : 1004	85 : 1004	84 : 1004
303.8	84 : 1004	84 : 1004	85 : 1004	85 : 1006
315.0	85 : 1004	84 : 1004	85 : 1004	85 : 1004
326.3	85 : 1000	85 : 1000	87 : 1000	87 : 1000
337.5	88 : 1000	88 : 1000	89 : 1000	89 : 1000
348.8	90 : 1000	90 : 1000	90 : 1000	91 : 1000

Between 938 and 1042 foot depths, maximum radius was 98 feet at bearing 174.4 at 988 foot depth.

Wall Ranges versus Depth
Sonarwire, Inc.
FERRELLGAS
STORAGE WELL NO. 10
Tue, Feb 28, 1995 8:54
HOLBROOK, AZ.

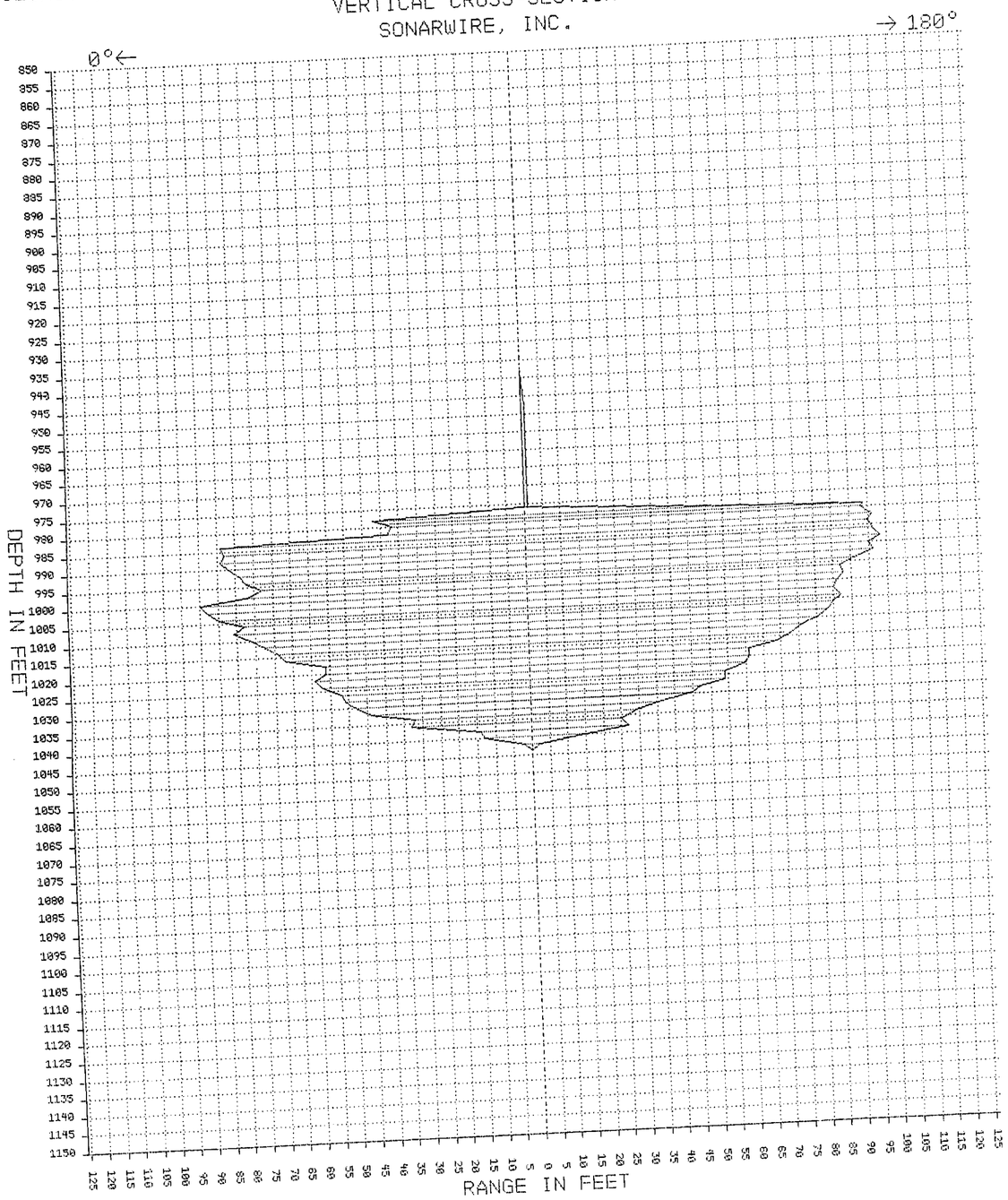
Depth	N	NE	E	SE	S	SW	W	NW
938	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
948	0.6	0.6	1.1	1.2	1.4	0.9	0.6	0.6
950	0.6	0.6	1.4	1.4	1.4	0.6	0.6	0.6
976	0.7	1.1	1.4	1.7	1.6	1.2	0.8	0.8
978	42.5	41.0	41.5	41.5	56.1	53.1	48.6	47.0
979	39.9	48.5	49.5	52.0	95.0	57.6	39.9	36.9
980	37.9	51.0	95.0	95.0	93.4	59.6	43.9	34.3
982	38.4	51.5	95.5	97.0	97.0	69.7	46.5	35.9
984	84.3	86.4	93.4	96.5	95.5	87.4	78.8	79.8
986	83.8	80.8	89.4	96.0	97.0	89.9	82.3	80.3
988	84.3	82.3	89.4	97.0	98.5	85.9	81.3	80.8
990	82.8	81.8	87.4	95.5	96.0	89.4	80.8	79.3
992	79.3	78.8	93.4	96.0	97.0	87.9	80.3	78.3
994	77.3	75.3	90.9	93.9	91.4	86.9	77.8	75.3
996	73.7	73.2	86.9	92.4	87.4	82.8	73.7	72.2
998	77.8	80.3	88.4	91.9	88.9	83.3	78.8	79.8
1000	90.4	89.9	91.9	91.9	86.9	84.3	72.2	81.3
1002	88.4	86.4	88.9	91.4	85.4	82.3	69.7	79.8
1004	85.4	80.3	82.8	83.8	87.9	84.3	85.4	85.4
1006	78.3	79.3	85.9	86.9	85.4	86.9	84.3	83.3
1008	81.3	79.8	80.8	82.3	83.3	82.3	77.8	77.3
1010	76.8	76.3	80.3	80.8	80.3	79.3	75.3	75.8
1012	73.2	72.2	76.3	76.8	76.8	76.8	73.2	71.7
1014	69.7	68.7	72.2	74.2	73.2	72.2	69.2	67.7
1016	67.7	68.7	69.2	67.7	69.7	69.2	65.7	64.6
1018	57.0	56.5	61.2	62.1	61.2	61.6	55.6	56.1
1020	56.1	57.5	58.4	56.5	61.6	58.8	57.5	57.5
1022	59.8	61.6	58.8	58.4	60.7	62.6	63.0	62.6
1024	57.5	57.5	56.1	56.1	54.7	57.0	61.2	59.3
1026	52.4	51.4	55.6	54.7	54.2	53.8	54.2	52.8
1028	51.0	50.2	49.3	48.9	47.6	44.3	50.6	51.9
1030	48.5	44.7	47.2	45.1	44.3	36.7	44.3	43.0
1032	44.7	44.7	44.3	39.6	35.4	34.6	38.8	44.7
1034	32.8	33.2	33.5	31.5	29.1	23.4	24.1	28.8
1036	33.2	33.5	31.8	28.1	25.1	22.4	23.4	29.8
1038	14.8	15.3	17.1	17.1	27.9	30.9	14.1	14.6
1040	13.3	9.8	10.6	12.8	15.8	30.4	13.8	13.3
1042	2.7	2.8	3.2	2.8	2.7	2.5	2.7	2.5

Depth	Tilt	N	NE	E	SE	S	SW	W	NW
1042	-90	2.5	2.5	2.5	2.7	2.5	2.5	2.5	2.5

FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

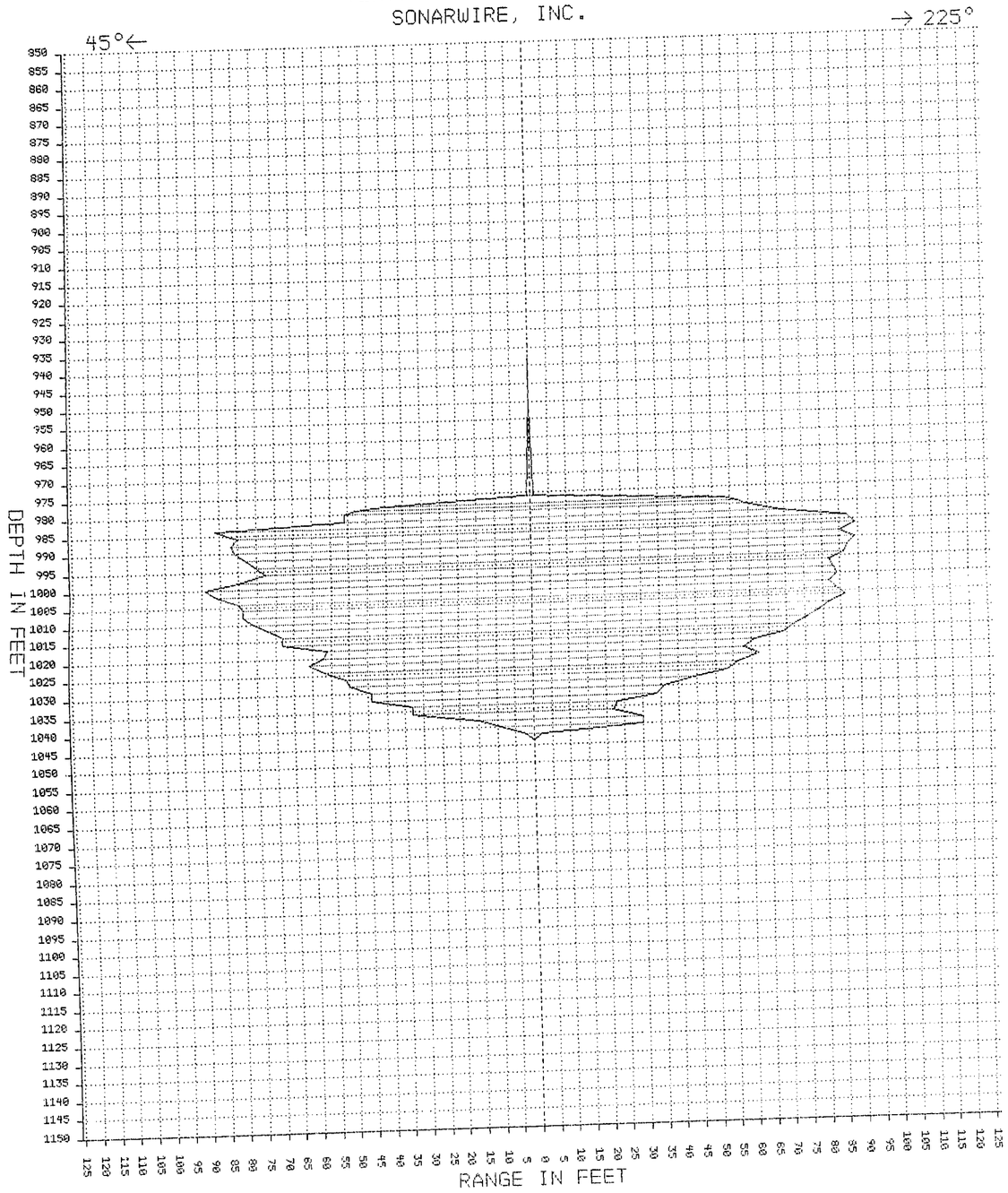
VERTICAL CROSS-SECTION
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

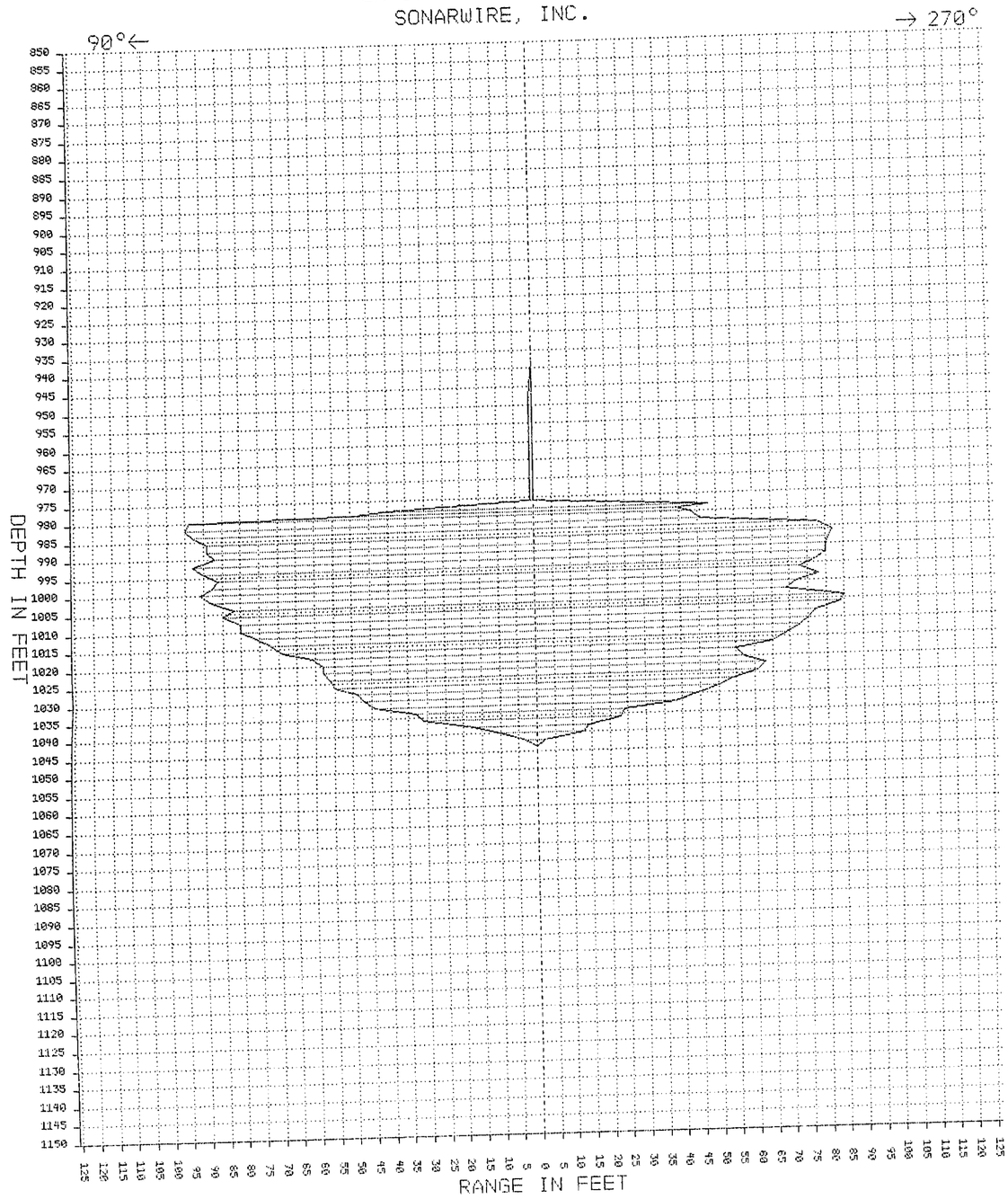
VERTICAL CROSS-SECTION
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

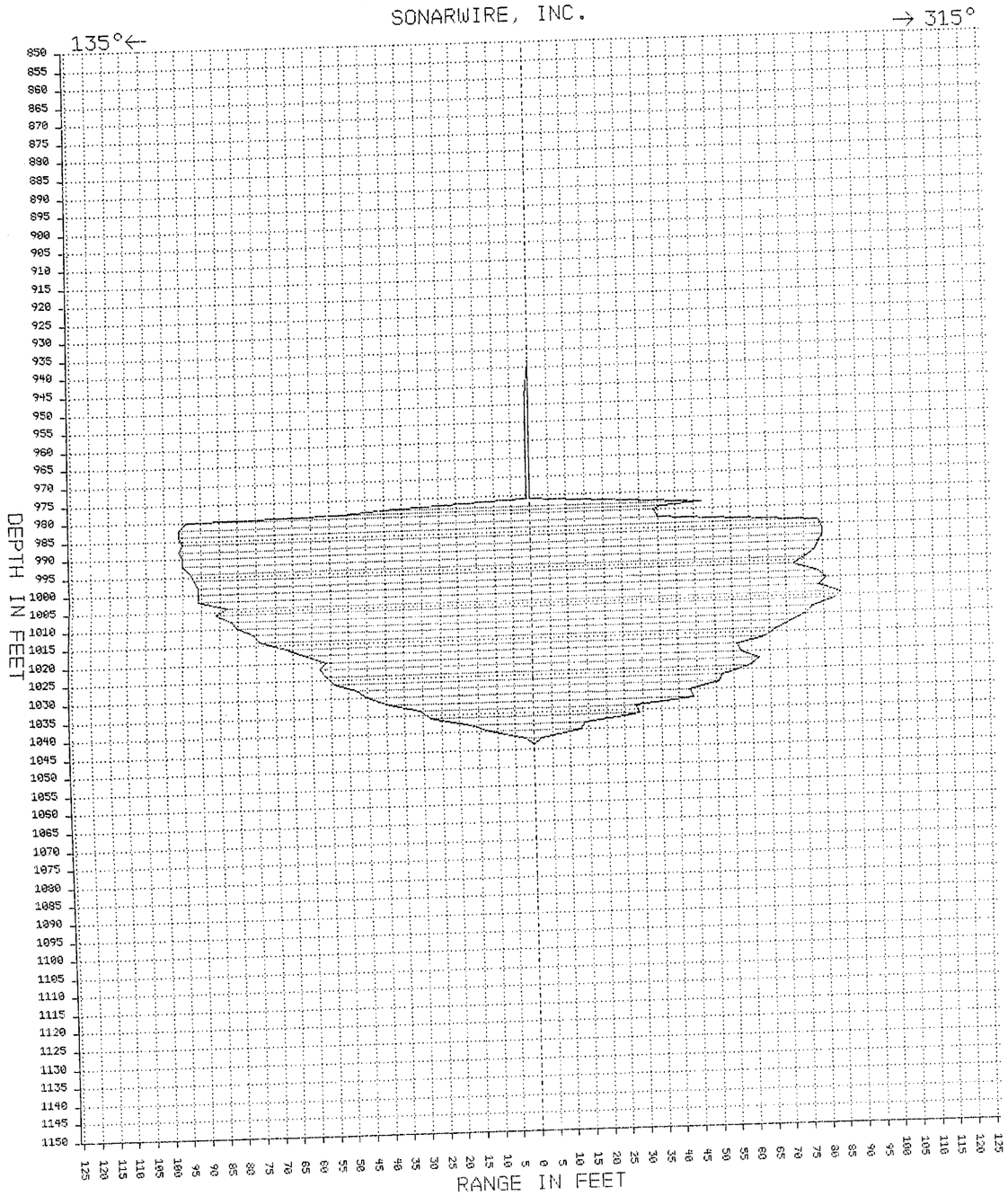
VERTICAL CROSS-SECTION
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

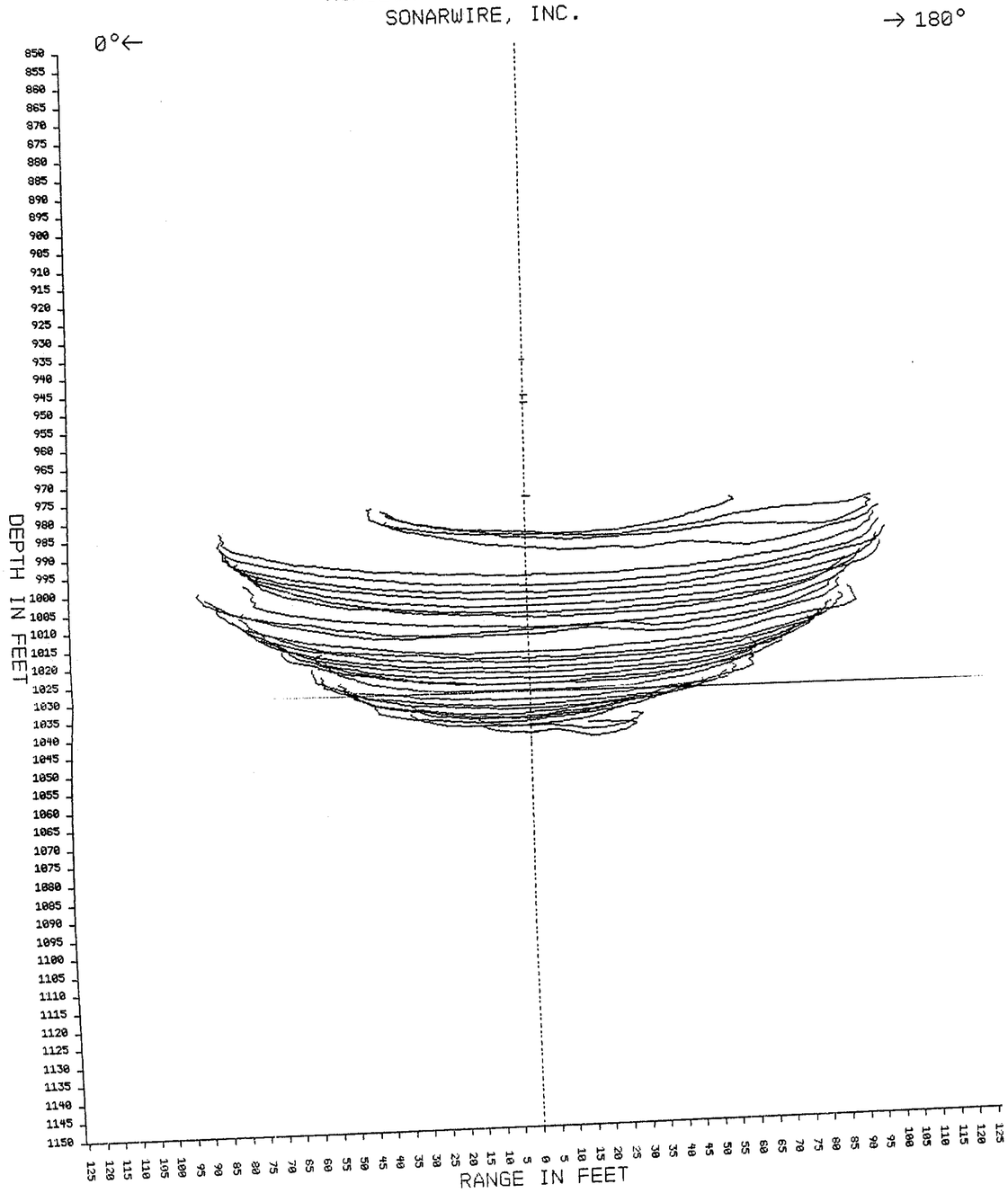
VERTICAL CROSS-SECTION
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

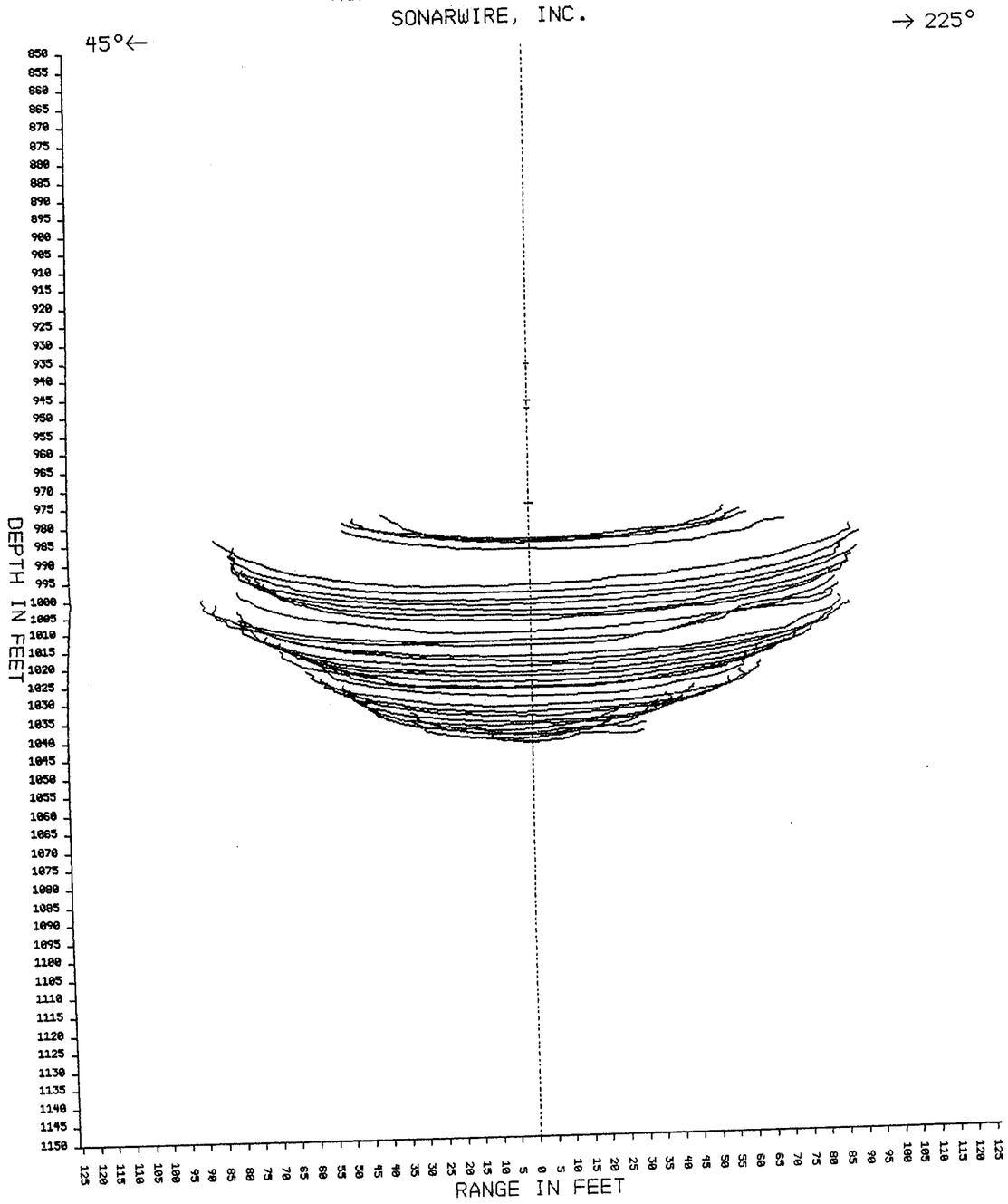
HORIZONTAL HALF-SECTIONS
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

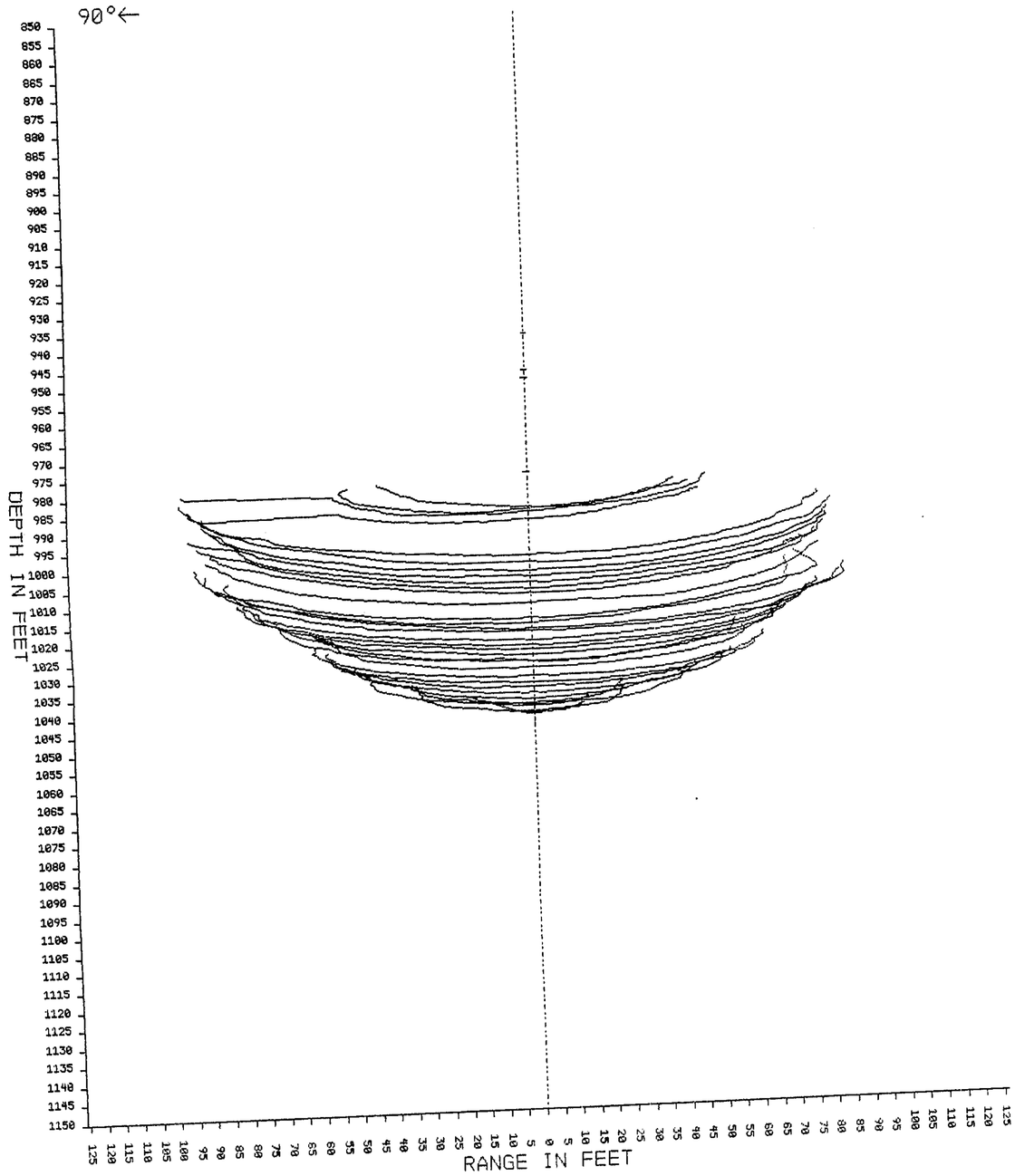
HORIZONTAL HALF-SECTIONS
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

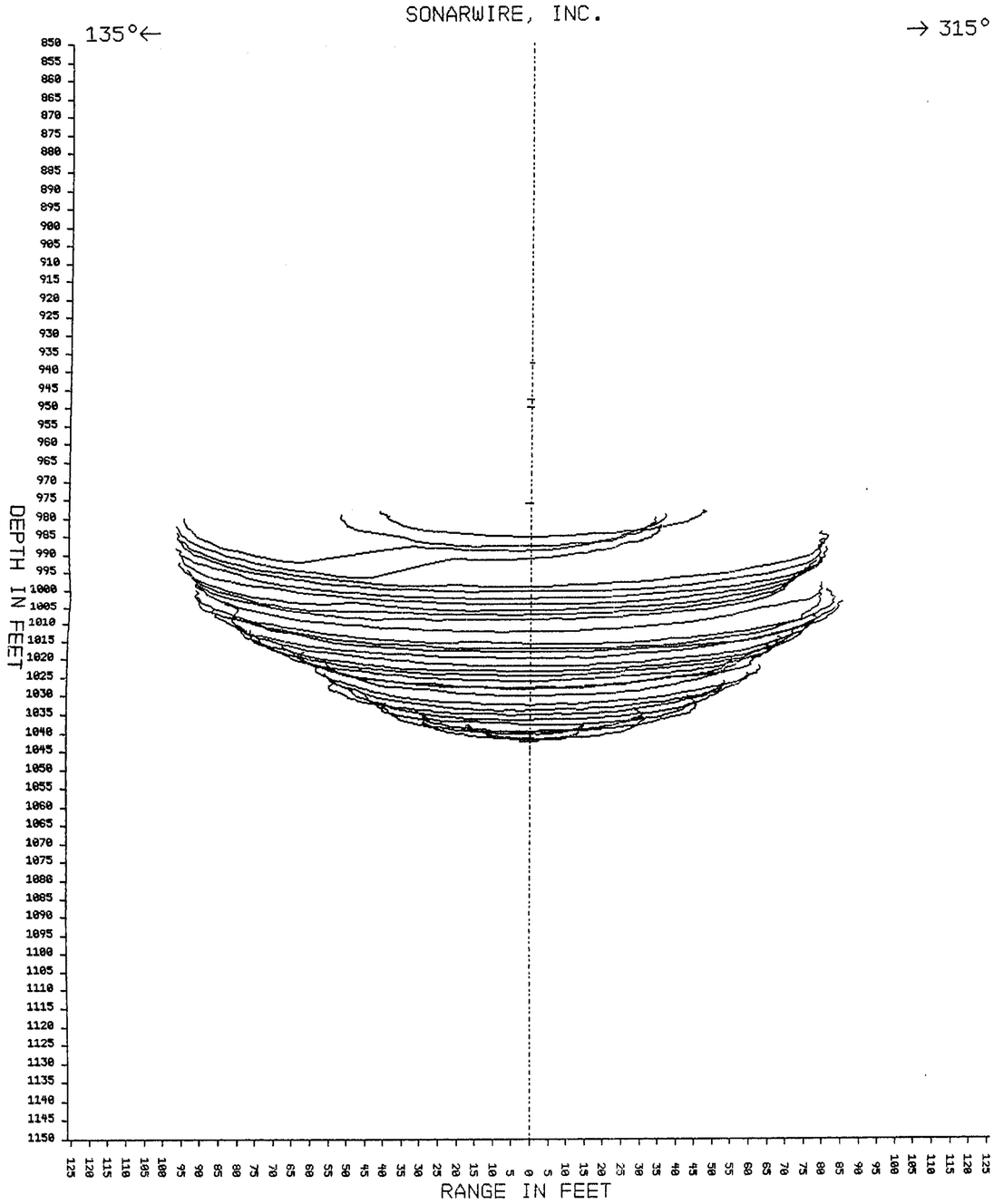
HORIZONTAL HALF-SECTIONS
SONARWIRE, INC.



FERRELLGAS
HOLBROOK, AZ.

STORAGE WELL NO. 10
TUE, FEB 28, 1995 8:54

HORIZONTAL HALF-SECTIONS
SONARWIRE, INC.



Wall Range versus Bearing and Depth
Sonarwire, Inc.
FERRELLGAS
STORAGE WELL NO. 10
Tue, Feb 28, 1995 8:54
HOLBROOK, AZ.

Depth: 938 Tilt: 0 Range: 24.7 VOS: 5950

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
22.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
67.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
90.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
112.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
135.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
157.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
180.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
202.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
225.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
247.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
270.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
292.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
315.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
337.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Depth: 948 Tilt: 0 Range: 24.7 VOS: 5950

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
22.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45.0	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8
67.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.1
90.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
112.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
135.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4
157.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
180.0	1.4	1.4	1.4	1.2	1.2	1.2	1.2	1.2
202.5	1.2	1.2	1.2	1.2	1.1	1.1	1.1	0.9
225.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8
247.5	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
270.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
292.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
315.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
337.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Depth: 950 Tilt: 0 Range: 24.7 VOS: 5950

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
22.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45.0	0.6	0.6	0.7	0.7	0.7	1.1	1.2	1.2
67.5	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4
90.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
112.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
135.0	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5
157.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4
180.0	1.4	1.4	1.2	1.2	1.2	1.2	1.2	1.2
202.5	1.2	1.2	0.7	0.7	0.6	0.6	0.6	0.6
225.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
247.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
270.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
292.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
315.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
337.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Depth: 976 Tilt: 0 Range: 24.7 VOS: 5950

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	0.7	0.7	0.7	0.7	0.8	0.9	0.8	0.9
22.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.1
45.0	1.1	1.1	1.1	1.2	1.2	1.4	1.4	1.4
67.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
90.0	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5
112.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6
135.0	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.7
157.5	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6
180.0	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5
202.5	1.5	1.5	1.5	1.4	1.4	1.4	1.2	1.2
225.0	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1
247.5	1.1	1.1	1.1	0.8	0.8	0.8	0.8	0.8
270.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
292.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
315.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7
337.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Depth: 978 Tilt: 0 Range: 119.9 VOS: 5950

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	42.5	42.0	41.5	41.0	41.5	40.5	40.0	39.4
22.5	38.9	39.4	40.0	39.4	39.4	39.4	40.0	40.5
45.0	41.0	41.0	40.5	39.4	39.4	39.4	40.0	39.4
67.5	40.0	39.4	39.4	39.4	40.0	40.5	41.0	41.5
90.0	41.5	41.0	42.0	42.0	41.5	41.5	41.0	40.5
112.5	40.5	41.0	41.0	41.0	40.0	40.5	41.0	41.5
135.0	41.5	41.5	41.5	42.0	42.5	42.5	42.5	44.0
157.5	45.0	46.0	47.5	48.6	50.6	51.6	53.1	55.1
180.0	56.1	57.1	57.7	56.6	56.1	55.6	54.6	53.6
202.5	53.1	52.6	52.1	51.6	52.6	52.1	52.1	53.1
225.0	53.1	52.6	53.1	53.1	52.6	52.6	52.6	52.1
247.5	51.6	51.1	50.6	50.6	50.1	50.1	49.6	49.6
270.0	48.6	48.6	48.0	48.0	48.0	48.6	49.1	49.1
292.5	48.6	48.0	48.0	48.0	47.5	47.5	47.5	47.0
315.0	47.0	48.0	47.5	47.0	47.0	47.0	46.5	46.0
337.5	46.5	45.5	45.0	44.5	44.0	43.5	43.5	43.5

Depth: 979 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	39.9	39.9	40.4	41.9	43.4	44.4	45.0	46.0
22.5	47.0	47.5	47.5	47.5	48.5	48.5	49.0	48.5
45.0	48.5	49.0	49.5	50.0	50.5	51.0	52.0	52.5
67.5	53.0	52.0	52.0	52.5	52.5	52.5	51.5	50.5
90.0	49.5	50.0	50.5	50.5	51.5	52.5	53.0	53.5
112.5	53.0	53.5	53.0	52.5	52.5	52.5	52.5	52.0
135.0	52.0	52.5	52.5	52.5	52.5	52.5	53.5	53.5
157.5	53.0	53.0	54.5	60.1	72.2	91.4	95.0	95.5
180.0	95.0	92.4	90.4	86.4	74.2	70.2	66.2	64.6
202.5	62.1	61.1	60.6	60.6	60.6	60.1	59.1	58.6
225.0	57.6	56.6	55.6	54.5	55.1	55.1	54.5	53.5
247.5	52.5	52.0	50.0	48.5	46.5	43.4	41.4	40.9
270.0	39.9	39.4	38.4	38.9	38.4	38.4	38.4	37.9
292.5	37.9	37.9	37.9	38.4	37.9	37.4	37.4	37.4
315.0	36.9	37.4	37.4	37.4	37.4	37.4	37.4	37.9
337.5	37.9	37.9	38.4	37.9	38.4	38.4	38.4	38.9

Depth: 980 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	37.9	38.9	39.9	40.4	41.9	42.4	42.4	43.4
22.5	43.9	45.0	45.5	46.0	48.0	49.0	50.5	51.0
45.0	51.0	51.5	52.0	51.0	51.5	52.5	53.0	53.5
67.5	53.0	52.5	54.0	54.0	54.5	54.0	65.2	93.9
90.0	95.0	95.5	95.0	95.0	95.5	96.0	96.5	96.0
112.5	95.0	96.0	95.5	95.0	95.0	95.0	95.0	95.0
135.0	95.0	93.4	93.9	93.4	93.9	93.9	95.0	95.0
157.5	95.0	93.4	93.4	92.9	93.4	93.9	93.4	93.4
180.0	93.4	95.0	93.9	95.0	93.9	93.4	92.9	92.4
202.5	92.4	90.4	73.7	64.1	63.1	62.1	61.1	60.6
225.0	59.6	58.1	57.1	56.6	55.1	53.5	53.0	52.5
247.5	51.5	51.0	50.0	49.5	48.5	46.5	45.5	44.4
270.0	43.9	42.4	42.4	41.9	38.9	37.4	35.9	34.8
292.5	34.8	34.3	34.3	34.8	34.3	34.3	34.3	34.3
315.0	34.3	34.3	34.3	34.3	34.8	35.4	35.4	35.4
337.5	35.4	35.9	35.9	36.4	36.9	37.9	37.9	38.4

Depth: 982 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	38.4	38.4	39.4	40.4	41.4	41.9	42.9	43.4
22.5	44.4	45.5	45.5	46.5	48.0	48.5	50.0	50.5
45.0	51.5	52.5	53.5	54.0	54.5	55.6	56.6	56.1
67.5	56.6	67.2	92.9	93.9	95.0	93.9	95.0	95.5
90.0	95.5	95.5	95.0	95.0	95.0	95.5	95.5	95.0
112.5	95.0	96.0	95.5	96.5	96.5	96.5	96.5	96.5
135.0	97.0	97.0	97.5	97.0	96.0	96.0	97.0	96.5
157.5	96.5	97.0	97.0	96.5	96.5	96.5	97.0	97.0
180.0	97.0	95.5	95.0	95.0	93.9	93.4	90.9	88.9
202.5	88.4	87.9	86.9	86.4	85.4	84.3	83.3	82.3
225.0	69.7	64.6	63.1	62.1	62.1	62.1	60.1	56.6
247.5	55.1	54.5	54.5	54.0	52.5	50.5	49.0	48.0
270.0	46.5	45.0	44.4	45.0	43.4	42.4	41.4	40.4
292.5	39.4	38.9	38.4	37.9	36.9	36.4	36.4	35.4
315.0	35.9	35.4	35.9	35.4	35.9	36.4	36.4	36.9
337.5	36.9	36.9	37.9	38.4	38.4	37.9	39.4	38.9

Depth: 984 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	84.3	84.8	84.3	84.3	83.8	83.3	83.3	83.3
22.5	83.8	83.8	83.8	83.3	83.8	84.3	84.8	85.9
45.0	86.4	86.9	87.4	87.4	85.9	86.4	87.9	89.9
67.5	90.9	90.9	91.4	90.9	91.4	91.9	92.4	92.9
90.0	93.4	92.9	95.0	95.0	95.0	95.0	95.5	96.0
112.5	95.5	95.5	96.0	96.5	96.0	96.0	97.0	96.5
135.0	96.5	96.5	96.0	96.5	97.5	98.0	97.5	98.0
157.5	97.5	98.0	98.0	97.0	97.5	97.0	96.0	96.5
180.0	95.5	95.5	95.0	95.5	95.0	95.0	95.0	93.4
202.5	93.4	92.4	92.4	91.9	90.4	90.9	90.4	88.4
225.0	87.4	87.4	88.4	86.9	86.4	86.4	84.8	84.3
247.5	82.8	82.3	82.3	81.8	81.8	81.3	80.8	78.8
270.0	78.8	79.3	78.8	78.3	76.8	77.3	78.3	77.8
292.5	77.3	76.3	76.8	78.3	78.8	78.3	78.8	79.3
315.0	79.8	79.3	81.8	81.8	81.8	82.8	82.3	83.8
337.5	84.3	85.4	85.4	84.8	85.4	83.8	84.3	83.8

Depth: 986 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	83.8	83.3	83.8	83.8	84.3	84.8	84.3	84.3
22.5	83.8	83.8	83.8	83.3	82.3	82.8	81.8	81.3
45.0	80.8	81.3	82.3	82.8	83.8	84.3	84.8	85.4
67.5	84.8	85.9	87.4	87.4	87.9	88.4	89.9	89.4
90.0	89.4	90.4	90.4	90.9	92.4	92.9	92.4	92.9
112.5	92.4	93.4	93.4	95.0	95.0	95.0	95.5	95.5
135.0	96.0	97.0	97.0	96.5	97.0	97.0	97.0	97.0
157.5	97.0	96.5	97.0	97.0	96.5	96.5	96.5	97.0
180.0	97.0	96.5	96.0	96.0	96.5	96.5	96.5	96.0
202.5	96.0	95.0	93.4	92.4	91.4	90.9	90.4	90.9
225.0	89.9	88.4	87.4	87.4	86.4	85.9	86.4	85.4
247.5	84.8	85.4	84.3	83.8	83.3	83.3	83.3	82.8
270.0	82.3	81.8	81.8	81.3	81.3	80.8	81.3	81.3
292.5	80.8	79.8	78.3	78.3	78.8	78.8	79.3	80.3
315.0	80.3	79.3	80.3	80.3	80.8	81.8	82.8	83.3
337.5	84.3	84.8	85.4	84.8	84.8	84.8	85.4	84.3

Depth: 988 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	84.3	84.3	83.8	82.3	83.3	82.8	82.3	82.8
22.5	83.3	83.3	83.8	83.3	82.8	81.8	81.3	81.8
45.0	82.3	82.8	83.8	84.3	84.8	84.3	84.3	85.4
67.5	85.9	86.4	86.9	86.4	85.9	87.4	87.9	88.9
90.0	89.4	89.4	90.4	90.9	90.9	90.9	90.4	90.9
112.5	90.9	92.4	92.9	95.0	95.0	95.5	96.5	96.0
135.0	97.0	96.0	96.0	97.0	97.5	97.0	97.5	97.5
157.5	97.0	96.5	96.5	97.5	97.5	98.0	98.5	98.5
180.0	98.5	98.0	98.0	98.0	97.5	97.0	96.0	93.4
202.5	91.9	91.4	90.4	90.4	88.9	88.9	87.4	87.4
225.0	85.9	84.8	84.8	85.9	85.4	86.4	86.9	85.9
247.5	84.8	84.3	83.8	83.3	83.3	82.3	82.3	82.3
270.0	81.3	81.3	80.8	81.3	80.8	80.3	80.8	80.8
292.5	79.8	79.8	80.3	80.8	80.3	80.3	80.8	80.3
315.0	80.8	81.3	81.3	81.3	82.3	82.3	83.3	83.8
337.5	84.8	85.4	84.8	84.3	84.8	84.3	83.8	83.8

Depth: 990 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	82.8	81.8	82.3	82.8	81.8	83.3	83.3	83.3
22.5	83.3	83.3	83.3	82.3	82.8	82.3	81.8	81.3
45.0	81.8	81.3	81.3	82.3	82.8	82.8	83.8	83.3
67.5	83.3	83.8	83.8	83.8	84.8	85.4	85.9	86.4
90.0	87.4	87.9	87.9	88.9	90.9	92.4	92.4	93.9
112.5	95.0	95.0	95.0	95.0	95.5	96.0	95.5	95.5
135.0	95.5	96.0	97.5	97.5	98.5	97.5	97.5	97.5
157.5	97.0	97.0	96.5	97.0	97.5	97.0	97.5	96.5
180.0	96.0	96.0	96.5	96.0	96.5	96.0	96.0	95.5
202.5	95.0	93.4	92.9	92.4	91.9	90.9	90.4	89.4
225.0	89.4	88.9	87.9	86.9	85.9	85.4	85.4	84.3
247.5	83.8	82.8	81.3	80.8	80.8	80.8	80.3	81.3
270.0	80.8	81.3	80.8	79.8	80.3	79.3	79.3	78.8
292.5	78.8	78.8	78.8	78.8	77.8	78.8	79.3	78.8
315.0	79.3	78.8	79.8	80.3	80.3	80.8	80.3	80.8
337.5	81.3	81.8	82.3	82.8	82.3	82.8	82.3	82.8

Depth: 992 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	79.3	79.8	80.3	79.8	80.8	80.3	80.3	79.8
22.5	79.8	79.8	79.3	79.3	78.3	78.8	79.3	79.3
45.0	78.8	79.8	80.8	81.3	82.3	82.3	82.8	82.8
67.5	82.3	82.3	81.8	81.8	81.3	82.8	88.9	91.9
90.0	93.4	92.9	93.9	95.0	95.0	95.0	95.0	95.0
112.5	95.0	95.5	95.5	95.5	95.5	96.0	96.0	96.5
135.0	96.0	96.0	97.0	96.5	96.0	95.5	95.0	95.0
157.5	95.0	95.5	95.5	95.0	95.5	96.5	97.0	97.0
180.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	95.5
202.5	95.0	92.9	91.4	90.9	90.9	90.4	90.4	89.9
225.0	87.9	86.4	87.4	87.4	86.4	85.4	84.3	83.8
247.5	83.3	83.3	82.3	80.8	80.8	80.8	79.8	79.8
270.0	80.3	79.8	79.3	79.8	80.3	80.3	79.8	79.3
292.5	79.3	79.3	79.8	79.8	79.8	78.8	77.8	77.8
315.0	78.3	77.3	76.8	77.3	76.8	76.8	76.8	77.3
337.5	78.3	79.3	79.3	78.8	79.8	79.8	80.3	80.8

Depth: 994 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	77.3	76.8	75.8	76.3	76.3	75.8	76.3	75.8
22.5	75.8	74.2	75.3	75.3	74.7	75.8	74.2	75.3
45.0	75.3	75.8	75.8	75.8	76.8	77.3	77.8	78.3
67.5	79.3	79.3	79.8	80.3	83.8	86.4	87.4	90.4
90.0	90.9	91.9	91.4	92.4	92.4	91.4	90.9	91.9
112.5	92.9	92.4	92.9	93.4	92.9	93.4	93.4	93.4
135.0	93.9	93.9	93.9	93.9	93.4	92.9	91.9	90.9
157.5	91.4	91.4	90.4	91.4	90.9	91.4	91.4	90.9
180.0	91.4	90.9	90.9	90.9	90.4	89.9	89.4	88.9
202.5	88.9	88.9	88.4	88.9	88.4	87.9	87.4	87.4
225.0	86.9	85.4	85.9	85.9	83.8	82.8	82.3	81.8
247.5	80.8	81.3	80.8	79.8	79.3	79.3	79.3	78.3
270.0	77.8	77.3	77.8	77.3	77.3	76.8	77.3	77.3
292.5	76.3	76.3	76.8	76.3	76.3	76.3	75.8	75.3
315.0	75.3	75.3	73.7	74.2	74.2	74.2	73.7	74.7
337.5	75.3	75.8	76.3	76.8	76.8	77.3	76.8	77.8

Depth: 996 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	73.7	74.2	74.2	73.2	73.2	72.7	73.2	72.2
22.5	72.2	72.7	72.2	71.7	71.7	72.7	72.2	73.2
45.0	73.2	72.7	73.2	73.2	74.7	75.8	76.3	78.3
67.5	77.8	78.8	80.8	83.8	83.8	85.9	85.9	87.4
90.0	86.9	87.4	87.9	87.9	87.9	87.9	88.9	89.4
112.5	90.4	90.9	91.9	91.4	91.9	92.4	91.9	92.4
135.0	92.4	92.4	91.9	91.4	90.4	89.4	90.4	89.4
157.5	88.9	89.4	89.4	88.9	88.9	87.9	87.4	87.4
180.0	87.4	86.4	86.4	85.9	85.4	84.8	85.4	84.8
202.5	85.4	84.8	84.8	84.3	84.8	83.8	83.3	82.8
225.0	82.8	81.8	81.8	80.8	80.3	79.8	79.8	79.8
247.5	78.8	77.8	77.8	77.3	76.3	76.3	75.3	75.8
270.0	73.7	74.7	72.2	70.2	70.7	70.7	70.2	70.2
292.5	71.2	71.2	70.2	70.2	69.7	69.7	70.7	72.7
315.0	72.2	72.2	72.2	72.2	71.7	72.2	72.7	73.7
337.5	73.7	74.2	74.2	75.3	74.7	75.3	75.3	74.7

Depth: 998 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	77.8	77.8	78.3	78.8	78.8	78.8	78.8	78.8
22.5	78.8	78.8	78.8	78.8	78.8	80.3	80.3	80.3
45.0	80.3	80.3	81.3	81.3	81.3	81.3	81.3	82.3
67.5	82.3	82.3	84.3	84.3	84.3	85.9	85.9	87.4
90.0	88.4	88.4	88.4	88.4	88.4	88.4	89.4	89.4
112.5	89.4	89.9	89.9	89.9	90.4	90.4	90.4	91.9
135.0	91.9	91.9	92.4	92.4	92.4	91.9	91.9	90.9
157.5	89.4	89.4	89.9	88.9	88.9	88.9	88.9	88.9
180.0	88.9	87.9	87.4	86.9	86.9	86.4	85.9	85.4
202.5	84.8	84.3	83.8	84.3	84.8	84.3	83.8	83.3
225.0	83.3	82.8	82.3	81.8	81.8	81.3	81.3	80.3
247.5	79.8	79.3	78.8	80.3	80.3	79.8	79.3	79.3
270.0	78.8	77.8	76.8	76.8	76.8	76.8	76.8	76.8
292.5	76.8	76.8	77.3	77.8	77.8	77.8	78.8	78.8
315.0	79.8	79.8	79.8	80.8	80.8	81.8	81.8	81.8
337.5	81.3	79.3	79.3	78.3	76.8	76.8	76.8	76.8

Depth: 1000 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	90.4	90.9	91.4	90.4	90.9	91.4	91.4	90.4
22.5	90.9	91.4	91.4	91.4	91.4	90.4	90.4	90.4
45.0	89.9	88.4	88.4	87.9	88.9	90.9	91.9	91.9
67.5	91.9	92.4	91.9	91.9	91.9	91.9	91.9	91.4
90.0	91.9	91.9	91.4	92.4	92.9	92.4	92.4	91.9
112.5	91.9	92.4	91.9	92.4	92.9	92.9	92.4	91.4
135.0	91.9	91.9	91.4	90.4	89.9	88.9	87.4	87.9
157.5	87.4	87.4	86.9	87.9	87.4	86.9	86.4	86.9
180.0	86.9	85.9	85.4	84.3	84.3	85.4	85.4	85.4
202.5	84.8	84.3	84.8	85.4	85.4	84.8	85.4	84.3
225.0	84.3	84.3	83.8	82.8	82.3	83.3	81.3	80.8
247.5	71.7	70.2	69.2	69.7	68.7	70.2	71.2	71.2
270.0	72.2	72.7	74.7	75.3	77.3	79.3	81.3	83.3
292.5	82.8	83.8	83.8	82.8	82.3	82.3	82.3	81.8
315.0	81.3	81.3	82.8	83.3	84.8	85.4	86.9	87.4
337.5	87.9	87.9	88.9	89.4	90.4	90.4	90.4	90.9

Depth: 1002 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	88.4	88.4	87.9	87.9	87.9	88.4	89.4	90.4
22.5	89.9	88.4	88.9	88.9	88.4	87.9	86.9	86.4
45.0	86.4	86.4	86.9	86.9	87.9	88.9	88.4	86.9
67.5	87.4	88.9	89.9	89.4	88.9	89.9	89.4	88.9
90.0	88.9	88.9	88.9	89.4	88.9	88.9	88.9	89.4
112.5	90.9	91.4	91.9	92.4	92.4	91.9	90.9	90.9
135.0	91.4	91.4	91.9	90.9	89.4	87.4	87.4	87.4
157.5	87.4	86.9	87.4	88.4	87.9	87.4	86.4	85.9
180.0	85.4	84.8	85.4	86.4	85.9	85.4	85.9	85.9
202.5	84.8	83.8	82.8	82.3	82.3	82.3	82.8	83.3
225.0	82.3	82.8	82.8	83.3	82.3	82.3	80.8	78.8
247.5	72.7	69.2	65.7	64.6	65.7	67.2	68.7	69.2
270.0	69.7	69.7	69.7	70.7	71.7	72.2	73.2	73.7
292.5	75.3	77.8	79.3	80.3	80.3	79.8	80.8	80.3
315.0	79.8	79.3	79.8	80.3	80.3	81.3	80.8	81.3
337.5	81.3	82.3	84.3	84.8	84.8	85.9	86.9	87.4

Depth: 1004 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	85.4	85.9	84.8	84.3	83.3	82.8	82.3	80.8
22.5	80.8	80.8	80.3	80.3	80.3	80.3	79.8	80.3
45.0	80.3	80.3	80.3	80.3	79.8	80.3	80.8	81.8
67.5	82.3	82.3	82.8	83.3	84.3	83.8	84.3	83.8
90.0	82.8	82.3	81.8	82.3	83.3	83.8	83.3	83.8
112.5	83.8	84.8	85.4	83.8	82.3	81.3	81.3	81.8
135.0	83.8	84.3	85.9	86.9	86.4	85.9	85.9	87.4
157.5	87.4	88.4	88.4	87.4	87.4	88.4	88.4	87.9
180.0	87.9	88.9	89.4	90.4	91.4	92.9	92.9	91.9
202.5	89.9	87.9	85.9	84.8	82.8	82.3	82.3	83.3
225.0	84.3	84.8	85.4	84.8	84.8	84.8	84.3	83.3
247.5	83.8	83.3	83.3	84.3	85.4	86.4	85.9	84.8
270.0	85.4	85.4	85.4	86.4	87.4	87.4	87.4	86.9
292.5	85.9	85.4	84.8	84.3	84.3	83.8	84.8	84.3
315.0	85.4	84.3	84.8	84.8	84.8	84.8	84.8	85.9
337.5	85.4	84.8	84.8	84.8	84.8	85.4	85.9	85.4

Depth: 1006 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	78.3	77.8	78.3	78.3	78.3	78.3	78.3	77.8
22.5	77.8	78.3	79.3	80.3	80.3	78.8	80.3	79.3
45.0	79.3	79.3	79.8	78.8	79.8	79.8	80.8	81.3
67.5	80.3	80.8	81.8	82.8	82.8	83.8	84.3	85.4
90.0	85.9	85.4	85.9	85.9	85.9	86.4	87.4	86.9
112.5	85.9	85.9	85.9	85.9	86.4	87.4	86.9	87.4
135.0	86.9	86.4	85.9	83.8	83.8	83.8	83.8	82.8
157.5	82.3	82.8	83.3	82.8	83.3	83.8	84.3	83.8
180.0	85.4	86.4	86.9	85.9	86.4	86.4	86.9	86.9
202.5	86.9	86.4	85.4	85.4	85.9	85.4	85.4	85.9
225.0	86.9	87.4	85.4	85.4	84.8	84.8	84.8	86.4
247.5	85.9	84.8	85.4	84.3	84.8	84.8	84.8	83.8
270.0	84.3	83.3	83.3	83.3	83.8	82.8	82.3	80.8
292.5	81.3	82.3	82.3	81.8	82.8	83.3	84.3	84.8
315.0	83.3	82.8	82.3	80.8	80.8	80.3	79.8	80.3
337.5	80.3	79.8	79.8	79.3	78.8	79.3	79.8	78.8

Depth: 1008 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	81.3	80.3	80.8	80.3	79.8	79.3	79.3	79.3
22.5	79.8	79.8	79.3	79.3	80.3	79.8	79.3	79.3
45.0	79.8	79.3	79.3	79.8	80.3	79.8	80.3	81.3
67.5	80.8	79.3	79.8	79.3	80.3	79.3	79.8	80.3
90.0	80.8	81.8	81.8	81.3	82.3	81.8	81.3	82.8
112.5	81.8	82.8	81.3	81.8	81.3	81.8	82.3	81.8
135.0	82.3	81.8	82.3	82.8	82.8	81.8	82.3	82.3
157.5	81.8	81.8	81.8	81.8	81.8	81.8	81.3	82.3
180.0	83.3	81.8	82.3	82.3	82.3	82.8	82.3	83.3
202.5	82.8	81.8	81.3	80.8	81.8	80.8	81.3	81.3
225.0	82.3	82.3	81.8	81.3	81.3	80.8	81.3	80.8
247.5	80.3	79.3	79.3	78.3	77.8	78.3	78.3	78.3
270.0	77.8	78.3	78.3	77.3	76.8	77.3	77.8	78.3
292.5	78.8	77.8	78.3	78.8	78.8	77.3	77.3	78.3
315.0	77.3	78.3	78.3	77.8	78.3	78.3	78.3	78.8
337.5	78.3	78.3	78.8	78.8	79.3	79.8	79.8	80.8

Depth: 1010 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	76.8	76.3	76.3	76.3	75.8	75.8	75.8	75.3
22.5	75.3	75.3	75.8	75.8	75.8	75.8	75.8	75.8
45.0	76.3	76.8	76.3	75.8	75.8	77.3	77.8	78.3
67.5	78.8	80.3	79.8	79.3	79.8	79.3	79.3	80.3
90.0	80.3	80.8	80.8	80.3	79.3	79.3	80.3	80.3
112.5	80.3	80.3	81.3	80.8	80.3	80.3	80.8	79.8
135.0	80.8	80.8	80.8	79.8	79.8	80.8	80.8	81.3
157.5	81.3	81.3	80.8	80.3	80.3	80.3	80.3	79.8
180.0	80.3	79.8	79.8	79.3	79.3	79.3	78.8	78.8
202.5	78.3	78.8	78.8	79.3	78.8	78.8	79.3	79.3
225.0	79.3	79.3	78.8	77.8	76.8	77.3	76.3	76.3
247.5	76.3	75.8	75.3	74.7	75.3	75.8	75.3	75.8
270.0	75.3	74.7	74.7	75.3	74.7	75.3	75.3	75.3
292.5	74.7	75.8	75.8	75.3	75.8	75.8	75.8	75.3
315.0	75.8	75.8	75.8	75.8	75.8	76.3	76.3	76.3
337.5	76.3	76.3	76.3	76.8	76.8	76.8	77.3	77.8

Depth: 1012 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	73.2	72.7	72.7	72.2	71.7	71.2	70.7	70.2
22.5	69.7	71.2	70.7	71.7	71.7	72.2	73.2	72.7
45.0	72.2	72.2	72.7	72.2	71.7	72.7	72.7	74.7
67.5	74.2	74.2	75.3	75.3	75.3	76.3	76.3	76.3
90.0	76.3	75.8	76.8	76.8	76.8	77.3	76.8	77.3
112.5	77.3	76.3	77.3	77.8	77.8	77.3	77.3	76.8
135.0	76.8	77.8	76.8	77.8	76.8	77.8	78.8	78.8
157.5	78.3	77.8	78.3	77.3	77.8	77.8	77.8	77.3
180.0	76.8	77.3	77.8	78.3	77.8	77.3	76.8	76.3
202.5	76.3	76.3	76.3	76.8	76.8	76.3	76.3	76.3
225.0	76.8	76.8	76.8	77.3	76.8	76.8	75.8	75.3
247.5	74.2	74.2	73.7	73.7	73.2	73.7	73.2	73.2
270.0	73.2	72.7	72.2	71.7	71.2	71.7	72.2	72.7
292.5	72.2	72.7	72.2	71.7	72.2	72.2	71.7	71.7
315.0	71.7	71.7	72.2	72.2	71.7	71.7	71.7	71.2
337.5	71.7	71.2	71.7	71.2	72.2	73.2	73.7	72.7

Depth: 1014 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	69.7	68.7	69.2	68.2	68.2	67.2	66.7	67.2
22.5	66.7	67.7	67.2	67.2	67.7	68.2	68.7	69.7
45.0	68.7	69.2	69.7	68.7	68.7	69.2	69.7	70.2
67.5	70.2	70.2	70.2	69.7	70.2	71.2	70.2	71.2
90.0	72.2	73.2	73.2	73.7	73.7	73.7	73.7	72.7
112.5	72.2	72.2	72.7	73.2	73.7	73.7	74.2	74.2
135.0	74.2	73.7	74.7	74.2	74.7	74.7	74.7	74.7
157.5	74.7	74.7	74.7	73.7	73.7	74.7	74.2	73.2
180.0	73.2	73.2	73.2	72.7	72.7	72.2	71.7	70.7
202.5	70.2	69.7	70.2	70.7	71.7	70.7	71.7	72.2
225.0	72.2	72.7	72.2	72.7	71.7	71.2	70.7	69.7
247.5	70.2	70.2	70.2	70.2	70.7	69.7	69.2	69.7
270.0	69.2	68.2	68.2	68.2	68.2	67.7	68.2	68.7
292.5	69.2	69.2	69.2	69.2	69.7	69.2	69.2	68.7
315.0	67.7	68.7	68.2	68.2	69.2	68.2	68.7	69.2
337.5	69.2	68.7	68.7	68.2	68.2	68.2	69.2	69.2

Depth: 1016 Tilt: 0 Range: 119.7 VOS: 5977

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	67.7	66.7	64.6	63.6	64.6	64.6	65.7	66.2
22.5	67.7	67.2	67.2	67.7	68.2	68.7	68.2	68.2
45.0	68.7	68.7	69.2	68.2	67.7	68.2	69.2	69.7
67.5	69.2	69.7	69.7	69.7	69.7	69.7	69.2	69.7
90.0	69.2	68.7	68.2	68.2	67.2	67.7	67.7	67.2
112.5	67.7	66.7	66.7	66.7	66.2	66.7	67.7	68.2
135.0	67.7	67.7	67.7	66.2	66.7	67.2	67.7	67.2
157.5	67.2	66.7	67.7	68.2	67.7	68.7	69.7	70.2
180.0	69.7	69.2	69.7	70.2	70.7	70.2	70.2	69.7
202.5	69.7	70.2	69.7	69.7	69.7	69.2	68.7	68.7
225.0	69.2	69.2	68.7	67.7	67.7	67.2	66.2	65.7
247.5	66.2	65.2	64.1	65.2	64.6	66.2	66.7	66.2
270.0	65.7	66.2	66.7	66.7	67.2	66.2	65.7	65.2
292.5	65.2	65.7	65.7	65.7	65.7	64.6	64.6	64.1
315.0	64.6	64.6	66.2	65.7	66.2	65.2	65.7	64.6
337.5	66.2	66.7	68.7	68.7	68.7	68.7	68.2	67.7

Depth: 1018 Tilt: 0 Range: 109.8 VOS: 5979

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	57.0	55.6	55.6	55.6	56.1	56.5	56.5	56.1
22.5	56.5	56.5	57.0	57.0	57.5	57.5	56.5	55.6
45.0	56.5	57.5	57.5	57.9	58.4	57.9	58.4	58.4
67.5	58.4	57.9	57.5	58.4	59.8	60.2	60.2	61.2
90.0	61.2	62.1	62.1	62.6	62.6	62.6	62.6	62.1
112.5	62.1	63.0	63.0	63.5	63.5	63.5	63.0	62.6
135.0	62.1	62.1	62.6	62.1	62.1	61.6	61.6	62.1
157.5	62.1	62.6	62.6	62.6	62.6	61.6	60.7	61.6
180.0	61.2	61.6	62.6	63.5	63.5	63.0	63.5	62.6
202.5	62.6	62.1	62.6	62.1	61.6	61.6	61.6	61.6
225.0	61.6	61.6	61.6	61.6	62.1	61.6	61.2	61.6
247.5	60.7	59.3	58.8	58.4	57.5	56.5	56.5	56.5
270.0	55.6	55.6	55.1	56.1	56.5	56.5	57.0	57.5
292.5	57.0	56.5	57.5	57.5	57.0	56.1	55.1	55.6
315.0	56.1	55.6	56.5	56.5	56.1	57.0	57.5	57.0
337.5	57.9	58.4	59.3	59.3	59.3	59.3	58.8	58.4

Depth: 1020 Tilt: 0 Range: 109.8 VOS: 5979

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	56.1	56.5	57.0	57.0	57.5	57.9	57.9	58.4
22.5	58.4	57.9	57.5	57.0	57.0	57.0	57.0	57.0
45.0	57.5	57.9	57.9	57.9	57.5	56.5	56.5	57.0
67.5	56.5	56.5	56.1	55.6	56.1	56.1	57.5	57.9
90.0	58.4	57.9	57.0	56.5	56.1	56.1	56.1	56.5
112.5	56.5	56.5	56.5	56.5	56.5	56.5	56.1	56.5
135.0	56.5	57.0	57.5	57.9	59.8	59.8	60.7	61.2
157.5	61.2	60.7	60.7	61.2	61.6	61.2	60.7	60.7
180.0	61.6	60.7	61.6	61.6	62.1	61.2	60.7	60.2
202.5	60.2	59.8	59.3	58.8	58.8	59.3	59.3	59.3
225.0	58.8	58.4	58.4	58.8	58.8	59.8	60.2	59.8
247.5	59.8	59.8	59.8	59.8	59.3	58.8	58.4	57.5
270.0	57.5	57.5	58.4	58.4	59.3	59.3	58.8	59.3
292.5	59.3	59.3	58.8	57.9	57.9	57.5	57.9	57.5
315.0	57.5	57.5	57.5	57.0	57.0	56.1	55.6	56.1
337.5	56.1	56.1	55.6	56.1	56.1	56.1	56.1	56.1

Depth: 1022 Tilt: 0 Range: 109.8 VOS: 5979

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	59.8	59.8	60.2	60.7	60.2	60.2	60.7	60.2
22.5	59.8	60.2	60.7	61.2	61.2	60.2	60.2	61.2
45.0	61.6	61.2	61.2	61.2	61.2	61.6	60.7	61.2
67.5	61.2	61.6	61.6	61.2	61.6	60.2	60.2	59.3
90.0	58.8	58.8	57.9	57.9	57.5	57.9	57.9	57.5
112.5	58.4	58.4	58.4	58.8	59.3	59.3	58.8	58.8
135.0	58.4	58.8	59.3	59.3	59.3	59.3	58.8	57.9
157.5	57.9	57.5	58.4	58.4	59.8	60.7	61.2	60.2
180.0	60.7	61.6	62.1	61.2	62.6	63.5	64.4	63.9
202.5	63.9	63.0	62.6	61.6	61.6	61.6	62.1	63.0
225.0	62.6	62.6	62.1	63.0	62.6	63.0	62.1	63.0
247.5	62.6	62.6	63.5	63.5	63.9	63.5	63.5	62.6
270.0	63.0	63.0	63.5	63.0	62.6	62.1	62.6	62.6
292.5	62.1	62.1	62.6	62.1	61.2	61.6	61.6	62.1
315.0	62.6	63.0	63.0	62.6	63.0	62.1	62.1	62.1
337.5	62.6	62.6	61.6	61.2	60.7	60.2	60.2	59.8

Depth: 1024 Tilt: 0 Range: 109.8 VOS: 5979

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	57.5	57.5	57.9	57.0	56.5	56.5	57.0	57.5
22.5	57.9	57.5	57.0	58.4	57.5	56.5	57.5	57.9
45.0	57.5	58.4	57.9	58.8	58.4	58.4	57.9	58.8
67.5	58.4	58.4	57.5	56.1	56.1	57.0	57.0	57.0
90.0	56.1	56.5	56.1	55.6	55.1	54.2	54.2	55.1
112.5	55.1	55.6	56.1	55.6	56.1	56.1	55.6	56.5
135.0	56.1	55.6	56.5	56.1	56.5	57.5	57.0	56.5
157.5	56.1	55.6	55.6	55.6	56.1	56.5	56.1	54.7
180.0	54.7	55.6	57.0	57.5	57.0	57.9	58.4	58.4
202.5	58.8	58.4	57.9	57.0	56.5	56.1	56.5	57.0
225.0	57.0	56.5	57.5	58.8	59.8	59.8	59.3	58.8
247.5	58.4	58.4	57.9	58.8	59.3	58.8	59.8	60.7
270.0	61.2	60.7	61.2	61.2	60.7	60.7	59.8	58.8
292.5	59.8	59.8	59.8	59.3	58.4	57.9	57.9	58.4
315.0	59.3	60.2	59.3	59.8	59.3	59.3	59.3	58.8
337.5	58.4	58.8	59.3	58.4	57.9	57.9	57.0	57.5

Depth: 1026 Tilt: 0 Range: 109.8 VOS: 5979

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	52.4	51.9	52.4	51.9	52.4	53.3	54.2	53.8
22.5	53.3	52.8	53.3	52.8	52.4	51.9	51.9	51.4
45.0	51.4	52.8	53.8	52.8	51.9	52.8	53.3	54.2
67.5	54.2	54.2	55.1	53.3	54.7	54.7	54.7	55.6
90.0	55.6	56.1	56.5	56.5	56.5	56.1	56.5	55.6
112.5	55.1	55.1	55.6	56.5	56.1	55.6	54.7	53.8
135.0	54.7	54.2	52.8	53.3	52.8	52.4	53.3	54.7
157.5	55.1	55.6	55.1	54.2	54.2	54.7	54.2	54.7
180.0	54.2	54.2	53.3	53.3	53.3	53.8	53.3	52.8
202.5	52.8	52.8	53.3	53.3	53.8	53.8	53.8	54.2
225.0	53.8	53.8	54.2	54.7	54.7	54.2	53.8	53.8
247.5	53.8	53.3	53.8	54.2	53.8	53.8	54.7	54.7
270.0	54.2	54.2	54.7	53.8	52.8	51.9	52.4	51.9
292.5	52.4	51.9	51.9	52.4	53.3	53.8	53.8	53.3
315.0	52.8	53.3	52.8	52.4	53.3	53.3	52.8	52.4
337.5	52.4	53.3	52.8	52.4	52.4	51.4	52.4	52.8

Depth: 1028 Tilt: 0 Range: 99.9 VOS: 5981

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	51.0	51.4	51.0	51.0	51.0	51.4	51.0	50.6
22.5	50.6	50.6	50.2	50.2	49.3	49.3	49.8	49.3
45.0	50.2	50.2	50.2	50.6	50.6	51.0	50.6	51.0
67.5	51.0	50.6	50.6	50.2	50.6	49.8	49.3	49.3
90.0	49.3	49.3	49.3	48.5	48.1	47.6	48.1	48.1
112.5	48.9	48.9	49.3	49.3	49.3	49.3	49.3	49.8
135.0	48.9	48.1	48.5	48.1	48.5	49.3	48.5	48.1
157.5	49.3	48.9	48.9	48.1	47.6	48.1	48.5	48.1
180.0	47.6	47.6	48.1	48.1	47.2	47.2	46.8	46.0
202.5	45.5	46.0	46.4	46.4	46.4	46.4	44.7	44.3
225.0	44.3	43.9	44.3	43.9	43.9	43.9	43.4	43.9
247.5	44.7	45.5	45.5	47.2	47.6	48.5	49.3	49.3
270.0	50.6	51.9	51.9	52.7	52.3	52.7	52.7	52.3
292.5	52.7	52.3	52.3	51.9	51.4	51.0	51.4	51.4
315.0	51.9	52.3	51.9	51.9	52.3	51.4	51.0	51.4
337.5	51.4	51.9	51.0	51.0	51.4	51.9	51.4	51.4

Depth: 1030 Tilt: 0 Range: 99.9 VOS: 5981

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	48.5	48.5	48.1	47.6	47.6	47.2	47.6	46.8
22.5	46.8	46.4	46.8	46.8	46.4	46.0	46.0	45.5
45.0	44.7	44.7	43.9	42.6	43.4	43.0	43.9	43.4
67.5	44.3	45.1	46.0	46.4	46.0	46.4	46.8	46.8
90.0	47.2	48.1	48.1	46.8	47.2	47.2	46.0	44.7
112.5	45.1	44.7	44.3	43.9	44.3	45.1	44.7	44.7
135.0	45.1	45.5	45.5	44.7	45.1	43.9	43.9	42.6
157.5	42.6	43.4	43.4	43.0	42.6	43.0	43.9	44.7
180.0	44.3	44.3	44.3	43.9	43.9	44.3	43.4	42.6
202.5	41.7	40.9	40.5	39.6	38.8	37.5	37.1	36.3
225.0	36.7	36.7	37.1	37.9	38.8	39.6	39.2	40.1
247.5	40.5	40.5	40.5	40.1	40.5	42.2	43.4	43.9
270.0	44.3	45.1	45.1	45.1	44.3	44.3	44.7	45.5
292.5	44.7	45.1	44.7	43.9	43.4	43.4	42.2	42.6
315.0	43.0	43.4	44.3	44.7	45.5	46.4	46.4	46.4
337.5	46.4	46.4	47.2	47.2	47.6	48.1	48.1	48.5

Depth: 1032 Tilt: 0 Range: 99.9 VOS: 5981

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	44.7	44.7	44.7	44.7	44.3	44.3	43.9	44.3
22.5	44.3	44.3	44.3	43.9	43.9	44.3	45.1	44.3
45.0	44.7	45.1	45.1	44.7	44.3	44.7	45.1	46.0
67.5	46.0	46.0	46.0	45.1	45.1	45.5	45.1	44.7
90.0	44.3	44.3	43.9	43.9	43.4	42.6	42.6	41.7
112.5	41.3	41.3	40.9	40.5	40.9	40.9	40.1	40.5
135.0	39.6	39.2	39.2	38.8	39.2	37.5	37.5	37.9
157.5	38.4	37.9	37.5	37.5	37.1	37.1	37.1	36.3
180.0	35.4	35.0	34.6	35.8	35.8	35.4	35.8	35.4
202.5	35.0	35.4	35.0	35.0	34.6	34.2	34.2	34.6
225.0	34.6	34.6	34.2	33.7	34.2	34.2	33.7	33.7
247.5	34.6	34.6	35.4	35.8	35.8	36.3	37.5	38.4
270.0	38.8	40.1	40.9	41.3	41.3	42.2	42.2	42.6
292.5	42.2	41.7	41.7	42.2	41.7	42.6	43.0	43.9
315.0	44.7	45.1	45.5	45.5	46.0	46.0	46.0	46.4
337.5	45.5	45.1	44.3	44.3	43.9	43.9	44.7	44.7

Depth: 1034 Tilt: 0 Range: 79.4 VOS: 5981

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	32.8	33.2	33.2	33.2	33.2	33.2	33.5	33.5
22.5	33.2	33.5	33.2	32.5	32.2	31.8	32.2	32.8
45.0	33.2	33.5	33.8	34.2	33.8	34.2	34.5	33.5
67.5	33.2	33.5	33.5	33.2	33.2	32.8	33.8	33.8
90.0	33.5	32.8	33.2	33.5	33.5	33.2	32.2	31.1
112.5	30.8	31.1	30.5	30.8	30.5	31.1	31.5	31.5
135.0	31.5	31.1	31.1	30.5	30.1	30.1	30.1	30.5
157.5	30.1	30.1	30.1	29.8	29.5	29.1	29.1	28.8
180.0	29.1	28.1	27.8	27.1	26.1	26.1	26.1	25.1
202.5	25.1	24.5	24.5	24.1	23.4	23.4	23.4	22.8
225.0	23.4	23.4	23.4	23.4	23.4	22.8	22.8	22.4
247.5	22.4	22.4	22.4	22.8	23.4	23.4	24.1	24.1
270.0	24.1	24.1	23.4	24.5	24.5	24.5	24.5	25.1
292.5	25.1	25.5	25.5	26.1	26.8	27.8	28.1	28.8
315.0	28.8	28.8	29.5	30.1	30.8	31.5	31.8	31.8
337.5	31.8	31.5	31.8	31.8	32.2	32.2	32.2	32.5

Depth: 1036 Tilt: 0 Range: 79.4 VOS: 5981

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	33.2	32.8	33.2	33.5	33.5	33.5	33.5	32.8
22.5	31.8	31.5	31.8	31.8	32.2	32.5	32.8	33.5
45.0	33.5	33.5	33.5	33.2	32.8	32.5	32.5	32.5
67.5	32.5	32.5	32.5	32.2	31.5	31.1	31.8	31.8
90.0	31.8	31.1	31.1	31.1	31.1	30.5	30.5	30.1
112.5	30.1	30.1	30.5	30.1	29.8	29.5	28.8	28.1
135.0	28.1	28.1	28.1	28.1	27.5	27.5	27.5	27.5
157.5	27.1	27.1	26.5	25.5	25.5	25.5	25.5	25.5
180.0	25.1	24.5	23.4	23.4	23.4	22.8	22.8	22.4
202.5	22.4	22.4	22.4	21.8	21.8	21.8	22.4	22.4
225.0	22.4	22.4	22.4	21.8	21.8	21.8	21.8	22.4
247.5	22.4	22.4	22.4	22.8	23.4	23.4	23.4	23.4
270.0	23.4	24.5	24.5	24.5	24.5	24.5	25.1	25.5
292.5	25.5	26.1	27.1	27.1	27.5	28.1	29.1	29.5
315.0	29.8	30.8	31.1	31.5	31.1	30.8	31.1	31.5
337.5	31.8	31.8	32.2	32.5	32.5	32.8	33.2	33.2

Depth: 1038 Tilt: 0 Range: 59.6 VOS: 5984

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	14.8	14.8	14.6	15.1	15.1	14.6	15.1	15.3
22.5	15.3	15.1	15.3	15.6	15.6	15.6	15.3	15.3
45.0	15.3	15.3	15.3	15.1	15.6	15.6	15.6	15.3
67.5	15.8	16.3	16.6	16.3	16.6	16.6	16.3	16.6
90.0	17.1	17.1	17.1	17.6	17.6	17.6	18.1	17.6
112.5	17.6	17.6	17.1	17.6	17.1	17.6	17.6	17.1
135.0	17.1	17.6	17.6	17.6	18.6	18.6	19.1	19.1
157.5	20.1	20.1	20.6	20.6	21.4	22.4	26.4	27.4
180.0	27.9	28.9	30.9	30.9	30.7	30.7	30.7	31.2
202.5	31.2	31.2	31.4	31.4	31.2	31.2	31.2	30.9
225.0	30.9	30.2	29.7	28.9	26.9	21.1	19.6	17.1
247.5	16.3	15.6	15.1	14.8	14.6	14.3	14.1	13.8
270.0	14.1	14.3	14.6	14.8	15.1	15.3	15.1	15.3
292.5	15.3	15.1	14.6	14.3	14.6	14.3	14.6	14.3
315.0	14.6	14.6	14.6	14.3	14.8	14.6	14.8	14.6
337.5	14.6	14.8	14.6	14.8	14.6	14.6	14.8	14.6

Depth: 1040 Tilt: 0 Range: 59.5 VOS: 5981

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	13.3	12.8	13.3	12.8	13.3	12.8	12.8	12.3
22.5	12.3	11.8	11.6	11.3	11.3	10.8	10.3	9.8
45.0	9.8	9.8	9.8	9.5	9.5	9.5	9.5	9.8
67.5	10.0	10.0	9.8	10.0	10.0	10.0	10.3	10.6
90.0	10.6	10.8	11.1	11.1	11.3	11.3	11.3	11.8
112.5	12.1	12.1	12.3	12.3	12.1	12.1	12.3	12.8
135.0	12.8	12.8	13.3	13.3	13.3	13.8	13.8	13.3
157.5	13.8	13.8	14.3	14.3	14.8	15.3	15.6	15.6
180.0	15.8	17.1	27.1	29.1	29.6	29.6	29.4	29.9
202.5	29.9	30.1	30.1	30.4	30.4	29.9	29.9	29.9
225.0	30.4	29.9	29.6	28.4	13.8	13.3	13.3	12.3
247.5	12.8	12.8	13.3	13.3	13.3	12.8	13.3	13.8
270.0	13.8	13.8	13.3	12.8	12.8	13.3	13.3	12.8
292.5	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
315.0	13.3	13.3	13.3	13.3	13.3	13.3	13.3	12.8
337.5	13.3	12.8	12.8	12.8	13.3	12.8	13.3	12.8

Depth: 1042 Tilt: 0 Range: 39.7 VOS: 5984

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	2.7	2.7	2.8	3.0	3.0	2.8	3.0	3.0
22.5	3.0	2.7	2.8	3.0	2.8	2.8	2.8	2.7
45.0	2.8	2.8	2.8	2.8	2.7	2.8	2.7	2.8
67.5	2.8	2.8	3.0	3.0	2.8	3.0	2.8	3.0
90.0	3.2	3.2	3.4	3.2	3.4	3.2	3.2	3.0
112.5	3.2	3.0	3.0	2.8	2.8	2.8	3.0	2.8
135.0	2.8	2.8	2.7	2.5	2.8	2.8	2.7	2.8
157.5	2.8	2.5	2.7	2.8	2.8	2.8	2.7	2.8
180.0	2.7	2.8	2.8	2.8	2.8	2.7	2.5	2.7
202.5	2.5	2.5	2.5	2.3	2.7	2.5	2.7	2.7
225.0	2.5	2.5	2.5	2.5	2.7	2.5	2.5	2.7
247.5	2.7	2.5	2.7	2.5	2.5	2.5	2.5	2.7
270.0	2.7	2.7	2.5	2.5	2.5	2.7	2.7	2.5
292.5	2.5	2.5	2.7	2.7	2.7	2.5	2.5	2.7
315.0	2.5	2.5	2.5	2.7	2.5	2.5	2.7	2.5
337.5	2.5	2.7	2.7	2.7	2.7	2.8	2.7	2.7

Depth: 1042 Tilt: -90 Range: 39.7 VOS: 5984

Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7
0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
22.5	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.5
45.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
67.5	2.5	2.3	2.5	2.5	2.3	2.5	2.7	2.5
90.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
112.5	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.5
135.0	2.7	2.7	2.5	2.7	2.7	2.7	2.7	2.8
157.5	2.7	2.7	2.7	2.7	2.5	2.7	2.7	2.5
180.0	2.5	2.5	2.5	2.7	2.5	2.5	2.5	2.7
202.5	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.5
225.0	2.5	2.7	2.7	2.7	2.7	2.7	2.7	2.7
247.5	2.7	2.7	2.7	2.7	2.5	2.5	2.5	2.5
270.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
292.5	2.7	2.5	2.5	2.5	2.5	2.5	2.7	2.5
315.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
337.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

SONAR SURVEY

MICRO GAGE, INC.

FERRELLGAS
WELL NO. 10 P/N 671
MARCH 3, 1989
ADAMANA FIELD HOLBROOK, ARIZONA

CUSTOMER REP : DAVE JONES
JOB NO: 61
SONAR OPERATOR: J. CHILDRESS
HOIST OPERATOR: J. CHILDRESS

WELL DATA:
PERMANENT DATUM: D.H.F.
ZERO: D.H.F.
CASING DIA: 9-5/8"
CASING DEPTH: 936'
INTERMEDIATE DIA : 7"
INTERMEDIATE DEPTH : OUT FOR SONAR
TUBING DIA : 4 1/2"
TUBING DEPTH : OUT FOR SONAR
CUSTOMER T.D. 1046'
SONAR T.D. 1043'

VOLUME REPORT

DEPTH feet	DEPTH meters	INCR ft³	TOTAL ft³	INCR m³	TOTAL m³	INCR bbls	TOTAL bbls
938	285.9	0	0	0.0	0	0.0	0
942	287.1	0	0	.0	0	.0	0
946	288.3	2	2	.0	0	.3	0
948	288.9	1	4	.0	0	.1	0
950	289.5	2	7	.0	0	.3	1
960	292.6	21	28	.5	0	3.7	4
974	296.8	38	66	1.0	1	6.7	11
976	297.4	7	74	.1	2	1.2	13
978	298.0	4867	4942	137.8	139	866.8	880
979	298.3	10248	15190	290.2	430	1825.1	2705
980	298.7	14315	29505	405.4	835	2549.5	5254
981	299.0	14616	44121	413.9	1249	2603.1	7857
983	299.6	30741	74862	870.5	2120	5474.9	13332
984	299.9	19094	93956	540.7	2660	3400.6	16733
986	300.5	46087	140044	1305.1	3966	8208.0	24941
988	301.1	46306	186350	1311.3	5277	8247.0	33188
990	301.7	46409	232759	1314.3	6591	8265.4	41454
992	302.3	46148	278908	1306.9	7898	8218.9	49673
994	302.9	45110	324018	1277.5	9176	8034.0	57707
996	303.5	44333	368352	1255.5	10431	7895.7	65603
998	304.1	44814	413166	1269.1	11700	7981.3	73584
1000	304.8	45317	458483	1283.3	12984	8070.9	81655
1002	305.4	44825	503309	1269.4	14253	7983.3	89639
1004	306.0	43468	546778	1231.0	15484	7741.6	97381
1006	306.6	42373	589151	1200.0	16684	7546.6	104927
1008	307.2	40764	629915	1154.4	17839	7260.0	112187
1010	307.8	37476	667392	1061.3	18900	6674.4	118862
1012	308.4	33243	700636	941.4	19842	5920.5	124783
1014	309.0	28953	729589	819.9	20661	5156.5	129939
1016	309.6	25413	755002	719.6	21381	4526.0	134465
1018	310.2	22157	777160	627.4	22009	3946.1	138412
1020	310.8	22686	799846	642.4	22651	4040.3	142452
1022	311.5	23896	823743	676.7	23328	4255.8	146708
1024	312.1	21370	845113	605.1	23933	3805.9	150514
1026	312.7	18402	863516	521.1	24454	3277.3	153792
1028	313.3	15676	879192	443.9	24898	2791.8	156584
1032	314.5	23389	902581	662.3	25561	4165.5	160749
1036	315.7	14406	916988	407.9	25969	2565.7	163315
1038	316.3	4071	921059	115.2	26084	725.0	164040
1040	316.9	2246	923306	63.6	26148	400.0	164440
1042	317.6	710	924017	20.1	26168	126.4	164567

VOLUME REPORT

DEPTH feet	DEPTH meters	INCR ft³	TOTAL ft³	INCR m³	TOTAL m³	INCR bbls	TOTAL bbls
938	285.9	0	0	0.0	0	0.0	0
939	286.2	0	0	.0	0	.0	0
940	286.5	0	0	.0	0	.0	0
941	286.8	0	0	.0	0	.0	0
942	287.1	0	0	.0	0	.0	0
943	287.4	0	0	.0	0	.0	0
944	287.7	0	1	.0	0	.0	0
945	288.0	0	1	.0	0	.0	0
946	288.3	0	2	.0	0	.0	0
947	288.6	0	3	.0	0	.0	0
948	288.9	0	4	.0	0	.0	0
949	289.2	1	5	.0	0	.1	0
950	289.5	1	7	.0	0	.1	1
951	289.8	2	9	.0	0	.3	1
952	290.1	2	11	.0	0	.3	1
953	290.4	2	13	.0	0	.3	2
954	290.7	2	16	.0	0	.3	2
955	291.0	2	18	.0	0	.3	3
956	291.3	2	20	.0	0	.3	3
957	291.6	2	22	.0	0	.3	3
958	291.9	2	24	.0	0	.3	4
959	292.3	1	26	.0	0	.1	4
960	292.6	1	28	.0	0	.1	4
961	292.9	1	30	.0	0	.1	5
962	293.2	2	32	.0	0	.3	5
963	293.5	2	34	.0	0	.3	6
964	293.8	2	36	.0	1	.3	6
965	294.1	2	38	.0	1	.3	6
966	294.4	2	41	.0	1	.3	7
967	294.7	2	43	.0	1	.3	7
968	295.0	2	46	.0	1	.3	8
969	295.3	3	49	.0	1	.5	8
970	295.6	3	52	.0	1	.5	9
971	295.9	3	55	.0	1	.5	9
972	296.2	3	59	.0	1	.5	10
973	296.5	3	62	.0	1	.5	11
974	296.8	3	66	.0	1	.5	11
975	297.1	3	70	.0	1	.5	12
976	297.4	3	74	.0	2	.5	13
977	297.7	654	729	18.5	20	116.4	129
978	298.0	4212	4942	119.2	139	750.1	880
979	298.3	10248	15190	290.2	430	1825.1	2705
980	298.7	14315	29505	405.4	835	2549.5	5254
981	299.0	14616	44121	413.9	1249	2603.1	7857
982	299.3	15098	59219	427.5	1677	2688.9	10546
983	299.6	15643	74862	443.0	2120	2786.0	13332
984	299.9	19094	93956	540.7	2660	3400.6	16733
985	300.2	23021	116978	651.9	3312	4100.0	20833
986	300.5	23065	140044	653.2	3966	4107.8	24941
987	300.8	23120	163164	654.7	4620	4117.6	29059
988	301.1	23186	186350	656.6	5277	4129.4	33188
989	301.4	23212	209563	657.3	5934	4134.0	37323
990	301.7	23196	232759	656.9	6591	4131.2	41454
991	302.0	23130	255890	655.0	7246	4119.4	45574

VOLUME REPORT

DEPTH feet	DEPTH meters	INCR ft^3	TOTAL ft^3	INCR m^3	TOTAL m^3	INCR bbls	TOTAL bbls
992	302.3	23018	278908	651.8	7898	4099.5	49673
993	302.6	22755	301664	644.4	8543	4052.6	53726
994	302.9	22354	324018	633.0	9176	3981.2	57707
995	303.2	22160	346178	627.5	9803	3946.6	61654
996	303.5	22173	368352	627.9	10431	3949.0	65603
997	303.8	22294	390647	631.3	11063	3970.5	69574
998	304.1	22519	413166	637.7	11700	4010.6	73584
999	304.4	22644	435811	641.2	12342	4032.8	77617
1000	304.8	22672	458483	642.0	12984	4037.8	81655
1001	305.1	22546	481029	638.5	13622	4015.4	85671
1002	305.4	22279	503309	630.9	14253	3967.8	89639
1003	305.7	21932	525241	621.1	14874	3906.0	93545
1004	306.0	21536	546778	609.8	15484	3835.5	97381
1005	306.3	21245	568023	601.6	16086	3783.7	101164
1006	306.6	21127	589151	598.3	16684	3762.7	104927
1007	306.9	20752	609903	587.6	17272	3695.9	108623
1008	307.2	20012	629915	566.7	17839	3564.1	112187
1009	307.5	19188	649104	543.4	18382	3417.3	115605
1010	307.8	18288	667392	517.9	18900	3257.0	118862
1011	308.1	17225	684617	487.8	19388	3067.7	121930
1012	308.4	16018	700636	453.6	19842	2852.8	124783
1013	308.7	14948	715584	423.3	20265	2662.2	127445
1014	309.0	14005	729589	396.6	20661	2494.2	129939
1015	309.3	13119	742709	371.5	21033	2336.4	132276
1016	309.6	12293	755002	348.1	21381	2189.3	134465
1017	309.9	11477	766480	325.0	21706	2044.0	136510
1018	310.2	10679	777160	302.4	22009	1901.9	138412
1019	310.5	10806	787966	306.0	22315	1924.5	140336
1020	310.8	11879	799846	336.4	22651	2115.6	142452
1021	311.2	12191	812038	345.2	22996	2171.2	144623
1022	311.5	11705	823743	331.4	23328	2084.6	146708
1023	311.8	11069	834813	313.4	23641	1971.3	148680
1024	312.1	10300	845113	291.6	23933	1834.4	150514
1025	312.4	9556	854670	270.6	24204	1701.9	152216
1026	312.7	8845	863516	250.4	24454	1575.2	153792
1027	313.0	8165	871681	231.2	24686	1454.1	155246
1028	313.3	7510	879192	212.6	24898	1337.5	156584
1029	313.6	6831	886024	193.4	25092	1216.6	157800
1030	313.9	6141	892165	173.9	25266	1093.7	158894
1031	314.2	5502	897667	155.8	25421	979.9	159874
1032	314.5	4914	902581	139.1	25561	875.1	160749
1033	314.8	4347	906929	123.1	25684	774.2	161524
1034	315.1	3811	910740	107.9	25792	678.7	162202
1035	315.4	3333	914074	94.3	25886	593.6	162796
1036	315.7	2914	916988	82.5	25969	518.9	163315
1037	316.0	2354	919343	66.6	26035	419.2	163734
1038	316.3	1716	921059	48.5	26084	305.6	164040
1039	316.6	1273	922333	36.0	26120	226.7	164267
1040	316.9	973	923306	27.5	26148	173.2	164440
1041	317.2	554	923860	15.6	26163	98.6	164539
1042	317.6	156	924017	4.4	26168	27.7	164567

MAJOR COMPASS RADII

Depth & Radii in feet

DEPTH	TILT	N	NE	E	SE	S	SW	W	NW
938	90	.6	.6	.6	.6	.6	.6	.6	.6
942	90	.7	.4	.8	.4	.4	.5	.6	.6
946	90	.6	.6	.6	.9	.9	.7	.5	.6
948	90	.5	.6	.5	1.0	.9	.6	.4	.5
950	90	.6	1.3	1.4	1.3	.9	.7	.6	.6
960	90	.6	.8	1.1	1.3	1.2	.8	.6	.7
974	90	.9	1.0	1.5	1.7	1.5	1.0	.9	.6
976	90	.9	1.1	1.4	1.7	1.5	1.0	.9	.6
978	90	36.2	44.0	48.8	43.3	39.4	80.7	51.5	37.1
979	90	36.3	44.2	89.9	93.7	95.2	75.3	51.9	37.4
980	90	34.0	42.4	87.6	93.4	95.8	71.9	52.6	37.1
981	90	33.5	42.3	88.3	93.1	95.0	77.1	54.0	38.8
983	90	34.5	44.5	88.6	92.9	94.4	85.1	54.5	36.7
984	90	82.0	79.9	87.0	93.4	95.5	87.4	78.8	77.1
986	90	80.9	81.4	86.5	94.6	96.6	86.6	80.5	76.9
988	90	81.3	82.3	87.9	95.8	98.2	82.3	79.5	78.1
990	90	81.0	83.3	88.2	97.6	99.3	82.0	79.2	77.3
992	90	80.5	78.9	88.8	97.3	97.8	87.0	78.3	75.5
994	90	80.0	80.4	89.5	91.4	90.1	86.7	78.1	73.5
996	90	82.2	83.0	91.5	85.9	85.8	83.3	80.0	70.7
998	90	82.1	84.6	91.3	87.5	88.8	84.5	81.8	74.2
1000	90	79.3	84.9	91.2	91.5	93.9	85.7	82.4	66.2
1002	90	78.8	84.6	91.3	91.8	91.8	84.9	69.2	59.7
1004	90	76.8	81.3	91.3	89.1	88.9	86.3	70.6	59.6
1006	90	84.1	85.6	80.2	78.1	81.2	81.0	82.5	82.3
1008	90	84.1	83.3	75.5	76.2	80.4	76.4	80.7	82.1
1010	90	82.5	75.4	71.9	71.8	77.0	72.7	77.3	80.2
1012	90	71.3	67.6	68.3	69.3	71.7	66.4	73.2	71.3
1014	90	68.2	64.6	63.7	65.4	67.6	64.3	66.7	65.7
1016	90	62.5	60.5	59.8	63.9	62.5	58.1	63.8	63.1
1018	90	59.2	57.1	56.9	60.8	56.7	54.0	60.3	59.1
1020	90	63.7	61.6	61.2	61.0	65.7	61.6	63.6	65.1
1022	90	63.4	59.4	59.2	57.9	59.3	59.2	63.6	62.0
1024	90	58.2	55.9	56.3	57.1	59.3	54.5	55.7	55.3
1026	90	55.7	45.2	53.3	53.3	55.9	51.9	51.8	55.7
1028	90	50.7	43.2	51.1	51.1	51.7	44.6	42.9	49.4
1032	90	43.5	36.4	37.4	32.4	36.1	33.8	40.0	45.5
1036	90	25.1	20.1	23.7	20.8	30.9	37.1	38.4	30.2
1038	90	16.3	16.1	17.0	15.1	25.8	33.2	17.1	25.7
1040	90	10.3	12.1	11.9	12.5	21.8	16.7	15.9	14.6
1042	90	4.9	5.8	3.5	2.8	2.8	2.9	2.9	2.9

5 DEGREE RADII REPORT

Radii in feet

AZ DEPTH: 938 ft TILT: 90 degrees

0	.6	.6	.6	.6	.6	.6	.6	.6	.6
45	.6	.6	.6	.6	.6	.6	.6	.6	.6
90	.6	.6	.6	.6	.6	.6	.6	.6	.6
135	.6	.6	.6	.6	.6	.6	.6	.6	.6
180	.6	.6	.6	.6	.6	.6	.6	.6	.6
225	.6	.6	.6	.6	.6	.6	.6	.6	.6
270	.6	.6	.6	.6	.6	.6	.6	.6	.6
315	.6	.6	.6	.6	.6	.6	.6	.6	.6

AZ DEPTH: 942 ft TILT: 90 degrees

0	.7	.7	.7	.9	.9	.9	.9	.9	.6
45	.4	.6	.5	.6	.5	.9	.6	.4	.7
90	.8	.6	.4	.6	.4	.4	.4	.4	.6
135	.4	.6	.4	.4	.4	.4	.5	.4	.4
180	.4	.4	.4	.5	.5	.5	.5	.5	.5
225	.5	.4	.5	.4	.4	.4	.5	.5	.6
270	.6	.6	.6	.6	.6	.6	.6	.6	.6
315	.6	.6	.6	.6	.6	.6	.7	.7	.7

AZ DEPTH: 946 ft TILT: 90 degrees

0	.6	.7	.6	.6	.7	.6	.7	.6	.8
45	.6	.9	.8	.9	.9	.8	.9	.9	.7
90	.6	.9	1.0	.9	.9	.9	.9	.9	.9
135	.9	1.0	.9	1.0	1.0	1.0	.7	.9	.9
180	.9	.5	.9	.7	.8	.9	.7	.7	.7
225	.7	.6	.6	.5	.6	.6	.6	.7	.6
270	.5	.6	.6	.6	.6	.6	.5	.5	.6
315	.6	.5	.6	.6	.5	.6	.5	.5	.6

AZ DEPTH: 948 ft TILT: 90 degrees

0	.5	.5	.6	.5	.6	.6	.4	.6	.7
45	.6	.6	.7	.8	.7	.8	.6	.9	.9
90	.5	.9	.8	.9	1.0	1.0	.8	.9	.7
135	1.0	.9	.9	.6	.7	.8	.8	.8	.8
180	.9	.6	.6	.6	.7	.6	.6	.6	.5
225	.6	.5	.6	.6	.5	.4	.4	.5	.5
270	.4	.4	.4	.5	.5	.5	.4	.4	.4
315	.5	.6	.6	.5	.5	.6	.5	.5	.5

AZ DEPTH: 950 ft TILT: 90 degrees

0	.6	.6	.7	.7	.7	.8	.8	1.2	1.3
45	1.3	1.4	1.3	1.3	1.4	1.4	1.3	1.3	1.6
90	1.4	1.4	1.2	1.4	1.4	1.4	1.4	1.4	1.4
135	1.3	1.4	1.3	1.3	1.1	1.0	.9	.9	.9
180	.9	.9	.8	.8	.8	.8	.9	.8	.9
225	.7	.7	.8	.8	.6	.6	.6	.6	.5
270	.6	.6	.5	.6	.6	.6	.6	.6	.6
315	.6	.6	.6	.6	.6	.6	.6	.6	.5

5 DEGREE RADII REPORT

Radii in feet

AZ	DEPTH: 960 ft				TILT: 90 degrees				
0	.6	.6	.6	.6	.6	.7	.7	.7	.8
45	.8	.9	.9	.9	.8	.9	.9	.9	.9
90	1.1	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.3
135	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.1
180	1.2	1.1	.9	.9	.8	.9	.9	.9	.9
225	.8	.8	.8	.8	.8	.7	.6	.6	.6
270	.6	.6	.6	.6	.6	.6	.6	.6	.7
315	.7	.7	.7	.6	.6	.6	.6	.6	.6

AZ	DEPTH: 974 ft				TILT: 90 degrees				
0	.9	.9	.9	.9	1.0	1.0	1.0	1.0	1.0
45	1.0	1.2	1.1	1.2	1.3	1.3	1.3	1.4	1.5
90	1.5	1.5	1.4	1.6	1.9	1.8	1.9	1.9	1.9
135	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.3
180	1.5	1.4	1.4	1.3	1.4	1.2	1.3	1.1	1.2
225	1.0	1.1	1.0	1.0	.9	1.0	1.0	.9	.9
270	.9	.7	.7	.7	.6	.6	.6	.6	.6
315	.6	.6	.6	.6	.7	.7	.9	.9	.8

AZ	DEPTH: 976 ft				TILT: 90 degrees				
0	.9	.9	.9	.9	.9	.9	1.0	.9	1.0
45	1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.6
90	1.4	1.6	1.6	1.7	1.8	2.0	2.1	1.8	1.8
135	1.7	1.6	1.7	1.7	1.7	1.8	1.6	1.6	1.5
180	1.5	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.1
225	1.0	1.1	.9	1.0	1.0	1.0	1.0	.9	.9
270	.9	.6	.6	.7	.6	.6	.6	.6	.6
315	.6	.6	.6	.6	.6	.7	.8	.9	.9

AZ	DEPTH: 978 ft				TILT: 90 degrees				
0	36.2	36.8	37.7	38.0	37.7	37.9	38.2	39.4	42.1
45	44.0	45.3	46.0	47.3	47.1	45.5	45.3	46.7	47.6
90	48.8	51.4	50.8	49.8	48.5	48.2	47.7	47.3	45.8
135	43.3	41.4	39.9	40.0	40.2	39.9	39.3	39.3	40.2
180	39.4	40.0	41.3	41.1	42.3	47.7	55.2	89.2	86.8
225	80.7	63.8	60.1	56.0	56.3	55.6	55.4	54.1	52.1
270	51.5	50.7	50.6	49.8	46.2	44.4	41.0	38.7	38.0
315	37.1	36.3	38.3	37.7	37.0	39.2	38.4	38.4	36.9

AZ	DEPTH: 979 ft				TILT: 90 degrees				
0	36.3	37.0	37.2	37.7	38.0	37.9	39.1	40.5	42.1
45	44.2	45.2	45.9	48.0	47.4	45.3	46.8	50.5	50.4
90	89.9	89.3	90.5	91.3	92.7	94.3	93.3	93.3	94.0
135	93.7	93.7	92.2	93.5	93.6	93.0	92.4	92.1	93.0
180	95.2	95.4	95.6	95.1	94.4	92.9	90.8	88.8	70.3
225	75.3	65.1	61.6	57.7	55.6	57.0	56.8	55.0	53.5
270	51.9	51.6	50.5	49.9	47.0	45.2	43.9	39.4	38.1
315	37.4	36.5	37.1	38.1	37.8	37.8	37.4	37.7	36.2

5 DEGREE RADII REPORT

Radii in feet

AZ DEPTH: 980 ft TILT: 90 degrees

0	34.0	35.2	35.8	36.5	37.1	37.4	37.5	38.0	40.0
45	42.4	44.6	45.6	47.6	48.6	49.6	48.7	49.1	68.6
90	87.6	88.4	88.8	89.8	90.6	92.1	93.7	93.6	93.4
135	93.4	93.7	93.1	93.5	93.7	93.1	93.5	93.8	94.5
180	95.8	94.7	95.3	95.3	94.7	91.4	90.4	88.8	87.6
225	71.9	64.7	61.3	57.8	55.8	57.3	57.7	56.8	54.3
270	52.6	51.9	51.7	50.4	49.2	47.8	45.2	42.9	39.7
315	37.1	35.8	35.5	36.4	36.2	37.3	35.4	35.3	34.5

AZ DEPTH: 981 ft TILT: 90 degrees

0	33.5	34.1	34.8	35.0	35.6	36.4	37.3	38.9	39.6
45	42.3	44.1	46.6	48.8	50.1	50.0	68.6	87.2	87.7
90	88.3	89.2	89.7	90.2	90.7	91.8	92.7	93.4	93.7
135	93.1	93.3	93.1	93.1	93.7	93.6	93.3	94.0	94.3
180	95.0	95.3	93.6	94.2	92.5	91.4	89.8	88.4	87.5
225	77.1	64.4	60.9	57.6	57.0	58.5	58.9	58.1	56.5
270	54.0	52.9	51.7	49.9	47.6	44.9	43.2	40.6	39.5
315	38.8	37.1	35.4	34.7	34.0	33.5	33.5	33.7	33.4

AZ DEPTH: 983 ft TILT: 90 degrees

0	34.5	35.1	35.4	36.5	37.8	38.4	40.0	40.0	42.9
45	44.5	46.3	48.9	50.1	50.7	85.9	86.5	87.5	87.8
90	88.6	89.1	90.3	90.8	91.8	92.4	93.4	94.0	93.1
135	92.9	93.4	93.8	93.9	93.6	93.2	94.4	95.0	95.9
180	94.4	93.6	94.6	92.1	90.1	90.1	88.6	88.4	88.1
225	85.1	83.7	85.4	83.1	81.8	78.3	64.8	58.8	55.6
270	54.5	50.8	47.5	45.3	43.2	41.6	40.7	39.7	38.7
315	36.7	35.5	34.8	34.4	34.8	34.1	33.9	34.1	34.4

AZ DEPTH: 984 ft TILT: 90 degrees

0	82.0	82.7	82.1	82.3	82.3	80.2	80.5	80.5	78.9
45	79.9	80.7	82.5	82.6	82.6	85.2	86.3	86.5	86.6
90	87.0	87.0	89.3	89.9	91.5	93.0	93.7	93.2	93.1
135	93.4	94.0	93.7	93.7	93.7	93.1	92.9	94.0	95.1
180	95.5	96.0	93.7	93.0	92.3	91.0	90.1	89.0	88.0
225	87.4	86.0	85.8	84.7	83.4	82.0	82.0	80.5	78.8
270	78.8	77.4	77.4	77.1	76.8	74.9	75.3	75.8	76.4
315	77.1	77.4	80.3	80.9	80.9	82.7	82.0	82.1	81.8

AZ DEPTH: 986 ft TILT: 90 degrees

0	80.9	81.7	81.7	81.0	81.0	81.1	80.4	79.3	79.4
45	81.4	82.0	82.6	82.9	82.5	82.7	82.9	83.7	85.9
90	86.5	87.6	88.5	90.1	90.1	91.3	92.1	93.3	93.7
135	94.6	94.7	94.3	94.2	93.7	92.7	93.4	94.5	96.0
180	96.6	97.6	98.3	97.9	93.8	94.1	88.8	89.2	88.3
225	86.6	86.5	85.5	85.3	84.4	83.9	82.1	80.2	80.3
270	80.5	79.7	79.0	78.1	78.1	77.1	75.8	75.8	76.9
315	76.9	76.9	78.3	79.5	79.8	81.3	81.3	81.0	80.8

5 DEGREE RADII REPORT

Radii in feet

AZ DEPTH: 988 ft TILT: 90 degrees

0	81.3	81.6	81.5	81.3	81.3	81.2	80.9	79.9	80.8
45	82.3	83.2	82.9	83.2	83.5	84.9	86.5	86.2	87.8
90	87.9	89.6	90.4	90.4	92.0	91.6	93.3	95.1	96.3
135	95.8	96.9	96.2	95.7	94.2	95.8	97.6	97.0	98.1
180	98.2	97.6	96.8	95.0	90.1	88.5	87.1	85.2	85.7
225	82.3	84.0	84.3	83.2	81.3	80.2	80.3	80.4	80.4
270	79.5	78.9	78.4	77.8	76.9	76.2	76.5	77.3	77.8
315	78.1	78.8	79.6	79.6	81.3	82.0	81.7	81.5	81.3

AZ DEPTH: 990 ft TILT: 90 degrees

0	81.0	81.4	81.7	81.9	81.7	80.4	79.4	80.7	81.8
45	83.3	84.0	83.0	82.0	82.7	83.3	82.7	83.9	87.3
90	88.2	90.1	90.8	91.4	91.6	92.3	93.2	95.9	95.7
135	97.6	96.9	96.0	94.1	95.3	96.2	97.7	98.1	98.6
180	99.3	98.3	97.0	95.2	90.6	88.8	87.1	86.5	86.0
225	82.0	81.5	82.5	83.6	80.9	79.7	80.3	80.9	79.8
270	79.2	78.3	78.2	77.6	76.3	77.0	77.3	77.8	77.9
315	77.3	78.2	77.4	79.0	82.8	81.9	81.7	81.4	81.2

AZ DEPTH: 992 ft TILT: 90 degrees

0	80.5	80.6	80.4	81.0	81.4	81.4	81.6	79.8	80.6
45	78.9	81.6	82.0	82.4	81.6	82.3	82.8	83.7	86.9
90	88.8	89.5	91.8	90.9	92.4	92.7	93.3	94.9	95.7
135	97.3	98.0	97.6	97.2	96.1	94.3	94.0	97.9	96.9
180	97.6	98.9	98.1	97.4	92.1	89.4	88.8	86.9	87.2
225	87.0	82.6	81.5	81.3	83.1	76.5	77.9	79.2	79.0
270	78.3	78.4	79.0	77.8	78.1	76.6	76.0	77.3	77.1
315	75.5	73.2	73.3	69.8	77.4	81.2	82.2	80.7	80.9

AZ DEPTH: 994 ft TILT: 90 degrees

0	80.0	80.6	81.7	81.1	81.0	81.7	80.8	81.0	80.4
45	80.4	82.6	84.6	83.7	84.0	85.3	84.6	86.2	87.9
90	89.5	90.9	92.4	92.2	93.1	93.4	91.7	93.6	92.4
135	91.4	90.1	92.4	92.2	90.8	88.1	91.7	89.8	90.5
180	90.1	87.5	83.3	89.1	85.6	90.3	89.1	86.4	87.8
225	86.7	82.8	82.6	82.3	76.8	76.4	78.7	79.1	78.1
270	78.1	78.8	79.1	76.8	78.4	77.3	74.1	74.2	72.4
315	73.5	72.9	73.4	74.4	74.8	77.3	79.0	79.2	80.4

AZ DEPTH: 996 ft TILT: 90 degrees

0	82.2	83.1	83.0	82.7	83.0	83.7	84.3	84.7	84.5
45	83.0	83.2	85.6	86.2	87.7	89.8	89.1	89.5	91.4
90	91.5	92.6	91.8	92.7	93.3	91.2	87.4	87.5	86.8
135	85.9	85.1	84.3	86.6	87.9	85.0	86.4	86.6	85.1
180	85.8	84.9	83.5	84.5	87.2	83.9	88.5	88.4	85.4
225	83.3	82.9	83.0	83.6	79.0	75.5	82.6	79.6	78.7
270	80.0	81.4	81.6	81.4	80.0	80.5	75.4	73.8	73.4
315	70.7	72.1	70.5	80.2	80.4	80.1	82.1	80.9	82.3

5 DEGREE RADII REPORT

Radii in feet

AZ	DEPTH: 998 ft				TILT: 90 degrees				
0	82.1	84.1	84.4	84.2	82.3	83.3	85.0	84.9	84.7
45	84.6	83.8	84.4	86.0	87.5	89.5	90.1	89.4	90.8
90	91.3	91.5	92.7	91.0	90.8	90.4	88.5	87.7	88.4
135	87.5	86.3	86.8	89.9	90.5	89.4	88.5	91.4	89.5
180	88.8	90.3	88.5	88.9	86.5	87.0	85.6	85.3	84.8
225	84.5	84.3	80.7	83.5	82.7	75.9	83.1	81.7	79.5
270	81.8	82.0	82.3	81.7	82.7	81.7	81.6	82.1	81.3
315	74.2	65.1	66.8	72.9	78.4	78.8	82.3	81.0	81.2

AZ	DEPTH: 1000 ft				TILT: 90 degrees				
0	79.3	79.4	83.6	84.0	84.3	83.6	81.8	79.8	84.1
45	84.9	85.1	84.9	86.4	88.3	89.5	90.0	90.1	89.8
90	91.2	90.9	91.5	91.4	90.2	90.1	90.9	89.4	89.9
135	91.5	90.3	89.3	91.6	92.4	92.5	91.4	91.3	92.1
180	93.9	91.5	93.0	92.3	92.4	91.4	90.6	87.3	87.4
225	85.7	85.1	79.0	83.6	83.2	80.6	77.6	83.8	84.6
270	82.4	77.2	78.7	82.6	83.3	82.5	83.0	83.2	74.6
315	66.2	61.9	63.1	66.7	70.7	75.1	77.4	78.3	80.0

AZ	DEPTH: 1002 ft				TILT: 90 degrees				
0	78.8	81.9	74.6	77.2	82.6	82.5	81.8	82.3	83.7
45	84.6	85.6	85.9	85.7	86.9	87.2	88.4	89.0	87.8
90	91.3	90.6	91.5	90.7	89.5	90.4	90.9	91.8	91.7
135	91.8	92.7	91.6	91.0	91.0	90.0	90.3	91.0	92.0
180	91.8	91.9	92.0	91.2	91.4	89.8	87.8	87.8	86.6
225	84.9	79.8	83.4	83.4	79.1	83.4	83.4	82.8	73.1
270	69.2	77.0	76.9	74.1	81.6	82.4	84.0	69.6	62.9
315	59.7	61.6	72.8	81.8	77.1	73.7	71.2	70.9	79.1

AZ	DEPTH: 1004 ft				TILT: 90 degrees				
0	76.8	82.3	79.4	76.8	73.6	75.8	80.9	81.2	80.7
45	81.3	81.4	81.4	83.7	85.3	87.2	88.4	87.7	91.3
90	91.3	91.8	89.5	90.2	88.8	88.5	88.7	89.1	89.8
135	89.1	88.8	88.5	88.7	87.2	88.5	87.5	87.1	88.1
180	88.9	91.5	89.5	88.8	90.0	88.6	88.7	87.7	86.8
225	86.3	85.4	85.1	85.9	83.1	84.1	82.3	83.4	82.4
270	70.6	72.0	77.3	77.6	80.7	82.6	79.7	61.8	58.3
315	59.6	61.2	67.0	69.3	75.0	75.0	77.2	73.4	74.8

AZ	DEPTH: 1006 ft				TILT: 90 degrees				
0	84.1	84.2	85.2	84.4	82.9	83.5	83.8	84.9	86.1
45	85.6	82.6	84.2	85.3	85.0	85.1	84.4	84.5	82.3
90	80.2	80.6	78.3	79.4	77.8	77.4	75.6	78.0	76.8
135	78.1	77.1	78.0	82.6	80.3	80.7	79.9	82.1	82.4
180	81.2	81.9	79.7	81.1	79.1	77.4	78.9	77.3	78.0
225	81.0	78.5	80.0	83.0	84.6	83.9	84.1	84.1	84.1
270	82.5	82.9	84.3	83.9	83.9	83.6	81.5	81.4	80.6
315	82.3	83.5	83.5	82.5	84.6	82.8	84.6	83.9	83.5

5 DEGREE RADII REPORT

Radii in feet

AZ DEPTH: 1008 ft TILT: 90 degrees

0	84.1	84.0	81.7	79.6	82.0	81.6	80.0	83.0	84.7
45	83.3	79.5	77.5	80.8	80.0	79.1	79.0	79.3	74.7
90	75.5	76.3	74.6	74.4	74.5	75.1	74.5	75.5	74.5
135	76.2	75.9	74.7	74.2	74.1	74.9	76.6	76.5	78.3
180	80.4	79.7	79.4	76.8	77.4	75.0	74.9	74.8	75.1
225	76.4	74.9	72.7	75.7	77.1	80.4	78.4	79.7	79.1
270	80.7	81.4	82.3	84.3	83.9	82.2	83.0	81.7	81.7
315	82.1	81.8	81.3	82.6	83.0	82.9	83.1	84.8	83.9

AZ DEPTH: 1010 ft TILT: 90 degrees

0	82.5	79.9	79.2	76.9	75.1	76.2	73.9	73.3	73.7
45	75.4	74.1	74.2	72.3	73.0	73.5	74.5	74.8	72.4
90	71.9	72.7	70.6	70.8	70.5	70.6	70.6	70.7	71.6
135	71.8	72.5	72.9	73.4	72.2	72.5	74.2	75.1	76.6
180	77.0	76.4	74.8	72.8	73.8	73.1	72.3	72.8	73.0
225	72.7	72.5	70.3	70.6	72.7	73.1	73.2	73.8	76.5
270	77.3	79.8	81.2	81.7	81.7	80.8	80.5	81.0	81.4
315	80.2	79.1	78.9	79.7	78.7	79.3	77.8	80.0	79.2

AZ DEPTH: 1012 ft TILT: 90 degrees

0	71.3	71.3	72.8	71.8	71.2	69.4	69.6	68.6	69.3
45	67.6	67.1	69.7	70.8	70.2	68.9	69.0	67.6	68.4
90	68.3	67.7	68.6	66.6	66.4	67.0	66.8	66.8	69.2
135	69.3	69.5	69.6	70.4	71.2	72.4	72.0	71.8	72.8
180	71.7	72.5	68.3	68.0	68.6	69.8	68.9	68.4	68.6
225	66.4	67.5	67.3	66.8	69.0	68.3	68.3	69.7	71.9
270	73.2	75.8	76.5	74.3	74.5	73.1	70.6	72.2	71.8
315	71.3	71.5	71.3	71.6	69.8	71.6	70.9	70.2	70.9

AZ DEPTH: 1014 ft TILT: 90 degrees

0	68.2	68.3	66.8	66.9	67.6	65.2	65.6	65.1	64.4
45	64.6	64.7	65.0	65.3	63.1	65.3	66.4	65.8	64.7
90	63.7	64.1	62.9	61.8	61.3	63.1	63.5	64.0	64.8
135	65.4	65.3	66.7	65.6	65.5	66.1	66.5	68.3	68.1
180	67.6	68.7	64.4	62.5	62.5	64.3	64.5	64.7	65.0
225	64.3	62.5	63.8	63.2	63.9	63.2	61.9	64.3	65.1
270	66.7	69.3	71.7	71.1	70.3	69.8	67.1	66.9	67.0
315	65.7	68.3	66.0	66.6	66.5	64.6	65.8	65.4	67.8

AZ DEPTH: 1016 ft TILT: 90 degrees

0	62.5	64.6	64.1	63.7	63.2	62.7	62.5	60.5	60.8
45	60.5	60.0	59.8	61.2	62.2	61.0	60.4	61.8	60.7
90	59.8	60.5	59.8	58.5	58.7	58.9	57.6	60.2	63.3
135	63.9	62.5	62.7	63.0	63.8	63.6	64.4	64.3	64.4
180	62.5	60.6	58.8	59.8	59.7	59.0	60.8	60.4	58.5
225	58.1	58.1	58.1	56.9	56.6	55.5	56.9	59.3	61.8
270	63.8	64.9	66.6	66.0	65.5	60.4	63.0	62.4	62.5
315	63.1	62.7	63.8	63.1	62.1	62.3	61.2	61.8	61.2

5 DEGREE RADII REPORT

Radii in feet

AZ	DEPTH: 1018 ft			TILT: 90 degrees					
0	59.2	60.1	60.5	58.1	56.6	56.0	55.6	55.5	56.2
45	57.1	57.7	58.4	58.2	58.0	57.5	57.2	57.1	56.3
90	56.9	55.3	55.3	55.9	55.5	54.7	56.8	57.8	60.5
135	60.8	59.8	59.1	59.3	59.8	58.4	59.2	58.9	56.5
180	56.7	55.4	54.4	54.4	55.5	56.2	54.3	53.7	53.8
225	54.0	54.0	53.7	53.0	53.7	53.5	54.7	55.4	57.6
270	60.3	55.6	55.3	56.2	57.7	59.3	59.4	59.5	60.5
315	59.1	60.2	60.5	59.1	57.8	58.9	58.3	57.9	60.4

AZ	DEPTH: 1020 ft			TILT: 90 degrees					
0	63.7	66.3	66.0	66.0	64.3	66.2	63.8	64.1	63.1
45	61.6	62.0	61.7	62.1	63.7	62.4	63.8	62.5	61.3
90	61.2	61.1	61.0	62.1	61.0	59.4	59.5	60.8	58.4
135	61.0	63.2	64.6	64.3	64.4	64.7	65.4	65.7	65.4
180	65.7	63.9	61.4	60.8	60.8	60.2	60.5	60.8	61.2
225	61.6	60.8	60.4	60.1	54.8	57.0	57.9	60.1	61.4
270	63.6	65.3	66.8	66.1	69.6	66.2	64.6	64.4	63.8
315	65.1	64.6	64.7	65.3	63.7	62.9	63.6	63.9	63.7

AZ	DEPTH: 1022 ft			TILT: 90 degrees					
0	63.4	63.7	63.0	62.8	61.6	61.1	60.3	59.9	59.9
45	59.4	58.3	59.2	59.5	59.6	61.5	60.6	59.8	59.3
90	59.2	58.3	57.0	57.3	58.2	57.9	58.4	57.3	57.4
135	57.9	59.4	61.6	62.5	61.5	62.1	62.8	62.6	61.3
180	59.3	58.7	58.0	58.8	58.5	57.9	57.7	58.7	58.5
225	59.2	58.2	57.0	57.3	56.6	55.0	58.1	60.0	61.6
270	63.6	64.1	62.8	64.1	66.4	65.1	60.9	60.9	61.9
315	62.0	62.6	62.5	60.8	61.2	61.1	60.5	64.0	63.4

AZ	DEPTH: 1024 ft			TILT: 90 degrees					
0	58.2	58.2	60.4	60.0	59.2	57.9	57.7	57.2	56.9
45	55.9	56.2	55.1	54.3	56.2	56.9	57.9	57.5	56.8
90	56.3	55.7	54.5	55.3	55.7	55.5	54.6	55.2	56.2
135	57.1	57.9	58.0	59.8	60.2	59.2	58.9	58.1	58.8
180	59.3	57.3	56.2	55.0	54.3	54.3	55.4	55.8	55.5
225	54.5	53.8	53.3	53.7	53.7	53.3	53.5	53.3	54.6
270	55.7	58.3	57.7	57.3	57.3	56.2	56.6	54.3	55.1
315	55.3	55.9	54.0	53.9	53.9	52.7	50.4	52.7	56.3

AZ	DEPTH: 1026 ft			TILT: 90 degrees					
0	55.7	52.5	51.3	51.9	48.8	49.3	51.1	51.0	47.2
45	45.2	45.4	46.4	48.3	53.2	52.1	50.1	54.9	53.9
90	53.3	53.6	52.7	51.4	51.9	52.4	53.3	53.4	53.1
135	53.3	54.9	55.8	56.3	51.8	50.3	53.7	54.9	56.5
180	55.9	54.2	53.9	51.7	52.0	50.6	50.8	51.2	52.1
225	51.9	46.5	46.4	44.5	47.5	48.5	50.1	48.7	50.6
270	51.8	50.9	50.8	51.2	47.1	49.5	50.6	52.5	54.9
315	55.7	58.0	55.5	55.0	54.3	54.5	54.3	55.0	54.3

5 DEGREE RADII REPORT

Radii in feet

AZ DEPTH: 1028 ft TILT: 90 degrees

0	50.7	44.7	41.4	47.2	45.4	45.9	45.2	45.0	45.6
45	43.2	41.5	41.9	43.9	48.5	51.8	47.7	43.9	50.5
90	51.1	51.1	49.8	49.0	49.4	50.0	50.6	51.4	50.9
135	51.1	52.0	52.0	52.7	47.8	47.8	50.4	52.4	54.5
180	51.7	51.1	50.1	49.1	48.4	47.5	47.8	46.2	44.5
225	44.6	49.0	41.3	41.9	42.4	43.9	46.3	45.2	43.4
270	42.9	43.3	42.6	44.4	42.2	46.2	49.6	49.6	48.5
315	49.4	56.5	49.8	49.4	52.0	51.7	49.3	48.8	49.7

AZ DEPTH: 1032 ft TILT: 90 degrees

0	43.5	43.2	44.4	43.9	41.3	40.3	37.5	36.7	35.8
45	36.4	37.0	38.4	36.1	35.7	38.3	38.4	36.2	37.0
90	37.4	36.2	34.1	32.5	33.0	32.5	32.2	32.5	32.4
135	32.4	32.2	33.2	33.5	33.2	34.4	34.5	34.8	35.3
180	36.1	34.5	33.8	34.5	34.6	33.9	34.1	34.1	34.2
225	33.8	34.1	33.6	33.5	32.8	34.9	37.1	39.3	43.0
270	40.0	38.0	40.0	46.5	46.4	44.9	44.5	44.7	45.4
315	45.5	45.2	45.4	45.3	45.4	46.0	47.3	45.9	44.6

AZ DEPTH: 1036 ft TILT: 90 degrees

0	25.1	23.4	22.3	21.8	20.7	20.1	20.0	19.5	20.3
45	20.1	20.8	21.4	22.2	23.1	23.4	23.9	24.5	23.7
90	23.7	23.7	24.2	24.0	23.7	22.5	21.7	21.3	20.3
135	20.8	21.6	20.1	20.5	23.9	26.0	27.9	29.2	29.7
180	30.9	31.3	31.0	30.0	34.4	37.2	38.7	38.7	37.6
225	37.1	37.5	37.9	37.8	39.3	39.2	37.3	37.4	37.9
270	38.4	38.4	38.4	38.4	38.4	35.4	33.2	32.6	30.9
315	30.2	29.5	30.8	31.0	29.7	30.2	29.3	28.6	26.7

AZ DEPTH: 1038 ft TILT: 90 degrees

0	16.3	15.9	14.7	14.3	13.9	14.1	14.6	15.0	15.7
45	16.1	16.7	17.3	17.7	18.0	17.4	17.2	17.0	16.4
90	17.0	16.2	15.9	16.3	16.2	16.2	16.4	16.1	15.9
135	15.1	16.1	17.0	18.1	19.4	22.5	23.8	26.0	25.3
180	25.8	26.8	26.8	29.8	31.0	32.2	33.2	33.5	32.5
225	33.2	33.5	32.2	25.3	19.2	17.8	16.8	16.4	17.5
270	17.1	16.9	16.7	20.5	23.5	23.8	23.0	23.1	25.0
315	25.7	27.1	24.4	22.1	20.0	18.5	18.2	17.4	16.7

AZ DEPTH: 1040 ft TILT: 90 degrees

0	10.3	10.0	10.0	10.2	10.6	10.7	11.2	11.5	12.0
45	12.1	12.7	13.3	13.0	12.3	12.2	11.9	12.0	12.0
90	11.9	12.2	12.3	12.7	13.2	13.3	12.5	13.1	12.7
135	12.5	12.4	12.3	12.4	13.2	13.6	14.4	16.9	19.0
180	21.8	24.4	28.3	29.6	29.6	29.6	30.1	29.8	30.9
225	16.7	16.6	14.6	13.6	13.0	13.5	13.8	14.4	15.6
270	15.9	16.2	18.9	20.1	20.0	19.8	19.9	19.8	20.2
315	14.6	13.0	12.4	11.8	11.1	10.9	10.4	10.4	10.3

5 DEGREE RADII REPORT

Radii in feet

AZ DEPTH: 1042 ft TILT: 90 degrees

0	4.9	5.5	6.5	6.7	6.6	6.8	6.6	6.5	5.7
45	5.8	5.6	5.0	5.2	4.6	4.5	4.2	3.9	3.8
90	3.5	3.6	3.4	3.2	3.2	3.1	2.9	2.8	2.7
135	2.8	2.7	2.7	2.6	2.6	2.7	2.6	2.6	2.6
180	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
225	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
270	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
315	2.9	2.9	4.2	4.1	4.3	4.5	4.6	4.9	5.4

MAXIMUM HORIZONTAL RADII

AZM deg	RADIUS ft	DEPTH ft
0	84.1	1006
2	84.3	1008
4	85.0	1006
6	84.3	1008
8	84.6	998
10	85.2	1006
12	84.8	1006
14	84.4	1006
16	84.5	1006
18	84.6	1006
20	84.3	1000
22	84.0	996
24	84.1	1000
26	83.7	996
28	85.3	996
30	85.0	998
32	84.8	998
34	84.8	996
36	85.5	1006
38	85.9	1006
40	86.1	1006
42	87.4	1006
44	86.0	1006
46	85.2	1006
48	85.3	1002
50	85.6	1002
52	85.6	1002
54	85.9	1002
56	86.0	1002
58	86.4	998
60	86.4	1000
62	87.4	998
64	88.0	1000
66	88.7	1000
68	89.3	996
70	89.8	996
72	89.8	998
74	89.9	998
76	90.4	998
78	89.8	1000
80	90.1	1000
82	91.2	1004
84	91.4	996
86	91.4	996
88	92.3	1004
90	91.5	996
92	92.0	996
94	92.2	996
96	93.0	996
98	92.6	996
100	92.7	998
102	92.4	994
104	93.0	996
106	92.5	996
108	92.6	994
110	93.3	996
112	93.7	979
114	94.7	979
116	94.0	979
118	93.7	979
120	93.7	984
122	95.0	988
124	95.5	990
126	96.3	990
128	96.9	990
130	96.3	988
132	96.5	992
134	97.8	990
136	97.5	990
138	97.6	992
140	98.0	992
142	98.1	992
144	98.0	992
146	97.3	992
148	97.3	992
150	97.2	992
152	95.3	992
154	96.2	992
156	96.0	992
158	96.0	990
160	96.2	990
162	97.0	990
164	97.6	990
166	97.8	988
168	98.1	990
170	98.1	990
172	98.3	992
174	98.5	990
176	98.8	992
178	99.1	990

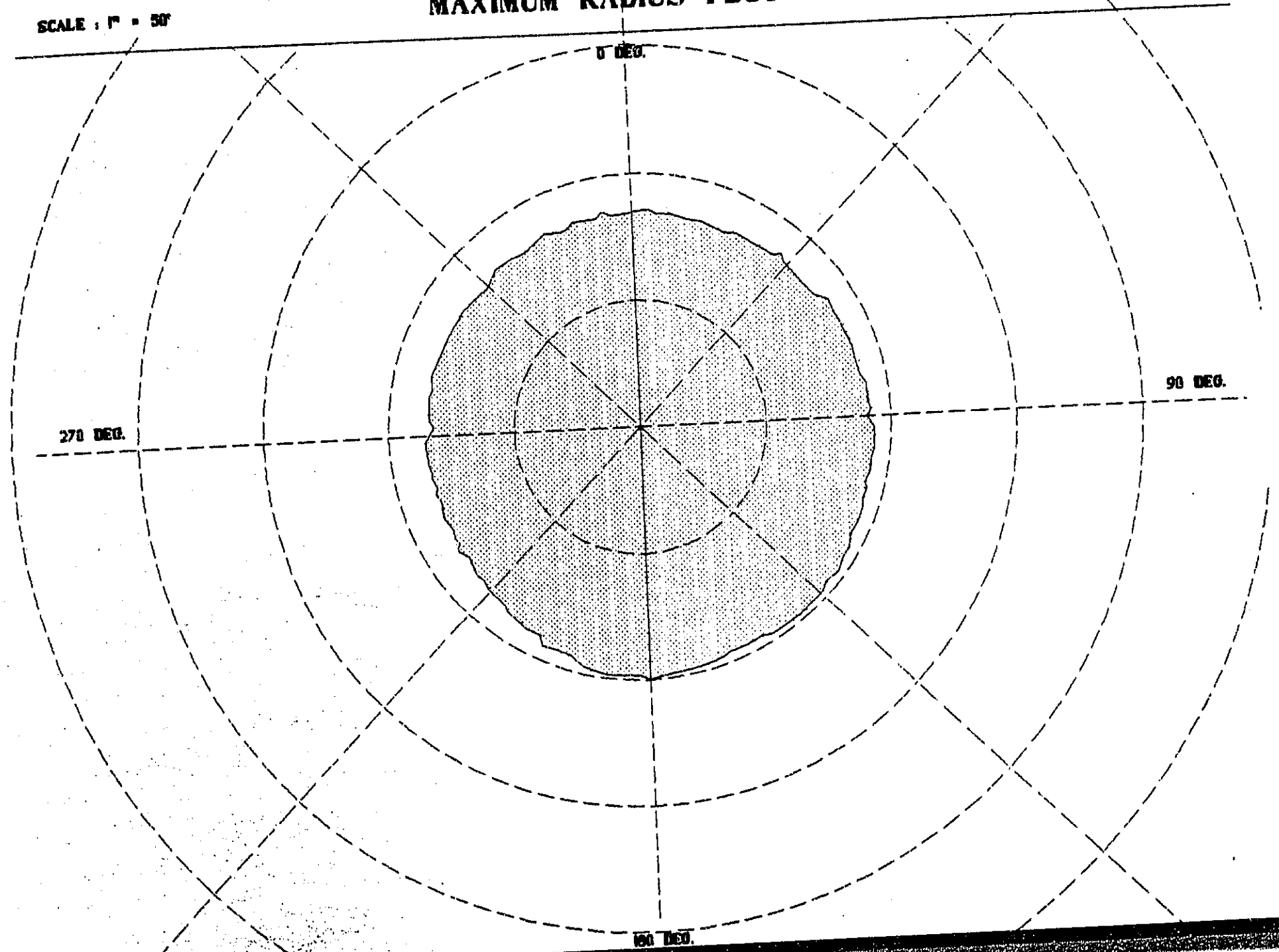
MAXIMUM HORIZONTAL RADII

AZM deg	RADIUS ft	DEPTH ft
180	99.3	990
182	99.1	990
184	99.1	992
186	98.9	992
188	98.6	992
190	98.3	986
192	98.2	986
194	98.1	986
196	97.6	986
198	95.6	986
200	94.7	980
202	94.3	986
204	93.8	986
206	94.4	986
208	90.8	979
210	90.8	979
212	91.4	1000
214	90.1	978
216	89.9	986
218	89.5	986
220	88.3	986
222	87.9	984
224	87.8	984
226	87.0	984
228	86.4	986
230	86.5	986
232	86.3	986
234	86.0	984
236	85.7	1004
238	86.9	1004
240	85.9	1004
242	84.9	986
244	84.4	986
246	84.7	1006
248	84.9	1006
250	84.1	1004
252	83.8	1004
254	84.5	1006
256	83.7	1006
258	84.3	1006
260	84.1	1006
262	84.3	1000
264	85.0	1000
266	84.3	1006
268	84.8	1006
270	82.5	1006
272	82.0	996
274	82.6	1006
276	83.3	1006
278	83.9	1006
280	84.3	1006
282	84.5	1006
284	84.3	1006
286	84.6	1008
288	84.6	1006
290	83.9	1006
292	84.3	1006
294	83.7	1006
296	83.6	1006
298	83.7	1002
300	84.0	1002
302	83.7	1002
304	83.6	1000
306	82.8	1000
308	82.1	1000
310	81.7	1008
312	82.3	1006
314	82.4	1006
316	82.3	1008
318	82.9	1006
320	83.5	1006
322	83.8	1006
324	83.6	1006
326	83.3	1006
328	82.6	1006
330	82.6	1008
332	82.1	1006
334	84.3	1006
336	84.8	1006
338	84.2	1008
340	82.9	1008
342	83.9	1006
344	84.9	1006
346	84.4	1006
348	84.3	1006
350	84.8	1008
352	85.7	1008
354	84.0	1008
356	83.8	1008
358	84.1	1006

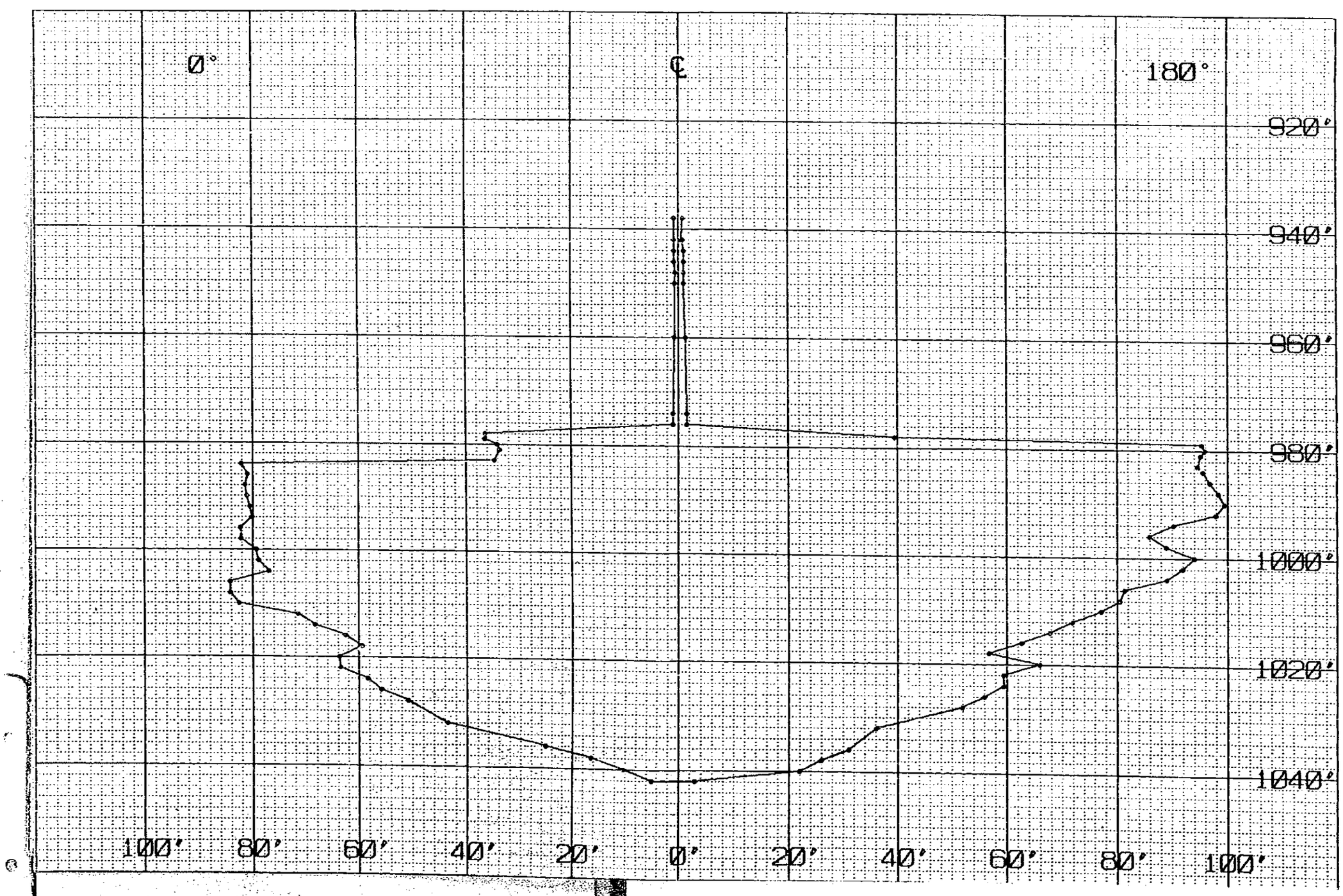
Maximum radius : 99.3
On Azmuth deg : 180

MAXIMUM RADIUS PLOT

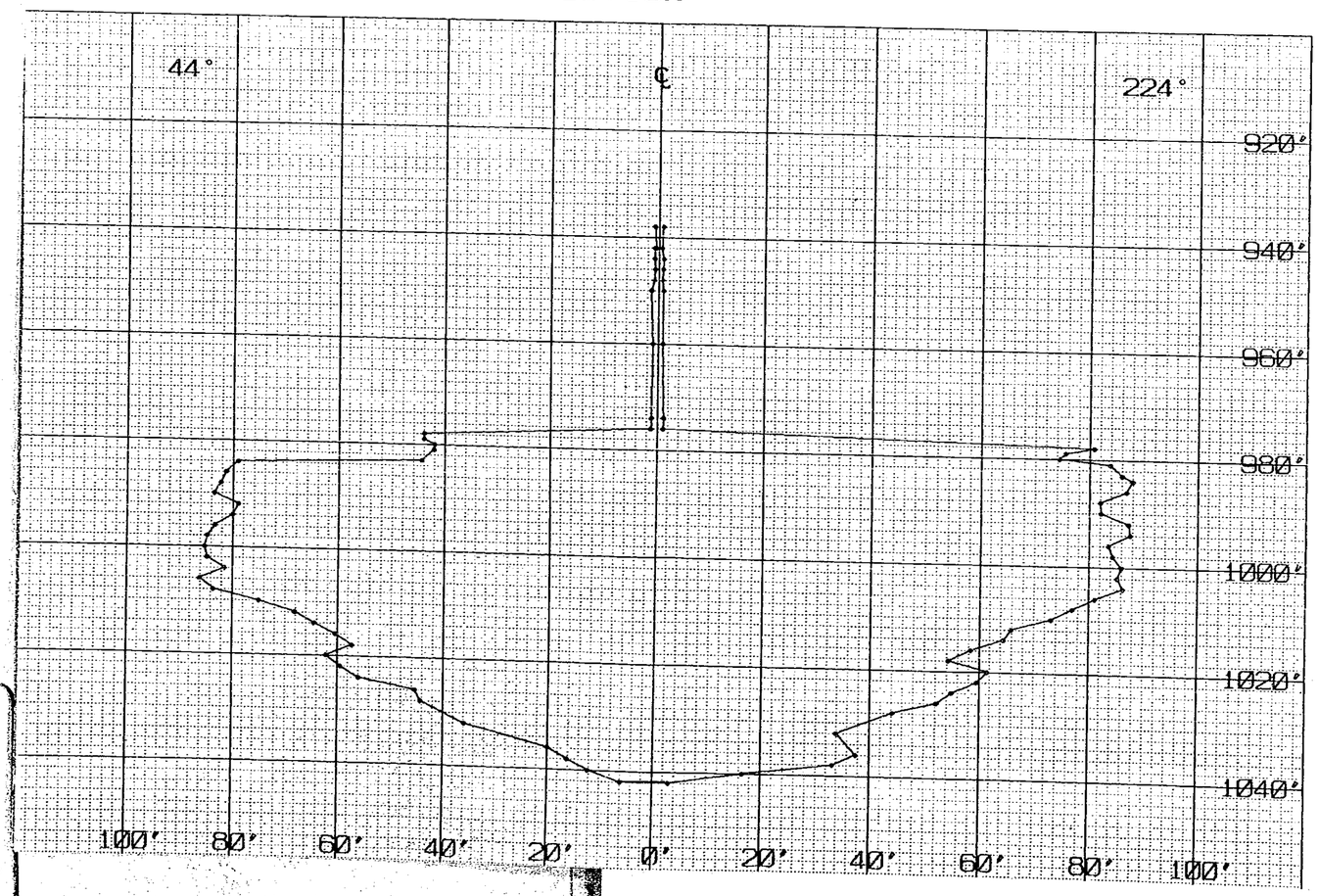
SCALE : 1" = 50'



VERTICAL CROSSECTION



VERTICAL CROSSECTION



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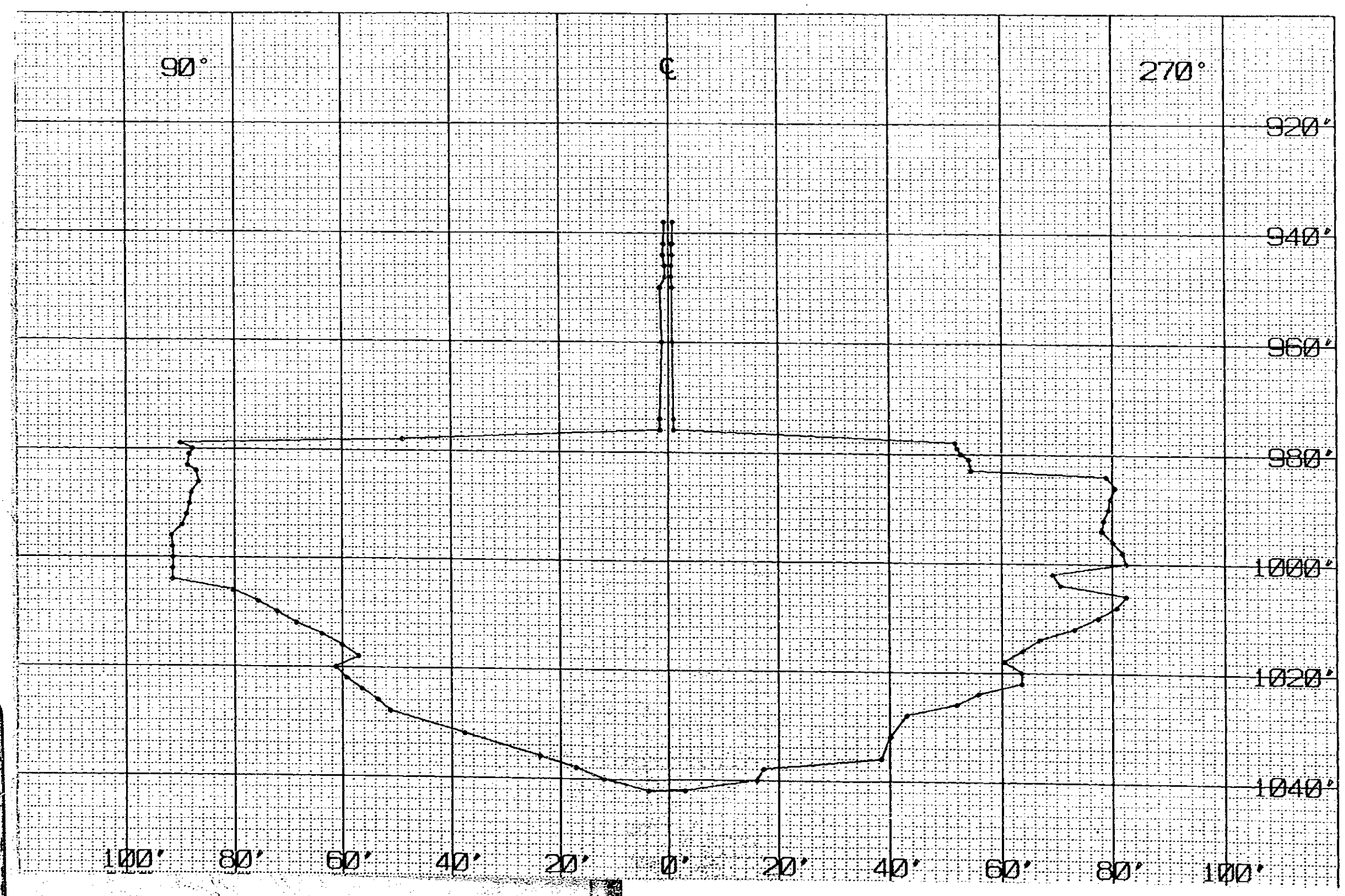

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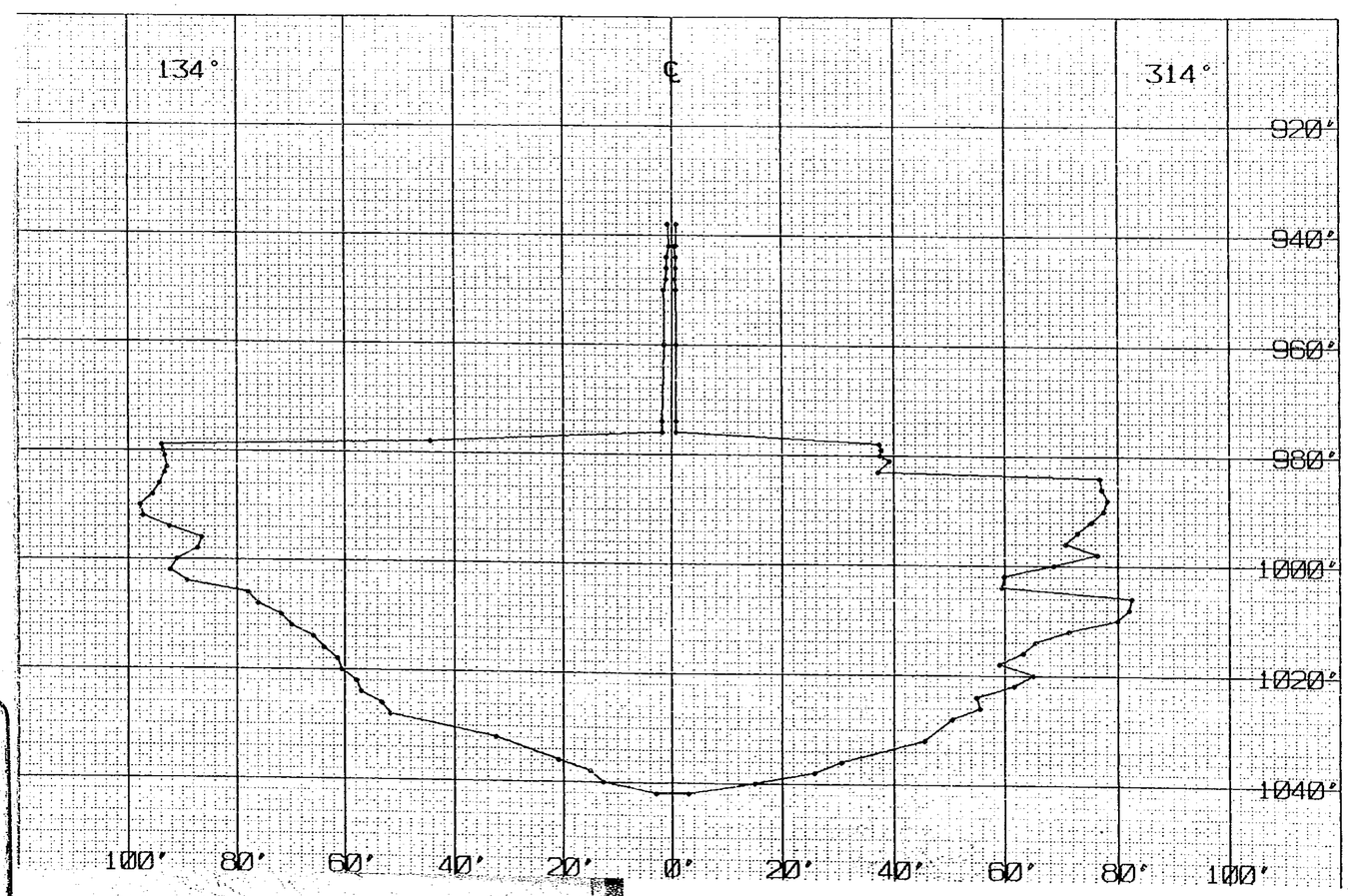


DOWELL

SONAR CALIPER REPORT

DOWELL SONAR CALIPER SURVEY

TREATMENT NO: 11-42-0273

JOB NO: 323

WELL DATA

ZERO @ 12 FT AGL

T.D. DOWELL 1054 FT

CASING SIZE 9-5/8 IN

INTERMEDIATE 7 IN

TUBING 4-1/2 IN

OPERATOR 1054 FT

DEPTH 942 FT
LINER - FT
DEPTH OUT FT

DEPTH OUT FT

WILLIAMS ENERGY COMPANY

WELL NO: 10

P/N 67

ADAMANA STORAGE TERMINAL

APRIL 13,1979

PRODUCTION: STORAGE

GENERAL COMMENTS

MAILING ADDRESS

STREET/BOX: P.O. BOX 849

CITY: HOLBROOK STATE: ARIZONA

ZIP: 86025

ATTN: MR. ARMANDO PADILLA

MR. ARMANDO PADILLA
COMPANY REPRESENTATIVE

HL VAN METRE
DOWELL ENGINEER

DOWELL SONAR CALIPER SURVEY

WILLIAMS ENERGY COMPANY ADAMANA STORAGE TERMINAL APRIL 13,1979

WELL NO. 10 JOB NO. 323

RADII IN FT

DEPTH	N	S	E	W	NE	SW	SE	NW	
942	0.4	0.6	0.5	0.5	0.5	0.6	0.6	0.5	
960	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	
970	0.8	0.8	1.0	0.8	0.8	0.7	1.0	0.9	
980	0.9	1.0	1.0	1.0	0.8	0.9	1.2	0.9	
981	0.9	1.0	1.1	1.0	0.8	0.8	1.2	0.9	
982	35.0	37.0	43.0	29.0	43.0	31.0	36.0	38.0	
983	6.0	35.0	6.0	7.0	6.0	12.0	35.0	5.0	
984	2.0	3.0	2.7	2.9	2.4	3.8	3.0	2.3	
985	1.6	2.2	2.2	1.8	1.8	2.3	2.3	1.8	
986	0.7	0.9	1.2	0.5	0.9	0.6	1.0	0.5	
987	6.3	5.5	5.3	6.0	5.4	5.5	5.3	5.8	
988	73.0	85.0	79.0	70.0	73.0	74.0	85.0	73.0	✓ max bodies
990	72.0	80.0	81.0	68.0	75.0	72.0	85.0	69.0	✓
995	71.0	83.0	81.0	67.0	74.0	72.0	84.0	71.0	
1000	72.0	78.0	79.0	67.0	74.0	71.0	80.0	67.0	
1005	70.0	75.0	75.0	67.0	76.0	61.0	76.0	67.0	
1010	68.0	75.0	78.0	63.0	71.0	69.0	77.0	66.0	
1015	73.0	68.0	70.0	68.0	75.0	70.0	67.0	69.0	

RADII IN FT

DEPTH	N	S	E	W	NE	SW	SE	NW
1020	69.0	64.0	63.0	67.0	67.0	64.0	63.0	68.0
1025	56.0	52.0	55.0	59.0	57.0	56.0	54.0	57.0
1030	50.0	48.0	49.0	51.0	53.0	49.0	53.0	49.0
1035	44.0	40.0	43.0	42.0	46.0	42.0	45.0	42.0
1040	35.0	34.0	38.0	35.0	40.0	33.0	39.0	37.0
1045	30.0	23.0	30.0	30.0	31.0	27.0	29.0	30.0
1048	23.7	17.5	26.3	23.9	25.5	19.4	18.2	23.5
1050	6.0	6.3	5.7	6.2	6.1	6.2	5.6	6.4
1051	5.7	5.4	4.3	5.0	4.9	5.0	5.0	5.2
1052	4.2	4.6	3.0	4.0	3.8	4.5	4.4	3.9
1053	3.5	3.6	1.6	3.3	2.5	3.5	3.5	3.2
1054	2.4	2.8	0.5	2.2	0.5	2.5	0.4	2.3

DOWELL SONAR CALIPER SURVEY

WILLIAMS ENERGY COMPANY ADAMANA STORAGE TERMINAL APRIL 13,1979

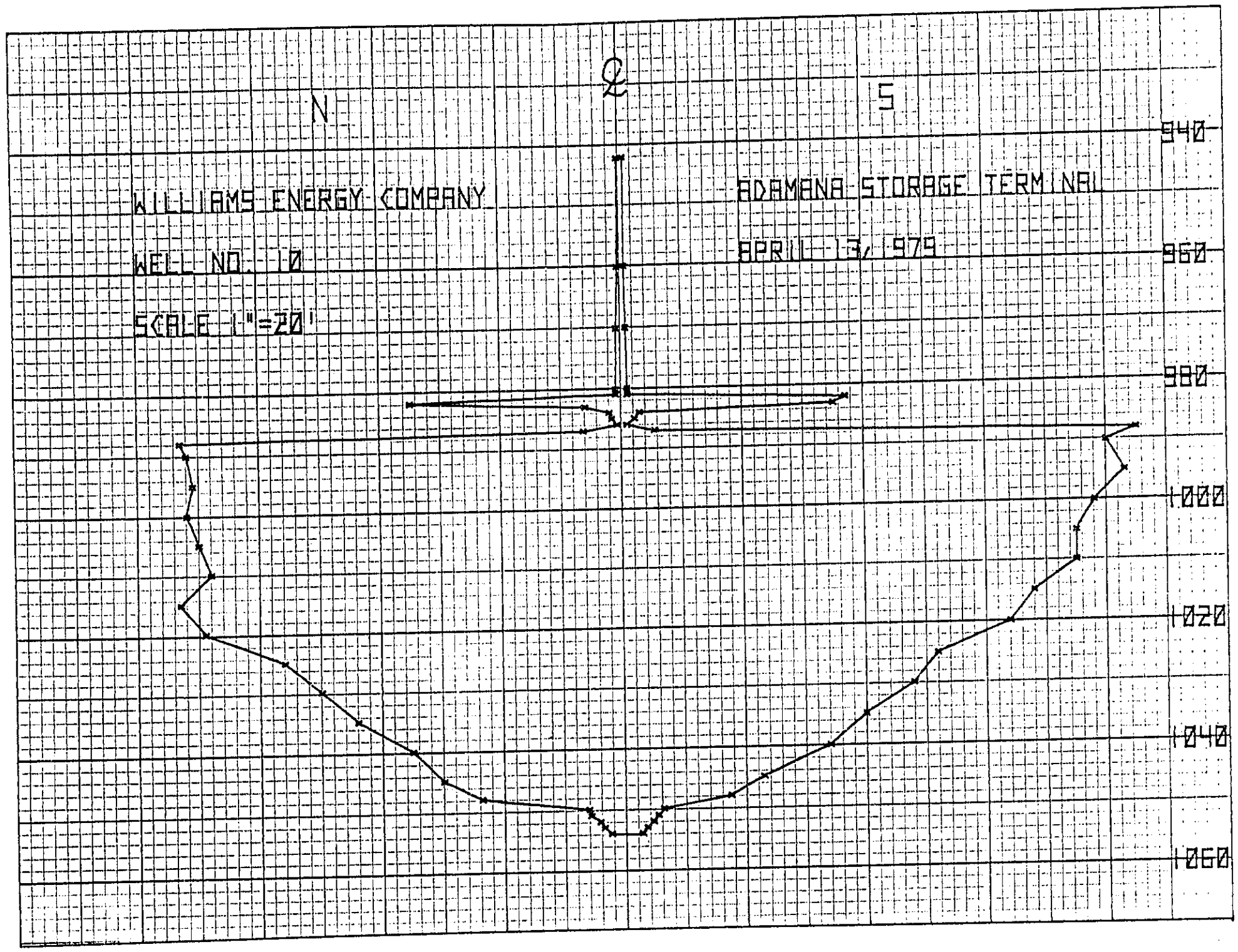
WELL NO: 10 JOB NO: 323

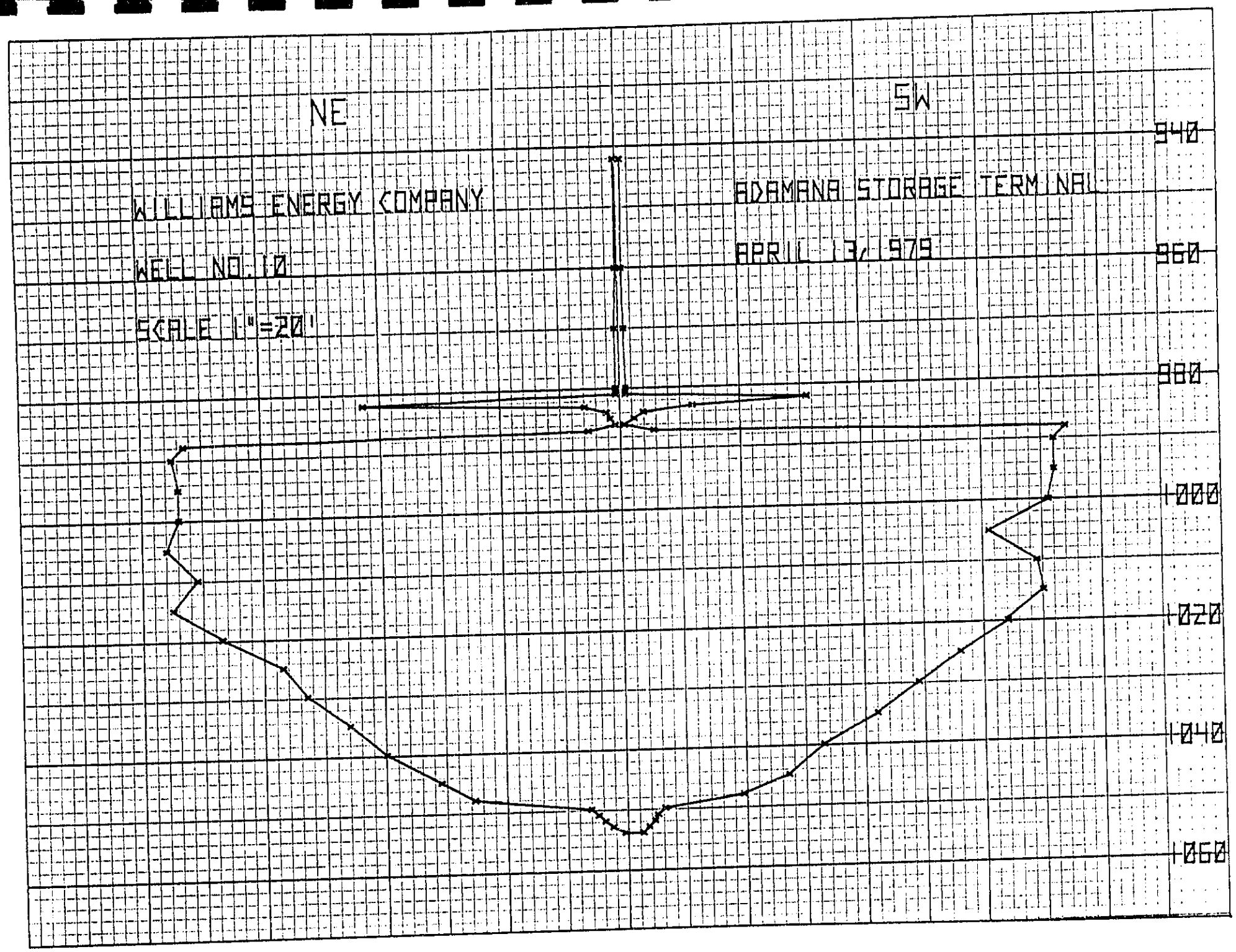
VOLUME CALCULATIONS

DEPTH	INCR CU FT	TOTAL CU FT	INCR BBLS	BBLS
942	0	0	0	0
960	15	15	3	3
970	15	30	3	5
980	26	57	5	10
981	3	60	1	11
982	1406	1466	250	261
983	2302	3768	410	671
984	352	4120	63	734
985	18	4138	3	737
986	7	4145	1	738
987	39	4184	7	745
988	6578	10762	1172	1917
990	36265	47027	6458	8375
995	90032	137059	16034	24409
1000	87010	224068	15496	39904
1005	81727	305795	14555	54459
1010	79663	385458	14187	68646
1015	78111	463569	13911	82557

VOLUME CALCULATIONS

DEPTH	INCR CU FT	TOTAL CU FT	INCR BBLS	BBLS
1020	72060	535628	12833	95390
1025	58055	593683	10339	105729
1030	44191	637874	7870	113599
1035	34252	672125	6100	119699
1040	24901	697026	4435	124134
1045	16788	713813	2990	127123
1048	6285	720097	1119	128242
1050	1451	721547	258	128501
1051	97	721644	17	128518
1052	66	721710	12	128530
1053	43	721752	8	128538
1054	21	721772	4	128541


N
℄
S
WILLIAMS ENERGY COMPANY
WELL NO. 10
SCALE 1"=20'
ADAMANA STORAGE TERMINAL
APRIL 13, 1979
940
960
980
1000
1020
1040
1060


NE
SW
WILLIAMS ENERGY COMPANY
WELL NO. 10
SCALE 1"=20'
ADAMANA STORAGE TERMINAL
APRIL 13, 979
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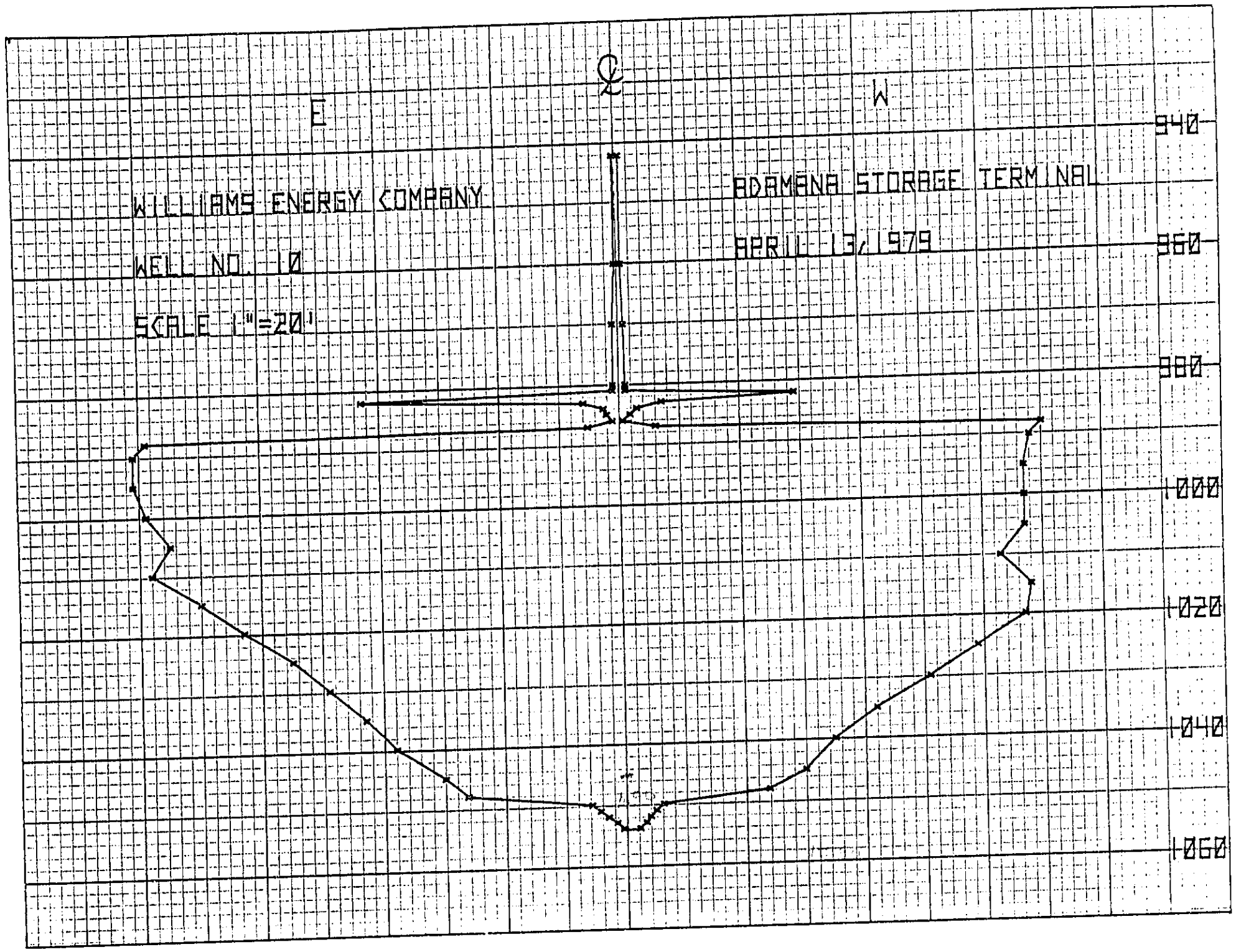
1060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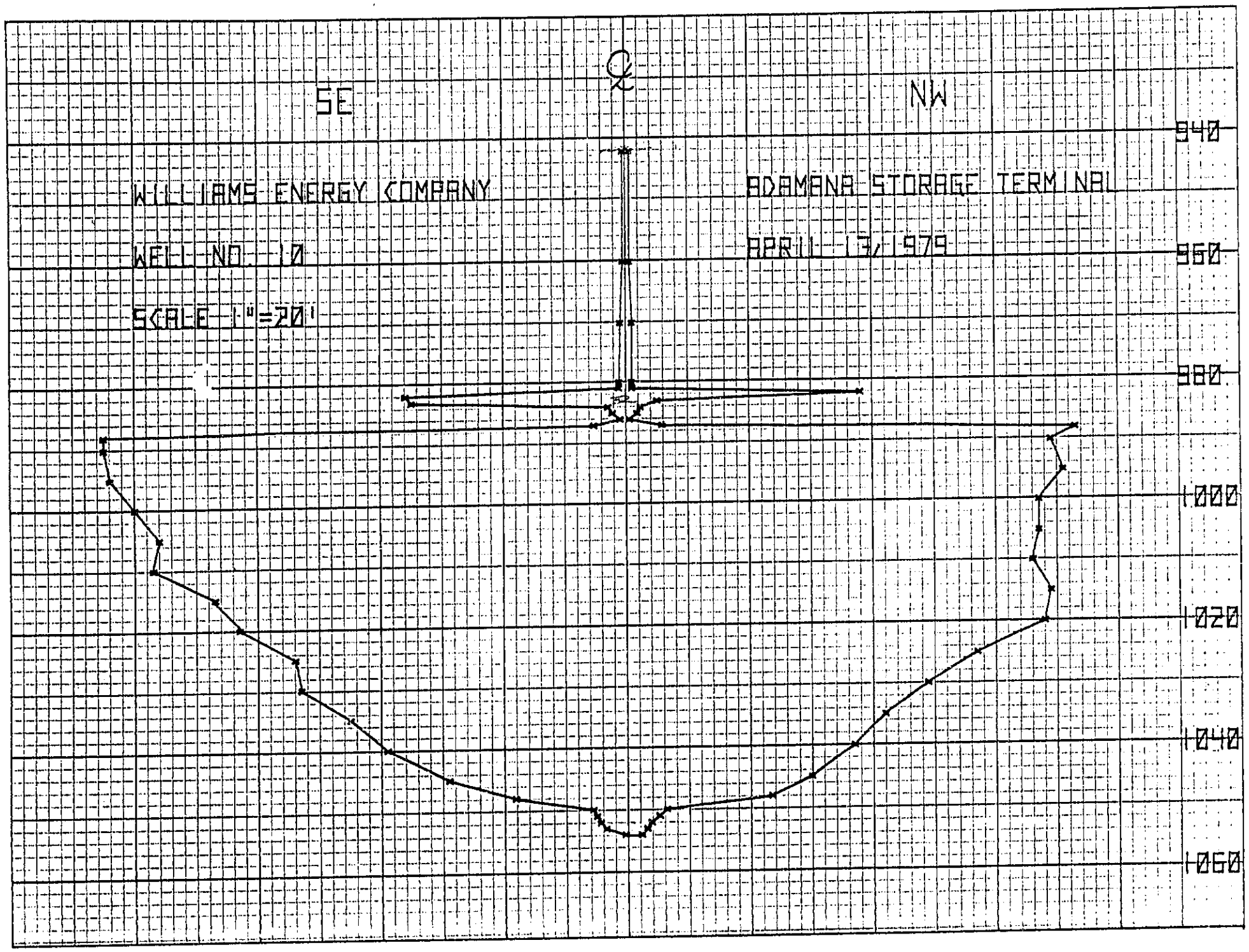
WILLIAMS ENERGY COMPANY
ADAMANA STORAGE TERMINAL
APRIL 13, 1979
WELL NO. 10
SCALE 1"=20'


SE
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1040
1060
WILLIAMS ENERGY COMPANY
ADAMANA STORAGE TERMINAL
WELL NO. 10
APRIL 13, 1979
SCALE 1"=20'

FERRELLGAS LPG FACILITY

Operator:	Ferrellgas Inc.
Bond Company:	Travelers Casualty and Surety Co. of America
Bond No.:	030 S 103626358 BCM
Amount:	$25,000.00
Date approved:	8/01/96

Permits covered by this bond:

556 (Cavern 01)
557 (Cavern 02)
562 (Water well)
602 (Cavern 03)
603 (Cavern 04)
606 (Cavern 05)
607 (Cavern 06)
646 (Cavern 07)
647 (Cavern 08)
648 (Cavern 09)
✓ 671 (Cavern 10)
672 (Cavern 11)
776 (Cavern 12 -- not developed)
777 (Expired)
778* (Expired)

* Bond in Permit #778

May 20, 1996

Memo to Ferrellgas files
From: Steve Rauzi SR
Re: Discussion of volume verification in May 17, 1996 Commission meeting

All of the Commissioners present agreed that the sonar method was the best available technology to determine cavity shapes. They agreed that accepting volumetric measurements would be appropriate as long as sonar measurements continued to be used. Dr. Nations noted that sonar determinations could be waived in individual cases in appropriate situations.

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Fife Symington
Governor

Larry D. Fellows
Director and State Geologist

May 1, 1996

Memo: Dale Thompson, Ferrellgas, Adamana — 9 pages total
Fax #: 524-2635
From: SR Steve Rauzi, Oil & Gas Administrator
Re: Volume verification surveys pursuant to A.A.C. R12-7-182(D)

I examined the sonar surveys on several of your storage wells after receiving the three sonar surveys run in March 1996. My analysis indicates that sonar surveys do not provide an exact picture of the shape and change of shape from survey to survey. On the other hand, sonar surveys, even when run by different companies and tools, do provide a good picture of the general shape and change in shape of a cavity as shown on the attached Exhibits 3 through 8.

The increase then decrease in sonar-determined volume for cavities 3 and 6 on Exhibit 1 is of special concern to me. I'm not sure if the discrepancy is due to running sonar in open hole versus through-pipe, different companies and tools, differences in tool design or calculation parameters, or improved technology through time. One way to verify sonar-determined volumes would be to complement them with volumetric measurements. The generally consistent cavity shape, change in shape, and rate of maximum radius increase over the last 16 years shown by the sonar survey results on the attached Exhibits 2 through 8 confirms the general integrity of the shape your caverns.

However, in light of the increase then decrease in sonar-determined volume in cavities 3 and 6 shown on Exhibit 1, it would be beneficial and appropriate to complement the sonar-determined volume verifications with volumetric measurements. As a result, I plan to recommend that the Oil and Gas Conservation Commission accept volumetric measurements and sonar surveys run on alternate five year cycles to provide a more accurate tracking and verification of cavity volumes; alternatively, to accept volumetric measurements annually complemented with sonar surveys at least every ten years or whenever a cavity is reentered and worked over, starting a new ten-year cycle.

Please feel free to comment on any aspect my analysis or reasoning. Also, I look forward to receiving your latest volumetric measurements pursuant to our discussion before the Commission's next meeting on May 17.

ADAMANA SONAR METHOD VOLUME VERIFICATION HISTORY

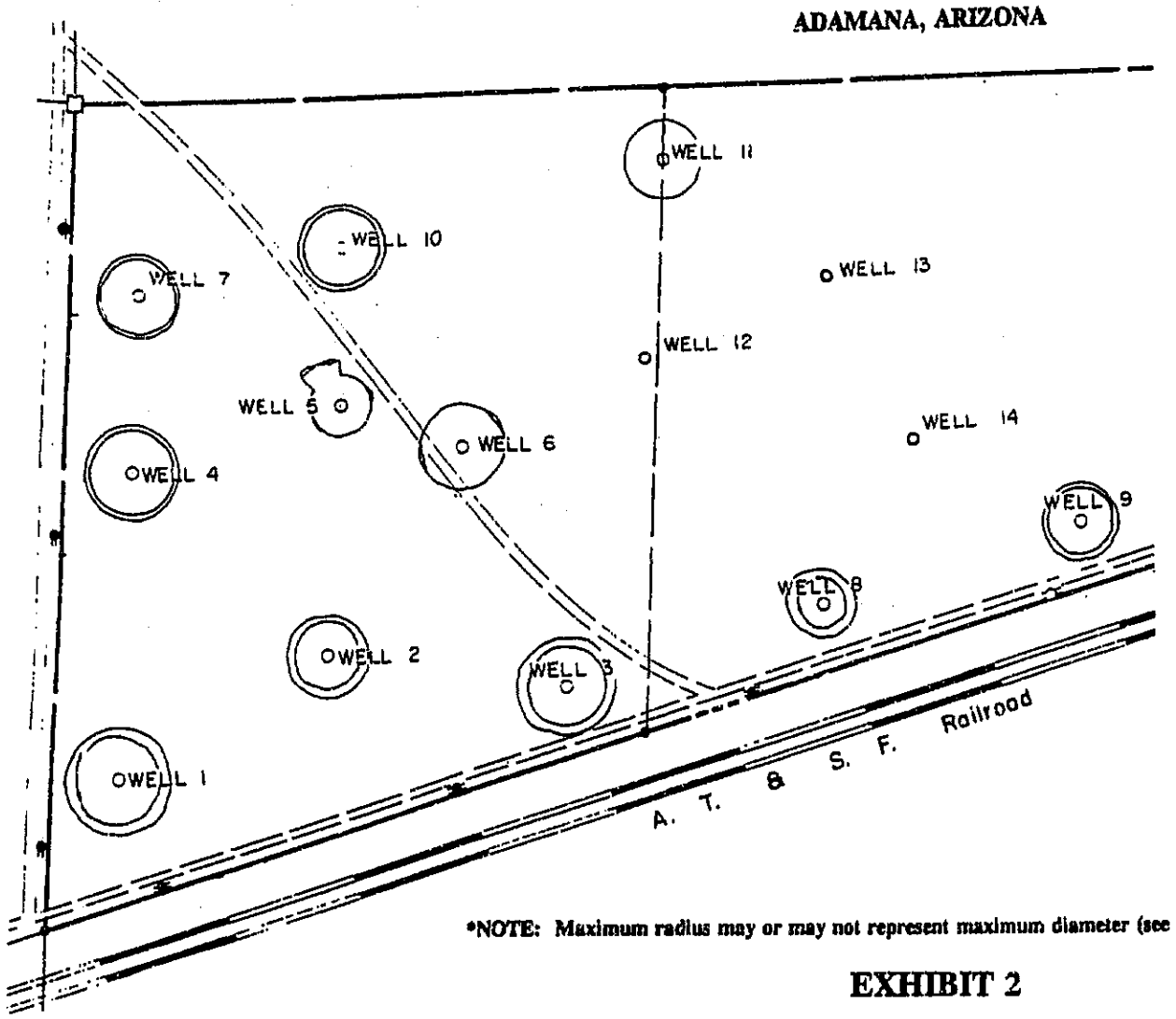
Permit	Well No.	TD	Cavern	Initial Sonar	Max Radius	Sonar Volume	Second Sonar	Max Radius	Sonar Volume	Third Sonar	Max Radius	Sonar Volume
556	1	1101'	900-985'	4/79 Dowell	99'@942'	150,532 bbls	3/92 Digital*	118'@944'	176,119 bbls			
557	2	1112'	906-995'	4/79 Dowell	74'@958'	149,008 bbls	2/89 MicroGage	90'@970'	193,563 bbls	2/95 Sonarwire**	89'@938'	197,559 bbls
602	3	1140'	944-1008'	4/79 Dowell	87'@995'	145,550 bbls	5/91 Digital*	104'@986'	195,355 bbls	3/96 Sonarwire*	104'@982'	185,607 bbls
603	4	1120'	950-1007'	4/80 Dowell	97'@945'	158,244 bbls	3/92 Digital	102'@978'	189,616 bbls			
606	5	1119'	938-1035'	---		---	3/89 MicroGage	100'@1026'	165,922 bbls	3/95 Sonarwire**	101'@1026'	169,615 bbls
607	6	1120'	924-1027'	4/80 Dowell	93'@952'	146,458 bbls	5/91 Digital*	94'@964'	200,659 bbls	3/96 Sonarwire*	90'@1006'	176,893 bbls
646	7	1152'	951-1079'	4/80 Dowell	84'@1055'	171,283 bbls	5/91 Digital	90'@1074'	179,122 bbls	3/96 Sonarwire**	90'@1066'	199,654 bbls
647	8	1132'	956-1069'	4/80 Dowell	57'@1060'	110,892 bbls	3/92 Digital*	72'@1054'	140,952 bbls			
648	9	1125'	973-1065'	4/80 Dowell	71'@1030'	108,222 bbls	3/92 Digital*	81'@1015'	168,797 bbls			
671	10	1150'	978-1042'	4/79 Dowell	85'@988'	128,541 bbls	3/89 MicroGage	99'@990'	164,567 bbls	2/95 Sonarwire**	98'@988'	168,792 bbls
672	11	1176'	960-1101'	---		---	3/89 MicroGage	84'@1070'	227,718 bbls	3/95 Sonarwire**	84'@1070'	244,537 bbls
776	12	1200'	Cavern not developed									
TOTAL CAPACITY									2,031,123 bbls 85,307,166 gallons			

* Sonar through one string of pipe
** Sonar through two strings of pipe

EXHIBIT 1

CAVERN MAXIMUM RADIUS* PLOT, FERRELLGAS LPG-STORAGE FACILITY

ADAMANA, ARIZONA



INDICATED RADIUS INCREASE THROUGH TIME BY SONAR MEASUREMENT

Well No.	TD	Cavern	Initial Sonar	Max Radius	Latest Sonar	Max Radius	Sonar Volume	Indicated net Increase
1	1101'	900-985'	4/79	99'@942'	3/92	118'@944'	176,119 bbls	19'/13yr (1.5'/yr)
2	1112'	906-995'	4/79	74'@958'	2/95	89'@938'	197,559 bbls	15'/16yr (1'/yr)
3	1140'	944-1008'	4/79	87'@995'	3/96	104'@982'	185,607 bbls	17'/17yr (1'/yr)
4	1120'	950-1007'	4/80	97'@945'	3/92	102'@978'	189,616 bbls	5'/12yr (.5'/yr)
5	1119'	938-1035'	3/89	100'@1026'	3/95	101'@1026'	169,615 bbls	1'/6yr (.2'/yr)
6	1120'	924-1027'	4/80	93'@952'	3/96	94'@1006'	176,893 bbls	1'/16yr (.06'/yr)
7	1152'	951-1079'	4/80	84'@1055'	3/96	90'@1066'	199,654 bbls	6'/16yr (.4'/yr)
8	1132'	956-1069'	4/80	57'@1060'	3/92	72'@1054'	140,952 bbls	39'/12yr (3'/yr)
9	1125'	973-1065'	4/80	71'@1030'	3/92	81'@1015'	168,797 bbls	10'/12yr (.8'/yr)
10	1150'	978-1042'	4/79	85'@988'	2/95	98'@988'	168,792 bbls	13'/16yr (.8'/yr)
11	1176'	960-1101'	3/89	84'@1070'	3/95	84'@1070'	244,537 bbls	0'/6yr (–/yr)
12	1200'	Cavern not developed						

*NOTE: Maximum radius may or may not represent maximum diameter (see Well 5 above & Exhibits 3-5)

EXHIBIT 2

SLR APR '96

SCALE : 1" = 50'

MAXIMUM RADIUS PLOT

FERRELLGAS WELL 5

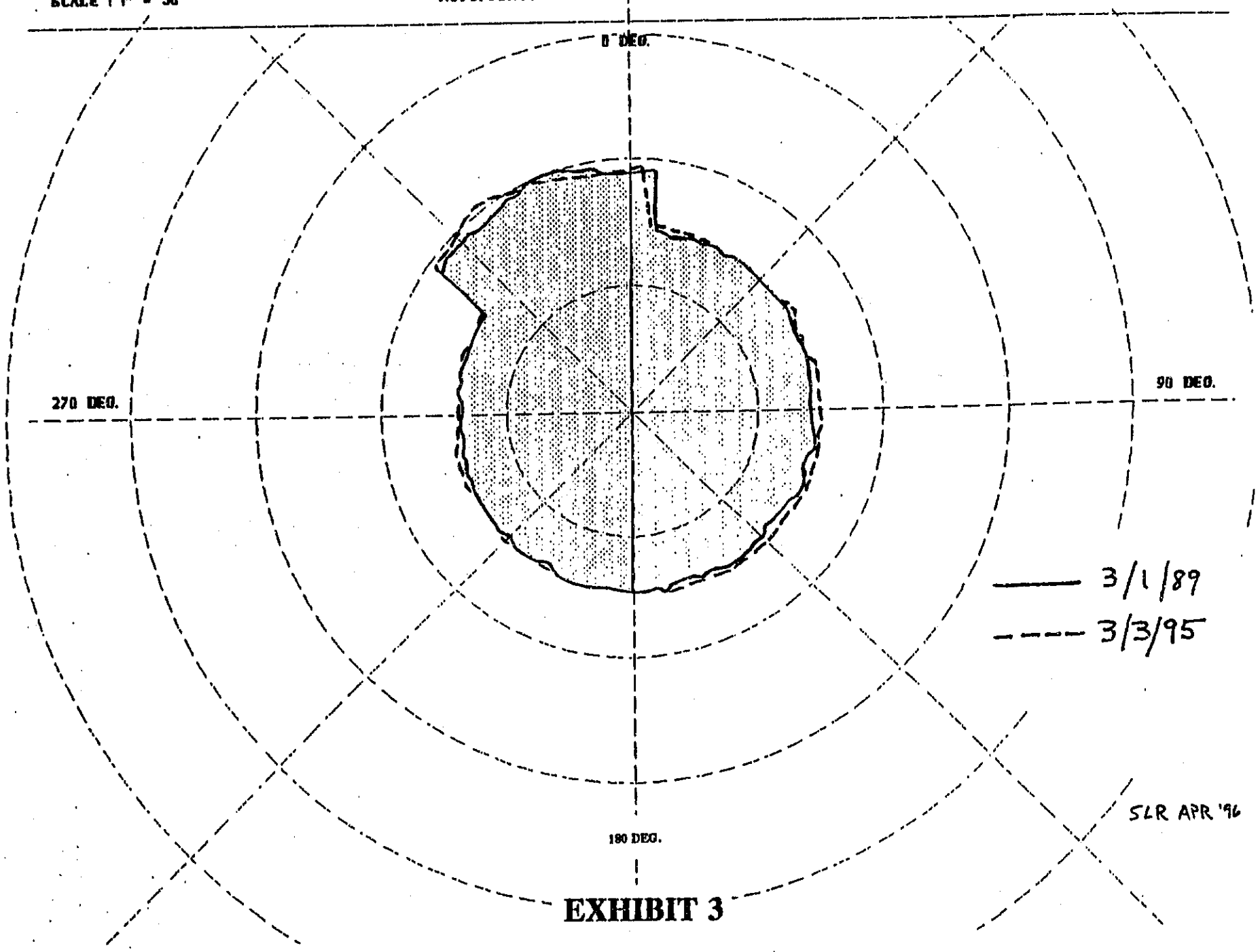


EXHIBIT 3

VERTICAL CROSSECTION

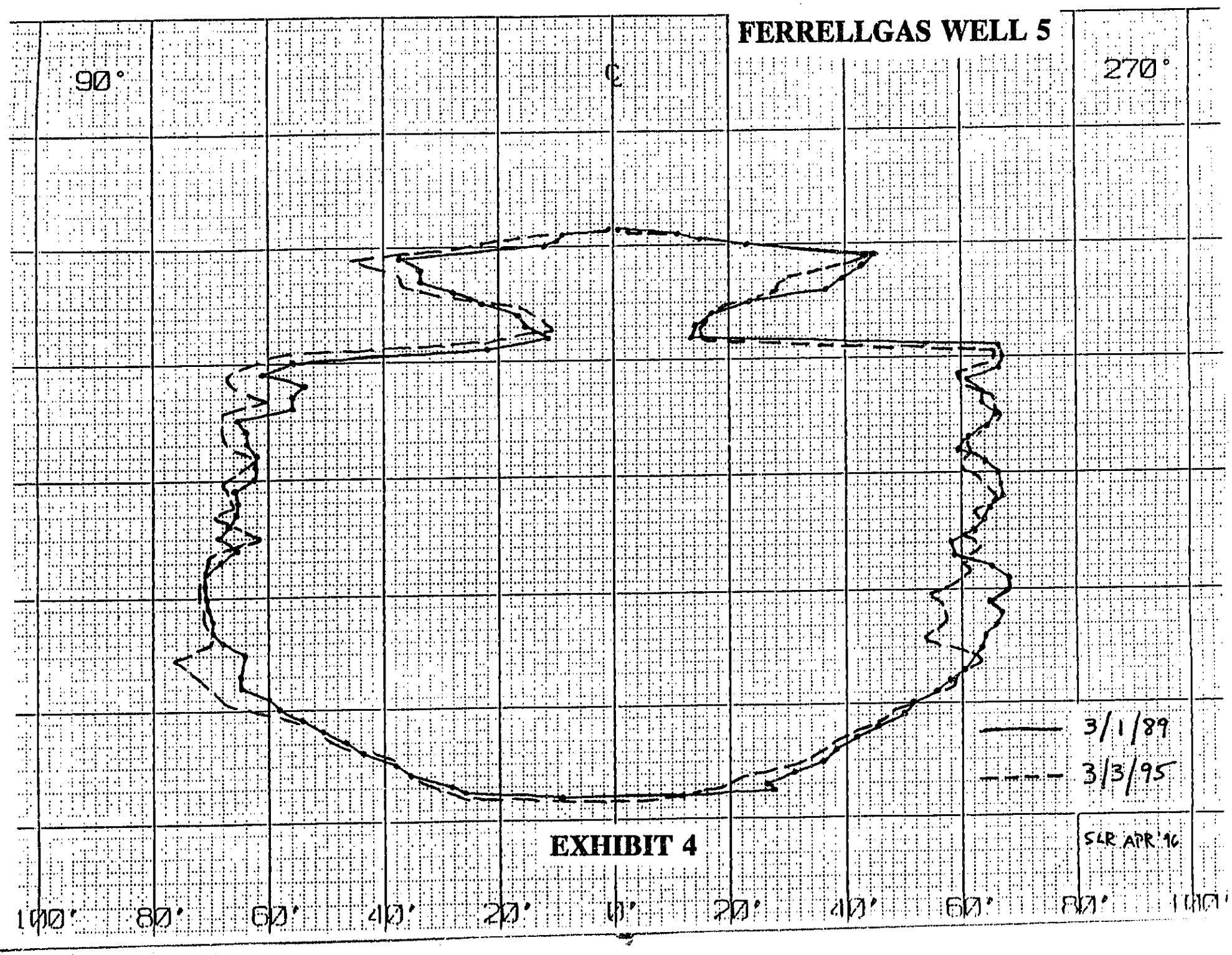


EXHIBIT 4

VERTICAL CROSSECTION

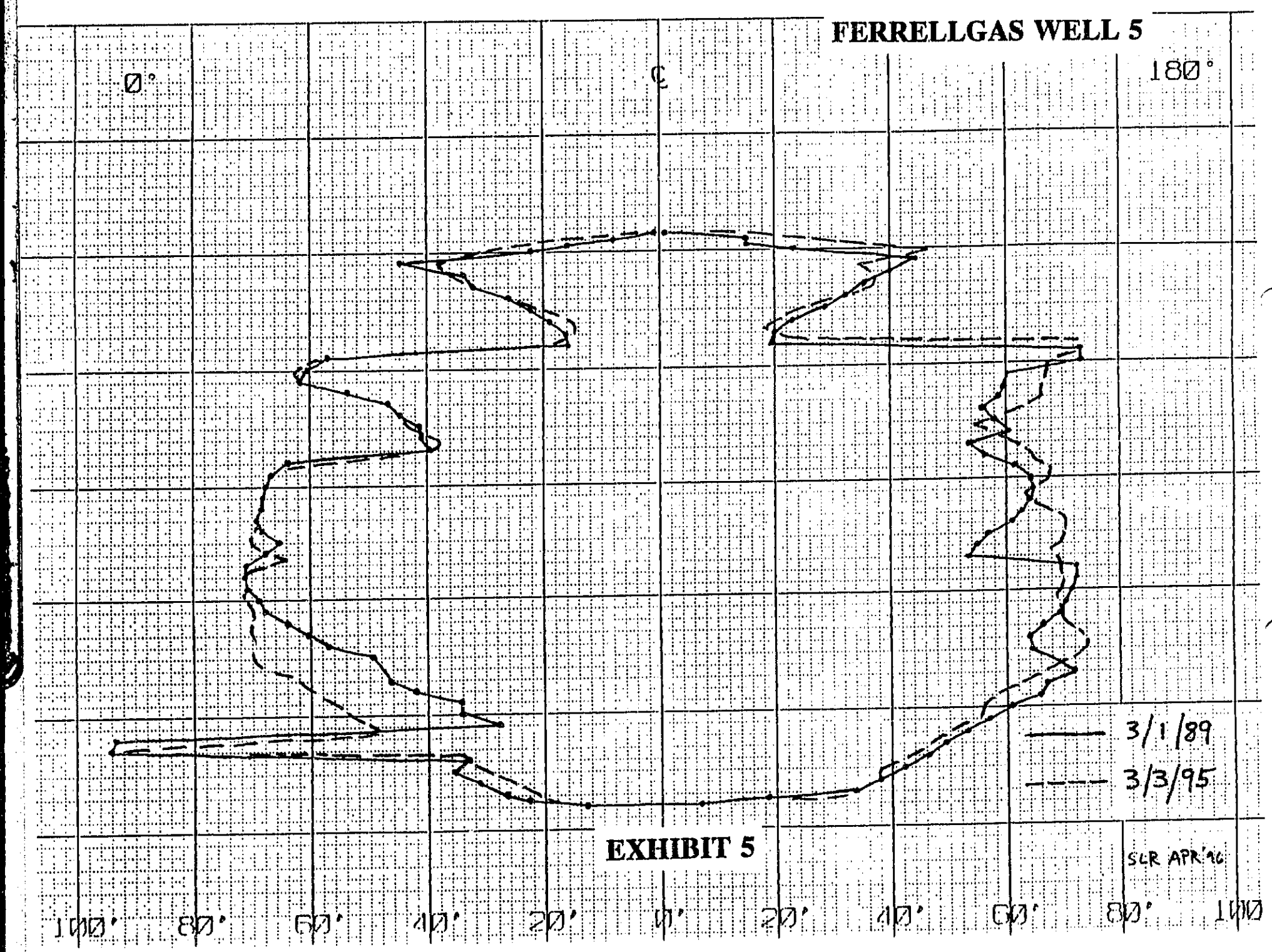


EXHIBIT 5

SCALE : 1" = 50'

MAXIMUM RADIUS PLOT

FERRELLGAS WELL 6

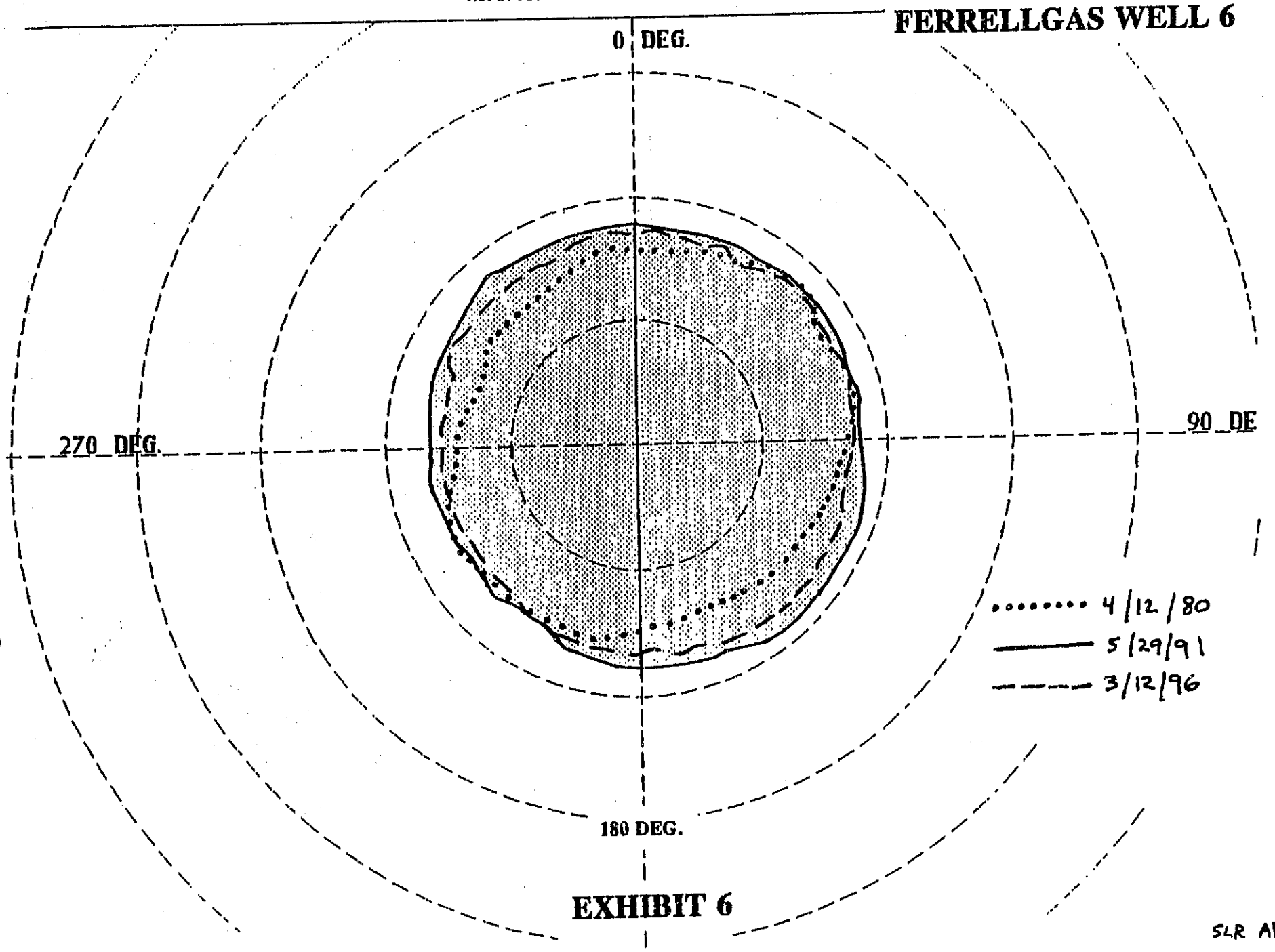


EXHIBIT 6

SLR APR '96

FERRELLGAS WELL 6

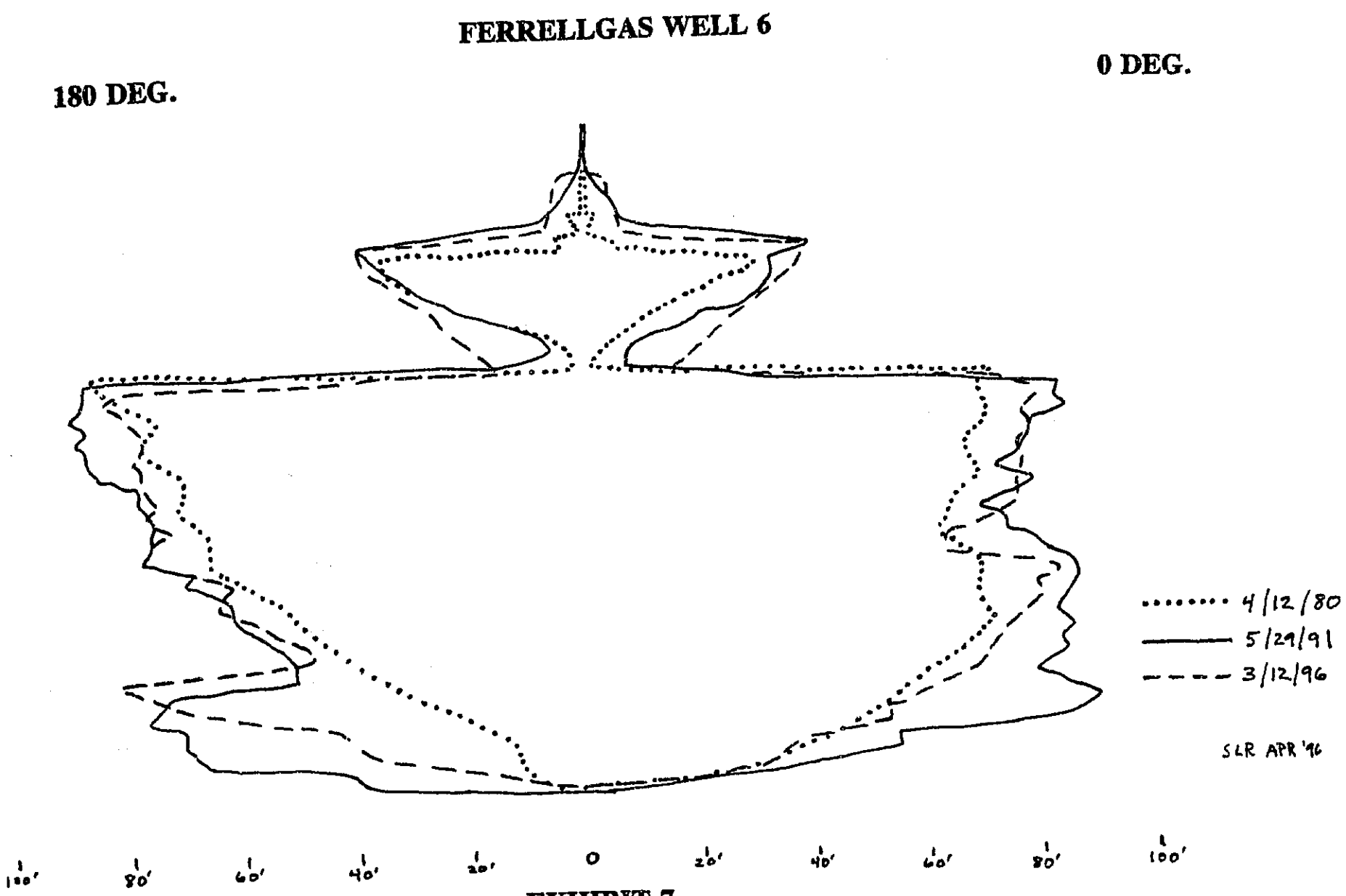


EXHIBIT 7

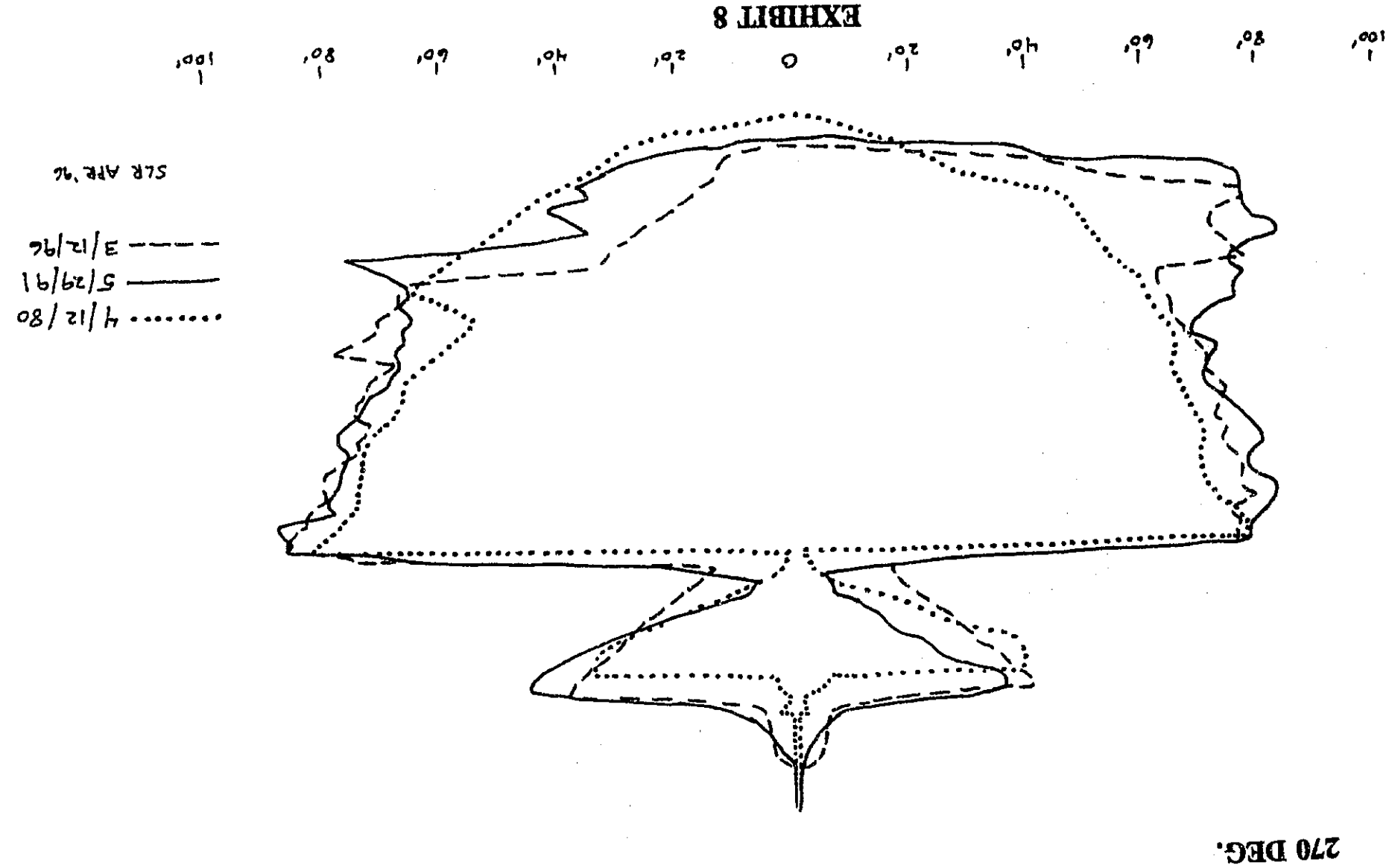

FERRELLGAS WELL 6
90 DEG.
270 DEG.
4/12/80
5/29/91
3/12/96
SLR APR.'96
100'
80'
60'
40'
20'
0
20'
40'
60'
80'
100'

EXHIBIT 8

Ferrellgas

April 24, 1996

To: Steve Rauzi
Arizona Geological Survey

From: Dale Thompson
Ferrell North America

Subject: Cavern Capacities

Steve, as of October 30, 1996 these are the last known capacities on all the Caverns at the Adamana Storage Facility. (Capacities are in gallons).

Cavern #1	8,496,730
Cavern #2	6,900,978
Cavern #3	7,368,738
Cavern #4	8,676,071
Cavern #5	6,884,626
Cavern #6	7,886,657
Cavern #7	8,068,158
Cavern #8	6,349,044
Cavern #9	6,969,816
Cavern #10	7,792,578
Cavern #11	10,601,992

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If we can be of further assistance please contact us at (520) 524-3229.

Sincerely,

Dale Thompson

Adamana Road • P.O. Box 1624 • Holbrook, Arizona 86025 • 602-524-3229

Ferrellgas

April 9, 1996

file 671

Steve L. Rauzi, Administrator
Oil and Gas Program
5150 N. 16th St., Ste. B141
Phoenix, Arizona 85016

APR 1996
ARIZONA GEOLOGICAL SURVEY

Dear Steve,

After our discussion on March 11, 1996 about "volumetric measurement" of our storage caverns I did some research.

Our past records on last known capacities indicate a more exact method of yearly cavern measurement. Due to the fact that almost all of our caverns are filled and emptied on a yearly basis, I feel this would be more accurate and more often a "yearly" measurement program.

Considering the reasons stated above, I would like to request the Adamana Facility perform the volumetric measurement program on a yearly basis and sonar measurement method every "ten years".

Steve, as you can see by our past sonar reports any increase in size has been very minute over the years. With the acceptance of the commission, my plan would be to sonar any cavern that had to be worked over; otherwise, all caverns would receive the sonar method on a "ten year" basis. All "volumetric measurement" information on our Adamana caverns can be submitted to your office on a yearly or five and/or ten year basis whichever you and the commission would prefer.

Steve, please let me know what you think and how to resolve this matter. Thank you for your time and consideration.

Sincerely,

Dale Thompson
Terminal Manager

Adamana Road • P.O. Box 1024 • Holbrook, Arizona 86025 • 602-524-3229

State of Arizona
Arizona Geological Survey
845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795

Fife Symington
Governor

Larry D. Fellows
Director and State Geologist

July 13, 1993

Ms. Brenda Davis, Mail Drop 5
Ferrellgas
One Liberty Plaza
Liberty, Missouri 64068

Re: Ferrellgas wells in Arizona
Approval of blanket bond #U1665522, United Pacific Insurance Company
Release of blanket bond #400 GV 7009, St. Paul Fire and Marine Insurance Company

Dear Ms. Davis:

I have enclosed an approved copy of the referenced blanket bond #U1665522 effective July 16, 1993, for all wells operated by Ferrellgas in Arizona.

This letter represents the Oil and Gas Conservation Commission's approval to release the referenced blanket bond #400 GV 7009 effective July 16, 1993.

Sincerely,

Steven L. Rauzi

Steven L. Rauzi
Oil & Gas Program Administrator

Enclosure

c Ms. Mary T. Flanigan, St. Paul Seaboard, Overland Park, Kansas

State of Arizona
Arizona Geological Survey
845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795

Fife Symington
Governor

Larry D. Fellows
Director and State Geologist

June 29, 1993

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Ms. Kathy Cordera
Martin Insurance
P. O. Box 8418
Prairie Village, Kansas 66208-0418

Fax 913-676-9145 one copy of bond form No 2 6/29 @ 7:20 am SLR

Dear Ms. Cordera:

In response to your telephone call this morning, I have enclosed two blank copies of the Oil and Gas Conservation Commission's Performance Bond. File two copies of the completed bond form to my attention at the letterhead address.

Our records show that Ferrellgas currently has twelve storage wells and one freshwater well under bond.

Let me know if I can be of further assistance.

Sincerely,

Steven L. Rauzi

Steven L. Rauzi
Oil & Gas Program Administrator

Enclosures

State of Arizona
Arizona Geological Survey
845 North Park Avenue, #100
Tucson, Arizona 85719
(602) 882-4795

Fife Symington
Governor

Larry D. Fellows
Director and State Geologist

May 20, 1993

~~649~~ 671

Ms. Mary T. Flanigan
Attorney-in-Fact
St. Paul Seaboard
P. O. Box 935
Overland Park, Kansas 66201-0935

Re: Ferrellgas, Inc. blanket performance Bond No. 400 GV 7009

Dear Ms. Flanigan:

I received your certified letter No. P 105-228-862 requesting the St. Paul Fire and Marine Insurance Company's release from obligation under the captioned bond because the captioned bond is being replaced by United Pacific Insurance Company Bond #U1665502 effective June 25, 1993.

A.A.C. R12-7-103 requires a performance bond to remain in effect until (1) the wells under the bond have been plugged and abandoned as approved by the Oil and Gas Conservation Commission, or (2) the a new blanket bond is posted for the wells. I have not received or approved a replacement bond for the captioned bond.

As a result, I cannot release St. Paul Fire and Marine Insurance Company's obligation under the captioned bond until the United Pacific Insurance Company Bond #U1665502 is received by this office and approved.

Please let me know if I can be of further assistance in this matter.

Sincerely,

Steven L. Rauzi

Steven L. Rauzi
Oil & Gas Program Administrator

c Mr. Greg Greer, Ferrellgas, P.O. Box 4644, Houston, Texas 77216
Mr. Dale Thompson, Ferrellgas, P.O. Box 1024, Holbrook, Arizona 86025

ADAMANA VOLUME VERIFICATION SURVEYS
(all by the sonar method)

Permit	Well	Survey Date	Survey Date	Current Status
556	1	4/79	3/92	In compliance
557	2	4/79	2/89	In compliance
602	3	4/79	5/91	In compliance
603	4	4/80	3/92	In compliance
606	5	---	3/89	In compliance
607	6	4/80	5/91	In compliance
646	7	4/80	5/91	In compliance
647	8	4/80	3/92	In compliance
648	9	4/80	3/92	In compliance
671	10	4/79	3/89	In compliance
672	11	---	3/89	In compliance
776	12			CAVERN NOT DEVELOPED

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Oil and Gas Conservation Commission
STATE OF ARIZONA
3110 N. 19th AVENUE, SUITE 190
PHOENIX, ARIZONA 85015
PHONE: (602) 255-5161

January 11, 1989

Mr. Glenn Mace
Ferrellgas
Granada Building, Suite 216
3316 East 32nd Street
Tulsa, OK 74135

Dear Mr. Mace:

As we discussed during your visit yesterday, Oil and Gas Conservation Commission Rule 12-7-181.1.i requires that "...a flare or other safety system shall be installed at or near each brine pit..." As you know, the Ferrellgas facility at Adamana does not have a flare installed at present since the dismantling of the rusted-out older system.

Thus it appears that your operation is not in compliance with this rule. Therefore, it is necessary for Ferrellgas to install such a device to come into compliance. Failure to comply would cause the Commission to invoke R12-7-181.1.i which involves shutting down the operation.

You indicated that it will take some time to design, fabricate, and install the flare system. We would hope that this can be completed before the next scheduled inspection of the facility which will be around the end of May 1989.

Although we did not specifically discuss this issue, Rule 12-7-181.1.i.v requires verification of the capacity of each storage cavern every five years. This has not been accomplished since 1979 and 1980. Thus your operation is not in compliance with this rule. It will be necessary for Ferrellgas to begin to verify these capacities very soon. I realize this is the busy season, but as soon as activity declines and caverns are shut in for a few days, the logs can be run.

I was thinking about the possible problem with liquid propane in extremely cold weather. One way to solve the problem is to include an oil-water separator in the flow line from the caverns to the pits. A simple "drip" system might work, or an actual oil-water separator such as is used at gas-condensate wells. We sure don't want to burn up any pit liners.

We will expect to hear from you regularly concerning your progress in the matter of the flare and the sonar.

Very truly yours,

Daniel J. Brennan
Executive Director

June 2, 1978

Mr. Bob Larsen
Williams Energy Company
P.O. Box 3478
Mail Drop #33-1
Tulsa, Oklahoma 74101

Dear Mr. Larsen:

During a visit yesterday to your LPG storage area at Adamana, Mr. Sam Snyder informed me that you have replaced Dan Dougherty as Manager of Storage Terminals.

The purpose of my visit to this terminal was to discuss our Rule 706. This rule was recently adopted by the Arizona Oil and Gas Conservation Commission at a public hearing. Mr. Dougherty attended this hearing.

Rule 706, as adopted, doesn't affect your storage terminal as it now exists, except Sections C and D. These sections primarily pertain to safety features. The safety feature of immediate concern to this commission is the installation of a flare system.

This Commission does not intend to dictate or even recommend a particular design for this system. We do retain the right to approve the system that you select. The system that Mr. Snyder has discussed with you is not acceptable to the Commission.

We are enclosing a copy of Rule 706, together with a copy of the general rules and regulations of the Commission. You will note that some of these general rules also pertain to your operation.

This Commission has enjoyed a very pleasant working relationship with Williams Energy and be assured that we want to cooperate with you and your staff to the fullest extent.

Your prompt attention to the installation of the flare system will be much appreciated.

Let us know if we can be of any help whatsoever.

Very truly yours,

W. E. Allen
Director
Enforcement Section

WEA/vb

Enc.

March 28, 1978

Mr. Dan J. Dougherty
Manager of Storage Terminal
Williams Energy Company
P.O. Box 3478
Tulsa, Oklahoma 74101

Dear Dan:

Recent developments connected with the underground storage of LPG in Arizona have caused this Commission to make a study of various safety devices which would tend to prevent any accidents from occurring during the pumping of LPG into a storage reservoir. It has been concluded that a flare system, properly installed and operated in a proper manner, would be the safest and most economical of all safety systems.

These conclusions make it necessary that this Commission request all operators of LPG storage projects within the State to install a flare system at their respective storage sites as quickly as possible. The Commission does not intend to dictate to the operator the technical design of this system, but does retain the right to approve the system selected.

Your full and early cooperation in the installation of such a safety system is expected.

Very truly yours,

W. E. Allen
Director
Enforcement Section

WEA/vb

WILLIAMS ENERGY COMPANY
321 SOUTH BOSTON
P. O. BOX 3478
TULSA, OKLAHOMA 74101
PHONE: (918) 583-1711

RECEIVED
DEC 10 1976
O & G CONS. COMM.

December 8, 1976
DJD:80:76
GOV 20/PRJ 1

Mr. William E. Allen, Director
Enforcement Section
Oil & Gas Conservation Comm.
State of Arizona
8686 North Central
Suite 106
Phoenix, Az. 85020

Dear Mr. Allen:

Enclosed are well completion reports for new wells numbered 10 and 11 at Adamana, Arizona along with a copy of the Borehole Compensated Sonic Log for each well.

Also enclosed to complete your file on the number 8 well drilled in 1975, is an updated report showing the addition of hanging the solution string while the rig was on location to drill wells 10 and 11. Well number 8 is now ready for space development as we had devoted our development capability during the past year to wells 7 and 9.

Very truly yours,

Dan J. Dougherty

Dan J. Dougherty
Manager of Storage Terminals

DJD/jd
encls.
cc: Alan B. Erwin; K&A, Inc.

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DOXOL UREGAS
Names in propane you can count on

STOR. TERM.
DEC - 7 1976
TRANSP.

K & A INC.
OIL & GAS PROPERTY MANAGEMENT
1400 FOURTH NATIONAL BUILDING • 15 WEST SIXTH ST. • TULSA, OKLA. 74119 • AREA 918 / 587-5115

RECEIVED
DEC 10 1976
D & G CONS. COMM.

December 6, 1976

Mr. Dan Dougherty
Williams Energy Company
P. O. Box 3478
Tulsa, Oklahoma 74101

Re: Adamana Project
Apache County, Arizona

Dear Dan:

Enclosed are the well completion forms for the State of Arizona on Well Nos. 8, 10 and 11, which are ready for your signature.

If you have any questions regarding these forms, please give me a call.

Very truly yours,

K & A, INC.

Alan

Alan B. Erwin
Vice President

ABE:pw
Enclosure

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STOR. TERM.
DEC - 8 1976
TRANSP.

K&A INC.
OIL & GAS PROPERTY MANAGEMENT
1400 FOURTH NATIONAL BUILDING • 15 WEST SIXTH ST. • TULSA, OKLA. 74119 • AREA 918 / 587-5115

RECEIVED
DEC 10 1976
O & G CONS. COMM.

December 7, 1976

Mr. Dan Dougherty
Williams Energy Company
P. O. Box 3478
Tulsa, Oklahoma 74101

Re: Adamana Project
Apache County, Arizona

Dear Dan:

Enclosed are the Borehole Compensated Sonic Logs on Adamana Well Nos. 10 and 11, per your request, to accompany the well completion reports for the State of Arizona.

Very truly yours,

K & A, INC.

Pat

Pat Whittington
Secretary to Alan Erwin

pw
Enclosure

671

OFFICE OF
Oil and Gas Conservation Commission
STATE OF ARIZONA
3686 NORTH CENTRAL, SUITE 106
PHOENIX, ARIZONA 85020
PHONE: (602) 271-5161

October 22, 1976

Mr. Dan J. Dougherty
Manager of Storage Terminals
Williams Energy Company
P.O. Box 3478
Tulsa, Oklahoma 74101

Dear Mr. Dougherty:

Enclosed please find approved copy of Application to Drill for storage wells number 10 and number 11, Drilling Permits 671 and 672 and receipt for your check for $50.00.

Very truly yours,

William E. Allen
Director
Enforcement Section

WEA/vb

Enc.

WILLIAMS ENERGY COMPANY
321 SOUTH BOSTON
P. O. BOX 3478
TULSA, OKLAHOMA 74101
PHONE: (918) 583 1711

October 18, 1976
DJD:69:76
GOV 20

Mr. W. E. Allen, Director,
Enforcement Section
Arizona Oil & Gas Conservation Comm.
8686 N. Central, Suite 106
Phoenix, Arizona

Dear Mr. Allen:

Enclosed is Williams Energy Company's check number 167115. This is to cover filing fee for the drilling of storage wells number 10 and number 11 on the Williams property at Adamana, Arizona.

Also enclosed are "Application to Drill" (Form 3) for each well along with a print copy of the certified plat showing the well locations. Should any additional data be required please advise the undersigned.

Sincerely,

Dan Dougherty

Dan J. Dougherty
Manager of Storage Terminals

DJD/jh
encls.

DOXOL UREGAS
Names in propane you can count on