BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

APPLICATION OF SAMUEL GARY JR. & ASSOCIATES, INC. FOR APPROVAL OF A GAS RE-INJECTION/PRESSURE MAINTENANCE PROJECT, SANDOVAL COUNTY, NEW MEXICO.

No. 10,141

AMENDED APPLICATION

Applicant Samuel Gary Jr. & Associates, Inc. hereby applies for approval of a gas re-injection/pressure maintenance project, and in support thereof states:

1. The San Isidro #13-11 Well, located in the NE¼SW¼ of Section 13, Township 20 North, Range 3 West, N.M.P.M. is completed in the Mancos formation and is currently shut-in or is producing small amounts of hydrocarbons.

2. Application requests permission to inject gas produced from the wells referenced in Paragraph 3 into the San Isidro #13-11 Well. The injection interval will be the current perforations in the Mancos formation. The project area will encompass all of Section 13.

NOTE: This application was originally filed with the Division requesting permission to inject into the San Isidro 11-16 Well located in Section 11, Township 20 North, Range 3 West.

3. The gas to be injected will be produced gas from horizontal and conventional wells within the San Isidro (Shallow) Unit completed in the Rio Puerco-Mancos Oil Pool.

4. A Form C-108 regarding this application has been filed with the Division.

5. The granting of this application is in the interests of conservation and prevention of waste.

WHEREFORE, Applicant requests that the Division enter its order granting the relief requested above.

Respectfully Submitted,

HINKLE, COX, EATON, COFFIELD & HENSLEY

By /s/ James Bruce

James Bruce
500 Marquette, N.W.
Suite 800
Albuquerque, N.M. 87102
(505) 768-1500

Attorneys for Applicant

BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

APPLICATION OF SAMUEL GARY JR. & ASSOCIATES, INC. FOR APPROVAL OF A GAS RE-INJECTION/PRESSURE MAINTENANCE PROJECT, SANDOVAL COUNTY, NEW MEXICO.

No. [illegible]

APPLICATION

Applicant Samuel Gary Jr. & Associates, Inc. hereby applies for approval of a gas re-injection/pressure maintenance project, and in support thereof states:

1. The San Isidro #11-16 Well, located in the SE¼SE¼ of Section 11, Township 20 North, Range 3 West, N.M.P.M. is completed in the Mancos formation and is currently shut-in or is producing small amounts of hydrocarbons.

2. Application requests permission to inject gas produced from the well(s) referenced in Paragraph 3 into the San Isidro #11-16 Well. The injection interval will be the current perforations in the Mancos formation. The project area will encompass all of Section 11.

3. The gas to be injected will be produced from horizontal wells within the San Isidro (Shallow) Unit completed in the Rio Puerco-Mancos Oil Pool. See Division Case Nos. 10,099 and 10,100.

4. A Form C-108 regarding this application has been or will be filed with the Division.

HINKLE, COX, EATON, COFFIELD & HENSLEY

ATTORNEYS AT LAW

500 MARQUETTE N.W., SUITE 800

ALBUQUERQUE, NEW MEXICO 87102-2121

(505) 768-1500

FAX (505) 768-1529

700 UNITED BANK PLAZA
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88202
(505) 622-6510
FAX (505) 623-9332

2800 CLAYDESTA NATIONAL BANK BUILDING
POST OFFICE BOX 3580
MIDLAND, TEXAS 79702
(915) 683-4691
FAX (915) 683-6518

1700 TEAM BANK BUILDING
POST OFFICE BOX 9238
AMARILLO, TEXAS 79105
(806) 372-5569
FAX (806) 372-9761

218 MONTEZUMA
POST OFFICE BOX 2068
SANTA FE, NEW MEXICO 87504
(505) 982-4554

LEWIS C. COX
PAUL W. EATON
CONRAD E. COFFIELD
HAROLD L. HENSLEY JR.
STUART D. SHANOR
ERIC D. LANPHERE
C. D. MARTIN
PAUL J. KELLY JR.
MARSHALL G. MARTIN
OWEN M. LOPEZ
DOUGLAS L. LUNSFORD
JOHN J. KELLY
T. CALDER EZZELL JR.
WILLIAM B. BURFORD*
RICHARD E. OLSON
RICHARD R. WILFONG*
THOMAS J. MARRIOTT
STEVEN D. ARNOLD
JAMES J. WECHSLER
NANCY S. CUSACK
JEFFREY L. FORNACIARI
JEFFREY D. HEWETT
JAMES BRUCE
JERRY F. SHACKELFORD*
JEFFREY W. HELLBERG*
ALBERT L. PITTS
THOMAS M. HNASKO
JOHN C. CHAMBERS*
MICHAEL A. GROSS
THOMAS D. HAINES, JR.
FRANKLIN H. MCCALLUM*
GREGORY J. NIBERT

DAVID T. MARKETTE*
MARK C. DOW
KAREN M. RICHARDSON*
FRED W. SCHWENDIMANN
JAMES M. HUDSON

RAYMOND HAMILTON
STANLEY K. KOTOVSKY JR.
BETTY H. LITTLE*
JEFFREY S. BAIRD*
RUTH S. MUSGRAVE
HOWARD R. THOMAS
PATRICIA A. WATTS
NANCY AUGUSTUS
MACDONNELL GORDON
REBECCA NICHOLS JOHNSON
PAUL R. NEWTON
WILLIAM R. JOHNSON
ELLEN R. CASEY
S. BARRY PAISNER
MARGARET CARTER LUDEWIG
MARTIN MEYERS
GREGORY S. WHEELER*
ANDREW J. CLOUTIER
JAMES A. GILLESPIE
GARY W. LARSON
STEPHANIE LANDRY
JERRY D. WORSHAM II
JOHN R. KULESETH, JR.
TONY CONNERS*

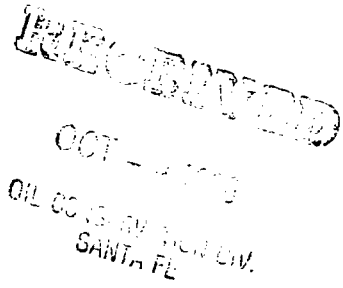
OF COUNSEL
O. M. CALHOUN
MACK EASLEY
JOE R. WOOD

CLARENCE E. HINKLE (1901-1985)
W. E. BONDURANT JR. (1913-1973)
ROY C. SNODGRASS, JR. (1914-1971)

*NOT LICENSED IN NEW MEXICO

October 9, 1990

VIA TELECOPY AND
HAND DELIVERED



Ms. Florene Davidson
New Mexico Oil Conservation Division
State Land Office Building
Santa Fe, New Mexico 87504

Dear Florene:

Enclosed is an Amended Application in case nos. 10,127 through 10,129 (regarding directional drilling), and a new Application regarding a gas reinjection/pressure maintenance project, both filed on behalf of Samuel Gary Jr. & Associates, Inc. Please set these matters for the October 31, 1990 hearing. The originals of these Applications will be forwarded to you by separate letter. Thank you.

Very truly yours,

HINKLE, COX, EATON, COFFIELD & HENSLEY

By: James Bruce

JB:le
Enclosures

BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

APPLICATION OF SAMUEL GARY JR. & ASSOCIATES, INC. FOR APPROVAL OF A GAS RE-INJECTION/PRESSURE MAINTENANCE PROJECT, SANDOVAL COUNTY, NEW MEXICO.

No. 11411

APPLICATION

Applicant Samuel Gary Jr. & Associates, Inc. hereby applies for approval of a gas re-injection/pressure maintenance project, and in support thereof states:

1. The San Isidro #11-16 Well, located in the SE¼SE¼ of Section 11, Township 20 North, Range 3 West, N.M.P.M. is completed in the Mancos formation and is currently shut-in or is producing small amounts of hydrocarbons.

2. Application requests permission to inject gas produced from the well(s) referenced in Paragraph 3 into the San Isidro #11-16 Well. The injection interval will be the current perforations in the Mancos formation. The project area will encompass all of Section 11.

3. The gas to be injected will be produced from horizontal wells within the San Isidro (Shallow) Unit completed in the Rio Puerco-Mancos Oil Pool. See Division Case Nos. 10,099 and 10,100.

4. A Form C-108 regarding this application has been or will be filed with the Division.

5. The granting of this application is in the interests of conservation and prevention of waste.

6. Applicant requests this matter be heard at the October 31, 1990 Examiner hearing.

Respectfully Submitted,

HINKLE, COX, EATON, COFFIELD & HENSLEY

By _____

James Bruce
500 Marquette, N.W.
Suite 800
Albuquerque, N.M. 87102
(505) 768-1500

Attorneys for Applicant

Form C-108
Application for Authorization to Inject
San Isidro 13-11

I. PURPOSE: The purposed of this application is to request approval to inject gas into the San Isidro 13-11 well, Section 13-Township 20 North-Range 3 West, Sandoval County, New Mexico. The gas re-injection is requested to allow disposal of the produced gas. This will allow unrestricted oil production in the Rio Puerco Field. Currently, due to gas venting restrictions, many wells are only allowed to produce part time during the month. This application does not qualify for administrative approval.

II. OPERATOR: Gary-Williams Oil Producers, 370 17th Street, Suite 5300, Denver, Colorado 80202. Telephone (303) 628-3800.

III. WELL DATA: See Attachment A.

IV. PROJECT EXPANSION: This is not an expansion of an existing project.

V. MAP: See Attachment B.

VI. TABULATION OF DATA IN AREA OF REVIEW: See Attachment C.

VII. PROPOSED OPERATIONS: Summarized below, full detail in Attachment D.

(1) The proposed average and maximum daily rates and volumes are expected to be .250-3.00 MMCFD with an estmated 3 MMCF per day injected.
(2) The system will be a closed system.
(3) The average injection pressure will be 1,400 psi with a maximum allowable surface pressure of 1,700 psi.
(4) The Gas injected into the Mancos formation is produced Mancos gas. It is compatable with existing reservoir fluids, and requires no additional analysis.
(5) Not required. This project is injecting Mancos Gas into the Mancos formation.

VIII. GEOLOGICAL DATA : The Mancos formation (Upper Cretaceous) is roughly 800' below the Point Lookout formation, and 900' above the Greenhorn formation. The Mancos has been subdivided into four zones called the Gallup "A", "B", "C", and "D".

The Mancos interval in the Rio Puerco area consists of highly interbedded very fine grained sandstones, siltstones and shales. Sandstones within the interval have very low porosities and permeabilities, usually averaging below 5% and 0.5 md respectively. The productive system is based primarily on natural fracturing which provides a permeability system to assist the drainage from the low porosity and permeability matrix blocks. The Mancos interval is very consistant throughout the Rio Puerco area.

IX. STIMULATION PROGRAM: There is no planned stimulation planned prior to injection of gas.

X. LOGS AND TEST DATA: All required logs and test data have been filed with the Division and will not be included in this application.

XI. FRESH WATER ANALYSIS: There are no fresh water wells within the one mile area of interest surrounding this well.

XII. AFFIRMATIVE STATEMENT: All available data has been reviewed and it is the undersigned's professional opinion that there is no evidence of open faults or other geological or hydrological phenomoma which could lead to the contamination of any zone containing drinking water.

XIII. PROOF OF NOTICE: A copy of this form has been mailed to operators within one-half mile of the well. The only operator is Benson-Montin-Greer, Farmington, New Mexico. The surface leasee is Eugene Johnson & Sons, Cuba, New Mexico.

XIV. CERTIFICATION: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name Richard Shuster Title Petroleum Engineer/Agent

Signature Richard Shuster Date January 15, 1991

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-108
Revised 10-1-78

APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR		ADDRESS	
Gary-Williams Oil Producer, Inc.		370 17th St. Suite 5300, Denver, CO 80202	
LEASE NAME	WELL NO.	FIELD	COUNTY
San Isidro 13	11	Rio Puerco Mancos	Sandoval

LOCATION

UNIT LETTER K ; WELL IS LOCATED 1980 FEET FROM THE South LINE AND 1980 FEET FROM THE East LINE, SECTION 13 TOWNSHIP 20 North RANGE 3 West NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING 36#,J-55 STC	9-5/8"	436' KB	135	Surface	Circulated to Surface
INTERMEDIATE 23#, J-55 STC	7"	3346' KB	205 sx Foamed 195 sx Class B	Surface	Circulated and Capped
LONG STRING Liner 10.5#, J-55 STC	4-1/2"	3140- 4262' KB	160	3473	Reversed out excess Bond Log
TUBING 4.7#, EUE	2-3/8"	3175' KB	NAME, MODEL AND DEPTH OF TUBING PACKER Baker Model C Set @ 3665'		

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Mancos Gallup	3610' KB	4172'

IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?	PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
Tubing	Perforations	3691'-4127'

IS THIS A NEW WELL DRILLED FOR DISPOSAL?	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED?	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE?
Yes		No

LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH
N/A

DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA
Ojo Alamo 305'	Menefee 2652'	Semilla 4425' (est top)

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE PSI
250 mcf	2000 mcf	Closed	Pressure	1400-1700

ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE —	WATER TO BE DISPOSED OF	NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
	N/A Gas		

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND)
Lessee - Eugene Johnson & Sons, Box 244, Cuba, NM 87013

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL
Benson-Montin-Greer Attn: Al Greer
221 Petroleum Center Building
Farmington, NM 87401

HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING? SURFACE OWNER	EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL
Yes	Yes

ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B) PLAT OF AREA	ELECTRICAL LOG	DIAGRAMMATIC SKETCH OF WELL
Yes	No	Yes

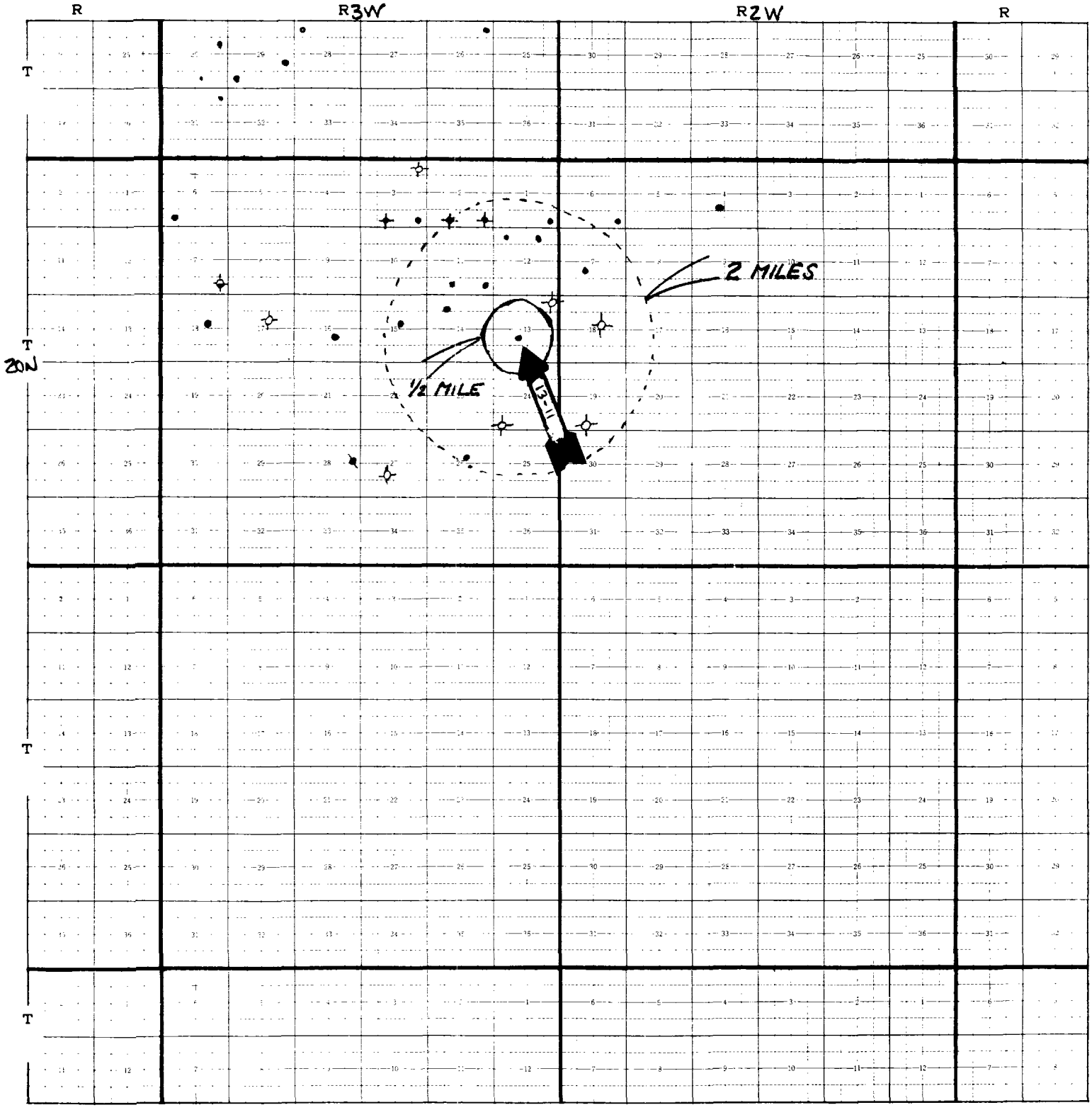
I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Richard Shuster (Signature) Petroleum Engineer/Agent (Title) January 15, 1991 (Date)

NOTE: Should waivers from the surface owner and all operators within one-half mile of the proposed injection well not accompany this application, the New Mexico Oil Conservation Division will hold the application for a period of 15 days from the date of receipt by the Division's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.

ATTACHMENT B

County SANDOVAL, State NEW MEXICO

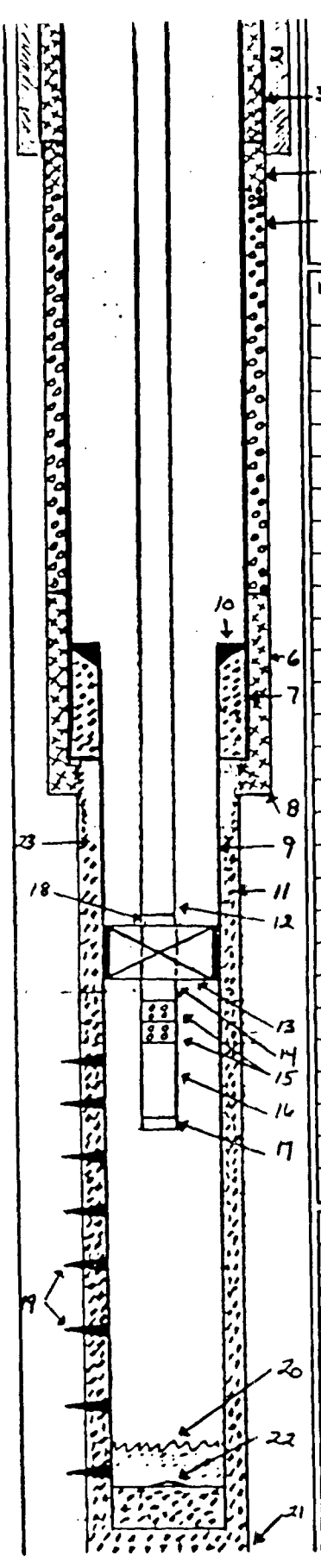


Four Township Island plat (½" to the mile)

ATTACHMENT C
SAN ISIDRO 13-11
WELL LOCATION MAP
FORM C-108

TABULATION OF ALL WELLS WITHIN 1/2 MILE RADIUS OF SAN ISIDRO 13-11

There are no wells located in the 1/2 mile area of review.



OPERATOR GARY-WILLIAMS OIL POOL

WELL # SAN ISIDRO 13-11

FIELD RIO PUERCO MANCOS

COUNTY SANDOVAL

STATE NEW MEXICO

DATE 10-22-85

☒ NEW COMPLETION ☐ WORKOVER

Casing			
SIZE	7	4½	2⅜
WEIGHT	23	10.5	4.7
GRADE	J-55	J-55	J-55
THREAD	8RD	8RD	EUE 8RD
DEPTH	3346	3140 & 4262	3715

ITEM NO.	EQUIPMENT AND SERVICES
1.	13⅜" Hole DRILLED TO 449' KB
2	135 Sx CLASS "B" CEMENT SURFACE TO 449' KB
3	36# J-55 STC CASING SET @ 436' KB
4.	45 Sx CLASS "B" CAP CEMENT SURFACE - 450' KB
5	205 Sx FOAMED CLASS "B" 450-2400' KB
6	150 Sx CLASS "B" TAIL CEMENT 2400'-3360' KB
7	23# J-55 STC CASING SET @ 3346
8	8¾" Hole DRILLED TO 3360
9	10.5# J-55 STC LINER SET 3140-4262' KB
10	4½" LINER HANGER WITH PACK-OFF @ 3140 KB
11	160 Sx 65/35 POZ 3140 - 4265' KB
12	2⅜" Tubing SET @ 3715' KB
13	BAKER MODEL "C" PACKER PACKING ELEMENTS @ 3665 KB
14	2⅜" x 6' SUB
15	2⅜" x 4' PERFORATED SUBS (2EA) 3672'-3680' KB
16	FULL JOINT of 2⅜" Tubing
17	2⅜" TAPPED BULL PLUG. (TO SEAT SET BOTTOM HOLE PRESSURE BOMBS) @ 3715 KB
18	"F" NIPPLE (1.81 ID) @ 3660
19	PERFORATIONS 3691 - 4127
20	FILL @ 4085' KB
21	6¼" HOLE TO 4265 KB
22	LATCH DOWN PLUG @ 4219
23	BOND LOG INDICATES CEMENT TOP @ 3473

COMMENTS:

6-21-85 PRESSURE TEST 9⅝" CASING TO 1500 PSI

6-25-85 PRESSURE TEST 7" CASING TO 1500 PSI

7-30-85 PRESSURE TEST 7" & 4½" CASING TO 3500 PSI

NOTE: LATCH DOWN PLUG DID NOT HOLD. LINER CEMENT FELL BACK 218' EVEN THO 25 Sx of CEMENT WAS REVERSED OUT DURING CEMENTING OPERATIONS. EXCELLENT BOND IS INDICATED ACROSS LINER LAP.

PREPARED BY	OFFICE	PHONE
Ray	ENGLEWOOD	

BHP • BU • PI • DD • GWT • RFS • GOR • FL • TS

TEFTELLER, INC.

reservoir engineering data

MIDLAND, TEXAS / FARMINGTON, NEW MEXICO
GRAND JUNCTION, COLORADO

P. O. Box 5247
Midland, Texas 79704
(915) 682-5574

November 6, 1985

Gary-Williams Oil Producer, Inc.
115 Inverness Drive East
Englewood, CO 80112

Attention: Mr. Ray Hager

Subject: Step Rate Test and Fall Off
Measurement
San Isidro No. 13-11
San Juan Basin Gallup Field
Sandoval County, New Mexico
Our File No. 2-17476-SRT&FO

Gentlemen:

Attached hereto are the results of a step rate injectivity test and fall off measurement which were conducted on the above captioned well October 22 through October 30, 1985.

The data presented are in tabular and graphical form.

It has been our pleasure to have conducted this service for you. If we may be of further assistance, please call us at any time.

Respectfully submitted,

TEFTELLER, INC.

Neil Tefteller

NT/lw
cc: Mr. Chuck Emerson
Gary-Williams Oil Producer, Inc.
Box 396
Cuba, NM 87013

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 1 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-22	Arrived on location, well shut-in	15:45				
	Release tandem instruments at 3722'	16:45				632
		17:45				637
		18:45				642
		19:45				646
		20:45				649
		21:45				652
		22:45				654
		23:45				657
10-23		00:45				659
		01:45				661
		02:45				664
		03:45				666
		04:45				668
		05:45				670
		06:45				672
		07:45				673
		08:45			640	675
	Start injectivity test Rate No. 1	08:47				
		08:53	0 06			731
		08:59	0 12			783
		09:05	0 18			822
		09:11	0 24			854
		09:17	0 30			886
		09:23	0 36			915
		09:29	0 42			941
		09:35	0 48			962
		09:41	0 54			981
		09:47	1 00			999
		09:53	1 06			1015
		09:59	1 12			1029
		10:05	1 18			1043
		10:11	1 24			1055
		10:17	1 30			1064
		10:23	1 36			1073
		10:29	1 42			1081
		10:35	1 48			1188
		10:41	1 54			1097
		10:47	2 00	1.00	*986	1105
	Injection stopped	10:47	0 00			

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 2 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	ELAPSED TIME MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-23		10:49	0	02			1101
	Start Rate No. 2	10:49	0	00			
		10:55	0	06			1119
		11:01	0	12			1133
		11:07	0	18			1143
		11:13	0	24			1152
		11:19	0	30			1161
		11:25	0	36			1169
		11:31	0	42			1176
		11:37	0	48			1183
		11:43	0	54			1188
		11:47	0	58	1.50	1073	1192
	Injection stopped	11:47	0	00			
		11:49	0	02		1044	1184
	Start Rate No. 3	11:49	0	00			
		11:55	0	06			
		12:01	1	12			1201
		12:07	0	18			1215
		12:13	0	24			1221
		12:19	0	30			1225
		12:25	0	36			1229
		12:31	0	42			1233
		12:37	0	48			1236
		12:43	0	54			1239
		12:47	0	58	2.00	1137	1242
		12:47	0	00			
		12:49	0	02		1090	1236
	Start Rate No. 4	12:49	0	00			
		12:55	0	06			1247
		13:01	0	12			1253
		13:07	0	18			1256
		13:13	0	24			1260
		13:19	0	30			1263
		13:25	0	36			1266
		13:31	0	42			1269
		13:37	0	48			1271
		13:43	0	54			1274
		13:47	0	58	2.50	1182	1276

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 3 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-23	Injection stopped	13:47	0	00			
		13:49	0	02		1121	1265
	Start Rate No. 5	13:49	0	00			
		13:55	0	06			1280
		14:01	0	12			1284
		14:07	0	18			1288
		14:13	0	24			1291
		14:19	0	30			1294
		14:25	0	36			1296
		14:31	0	42			1298
		14:37	0	48			1301
		14:43	0	54			1303
		14:47	0	58	3.00	1228	1304
	Start Rate No. 6	14:47	0	00			
		14:53	0	06			1313
		14:59	0	12			1317
		15:05	0	18			1320
		15:11	0	24			1323
		15:17	0	30			1326
		15:23	0	36			1329
		15:27	0	40	4.00	1309	1332
	Start Rate No. 7	15:27	0	00			
		15:33	0	06			1347
		15:39	0	12			1351
		15:45	0	18			1357
		15:51	0	24			1362
		15:57	0	30			1367
		16:03	0	36			1370
		16:07	0	40	6.00	1467	1371
	Injection stopped	16:07					
		16:13	0	06			1347
		16:19	0	12			1342
		16:25	0	18			1338
		16:31	0	24			1335
		16:37	0	30			1332
		16:43	0	36			1330
		16:49	0	42			1329
		16:55	0	48			1327
		17:01	0	54			1326
		17:07	1	00			1324

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 4 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-23		17:22	1	15			1320
		17:37	1	30			1315
		17:52	1	45			1311
		18:07	2	00			1307
		18:37	2	30			1303
		19:07	3	00			1298
		19:37	3	30			1294
		20:07	4	00			1289
		21:07	5	00			1278
		22:07	6	00			1269
		23:07	7	00			1262
10-24		00:07	8	00			1254
		01:07	9	00			1247
		02:07	10	00			1239
		03:07	11	00			1230
		04:07	12	00			1222
		06:07	14	00			1207
		08:07	16	00			1187
		10:07	18	00			1169
		12:07	20	00			1149
		14:07	22	00			1129
		16:07	24	00			1110
		18:07	26	00			1090
		20:07	28	00			1070
		22:07	30	00			1050
10-25		00:07	32	00			1032
		02:07	34	00			1014
		04:07	36	00			996
		06:07	38	00			979
		08:07	40	00			965
		10:07	42	00			952
		12:07	44	00			939
		14:07	46	00			925
		16:07	48	00			912

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 5 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
		20:07	52	00			887
10-26		00:07	56	00			866
		04:07	60	00			844
		08:07	64	00			837
		12:07	68	00			825
		16:07	72	00			812
		20:07	76	00			802
10-27		00:07	80	00			791

*Final Injection Pressure

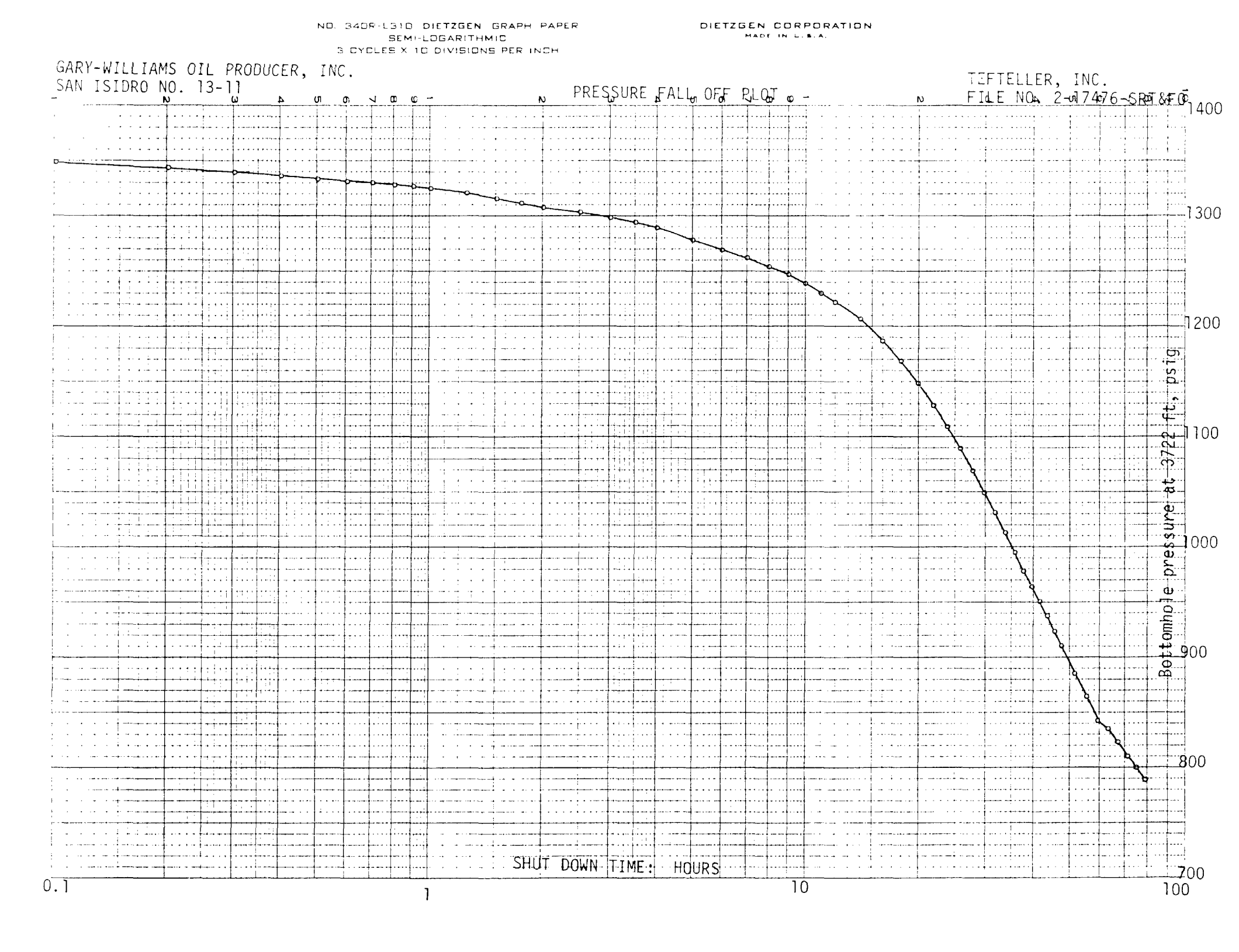
NO. 340R-L31D DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

DIETZGEN CORPORATION
MADE IN U.S.A.

GARY-WILLIAMS OIL PRODUCER, INC.
SAN ISIDRO NO. 13-11

PRESSURE FALL OFF PLOT

TEFTELLER, INC.
FILE NO. 2-17476-SRT&FO



((2))

WELL HISTORY

GARY-WILLIAMS OIL PRODUCER

115 Inverness Drive East
Englewood, Colorado 80112

Operating Agreement: _____
Operator: GWOP
Well Name: #13-11 San Isidro
Location: NE SW 13-20N-3W
County: Sandoval State: NM
Prospect/Field: Rio Puerco
GWOP's WI: 25.73025%

Call on Production: _____
Contractor: Young Drilling Rig #2
Lease: _____
Elevation: GL 6879' KB 6892'
PTD: 4300' Type: Dev
Deal Number: 640.31
Spud Date: 6/19/85

Date	Depth	Progress History

10/24/85

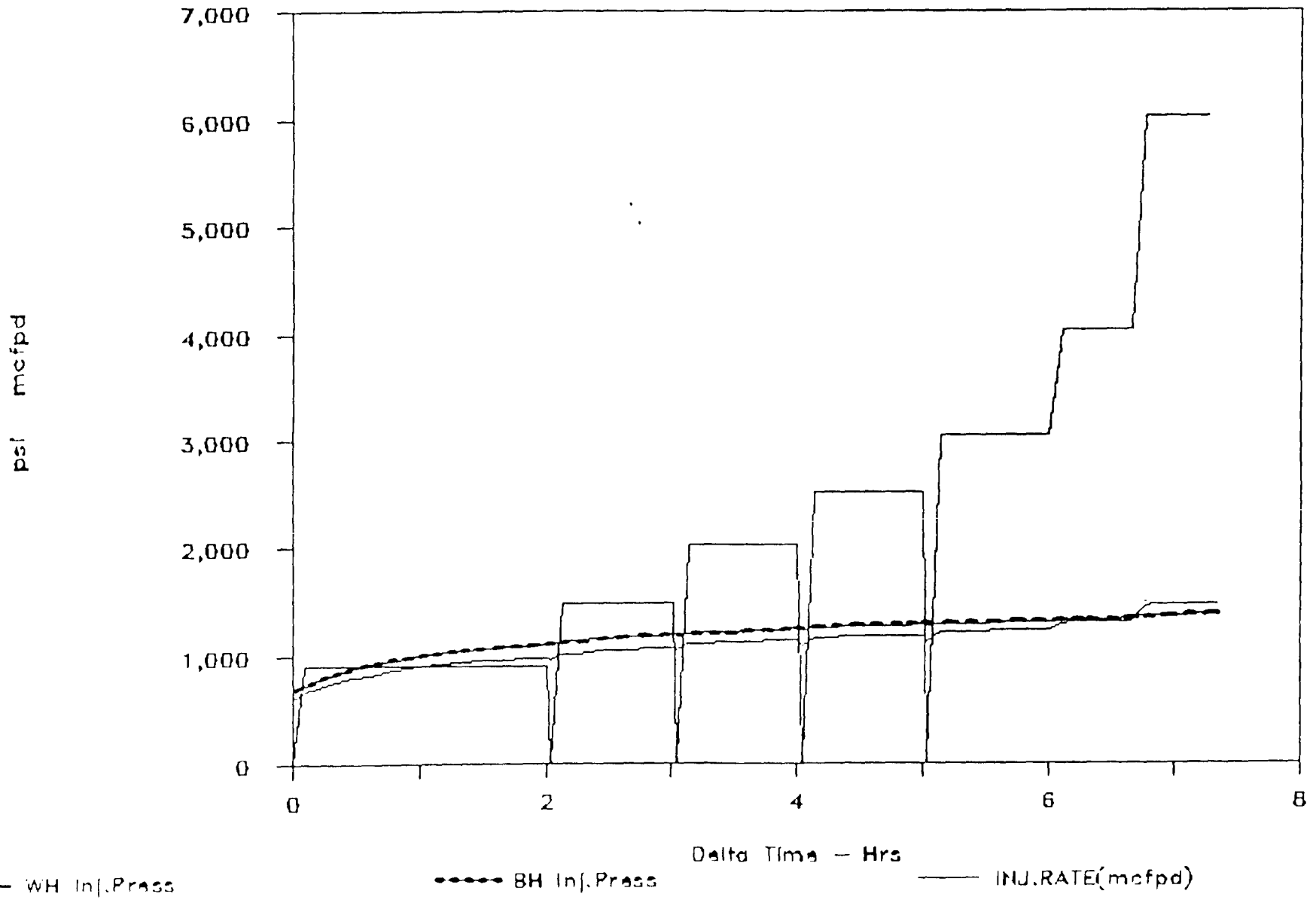
RU Howco. Pumped a total of 755,400 scf nitrogen via 2-3/8" tbg for injectivity test as follows:

STAGE	RATE (SCF/MIN)	MCFD RATE	STARTING SURFACE PRESSURE	FINAL SURFACE PRESSURE	STAGE LENGTH (MINS)
1	700	1 mm	613	966	120
2	1048	1.5 mm	1013	1050	60
3	1403	2 mm	1085	1135	60
4	1744	2.5 mm	1152	1182	60
5	2098	3 mm	1204	1228	60
6	2800	4 mm	1281	1389	40
7	4200	6 mm	1476	1469	40

Conducted leak off test after Stages 2, 3, and 7. Only immediate friction pressure losses were observed.

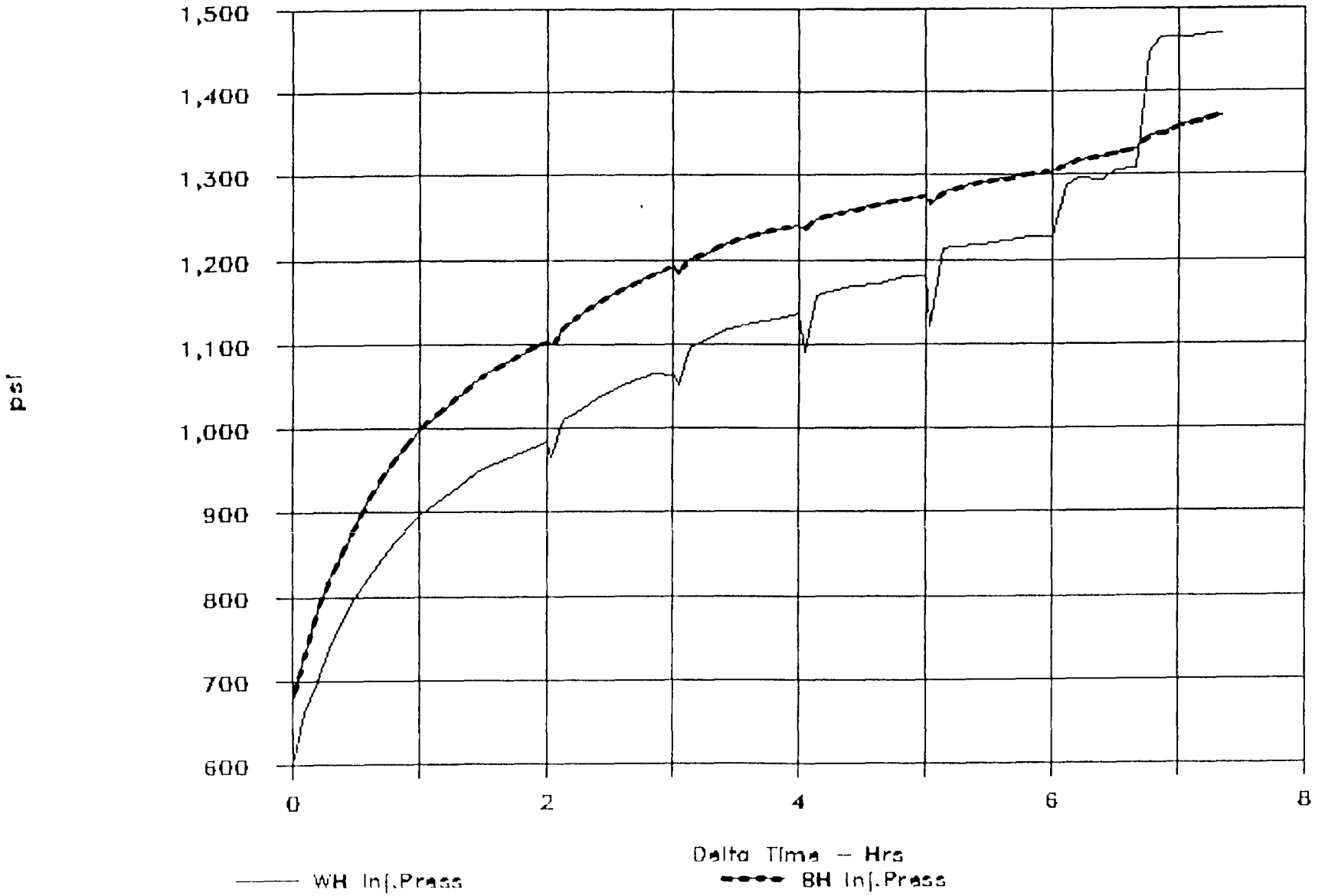
San Isidro #13-11 Injectivity Test

Río Puerco Mancos Oil Pool



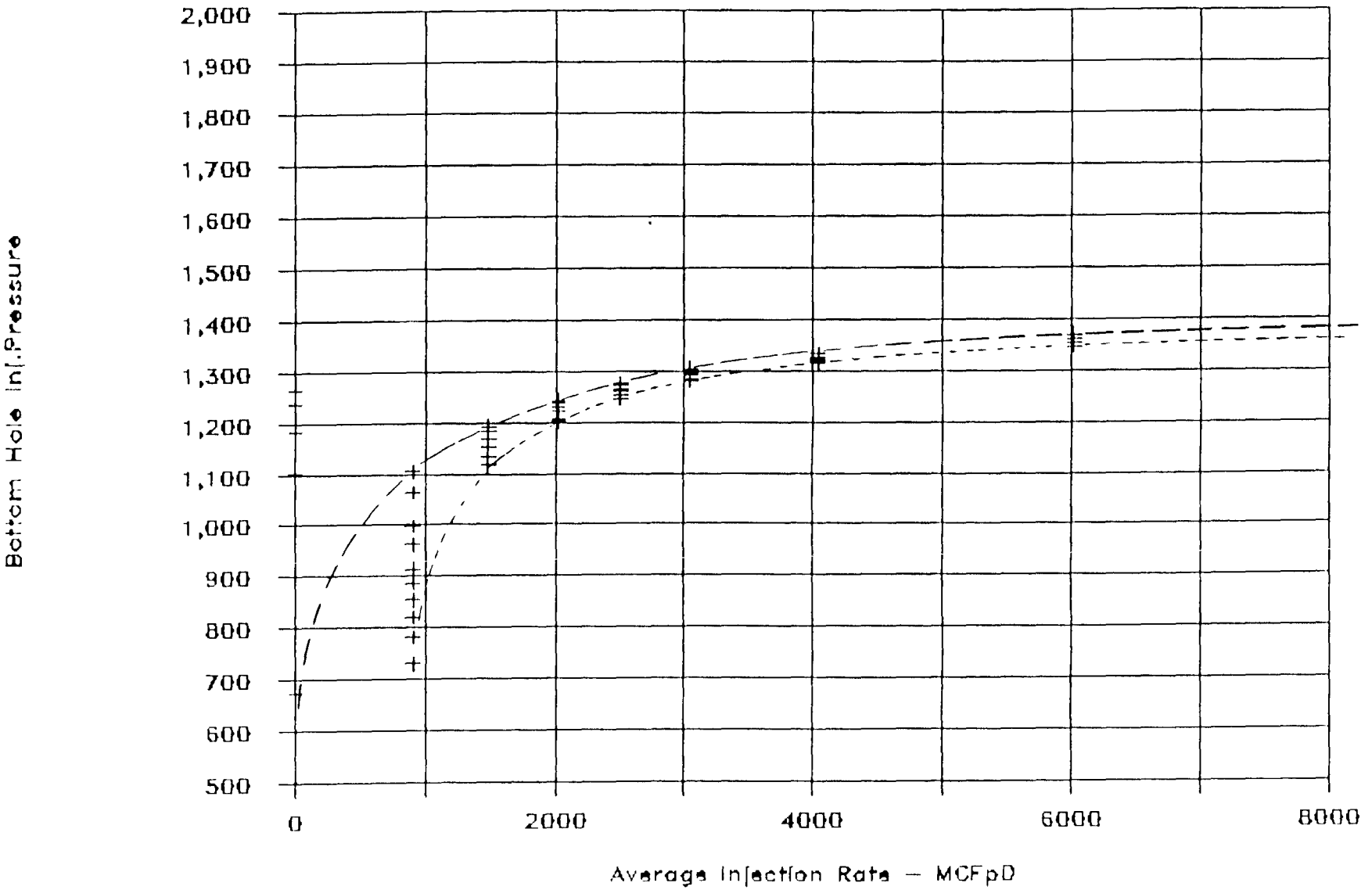
San Isidro #13-11 Injectivity Test

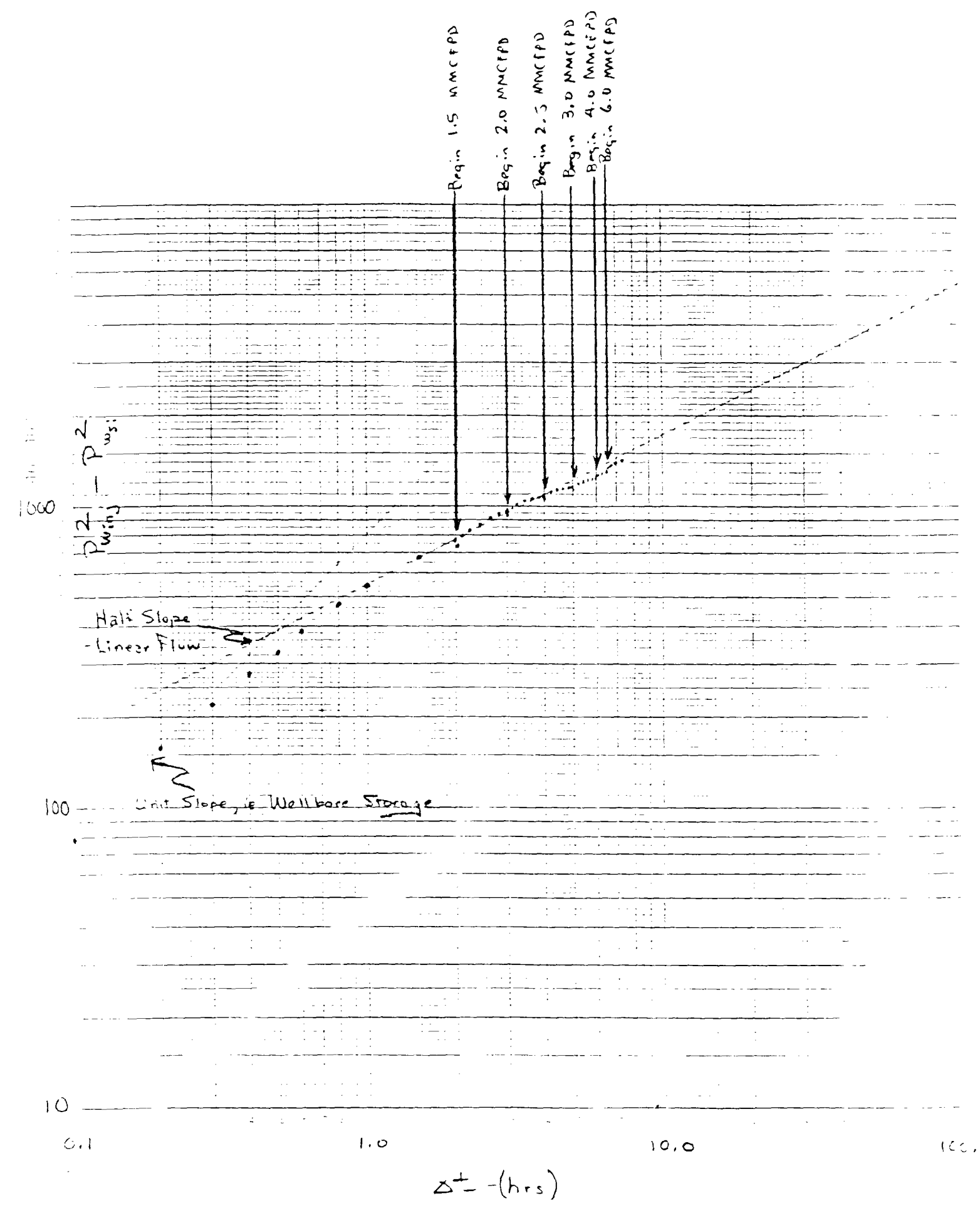
Rio Puerco Mancos Oil Pool



San Isidro #13-II Injectivity Test

Rio Puerco Mancos Oil Pool




Begin 1.5 MMCFPD
Begin 2.0 MMCFPD
Begin 2.5 MMCFPD
Begin 3.0 MMCFPD
Begin 4.0 MMCFPD
Begin 6.0 MMCFPD
P^2_{wf}
1
P^2_{wf}
1000
Half Slope
- Linear Flow
Unit Slope, ie Wellbore Storage
100
10
0.1
1.0
10.0
100.
Δt - (hrs)

San Isidro #13-11 Nitrogen Injectivity Test Summary

	Incrmt Time (min)	Avg Rate (MCF/d)	WHP (psia)	Adjust'd BHP* (psi)	Estm Pfric (psi)	Calc'd BHP (psi)	Measured BHP (psi)	BHP^2	Delta BHP^2	Delta t Hours	Dt^1/2 Hrs^1/2
08:47 AM	0	0	600	675	0.0	674.9	675	455.6	0.0	0.000	0.000
08:53 AM	6	908	663	746	17.3	728.5	731	534.4	78.7	0.100	0.316
08:59 AM	12	908	701	788	17.3	771.2	783	613.1	157.5	0.200	0.447
09:05 AM	18	908	739	831	17.3	814.0	822	675.7	220.1	0.300	0.548
09:11 AM	24	908	772	868	17.3	851.0	854	729.3	273.7	0.400	0.632
09:17 AM	30	908	800	900	17.3	882.4	886	785.0	329.4	0.500	0.707
09:23 AM	36	908	823	926	17.3	908.2	915	837.2	381.6	0.600	0.775
09:35 AM	48	908	865	973	17.3	955.4	962	925.4	469.8	0.800	0.894
09:47 AM	60	908	897	1009	17.3	991.3	999	998.0	542.4	1.000	1.000
10:17 AM	90	908	952	1070	17.3	1053.0	1064	1132.1	676.5	1.500	1.225
10:47 AM	120	908	985	1107	17.3	1090.0	1105	1221.0	765.4	2.000	1.414
10:49 AM	122	0	965	1085	0.0	1084.8	1101	1212.2	756.6	2.033	1.426
10:55 AM	128	1488	1009	1134	28.9	1105.3	1119	1252.2	796.5	2.133	1.461
11:01 AM	134	1488	1020	1147	28.9	1117.6	1133	1283.7	828.1	2.233	1.494
11:13 AM	146	1488	1041	1170	28.9	1141.2	1152	1327.1	871.5	2.433	1.560
11:25 AM	158	1488	1054	1185	28.9	1155.7	1169	1366.6	910.9	2.633	1.623
11:37 AM	170	1488	1065	1197	28.9	1168.1	1183	1399.5	943.9	2.833	1.683
11:47 AM	180	1488	1064	1196	28.9	1166.9	1192	1420.9	965.2	3.000	1.732
11:49 AM	182	0	1052	1182	0.0	1182.4	1184	1401.9	946.2	3.033	1.742
11:55 AM	188	2021	1096	1232	45.8	1185.9	1201	1442.4	986.8	3.133	1.770
12:01 PM	194	2021	1105	1242	45.8	1196.0	1207	1456.8	1001.2	3.233	1.798
12:13 PM	206	2021	1118	1256	45.8	1210.6	1221	1490.8	1035.2	3.433	1.853
12:25 PM	218	2021	1125	1264	45.8	1218.4	1229	1510.4	1054.8	3.633	1.906
12:37 PM	230	2021	1131	1271	45.8	1225.1	1236	1527.7	1072.1	3.833	1.958
12:47 PM	240	2021	1136	1277	45.8	1230.7	1242	1542.6	1086.9	4.000	2.000
12:49 PM	242	0	1090	1225	0.0	1225.0	1236	1527.7	1072.1	4.033	2.008
12:55 PM	248	2506	1158	1301	61.2	1240.0	1247	1555.0	1099.4	4.133	2.033
01:01 PM	254	2506	1163	1307	61.2	1245.6	1253	1570.0	1114.4	4.233	2.058
01:13 PM	266	2506	1170	1315	61.2	1253.5	1260	1587.6	1132.0	4.433	2.106
01:25 PM	278	2506	1173	1318	61.2	1256.8	1266	1602.8	1147.1	4.633	2.153
01:37 PM	290	2506	1180	1326	61.2	1264.7	1271	1615.4	1159.8	4.833	2.198
01:47 PM	300	2506	1182	1328	61.2	1266.9	1276	1628.2	1172.6	5.000	2.236
01:49 PM	302	0	1121	1260	0.0	1259.7	1265	1600.2	1144.6	5.033	2.244
01:55 PM	308	3044	1211	1361	79.2	1281.4	1280	1638.4	1182.8	5.133	2.266
02:01 PM	314	3044	1213	1363	79.2	1283.6	1284	1648.7	1193.0	5.233	2.288
02:13 PM	326	3044	1218	1368	79.2	1289.2	1291	1666.7	1211.1	5.433	2.331
02:25 PM	338	3044	1224	1375	79.2	1295.9	1296	1679.6	1224.0	5.633	2.373
02:37 PM	350	3044	1226	1377	79.2	1298.2	1301	1692.6	1237.0	5.833	2.415
02:47 PM	360	3044	1228	1380	79.2	1300.4	1304	1700.4	1244.8	6.000	2.449
02:53 PM	366	4035	1289	1448	116.9	1331.1	1313	1724.0	1268.3	6.100	2.470
02:59 PM	372	4035	1292	1451	116.9	1334.5	1317	1734.5	1278.9	6.200	2.490
03:11 PM	384	4035	1297	1457	116.9	1340.1	1323	1750.3	1294.7	6.400	2.530
03:17 PM	390	4035	1305	1466	116.9	1349.0	1326	1758.3	1302.7	6.500	2.550
03:27 PM	400	4035	1309	1470	116.9	1353.5	1332	1774.2	1318.6	6.667	2.582
03:33 PM	406	6018	1480	1662	239.6	1422.5	1347	1814.4	1358.8	6.767	2.601
03:39 PM	412	6018	1446	1624	239.6	1384.4	1351	1825.2	1369.6	6.867	2.620
03:51 PM	424	6018	1464	1644	239.6	1404.6	1362	1855.0	1399.4	7.067	2.658
04:03 PM	436	6018	1466	1646	239.6	1406.8	1370	1876.9	1421.3	7.267	2.696
04:07 PM	440	6018	1468	1649	239.6	1409.1	1371	1879.6	1424.0	7.333	2.708

* Adjusted for Hydrostatic Head of Nitrogen

AMARADA BOMB PRESSURES

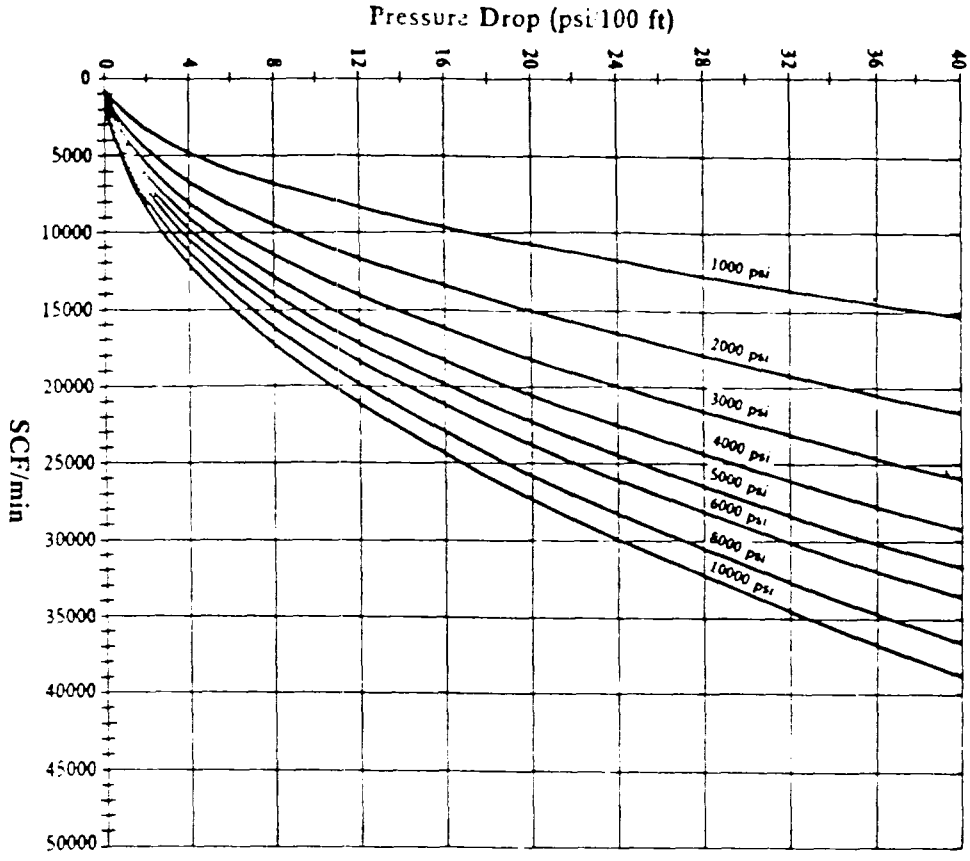
TABLE I

PRESSURE AT DEPTH DUE TO A COLUMN OF NITROGEN HAVING A WELLHEAD PRESSURE, PW (PSIA)*

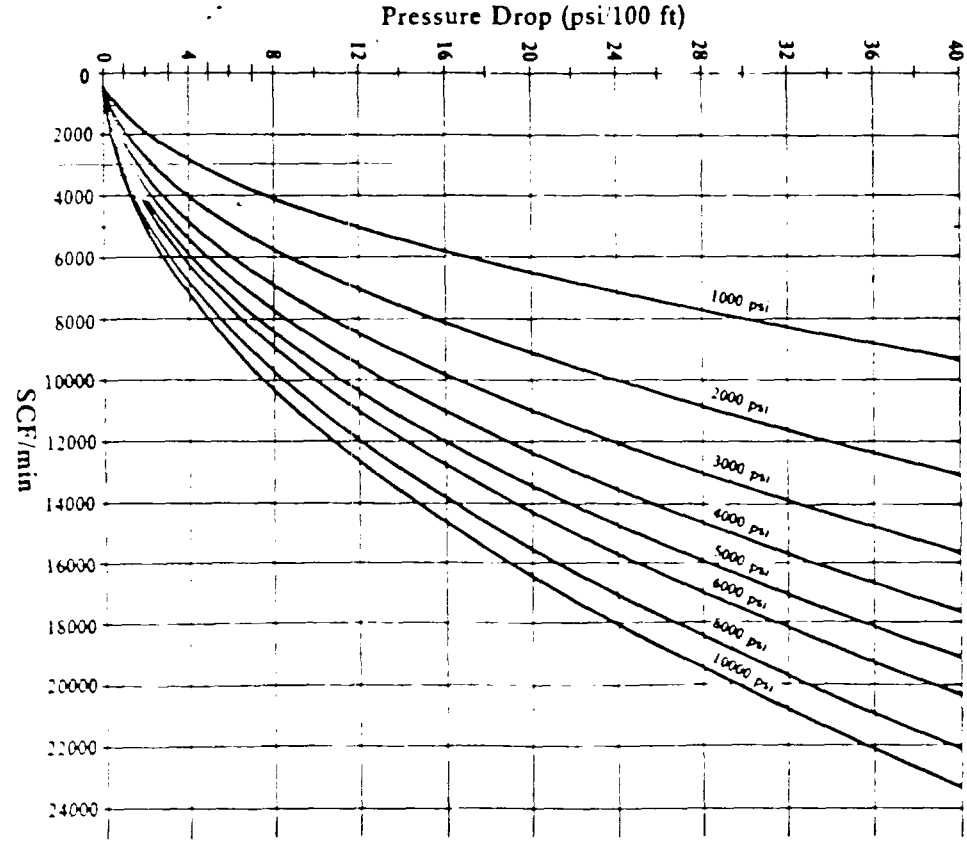
Depth Feet \ Pw psia	250	500	750	1000	1250	1500	1750	2000	2250	2500
500	254	509	763	1017	1271	1525	1779	2033	2287	2541
1000	259	517	776	1034	1292	1551	1809	2067	2324	2582
1500	263	526	788	1051	1314	1576	1838	2100	2361	2622
2000	267	534	801	1068	1335	1601	1867	2133	2398	2663
2500	271	543	814	1085	1356	1626	1896	2166	2435	2703
3000	276	551	827	1102	1377	1652	1926	2199	2472	2744
3500	280	560	840	1119	1398	1677	1955	2232	2508	2784
4000	284	568	852	1136	1419	1702	1984	2265	2545	2824
4500	289	577	865	1153	1440	1727	2013	2298	2581	2864
5000	293	586	878	1170	1461	1752	2042	2330	2618	2904
5500	297	594	891	1187	1482	1777	2071	2363	2654	2944
6000	301	603	904	1204	1504	1802	2100	2396	2590	2984
6500	306	611	917	1221	1525	1827	2128	2428	2727	3023
7000	310	620	929	1238	1546	1852	2157	2461	2763	3063
7500	314	629	942	1255	1567	1877	2186	2493	2799	3102
8000	319	637	955	1272	1588	1902	2215	2526	2835	3141
8500	323	646	968	1289	1609	1927	2243	2558	2870	3181
9000	328	655	981	1306	1630	1952	2272	2590	2906	3220
9500	332	663	994	1323	1651	1976	2300	2622	2942	3259
10000	336	672	1006	1340	1671	2001	2329	2654	2977	3297
10500	341	680	1019	1357	1692	2026	2357	2686	3013	3336
11000	345	689	1032	1374	1713	2051	2386	2718	3048	3375
11500	349	698	1045	1391	1734	2076	2414	2750	3084	3414
12000	354	707	1058	1408	1755	2100	2443	2782	3119	3452
12500	358	715	1071	1424	1776	2125	2471	2814	3154	3491
13000	363	724	1084	1441	1797	2150	2499	2846	3189	3529
13500	367	733	1097	1458	1818	2174	2528	2878	3224	3567
14000	371	741	1109	1475	1839	2199	2556	2910	3260	3606
14500	376	750	1122	1492	1859	2224	2584	2941	3295	3644
15000	380	759	1135	1509	1880	2248	2613	2973	3330	3682
15500	385	767	1148	1526	1901	2273	2641	3005	3365	3720
16000	389	776	1161	1543	1922	2298	2669	3037	3400	3758
16500	393	785	1174	1560	1943	2322	2697	3068	3435	3797
17000	398	794	1187	1577	1964	2347	2726	3100	3470	3835
17500	402	802	1200	1594	1985	2372	2754	3132	3505	3873
18000	407	811	1213	1611	2006	2396	2782	3164	3540	3911
18500	411	820	1226	1628	2027	2421	2811	3196	3575	3950
19000	416	829	1239	1645	2048	2446	2839	3227	3610	3988
19500	420	838	1252	1662	2069	2471	2868	3259	3646	4027
20000	425	846	1265	1680	2090	2496	2896	3292	3681	4064
20500	429	855	1278	1697	2111	2521	2925	3324	3717	4102
21000	433	864	1291	1714	2132	2546	2954	3356	3753	4140
21500	438	873	1304	1731	2154	2571	2982	3388	3788	4177
22000	442	882	1317	1748	2175	2596	3011	3421	3825	4215
22500	447	891	1330	1766	2196	2621	3041	3454	3861	4253
23000	451	899	1344	1783	2218	2647	3070	3487	3897	4290
23500	456	908	1357	1801	2239	2672	3099	3520	3934	4328
24000	460	917	1370	1818	2261	2698	3129	3553	3971	4365
24500	465	926	1383	1836	2282	2724	3159	3587	4009	4403
25000	469	935	1397	1853	2304	2750	3189	3621	4044	4441
25500	474	944	1410	1871	2326	2776	3219	3655	4079	4478
26000	479	953	1424	1889	2348	2802	3249	3690	4113	4516
26500	483	962	1437	1907	2371	2829	3280	3725	4148	4553
27000	488	971	1451	1925	2393	2855	3312	3761	4183	4591
27500	492	981	1464	1943	2416	2883	3343	3797	4218	4628
28000	497	990	1478	1961	2438	2910	3375	3834	4252	4666
28500	501	999	1492	1979	2461	2938	3408	3871	4287	4703
29000	506	1008	1505	1998	2485	2966	3441	3910	4322	4741
29500	511	1017	1519	2016	2508	2994	3474	3949	4357	4778
30000	515	1026	1533	2035	2532	3023	3509	3989	4392	4815

*Temperature = 74°F + 0.016°F/Ft.

3700 × .016 = 59.2 + 74 = 133° F



Pressure Drop for Pure Nitrogen Gas
2.875" 6.5#/ft Tubing 2.441 I.D.
Temp = 100°F



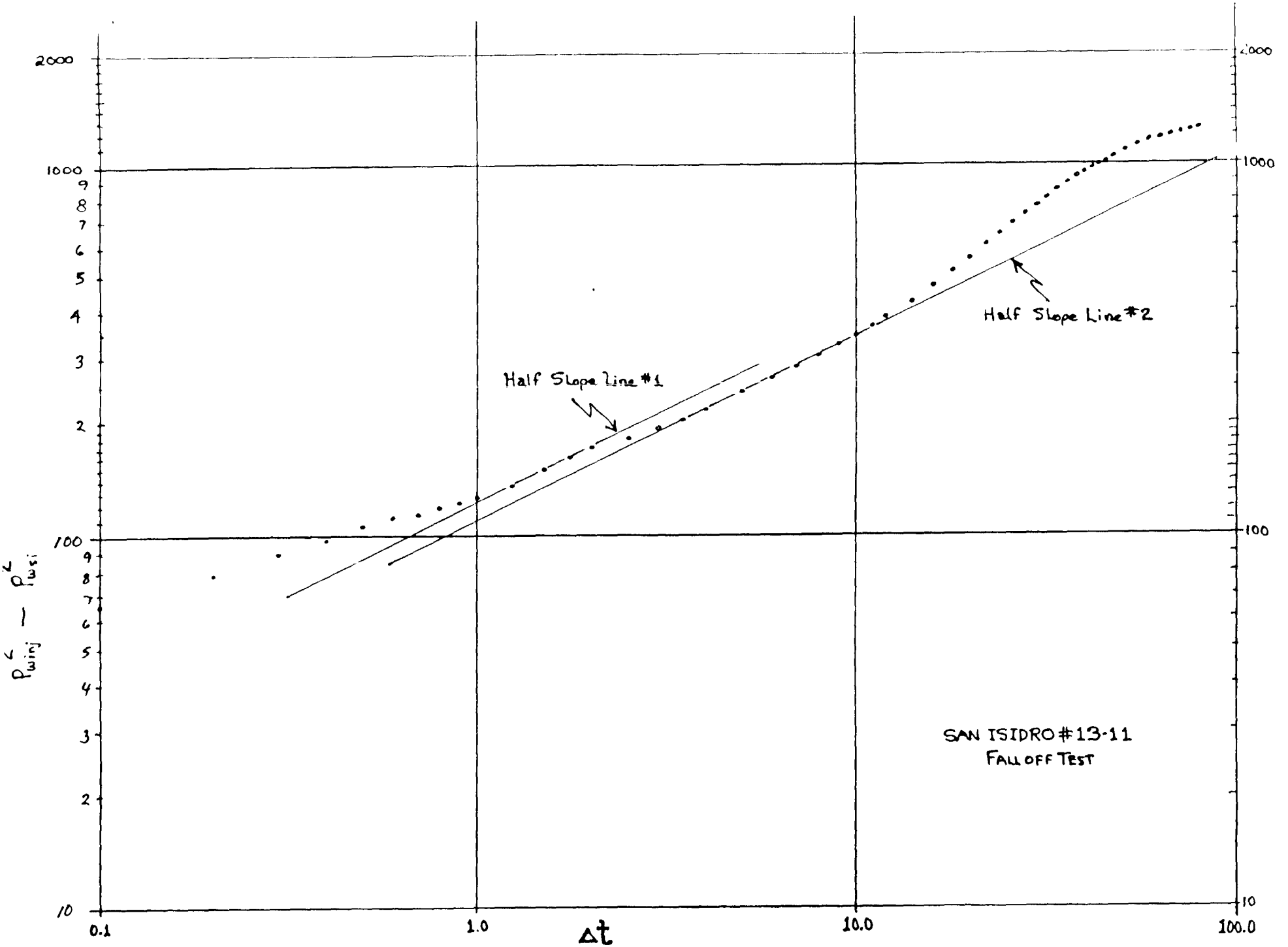
Pressure Drop for Pure Nitrogen Gas
2.375" 4.6#/ft Tubing 1.995 I.D.
Temp = 100°F

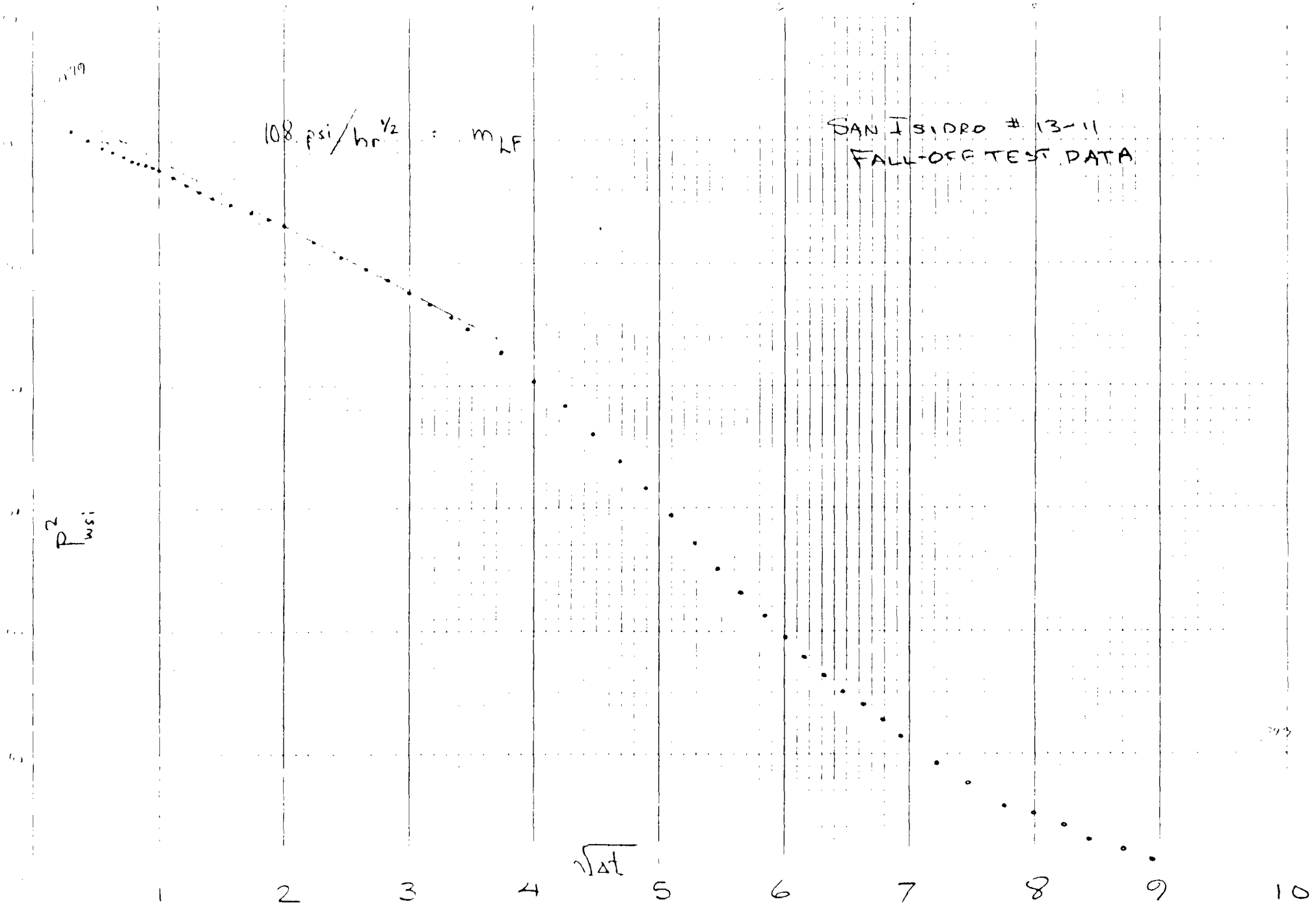
San Isidro #13-11 Pressure Falloff Test Summary

Date	Time	Min.	Hrs	Hrs^1/2	BHP	BHP^2	Pwf^2 -Psi^2
10/23/85	04:07 PM	0	0.00	0.000	1371	1,880	0
10/23/85	04:13 PM	6	0.10	0.316	1347	1,814	65
10/23/85	04:19 PM	12	0.20	0.447	1342	1,801	79
10/23/85	04:25 PM	18	0.30	0.548	1338	1,790	89
10/23/85	04:31 PM	24	0.40	0.632	1335	1,782	97
10/23/85	04:37 PM	30	0.50	0.707	1332	1,774	105
10/23/85	04:43 PM	36	0.60	0.775	1330	1,769	111
10/23/85	04:49 PM	42	0.70	0.837	1329	1,766	113
10/23/85	04:55 PM	48	0.80	0.894	1327	1,761	119
10/23/85	05:01 PM	54	0.90	0.949	1326	1,758	121
10/23/85	05:07 PM	60	1.00	1.000	1324	1,753	127
10/23/85	05:22 PM	75	1.25	1.118	1320	1,742	137
10/23/85	05:37 PM	90	1.50	1.225	1315	1,729	150
10/23/85	05:52 PM	105	1.75	1.323	1311	1,719	161
10/23/85	06:07 PM	120	2.00	1.414	1307	1,708	171
10/23/85	06:37 PM	150	2.50	1.581	1303	1,698	182
10/23/85	07:07 PM	180	3.00	1.732	1298	1,685	195
10/23/85	07:37 PM	210	3.50	1.871	1294	1,674	205
10/23/85	08:07 PM	240	4.00	2.000	1289	1,662	218
10/23/85	09:07 PM	300	5.00	2.236	1278	1,633	246
10/23/85	10:07 PM	360	6.00	2.449	1269	1,610	269
10/23/85	11:07 PM	420	7.00	2.646	1262	1,593	287
10/24/85	12:07 AM	480	8.00	2.828	1254	1,573	307
10/24/85	01:07 AM	540	9.00	3.000	1246	1,553	327
10/24/85	02:07 AM	600	10.00	3.162	1239	1,535	345
10/24/85	03:07 AM	660	11.00	3.317	1230	1,513	367
10/24/85	04:07 AM	720	12.00	3.464	1222	1,493	386
10/24/85	06:07 AM	840	14.00	3.742	1207	1,457	423
10/24/85	08:07 AM	960	16.00	4.000	1187	1,409	471
10/24/85	10:07 AM	1,080	18.00	4.243	1169	1,367	513
10/24/85	12:07 PM	1,200	20.00	4.472	1149	1,320	559
10/24/85	02:07 PM	1,320	22.00	4.690	1129	1,275	605
10/24/85	04:07 PM	1,440	24.00	4.899	1110	1,232	648
10/24/85	06:07 PM	1,560	26.00	5.099	1090	1,188	692
10/24/85	08:07 PM	1,680	28.00	5.292	1070	1,145	735
10/24/85	10:07 PM	1,800	30.00	5.477	1050	1,103	777
10/25/85	12:07 AM	1,920	32.00	5.657	1032	1,065	815
10/25/85	02:07 AM	2,040	34.00	5.831	1014	1,028	851
10/25/85	04:07 AM	2,160	36.00	6.000	996	992	888
10/25/85	06:07 AM	2,280	38.00	6.164	979	958	921
10/25/85	08:07 AM	2,400	40.00	6.325	965	931	948
10/25/85	10:07 AM	2,520	42.00	6.481	952	906	973
10/25/85	12:07 PM	2,640	44.00	6.633	939	882	998
10/25/85	02:07 PM	2,760	46.00	6.782	925	856	1,024
10/25/85	04:07 PM	2,880	48.00	6.928	912	832	1,048
10/25/85	08:07 PM	3,120	52.00	7.211	886	785	1,095
10/26/85	12:07 AM	3,360	56.00	7.483	866	750	1,130
10/26/85	04:07 AM	3,600	60.00	7.746	844	712	1,167

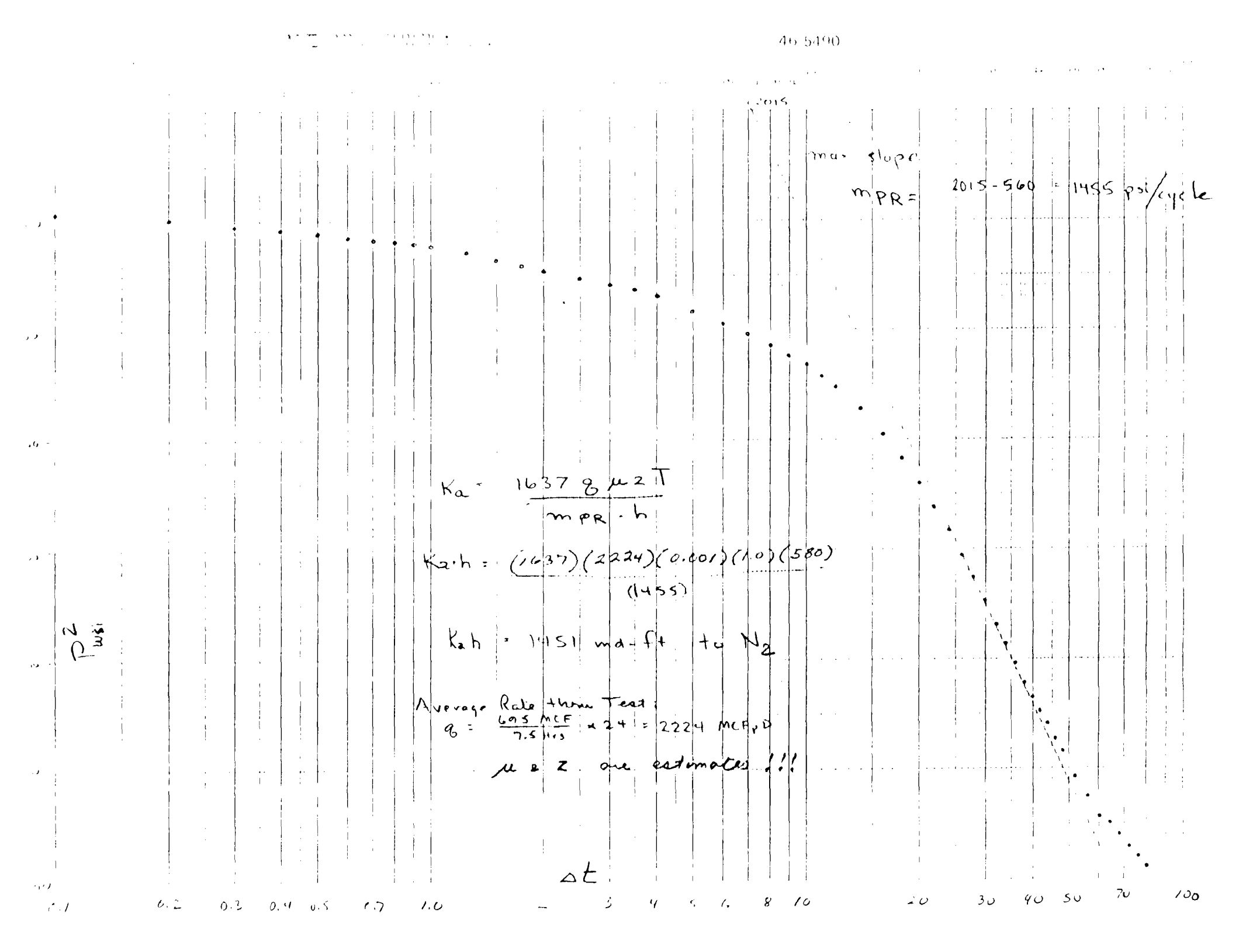
San Isidro #13-11 Pressure Falloff Test Summary

Date	Time	Min.	Hrs	Hrs^1/2	BHP	BHP^2	Pwf^2 -Psi^2
10/26/85	08:07 AM	3,840	64.00	8.000	837	701	1,179
10/26/85	12:07 PM	4,080	68.00	8.246	825	681	1,199
10/26/85	04:07 PM	4,320	72.00	8.485	812	659	1,220
10/26/85	08:07 PM	4,560	76.00	8.718	802	643	1,236
10/27/85	12:07 AM	4,800	80.00	8.944	791	626	1,254


2000
1000
9
8
7
6
5
4
3
2
100
9
8
7
6
5
4
3
2
10
$p^{*}_{winj} - p^{*}_{wsi}$
Half Slope Line #1
Half Slope Line #2
SAN ISIDRO #13-11
FALL OFF TEST
0.1
1.0
10.0
100.0
Δt


108 psi/hr^1/2 : m_LF
SAN ISIDRO # 13-11
FALL-OFF TEST DATA
P_ws^2
√Δt
1
2
3
4
5
6
7
8
9
10

46 5400



$$K_a = \frac{1637\ \phi \mu z T}{m_{PR} \cdot h}$$

$$K_a h = \frac{(1637)(2224)(0.001)(1.0)(580)}{(1455)}$$

$K_a h$ = 1451 md-ft to N_2

Average Rate thru Test:

$q = \frac{695\ MCF}{7.5\ hrs} \times 24 = 2224\ MCF_{pD}$

μ & z are estimates !!!

Form C-108
Application for Authorization to Inject
San Isidro 13-11

I. PURPOSE: The purposed of this application is to request approval to inject gas into the San Isidro 13-11 well, Section 13-Township 20 North-Range 3 West, Sandoval County, New Mexico. The gas re-injection is requested to allow disposal of the produced gas. This will allow unrestricted oil production in the Rio Puerco Field. Currently, due to gas venting restrictions, many wells are only allowed to produce part time during the month. This application does not qualify for administrative approval.

II. OPERATOR: Gary-Williams Oil Producers, 370 17th Street, Suite 5300, Denver, Colorado 80202. Telephone (303) 628-3800.

III. WELL DATA: See Attachment A.

IV. PROJECT EXPANSION: This is not an expansion of an existing project.

V. MAP: See Attachment B.

VI. TABULATION OF DATA IN AREA OF REVIEW: See Attachment C.

VII. PROPOSED OPERATIONS: Summarized below, full detail in Attachment D.

(1) The proposed average and maximum daily rates and volumes are expected to be .250-3.00 MMCFD with an estmated 3 MMCF per day injected.
(2) The system will be a closed system.
(3) The average injection pressure will be 1,400 psi with a maximum allowable surface pressure of 1,700 psi.
(4) The Gas injected into the Mancos formation is produced Mancos gas. It is compatable with existing reservoir fluids, and requires no additional analysis.
(5) Not required. This project is injecting Mancos Gas into the Mancos formation.

VIII. GEOLOGICAL DATA : The Mancos formation (Upper Cretaceous) is roughly 800' below the Point Lookout formation, and 900' above the Greenhorn formation. The Mancos has been subdivided into four zones called the Gallup "A", "B", "C", and "D".

The Mancos interval in the Rio Puerco area consists of highly interbedded very fine grained sandstones, siltstones and shales. Sandstones within the interval have very low porosities and permeabilities, usually averaging below 5% and 0.5 md respectively. The productive system is based primarily on natural fracturing which provides a permeability system to assist the drainage from the low porosity and permeability matrix blocks. The Mancos interval is very consistant throughout the Rio Puerco area.

IX. STIMULATION PROGRAM: There is no planned stimulation planned prior to injection of gas.

X. LOGS AND TEST DATA: All required logs and test data have been filed with the Division and will not be included in this application.

XI. FRESH WATER ANALYSIS: There are no fresh water wells within the one mile area of interest surrounding this well.

XII. AFFIRMATIVE STATEMENT: All available data has been reviewed and it is the undersigned's professional opinion that there is no evidence of open faults or other geological or hydrological phenomoma which could lead to the contamination of any zone containing drinking water.

XIII. PROOF OF NOTICE: A copy of this form has been mailed to operators within one-half mile of the well. The only operator is Benson-Montin-Greer, Farmington, New Mexico. The surface leasee is Eugene Johnson & Sons, Cuba, New Mexico.

XIV. CERTIFICATION: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name Richard Shuster Title Petroleum Engineer/Agent

Signature Richard Shuster Date January 15, 1991

ATTACHMENT A

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-108
Revised 10-1-78

APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR		ADDRESS	
Gary-Williams Oil Producer, Inc.		370 17th St. Suite 5300, Denver, CO 80202	
LEASE NAME	WELL NO.	FIELD	COUNTY
San Isidro 13	11	Rio Puerco Mancos	Sandoval

LOCATION

UNIT LETTER K ; WELL IS LOCATED 1980 FEET FROM THE South LINE AND 1980 FEET FROM THE East LINE, SECTION 13 TOWNSHIP 20 North RANGE 3 West NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING 36#,J-55 STC	9-5/8"	436' KB	135	Surface	Circulated to Surface
INTERMEDIATE 23#, J-55 STC	7"	3346' KB	205 sx Foamed 195 sx Class B	Surface	Circulated and Capped
LONG STRING Liner 10.5#, J-55 STC	4-1/2"	3140- 4262' KB	160	3473	Reversed out excess Bond Log
TUBING 4.7#, EUE	2-3/8"	3175' KB	NAME, MODEL AND DEPTH OF TUBING PACKER Baker Model C Set @ 3665'		

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Mancos Gallup	3610' KB	4172'

IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?	PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
Tubing	Perforations	3691'-4127'

IS THIS A NEW WELL DRILLED FOR DISPOSAL?	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED?	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE?
Yes		No

LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH

N/A

DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA
Ojo Alamo 305'	Menefee 2652'	Semilla 4425' (est top)

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
250 mcf	2000 mcf	Closed	Pressure	1400-1700

ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE —	WATER TO BE DISPOSED OF	NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
	N/A Gas		

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND)

Lessee - Eugene Johnson & Sons, Box 244, Cuba, NM 87013

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL

Benson-Montin-Greer Attn: Al Greer

221 Petroleum Center Building

Farmington, NM 87401

HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER	EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL
	Yes	Yes

ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	PLAT OF AREA	ELECTRICAL LOG	DIAGRAMMATIC SKETCH OF WELL
	Yes	No	Yes

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

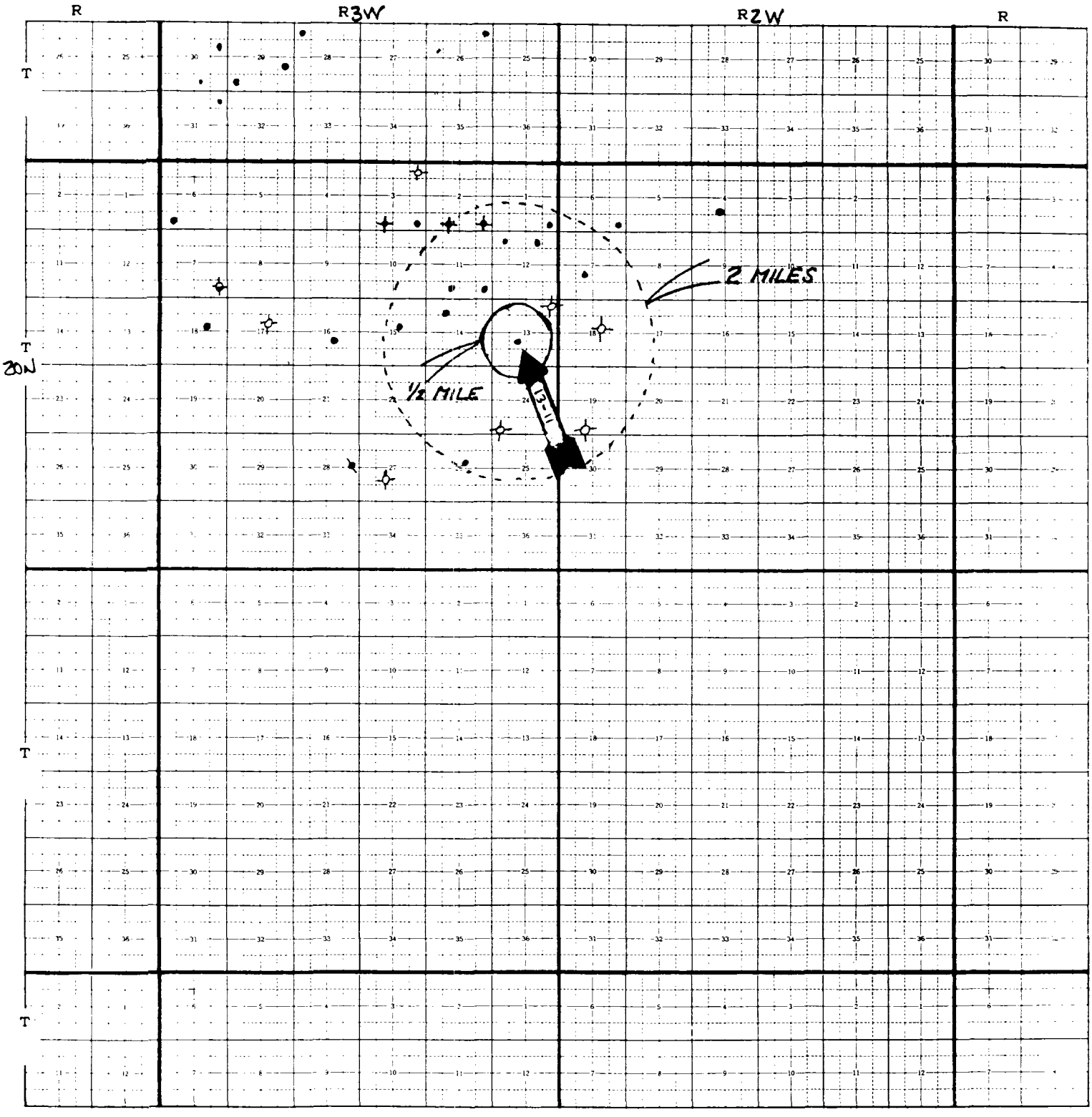
Richard Shuster — Petroleum Engineer/Agent — January 15, 1991

(Signature) (Title) (Date)

NOTE: Should waivers from the surface owner and all operators within one-half mile of the proposed injection well not accompany this application, the New Mexico Oil Conservation Division will hold the application for a period of 15 days from the date of receipt by the Division's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.

ATTACHMENT D

County SANDOVAL, State NEW MEXICO

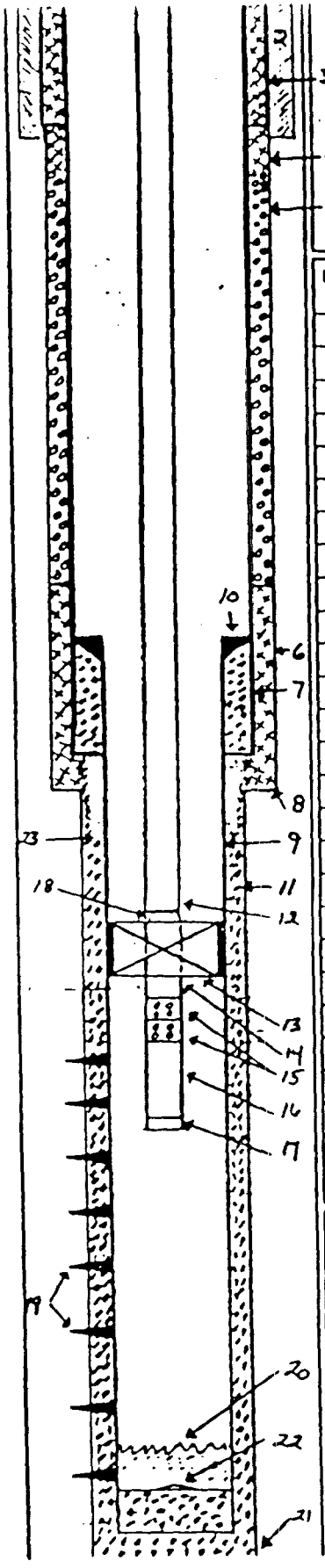


Four Township Island plat (½" to the mile

ATTACHMENT C
SAN ISIDRO 13-11
WELL LOCATION MAP
FORM C-108

TABULATION OF ALL WELLS WITHIN 1/2 MILE RADIUS OF SAN ISIDRO 13-11

There are no wells located in the 1/2 mile area of review.



OPERATOR WALSH ENGINEERING & PRODUCTION

WELL # SAN JUAN 13-11

FIELD RIO PUERCO MANCOS

COUNTY SANDOVAL

STATE NEW MEXICO

DATE 10-22-85

☒ NEW COMPLETION ☐ WORKOVER

SIZE	7	4½	2⅜
WEIGHT	23	10.5	4.7
GRADE	J-55	J-55	J-55
THREAD	8RD	8RD	EUE 8RD
DEPTH	3346	3140 & 4262	3715

ITEM NO.	EQUIPMENT AND SERVICES
1.	12¼" Hole DRILLED TO 449' KB
2.	135 SX CLASS "B" CEMENT SURFACE TO 449' KB
3	36" J-55 STC CASING SET @ 436' KB
4.	45 SX CLASS "B" CAP CEMENT SURFACE - 450' KB
5	285 SX FOAMED CLASS "B" 450-2400' KB
6	150 SX CLASS "B" TAIL CEMENT 2400'-3360' KB
7	23" J-55 STC CASING SET @ 3346
8	8¾" Hole DRILLED TO 3360
9	10.5" J-55 STC LINER SET 3140-4262' KB
10	4½" LINER HANGER WITH PACK-OFF @ 3140 KB
11	160 SX 65/35 POZ 3140 - 4265' KB
12	2⅜" TUBING SET @ 3715' KB
13	BAKER MODEL "C" PACKER PACKING ELEMENTS @ 3665 KB
14	2⅜" X 6' SUB
15	2⅜" X 4' PERFORATED SUBS (2EA) 3672'-3620' KB
16	FULL JOINT of 2⅜" Tubing
17	2⅜" TAPPED BULL PLUG. (TO SOFT SET BOTTOM HOLE PRESSURE BOMBS) @ 3715 KB
18	"F" NIPPLE (1.81 ID) @ 3660
19	PERFORATIONS 3691 - 4127
20	FILL @ 4085' KB
21	6¼" HOLE TO 4265 KB
22	LATCH DOWN PLUG @ 4219
23	BOND LOG INDICATES CEMENT TOP @ 3473

COMMENTS:

6-21-85 PRESSURE TEST 9⅝" CASING TO 1500 PSI

6-25-85 PRESSURE TEST 7" CASING TO 1500 PSI

7-30-85 PRESSURE TEST 7" & 4½" CASING TO 3500 PSI

NOTE: LATCH DOWN PLUG DID NOT HOLD. LINER CEMENT FELL BACK 218' EVEN THO 25 SX of CEMENT WAS REVERSED OUT DURING CEMENTING OPERATIONS. EXCELLENT BOND IS INDICATED ACROSS LINER LAP.

PREPARED BY Ray | OFFICE ENGLEWOOD | PHONE

TEFTELLER, INC.
reservoir engineering data

MIDLAND, TEXAS / FARMINGTON, NEW MEXICO
GRAND JUNCTION, COLORADO

P. O. Box 5247
Midland, Texas 79704
(915) 682-5574

November 6, 1985

Gary-Williams Oil Producer, Inc.
115 Inverness Drive East
Englewood, CO 80112

Attention: Mr. Ray Hager

Subject: Step Rate Test and Fall Off
Measurement
San Isidro No. 13-11
San Juan Basin Gallup Field
Sandoval County, New Mexico
Our File No. 2-17476-SRT&FO

Gentlemen:

Attached hereto are the results of a step rate injectivity test and fall off measurement which were conducted on the above captioned well October 22 through October 30, 1985.

The data presented are in tabular and graphical form.

It has been our pleasure to have conducted this service for you. If we may be of further assistance, please call us at any time.

Respectfully submitted,

TEFTELLER, INC.

Neil Tefteller

Neil Tefteller

NT/lw
cc: Mr. Chuck Emerson
Gary-Williams Oil Producer, Inc.
Box 396
Cuba, NM 87013

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 1 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-22	Arrived on location, well shut-in	15:45				
	Release tandem instruments at 3722'	16:45				632
		17:45				637
		18:45				642
		19:45				646
		20:45				649
		21:45				652
		22:45				654
		23:45				657
10-23		00:45				659
		01:45				661
		02:45				664
		03:45				666
		04:45				668
		05:45				670
		06:45				672
		07:45				673
		08:45			640	675
	Start injectivity test Rate No. 1	08:47				
		08:53	0 06			731
		08:59	0 12			783
		09:05	0 18			822
		09:11	0 24			854
		09:17	0 30			886
		09:23	0 36			915
		09:29	0 42			941
		09:35	0 48			962
		09:41	0 54			981
		09:47	1 00			999
		09:53	1 06			1015
		09:59	1 12			1029
		10:05	1 18			1043
		10:11	1 24			1055
		10:17	1 30			1064
		10:23	1 36			1073
		10:29	1 42			1081
		10:35	1 48			1188
		10:41	1 54			1097
		10:47	2 00	1.00	*986	1105
	Injection stopped	10:47	0 00			

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 2 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-23		10:49	0	02			1101
	Start Rate No. 2	10:49	0	00			
		10:55	0	06			1119
		11:01	0	12			1133
		11:07	0	18			1143
		11:13	0	24			1152
		11:19	0	30			1161
		11:25	0	36			1169
		11:31	0	42			1176
		11:37	0	48			1183
		11:43	0	54			1188
		11:47	0	58	1.50	1073	1192
	Injection stopped	11:47	0	00			
		11:49	0	02		1044	1184
	Start Rate No. 3	11:49	0	00			
		11:55	0	06			
		12:01	1	12			1201
		12:07	0	18			1215
		12:13	0	24			1221
		12:19	0	30			1225
		12:25	0	36			1229
		12:31	0	42			1233
		12:37	0	48			1236
		12:43	0	54			1239
		12:47	0	58	2.00	1137	1242
		12:47	0	00			
		12:49	0	02		1090	1236
	Start Rate No. 4	12:49	0	00			
		12:55	0	06			1247
		13:01	0	12			1253
		13:07	0	18			1256
		13:13	0	24			1260
		13:19	0	30			1263
		13:25	0	36			1266
		13:31	0	42			1269
		13:37	0	48			1271
		13:43	0	54			1274
		13:47	0	58	2.50	1182	1276

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 3 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-23	Injection stopped	13:47	0	00			
		13:49	0	02		1121	1265
	Start Rate No. 5	13:49	0	00			
		13:55	0	06			1280
		14:01	0	12			1284
		14:07	0	18			1288
		14:13	0	24			1291
		14:19	0	30			1294
		14:25	0	36			1296
		14:31	0	42			1298
		14:37	0	48			1301
		14:43	0	54			1303
		14:47	0	58	3.00	1228	1304
	Start Rate No. 6	14:47	0	00			
		14:53	0	06			1313
		14:59	0	12			1317
		15:05	0	18			1320
		15:11	0	24			1323
		15:17	0	30			1326
		15:23	0	36			1329
		15:27	0	40	4.00	1309	1332
	Start Rate No. 7	15:27	0	00			
		15:33	0	06			1347
		15:39	0	12			1351
		15:45	0	18			1357
		15:51	0	24			1362
		15:57	0	30			1367
		16:03	0	36			1370
		16:07	0	40	6.00	1467	1371
	Injection stopped	16:07					
		16:13	0	06			1347
		16:19	0	12			1342
		16:25	0	18			1338
		16:31	0	24			1335
		16:37	0	30			1332
		16:43	0	36			1330
		16:49	0	42			1329
		16:55	0	48			1327
		17:01	0	54			1326
		17:07	1	00			1324

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

WELL : SAN ISIDRO NO. 13-11 PAGE 4 OF 6

FIELD : SAN JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

1985 DATE	STATUS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
10-23		17:22	1	15			1320
		17:37	1	30			1315
		17:52	1	45			1311
		18:07	2	00			1307
		18:37	2	30			1303
		19:07	3	00			1298
		19:37	3	30			1294
		20:07	4	00			1289
		21:07	5	00			1278
		22:07	6	00			1269
		23:07	7	00			1262
10-24		00:07	8	00			1254
		01:07	9	00			1247
		02:07	10	00			1239
		03:07	11	00			1230
		04:07	12	00			1222
		06:07	14	00			1207
		08:07	16	00			1187
		10:07	18	00			1169
		12:07	20	00			1149
		14:07	22	00			1129
		16:07	24	00			1110
		18:07	26	00			1090
		20:07	28	00			1070
		22:07	30	00			1050
10-25		00:07	32	00			1032
		02:07	34	00			1014
		04:07	36	00			996
		06:07	38	00			979
		08:07	40	00			965
		10:07	42	00			952
		12:07	44	00			939
		14:07	46	00			925
		16:07	48	00			912

TEFTELLER, INC.
RESERVOIR ENGINEERING DATA
MIDLAND, TEXAS

ISIDRO NO. 13-11 PAGE 5 OF 6

JUAN BASIN GALLUP FILE 2-17476-SRT&FO

CHRONOLOGICAL PRESSURE AND PRODUCTION DATA

JS OF WELL	TIME	ELAPSED TIME HRS.	MIN.	INJECTION RATE MCF/DAY	TUBING PRESSURE PSIG	BHP @ 3722' PSIG
	20:07	52	00			887
	00:07	56	00			866
	04:07	60	00			844
	08:07	64	00			837
	12:07	68	00			825
	16:07	72	00			812
	20:07	76	00			802
	00:07	80	00			791

on Pressure

((2))

WELL HISTORY

GARY-WILLIAMS OIL PRODUCER
115 Inverness Drive East
Englewood, Colorado 80112

Operating Agreement:
Operator: GWOP
Well Name: #13-11 San Isidro
Location: NE SW 13-20N-3W
County: Sandoval State: NM
Prospect/Field: Rio Puerco
GWOP's WI: 25.73025%

Call on Production:
Contractor: Young Drilling Rig #2
Lease:
Elevation: GL 6879' KB 6892'
PTD: 4300' Type: Dev
Deal Number: 640.31
Spud Date: 6/19/85

Date	Depth	Progress History

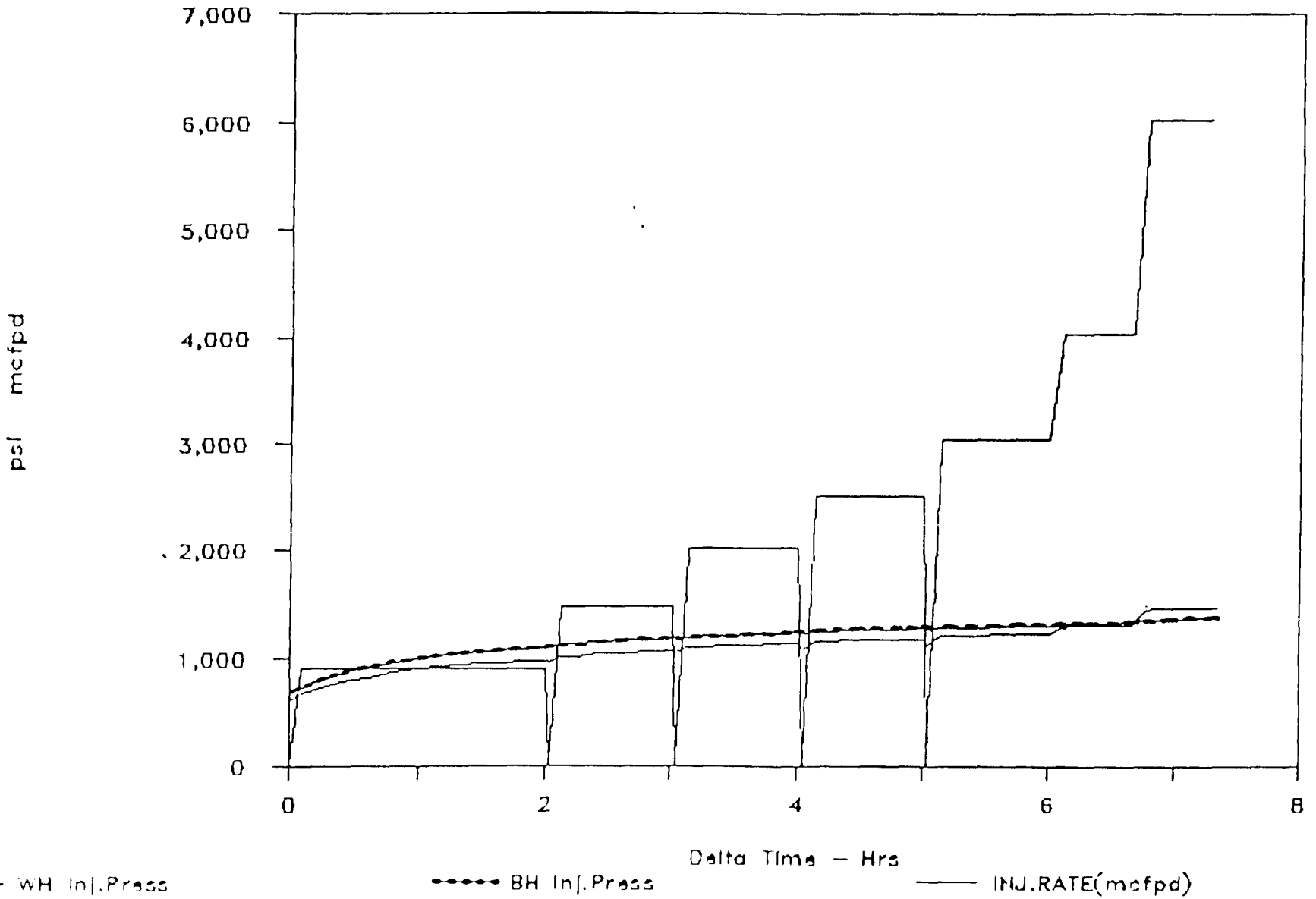
10/24/85 RU Howco. Pumped a total of 755,400 scf nitrogen via 2-3/8" tbg for injectivity test as follows:

STAGE	RATE (SCF/MIN)	MCFD RATE	STARTING SURFACE PRESSURE	FINAL SURFACE PRESSURE	STAGE LENGTH (MINS)
1	700	1 mm	613	966	120
2	1048	1.5 mm	1013	1050	60
3	1403	2 mm	1085	1135	60
4	1744	2.5 mm	1152	1182	60
5	2098	3 mm	1204	1228	60
6	2800	4 mm	1281	1389	40
7	4200	6 mm	1476	1469	40

Conducted leak off test after Stages 2, 3, and 7. Only immediate friction pressure losses were observed.

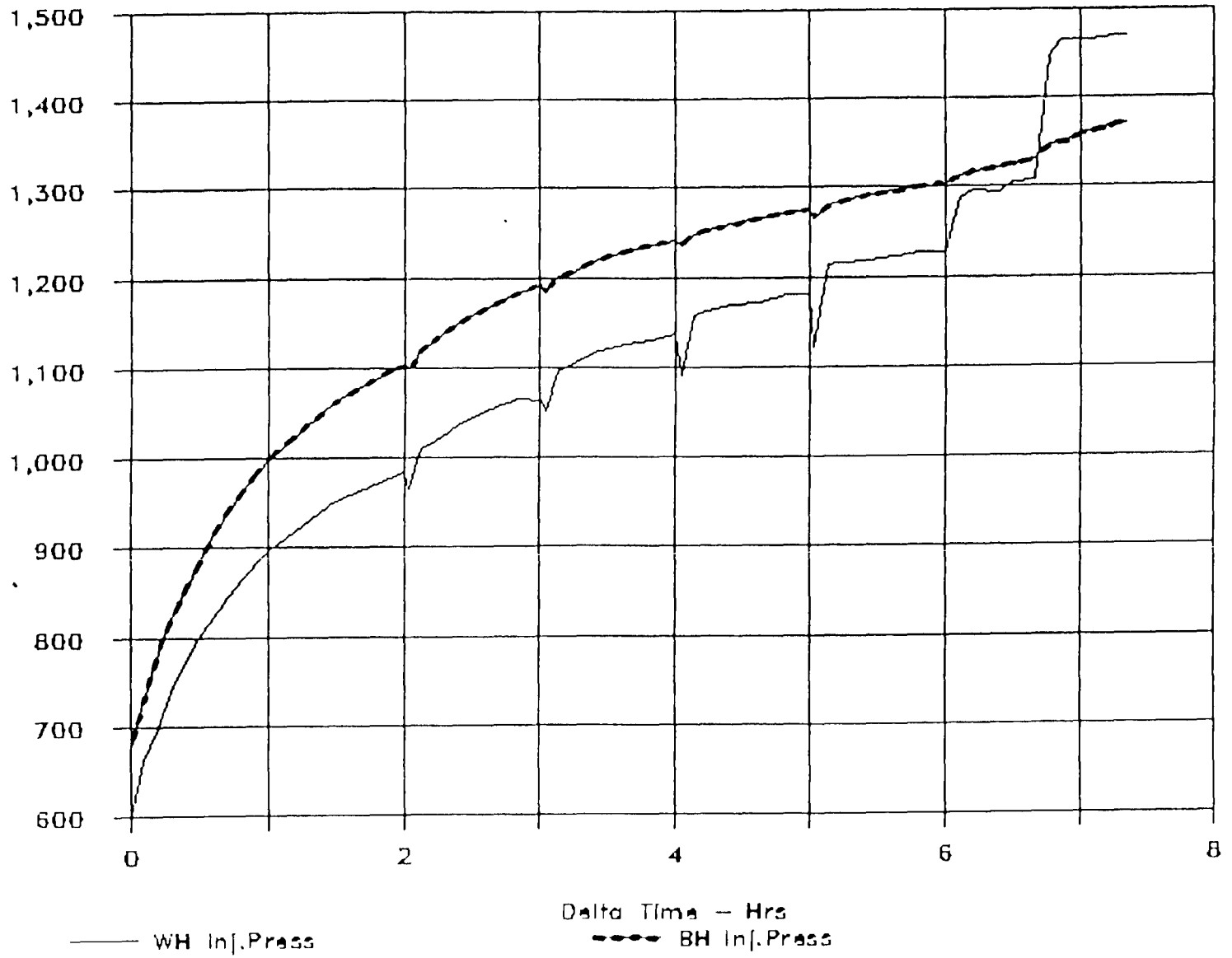
San Isidro #13-11 Injectivity Test

Rio Puerco Mancos Oil Pool



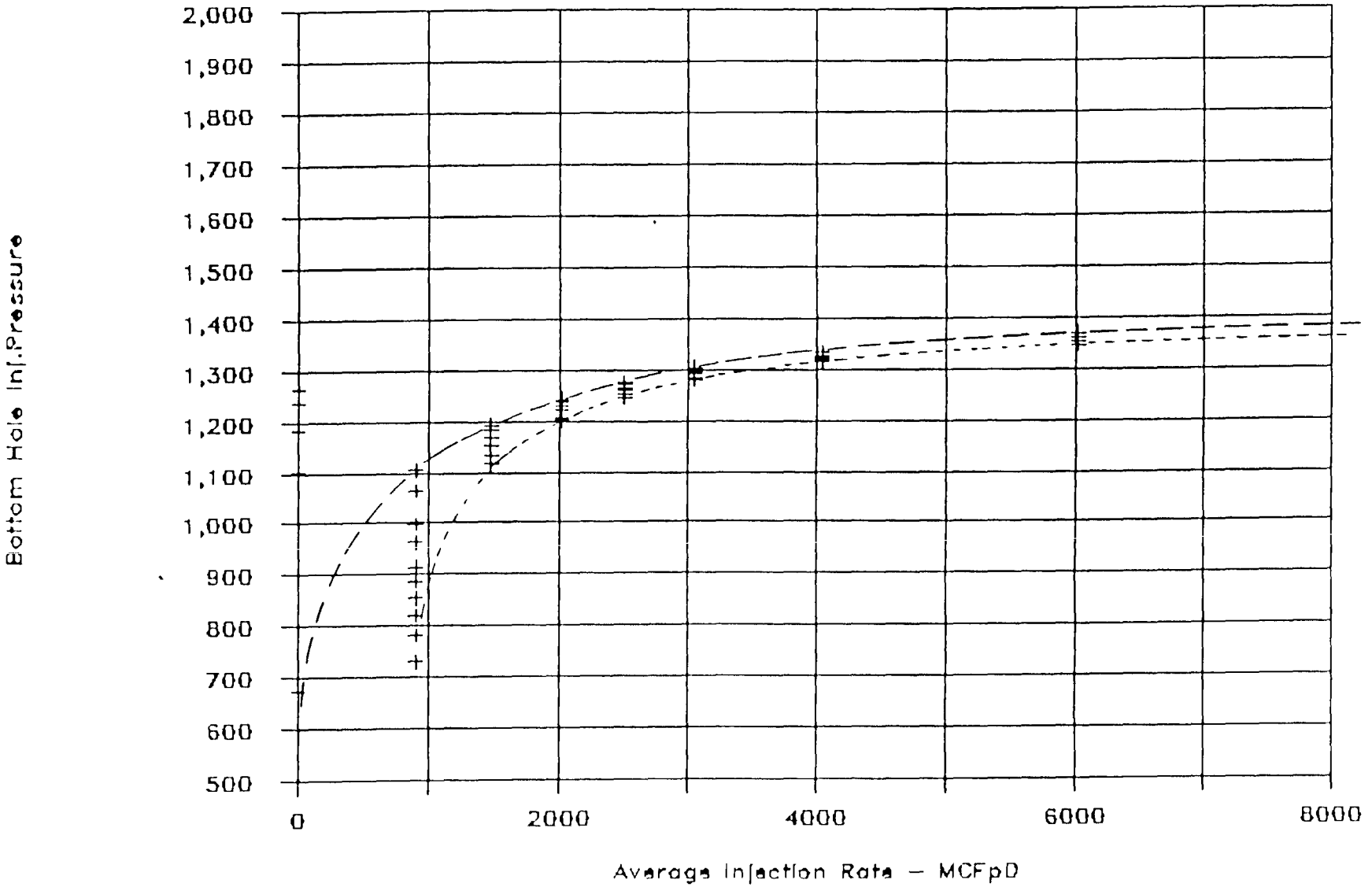
San Isidro #13-II Injectivity Test

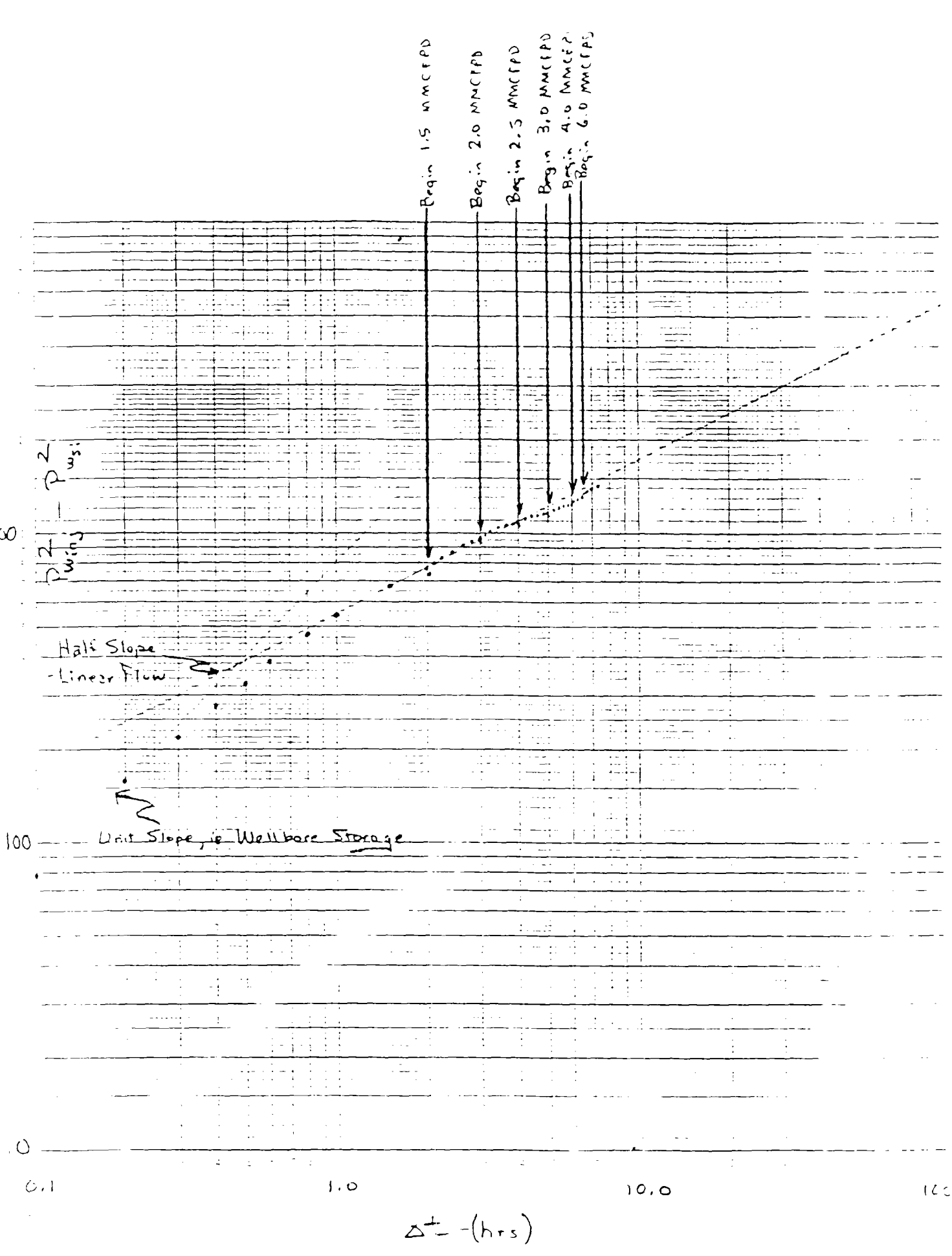
Rio Puerco Mancos Oil Pool

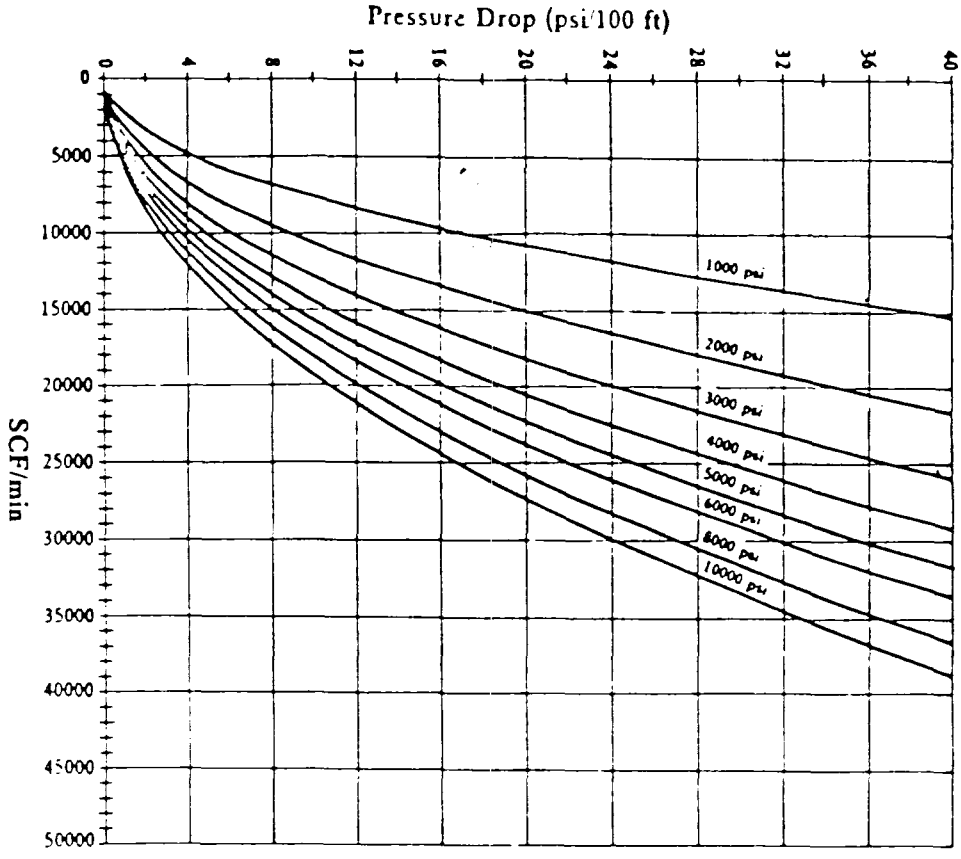


San Isidro #13-II Injectivity Test

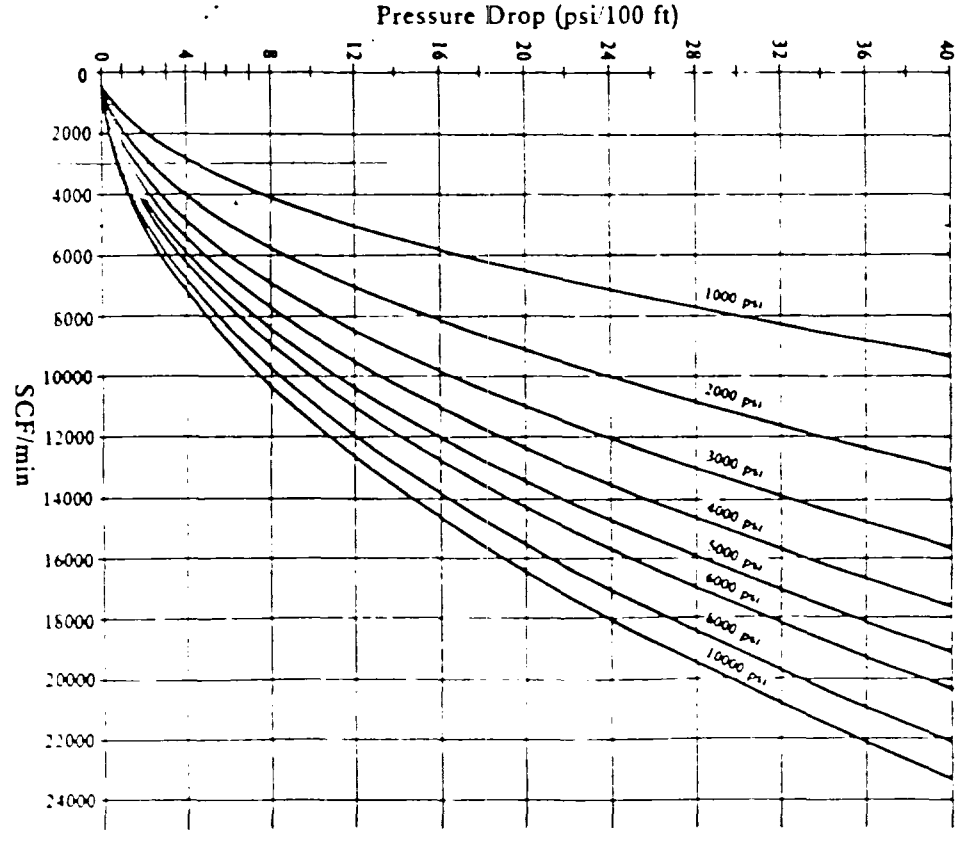
Rio Puerco Mancos Oil Pool




Begin 1.5 MMCFPD
Begin 2.0 MMCFPD
Begin 2.5 MMCFPD
Begin 3.0 MMCFPD
Begin 4.0 MMCFPD
Begin 6.0 MMCFPD
P^2_{ws}
P^2_{wf}
Half Slope
-Linear Flow
Unit Slope, ie Wellbore Storage
100
.0
0.1
1.0
10.0
Δt - (hrs)

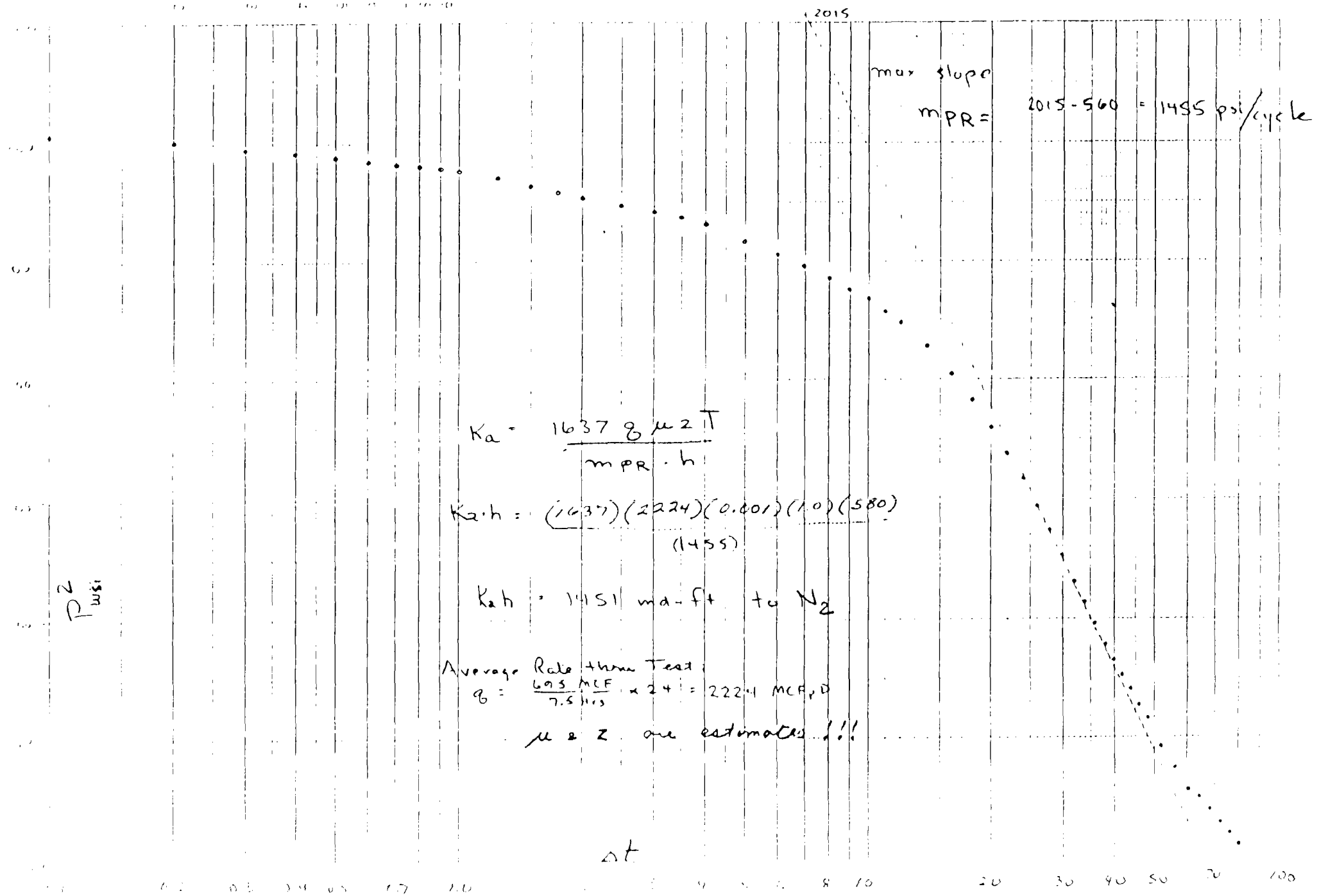


Pressure Drop for Pure Nitrogen Gas
2.875" 6.5#/ft Tubing 2.441 I.D.
Temp = 100°F



Pressure Drop for Pure Nitrogen Gas
2.375" 4.6#/ft Tubing 1.995 I.D.
Temp = 100°F

46 5490



$$K_a = \frac{1637\, q \mu z T}{m_{PR} \cdot h}$$

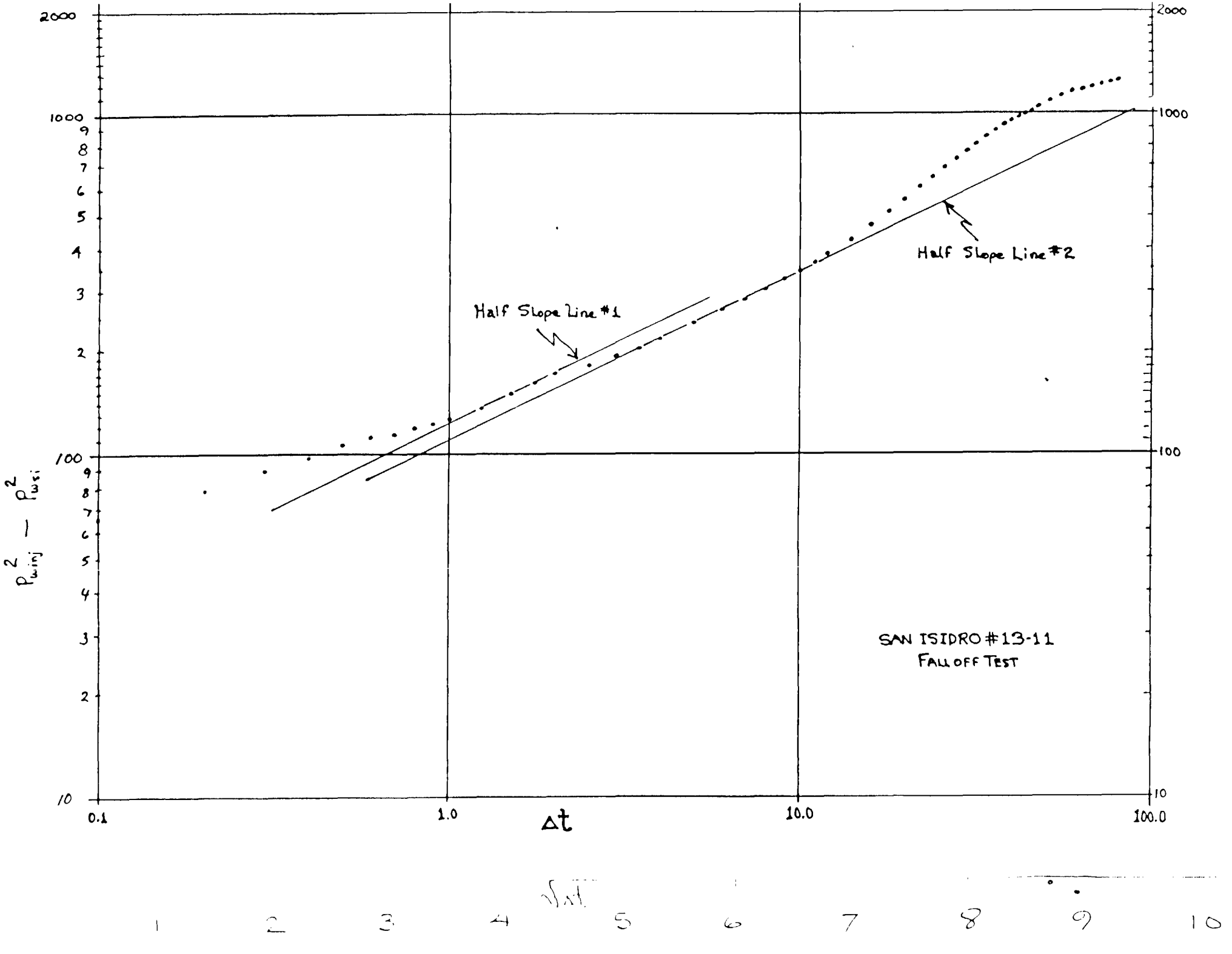
$$K_a h = \frac{(1637)(2224)(0.401)(1.0)(580)}{(1455)}$$

$K_a h$ = 1451 md-ft to N_2

Average Rate thru Test:

$q = \frac{605\ MCF}{7.5\ hrs} \times 24 = 2224\ MCF/D$

μ & z are estimates !!!


2000
1000
100
10
9
8
7
6
5
4
3
2
$P_{winj}^2 - P_{wsi}^2$
Half Slope Line #1
Half Slope Line #2
SAN ISIDRO #13-11
FALL OFF TEST
0.1
1.0
10.0
100.0
Δt
$\sqrt{\Delta t}$
1
2
3
4
5
6
7
8
9
10