STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☒ Pressure Maintenance ☐ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ yes ☐ no

II. Operator: Marathon Oil Company

Address: P. O. Box 552, Midland, Texas 79702

Contact party: Engineering Manager Phone: (915) 682-1626

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

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: D. Jo Loran Title Engineering Manager

Signature: David J Loran Date: May 21, 1991

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. All well data on the proposed injectors has been submitted to the NMOCD on appropriate completion and remedial workover notices at various times from January, 1988 to current date.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office

BEFORE EXAMINER STOGNER
OIL CONSERVATION DIVISION
Marathon Exhibit No. 3
Case No. 10341

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ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
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If yes, give the Division order number authorizing the project _____.

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VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

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: D. J. Loran Title Engineering Manager

Signature: _____ Date: May 21, 1991

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. All well data on the proposed injectors has been submitted to the NMOCD on appropriate completion and remedial workover notices at various times from January, 1988 to current date.

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ATTACHMENT TO FORM C-108

PROPOSED TAMANO (BSSC) UNIT

SECTION

III. Well Data: See attached well diagram sheets for each of the five proposed injection wells. All five injectors were originally drilled as Bone Spring Second Carbonate producers. The next higher zone productive of hydrocarbons in the area around the injection wells is the Bone Spring First Sand at approximately 7,650'. The next lower zone productive of hydrocarbons in the area is the Bone Spring Second Sand at approximately 8,250'.

V. Area of Review: See attached map.

VI. Well Data in Area of Review: See attached well data spreadsheet and wellbore schematics on any plugged wells.

VII. 1. Proposed Average Daily Injection Rate: 5,000 BWPD, 1,000 BWPW
Proposed Average Maximum Daily Injection Rate: 7,500 BWPD, 1,500 BWPW.

2. The proposed system will be closed.

3. Proposed average surface injection pressure: [redacted]g
Proposed maximum surface injection pressure: [redacted]

380 psi More Than Usually

Note: Step rate test data will be submitted at the hearing on the application to support a surface injection pressure in excess of 0.2 psi/ft (1,600 psi).

4. Injection Water Source: [redacted] Double Eagle fresh water system (Ogallala) and [redacted] Bone [redacted] produced water.

Compatibility tests (see attached water analysis).

5. Not applicable.

VII. Geologic Data Injection Zone: The proposed injection zone will be the Bone Spring Second Carbonate. The productive interval of the aforementioned zone is a vuggy, naturally fractured dolomite debris flow confined by dense dolomites having no matrix or secondary porosity. The injection interval occurs at a depth of approximately 8,000' to 8,200' from the surface.

Two sources of drinking water overlying the zone of injection are the alluvium and the triassic. The alluvium is a sand and gravel zone and is present at a depth of 10 - 40' over the area of interest. The

triassic is comprised of clays and sands and is encountered between depth of 40' - 800' in the area of interest. Water analysis of these water bearing formations are as follows:

Alluvium: 6 Mg/L, 597 MMhos (Section 7, T-18-S, R-32-E, Lea County, New Mexico).

Triassic: 222 Mg/L, 1,234 MMhos (Section 12, T-18-S, R-31-E, Eddy County, New Mexico).

There are no sources of drinking water below the zone of injection. Fresh water data was obtained from Ken Fesquez, Water Specialist, with the State Engineering Office, Roswell, New Mexico.

IX. The stimulation program for the proposed injection wells will consist of re-acidizing with approximately 5,000 gallons of HCl acid (may vary depending on interval thickness).

X. Log and test data on all proposed injection wells has been submitted to the NMOCD and are on file in the Artesia office.

XI. See above for fresh water analysis and the "area of review" map for their locations.

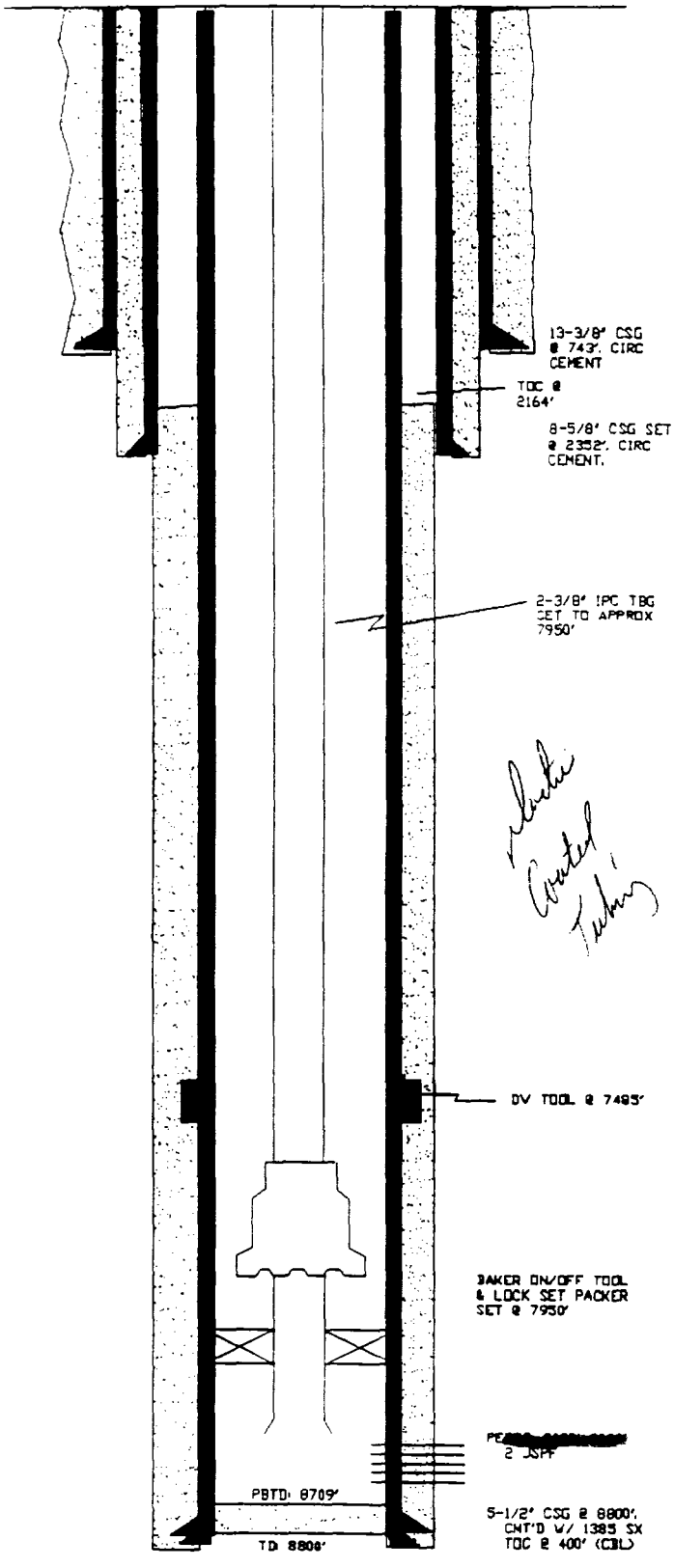
XII. Not applicable.

XIII. Notice, by submission of this application, has been sent to surface owners, surface lessees and offset operators by registered mail.

3500 BWPD
I
5000 BWPD

TWW/289.274/sk

WELL DATA SHEET



MARATHON OIL CO
PROPOSED TAMANO (BSSC) UNIT
STETCO "10" FEDERAL #3
1980' FSL & 1650' FEL (J)
SEC 10, T-18-S, R-31-E
EDDY CO., NEW MEXICO

TD: 8800' PBTD: 8709' KB: 3738' GL: 3702'

SURFACE CSG: 13-3/8", 48#/FT
SET @ 743'. CMT'D W/347 SX CLASS "C".
CIRCULATED CMT. HOLE SIZE 17-1/2"

INTERMEDIATE CSG: 8-5/8", 24#/FT, SET @ 2352'. CMT'D W/658 SX CLASS "C".
CIRCULATED CMT. HOLE SIZE 11".

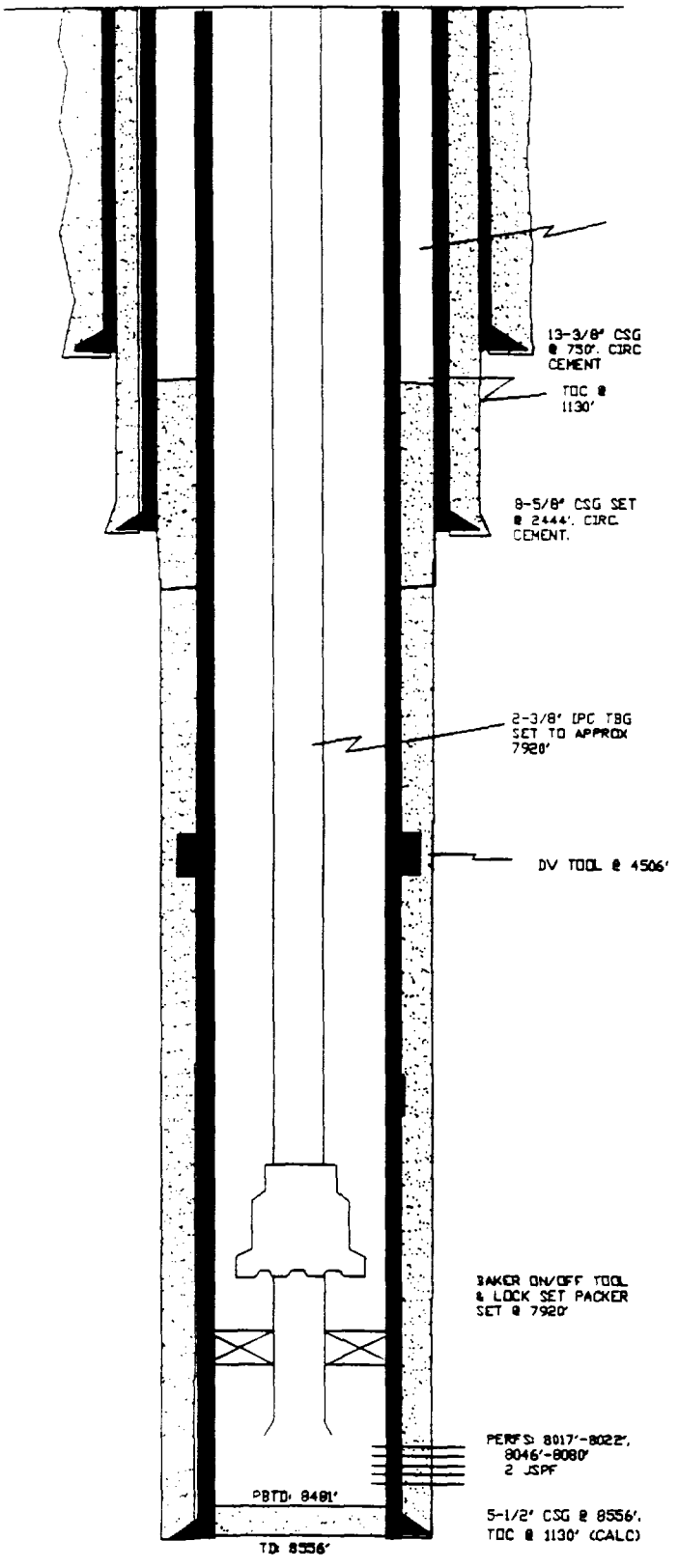
PRODUCTION CSG: 5-1/2", 15.5# & 17#/FT
SET @ 8800'. DV TOOL @ 7485'. CMT'D 1ST STAGE W/ 285 SX CLASS "H".
CMT'D 2ND STAGE W/ 1000 SX CLASS "H" LITE AND 100 SX CLASS "H". TOC @ APPROX 2164'(CALC). HOLE SIZE 7-7/8".

TBG/BHA: 2-3/8", 4.7#/FT, N-80, EUE IPC
TBG TO BE SET @ APPROX 7950'.
2-3/8" x 1.781" BAKER MODEL "FL" ON/OFF TOOL W/ 1.781" "F" PROFILE NIPPLE (316 STAINLESS) ON/OFF TOOL PLASTIC COATED. 5-1/2" x 2-3/8" BAKER MODEL LOK-SET PKR (IPC, EPC).
1 JT 2-3/8" TAILPIPE W/ WIRELINE RE-ENTRY GUIDE.

PERFS: 8030'-8090' W/ 2 JSPF

HISTORY: COMPLETED JAN 1991, AS A 2ND BONE SPRING CARBONATE OIL WELL. ACID FRAC'D W/ 10,000 GALS GELLED 15% ACID W/ 275 BALLS. POTENTIALED 1-7-91 @ 600 BOPD, 0 BWPD, 347 MCFD, FTP=300 PSIG ON A 30/64" CHOKE.
PROPOSED AS AN INJECTION WELL.
INJECTION WILL BE INTO THE 2ND BONE SPRING CARBONATE PERFS @ 8030'-8096'

WELL DATA SHEET



MARATHON OIL CO
PROPOSED TAMANO (BSSC) UNIT
JOHNSON "B" FEDERAL A/C 1 #10
990' FNL & 450 FWL (D)
SEC 11, T-18-S,R-31-E
EDDY CO., NEW MEXICO

TD: 8556' PBTD: 8481' KB: 3767' GL: 3749'

SURFACE CSG: 13-3/8", 48# & 72# /FT
SET @ 750'. CMT'D W/635 SX CLASS "C". CIRCULATED CMT. HOLE SIZE 17-1/2"

INTERMEDIATE CSG: 8-5/8", 24# & 32# /FT, SET @ 2444'. CMT'D W/600 SX CLASS "C". CIRCULATED CMT. HOLE SIZE 11".

PRODUCTION CSG: 5-1/2", 15.5# & 17#/FT
SET @ 8556'. DV TOOL @ 4506'. CMT'D 1ST STAGE W/ 700 SX CLASS "H LITE. CMT'D 2ND STAGE W/ 850 SX CLASS "H" LITE AND 100 SX CLASS "H". TOC @ APPROX 1130'(CALC). (CBL SHOWED CMT UP INTO THE INTM CASING)

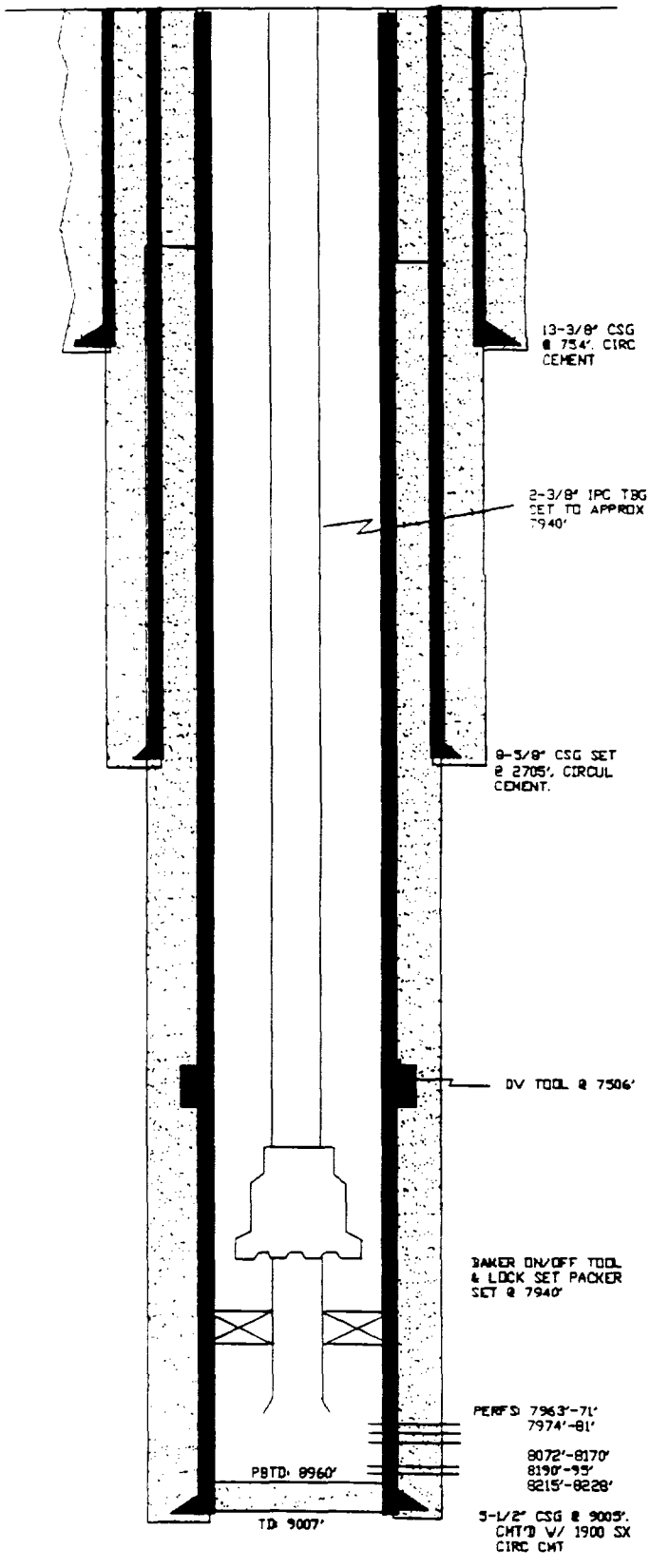
TBG/BHA: 2-3/8", 4.7#/FT, N-80, EUE IPC
TBG TO BE SET @ APPROX 7920'.
2-3/8" x 1.781" BAKER MODEL "FL" ON/OFF TOOL W/ 1.781" "F" PROFILE NIPPLE (316 STAINLESS) ON/OFF TOOL PLASTIC COATED.
5-1/2" x 2-3/8" BAKER MODEL LOK-SET PKR (IPC, EPC). 1 JT 2-3/8" TAILPIPE W/ WIRELINE RE-ENTRY GUIDE.

PERFS: 8017'-8022' & 8046'-8080' W/ 2 JSPF

HISTORY: COMPLETED SEPT 1990, AS A 2ND BONE SPRING CARBONATE OIL WELL. ACIDIZED W/ 5,000 GALS 20% NEFE. ACID FRACED W/ W/ 25,000 GALS X-LINKED 20% NEFE & 27,050 GALS GELLED 2% KCL. POTENTIALED 10-5-90 @ 53 BOPD , 0 BWPD, & 305 MCFD.

PROPOSED AS AN INJECTION WELL.
INJECTION WILL BE INTO THE 2ND BONE SPRING CARBONATE PERFS @ 8017'-8022' & 8046'-8080'.

WELL DATA SHEET



MARATHON OIL CO
PROPOSED TAMANO (BSSC) UNIT
MARATHON-SHUGART "B" #1
660' FWL & 470' FSL (M)
SEC 11, T-18-S, R-31-E
EDDY CO., NEW MEXICO

TD: 9007' PBTD: 8960' KB: 3740' GL: 3725'

SURFACE CSG: 13-3/8", 48#/FT
SET @ 754'. CMT'D W/395 SX LITE & 250 SX CLASS "C". CIRCULATED CMT. HOLE SIZE 17-1/2"

INTERMEDIATE CSG: 8-5/8", 24# & 32#/FT, SET @ 2703'. CMT'D W/1000 SX LITE & 250 SX CLASS "C". CIRCULATED CMT. HOLE SIZE 11".

PRODUCTION CSG: 5-1/2", 15.5# & 17#/FT
SET @ 9005'. DV TOOL @ 7506'. CMT'D 1ST STAGE W/ 360 SX CLASS "H". CMT'D 2ND STAGE W/ 1440 SX CLASS "H" POZ AND 100 SX CLASS "H". CIRC CMT.

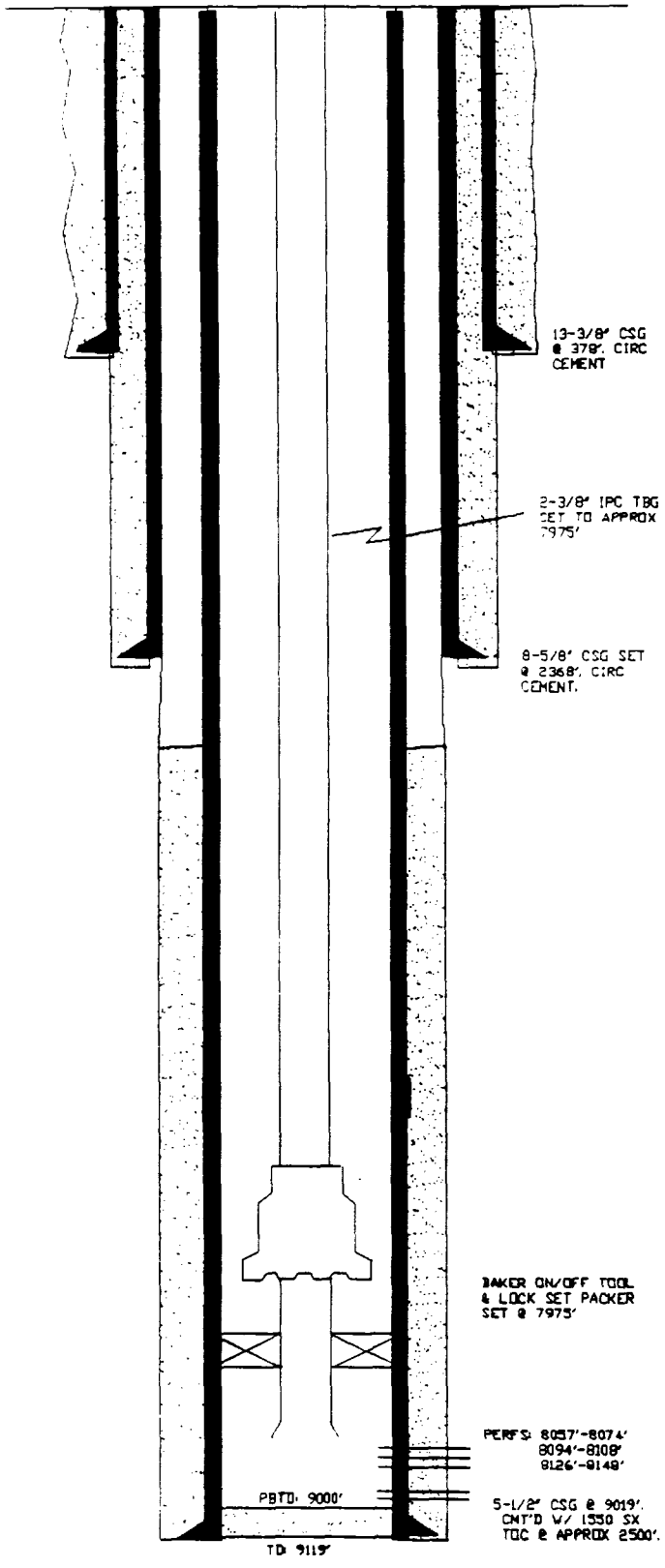
TBG/BHA: 2-3/8", 4.7#/FT, N-80, EUE IPC
TBG TO BE SET @ APPROX 7940'.
2-3/8" x 1.781" BAKER MODEL "FL" ON/OFF TOOL W/ 1.781" "F" PROFILE NIPPLE (316 STAINLESS) ON/OFF TOOL PLASTIC COATED. 5-1/2" x 2-3/8" BAKER MODEL PKR (IPC, EPC) W/ 1 JT 2-3/8" TAILPIPE W/ WIRELINE RE-ENTRY GUIDE.

PERFS: 7963'-71' & 7974'-81'. (WILL BE SQUEEZED PRIOR TO INJECTION)
8072'-8170', 8190'-8195', & 8215'-28' (265 HOLES)

HISTORY: COMPLETED IN SEPTEMBER, 1989 AS A 2ND BONE SPRING CARBONATE OIL WELL. PERF'D 2ND BONE SPRING CARBONATE FROM 8072'-8120' (2 JSPF) ACIDIZED W/ 3000GAL 15% HCL. IP 9-28-89: 40 BOPD, 0 BWPD, 58 MCFD. 12-17-88 ADDED PERFS 8120'-70', 8190'-95', 8215'-28', (139 HOLES). ACIDIZED W/6400 GALS 15% HCL (W/100 BALL SEALERS). PRODUCED 136 BOPD, 8 BWPD. 8-3-90 FRACED W/90934 GALS (PAD & GEL) & 1-4 PPG 20/40 SAND AND 4 PPG RESIN COATED 20/40. 10-24-90 PERF'D 7963'-81'. ACIDIZED W/ 3000 GALS 15% NEFE. PRODUCED 22 BOPD, 3 BWPD, & 30 MCFD.

PROPOSED AS AN INJECTOR INTO THE 2ND BONE SPRING CARBONATE PERFS @ 8072'-8228'. THE PERFS @ 7963'-71' & 7974'-81' WILL BE SQUEEZED W/ CEMENT PRIOR TO INJECTION.

WELL DATA SHEET



HARVEY E. YATES COMPANY
PROPOSED TAMANO (BSSC) UNIT
HUDSON "11" FEDERAL #4
2310' FNL & 2310' FEL (G)
SEC 11, T-18-S, R-31-E
EDDY CO., NEW MEXICO

TD: 9119' PBTD: 9000' KB: 3747' GL: 3756'

SURFACE CSG: 13-3/8",
SET @ 378'. CMT'D W/385 SX
CIRCULATED CMT. HOLE SIZE 17-1/2"

INTERMEDIATE CSG: 8-5/8 SET @ 2368'.
CMT'D W/1300 SX. CIRCULATED CMT.
HOLE SIZE 11".

PRODUCTION CSG: 5-1/2" SET @ 9119'.
CMT'D W/1550 SX. TOC @ 2500'.
HOLE SIZE 7-7/8".

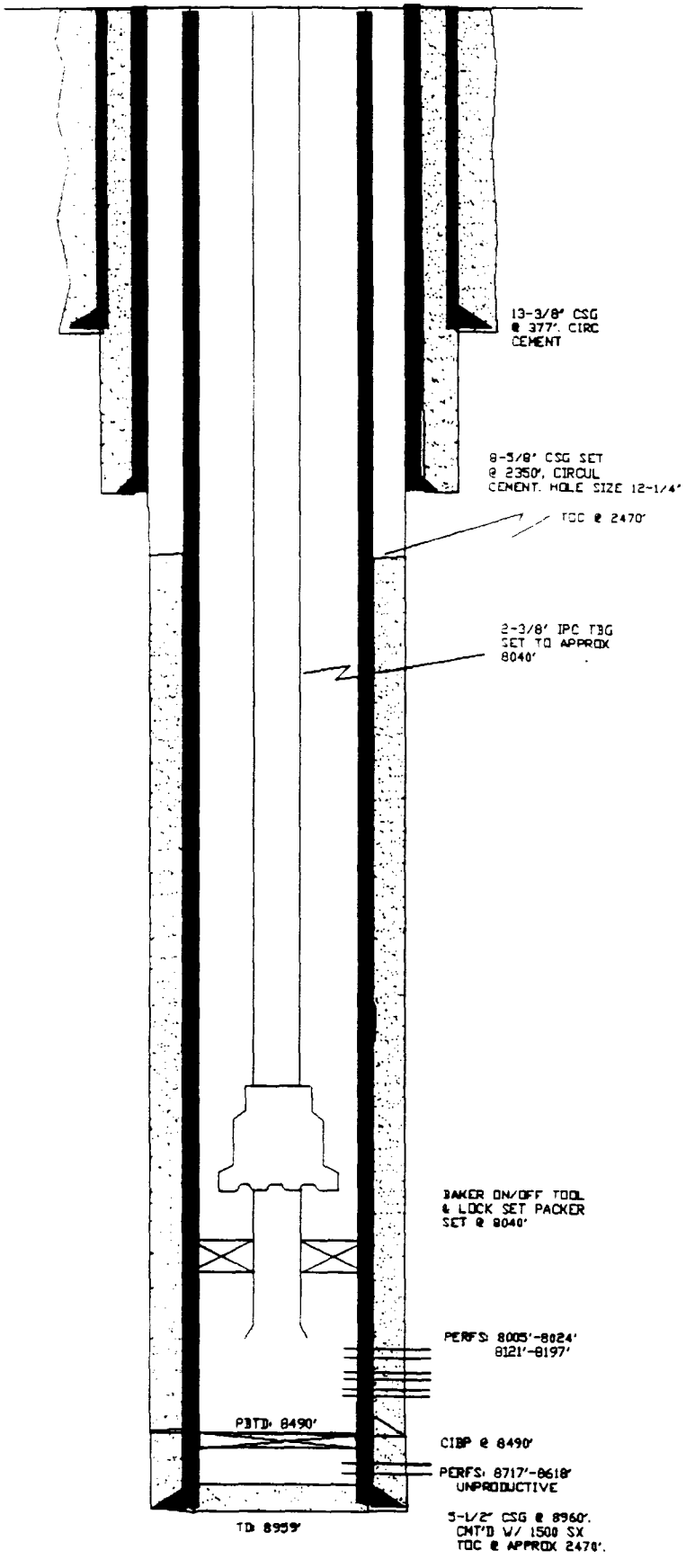
TBG/BHA: 2-3/8", 4.7#/FT, N-80, EUE IPC
TBG TO BE SET @ APPROX 7975'.
2-3/8" x 1.781" BAKER MODEL "FL"
ON/OFF TOOL W/ 1.781" "F" PROFILE
NIPPLE (316 STAINLESS) ON/OFF TOOL
PLASTIC COATED. 5-1/2" x 2-3/8"
BAKER MODEL PKR (IPC, EPC) W/ 1 JT
2-3/8" TAILPIPE W/ WIRELINE RE-ENTRY
GUIDE.

PERFS: 8057'-74', 8094'-8108', & 8126'-8148'.

HISTORY: COMPLETED 7-14-88. WELL POTENTIALED FLOWING 216 BOPD, 24 BWPD, & 138 MCFD ON A 16/64" CHOKE W/350 PSIG FLOWING PRESSURE.
THIS WELL IS PROPOSED AS AN INJECTOR. THE WELL WILL INJECT INTO THE 2ND BONE SPRING CARBONATE THROUGH PERFS @ 8057'-74', 8094'-8108', & 8126'-48'.

WELL DATA SHEET

HARVEY E. YATES COMPANY
PROPOSED TAMANO (BSSC) UNIT
A.J. "11" FEDERAL #1
560' FSL & 990' FEL (P)
SEC 11, T-18-S, R-31-E
EDDY CO., NEW MEXICO



TD: 8959' PBTD: 8490' KB: 3740' GL: 3751'

SURFACE CSG: 13-3/8" SET @ 377'
CMT'D W/ 600 SX. CIRC CMT.
HOLE SIZE 17-1/2"

INTERMEDIATE CSG: 8-5/8 SET @ 2350'.
CMT'D W/1600 SX. CIRCULATED CMT.
HOLE SIZE 12-1/4"

PRODUCTION CSG: 5-1/2" SET @ 8960'.
CMT'D W/1500 SX. TOC @ 2470'.
HOLE SIZE 7-7/8. CIBP SET @ 8490'

TBG/BHA: 2-3/8", 4.7#/FT, N-80, EUE IPC
TBG TO BE SET @ APPROX 8040'.
2-3/8" x 1.781" BAKER MODEL "FL"
ON/OFF TOOL W/ 1.781" "F" PROFILE
NIPPLE (316 STAINLESS) ON/OFF TOOL
PLASTIC COATED. 5-1/2" x 2-3/8"
BAKER MODEL PKR (IPC, EPC) W/ 1 JT
2-3/8" TAILPIPE W/ WIRELINE RE-ENTRY
GUIDE.

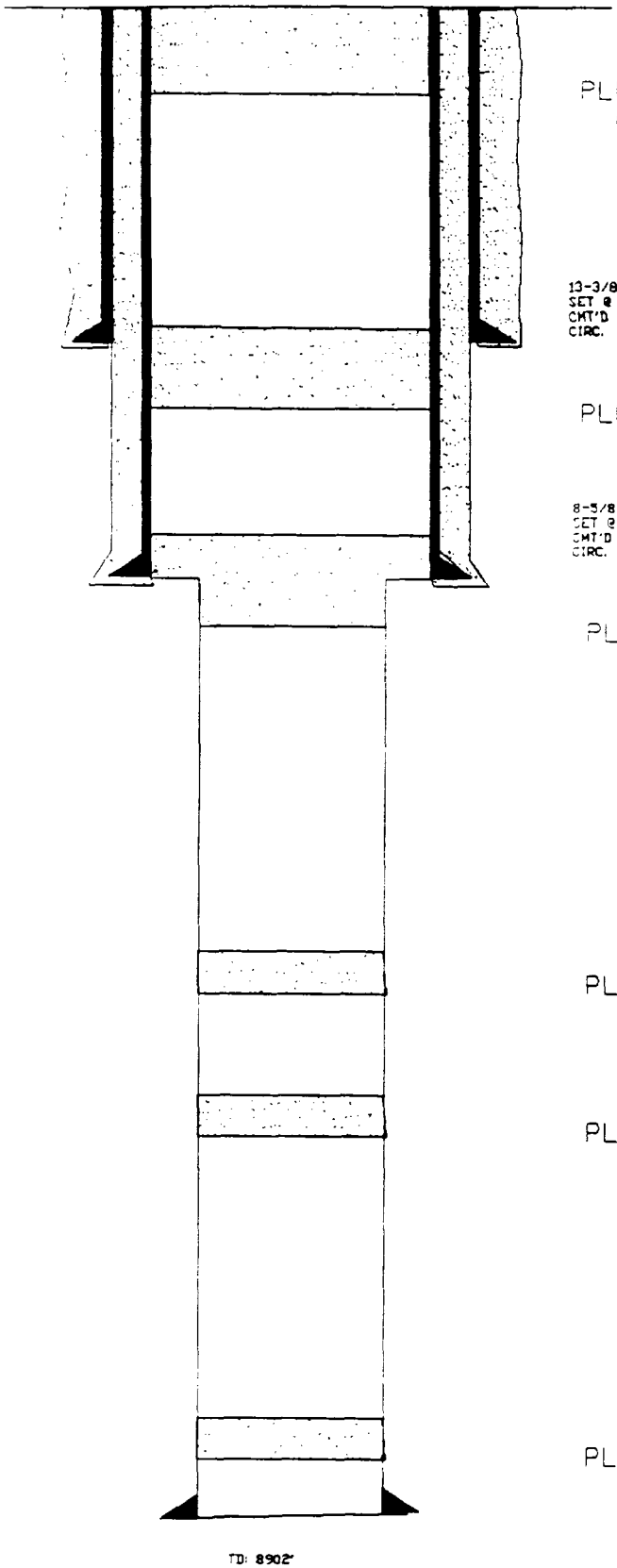
PERFS: 8005'-24' & 8121'-97'.

HISTORY: COMPLETED 7-4-89. WELL POTENTIALED PUMPING 255 BOPD, 91 BWPD, & 240 MCFD. ADDED PERFS (8005'-8024') 10-3-90. ACIDIZED W/17,700 GALS 20% ACID.

WELL PROPOSED FOR WATER INJECTION. INJECTION WILL BE INTO THE 2ND BONE SPRING CARBONATE THROUGH PERFS @ 8005'-8024' & 8121'-8197'

WELL DATA SHEET

TAYLOR "12" FEDERAL #5
990' FNL & 660' FWL (D)
SEC 12, T-18-S, R-31-E
EDDY CO., NEW MEXICO
STATUS: P & A



PLUG #6: SURFACE (50 SX)

PLUG #5: 930'-1030' (100 SX)

PLUG #4: 2211'-2418' (100 SX)

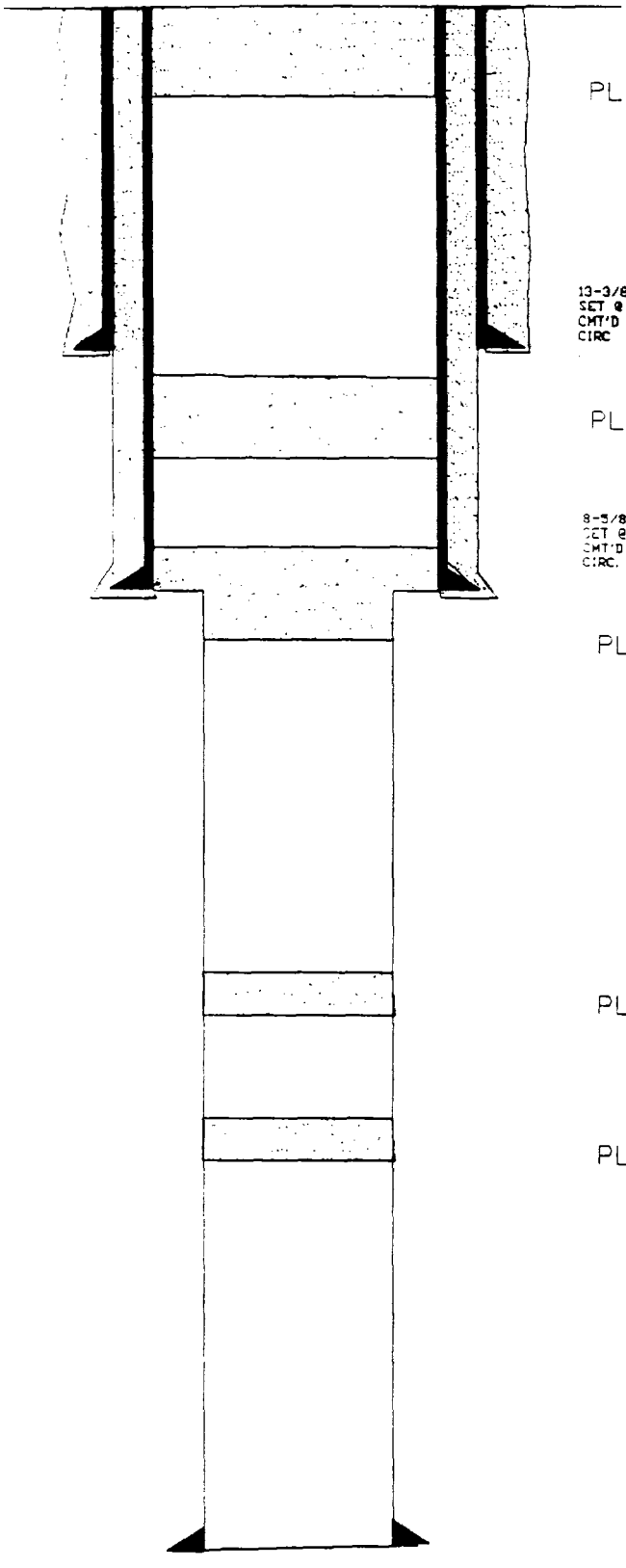
PLUG #3: 4800'-4900' (100 SX)

PLUG #2: 5600'-5780' (100 SX)

PLUG #1: 8800'-8900' (100 SX)

WELL DATA SHEET

TAYLOR "12" FEDERAL #2
660' FSL & 330' FWL (M)
SEC 12, T-18-S, R-31-E
EDDY CO., NEW MEXICO
STATUS: P & A



PLUG #5: SURFACE (15 SX)

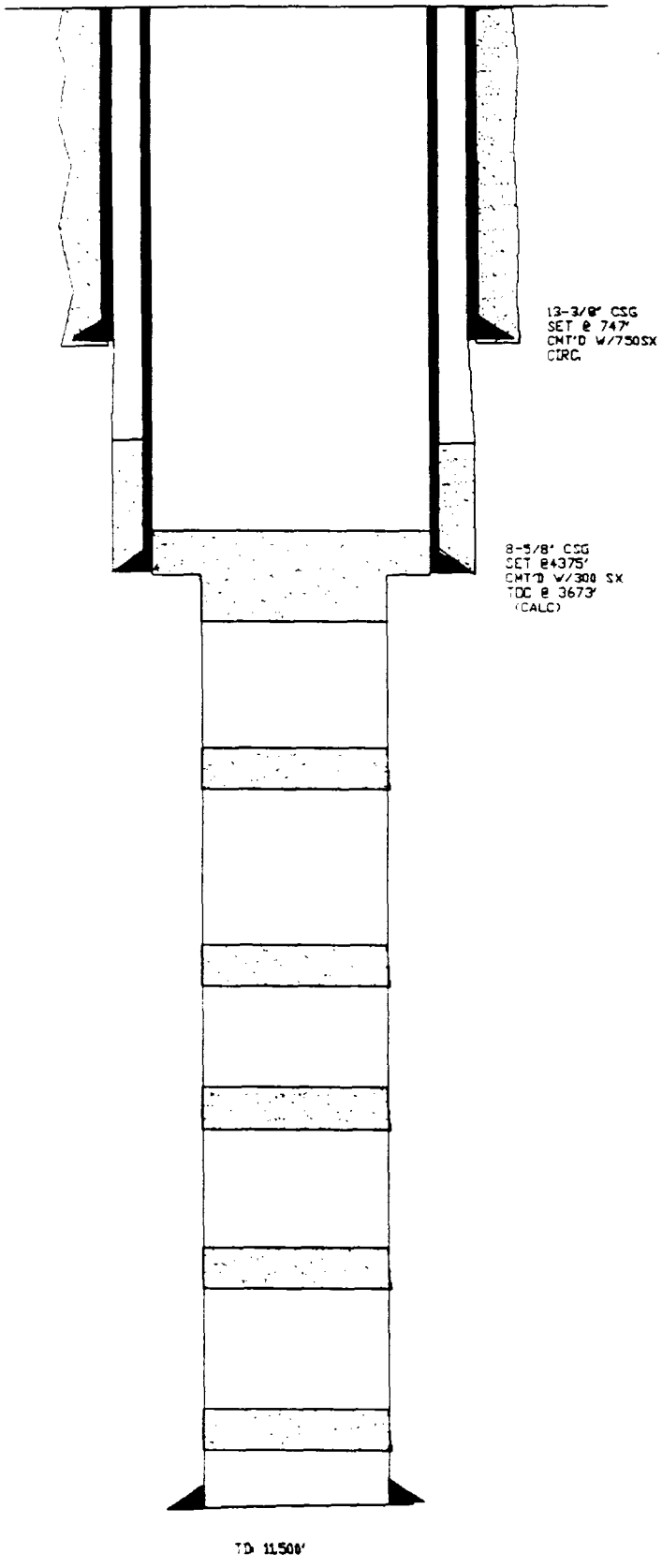
PLUG #4: 298'-398' (45 SX)

PLUG #3: 2295'-2395' (45 SX)

PLUG #2: 4764'-4864' (45 SX)

PLUG #1: 5894'-5994' (35 SX)

WELL DATA SHEET



HUDSON FEDERAL #1
990' FNL & 1980' FEL (B)
SEC 11, T-18-S, R-31-E
EDDY CO., NEW MEXICO
STATUS: P & A

PLUG #6: 4320'-4430' (30 SX)

PLUG #5: 5900'-6030' (50 SX)

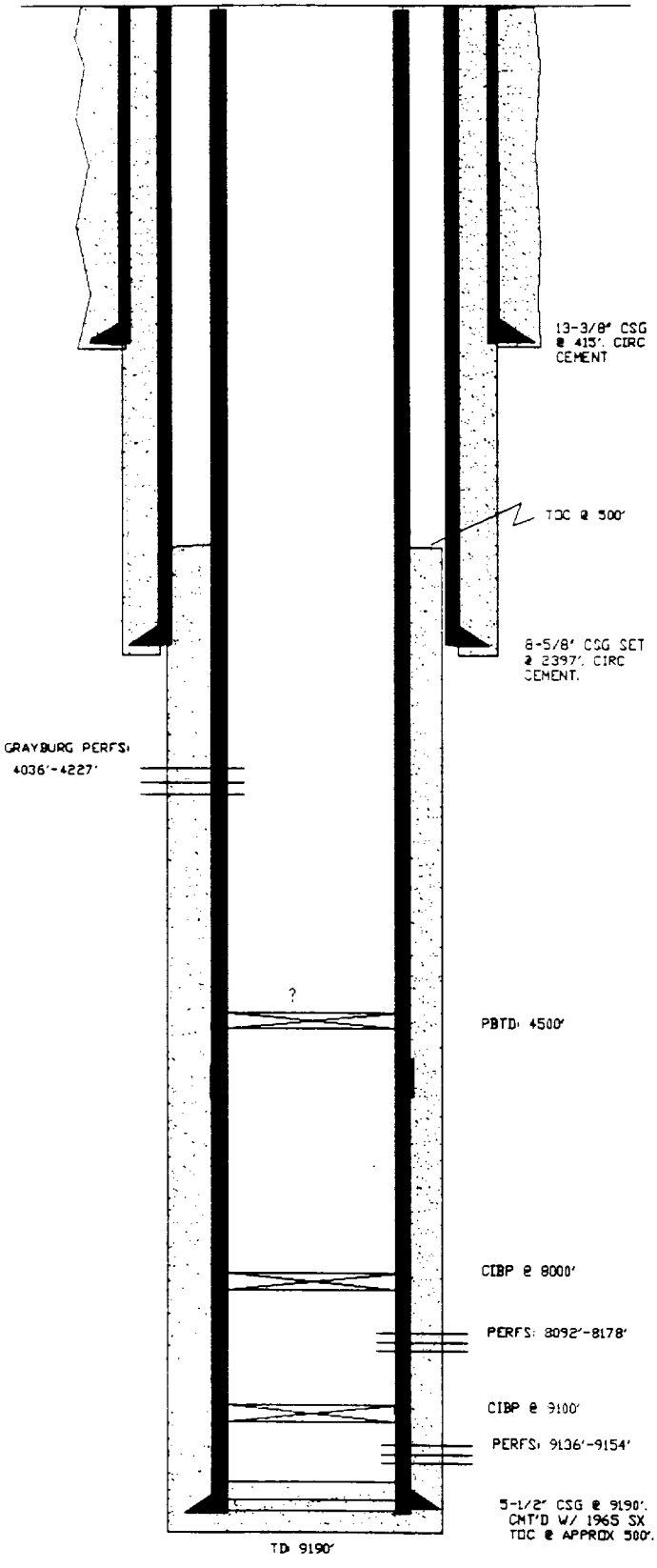
PLUG #4: 6490'-6600' (30SX)

PLUG #3: 8000'-8150' (50 SX)

PLUG #2: 9400'-9600' (60 SX)

PLUG #1: 11,100'-11,400' (100 SX)

WELL DATA SHEET



READ & STEVENS
JAMIE FEDERAL #1

330' FNL & 1920' FWL (C)
SEC 14, T-18-S, R-31-E
EDDY CO., NEW MEXICO

TD: 9190' PBTD: 4500' KB: ? GL: 3722'

SURFACE CSG: 13-3/8",
SET @ 415'. CMT'D W/500 SX
CIRCULATED CMT. HOLE SIZE 17-1/2"

INTERMEDIATE CSG: 8-5/8 SET @ 2397'.
CMT'D W/1250 SX. CIRCULATED CMT.
HOLE SIZE 11".

PRODUCTION CSG: 5-1/2" SET @ 9190'.
CMT'D W/1965 SX. TOC @ 500'.
HOLE SIZE 7-7/8".

UNICHEM INTERNATIONAL

Home Office 707 N. Leech, P.O. Box 1499 / Hobbs, MN 88240 / Ph. 505/393-7751, Fax 505/393-6754

May 6, 1991

Mr. Allen Wilson
Marathon Oil Company
P. O. Box 552
Midland, TX 79702

Dear Mr. Wilson:

Enclosed please find requested compatability report as requested from the following locations:

70% - City of Carlsbad Fresh Water

20% - Johnson B Federal A/C 1 #2

2% - Johnson B Federal A/c #1

2% - Johnson B Federal

2% - Shugart B

2% - Stetco Federal 10 Fed #2

2% - Stetco 10 Federal #1 & 3

If you have any questions or require further information, please contact us.

Sincerely,

Sharon Wright

Sharon Wright
Laboratory Technician

SW/sr

cc: John Offutt
Rick Gaddis
Joe Hay

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON
Date : 05-06-1991
Location: COMPATABILITIES (on)

	Sample 1
Specific Gravity:	1.039
Total Dissolved Solids:	54468
pH:	8.16
IONIC STRENGTH:	1.014

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	98.7	1970
Magnesium	(Mg^{+2})	32.9	400
Sodium	(Na^{+1})	808	18600
Iron (total)	(Fe^{+2})	0.209	5.85
Barium	(Ba^{+2})	0.007	0.466
Manganese	(Mn^{+2})	0.001	0.024
ANIONS:			
Bicarbonate	(HCO_3^{-1})	2.06	126
Carbonate	(CO_3^{-2})	0.560	16.8
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	14.1	679
Chloride	(Cl^{-1})	922	32700
DISSOLVED GASES			
Carbon Dioxide	(CO_2)		
Hydrogen Sulfide	(H_2S)		
Oxygen	(O_2)		

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.89	-39
104°F	40°C	1.5	-39
122°F	50°C	1.8	-39
140°F	60°C	2.2	-39
168°F	76°C	2.7	-36
176°F	80°C	2.9	-36

Comments:
CITY OF CARLSBAD @ 70%; JOHNSON B FEDERAL A/C 1 #2 @ 20%
2% EACH OF - JOHNSON B FEDERAL AC #1, JOHNSON B FEDERAL, SHUGART B, STETCO FED 10 FED #2, STETCO 10 FED #1 & 3

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: COMPATABILITY - (on 3-8-1991)

	Sample 1
Specific Gravity:	1.025
Total Dissolved Solids:	35565
pH:	8.06
IONIC STRENGTH:	0.696

		me/liter	mg/liter
CATIONS:			
Calcium	(Ca^{+2})	94.6	1890
Magnesium	(Mg^{+2})	49.0	595
Sodium	(Na^{+1})	476	11000
Iron (total)	(Fe^{+2})	0.500	14.0
Barium	(Ba^{+2})	0.007	0.515
ANIONS:			
Bicarbonate	(HCO_3^{-1})	2.06	126
Carbonate	(CO_3^{-2})	0.600	18.0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	7.69	369
Chloride	(Cl^{-1})	610	21600
DISSOLVED GASES			
Carbon Dioxide	(CO_2)		
Hydrogen Sulfide	(H_2S)		
Oxygen	(O_2)		

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.90	-34

Comments:
JOHNSON B FEDERAL A/C #1= 5% SHUGART B = 5% JOHNSON B FEDERAL = 5%
STETCO 10 FEDERAL #2 = 5% STETCO 10 FEDERAL #1 & 3 = 5%
CITY OF CARLSBAD FRESH WATER = 75%

HALLIBURTON DIVISION LABORATORY

HALLIBURTON SERVICES

ARTESIA DISTRICT

LABORATORY REPORT No. W101-91

TO Hudson & Hudson

P. O. Box 9

Maljamar, NM 88264

Date March 17, 1991

Submitted by Dwaine Howard Date Rec. March 16, 1991

Well No. Shugart B #4 Depth 4030-42 Formation Grayburg

Field Shugart Queen-SA-GB County Eddy Source Swab

Resistivity	0.079 @ 70°		
Specific Gravity ..	1.0815 @ 70°		
pH	7.0		
Calcium	6,565		
Magnesium	2,759		
Chlorides	70,000		
Sulfates	Over 1,600		
Bicarbonates	153		
Soluble Iron	250		
KCL	0		

Remarks:

This water sample was taken after the load water was recovered. It is a representation analysis.

Scott Taylor

Respectfully submitted

Analyst: Scott Taylor - EIT

HALLIBURTON SERVICES

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-07-1991
Location: JOHNSON "B" FEDERAL 4,5,6,8 (on 6-23-1989)

	Sample 1
Specific Gravity:	1.150
Total Dissolved Solids:	209859
pH:	7.37
IONIC STRENGTH:	3.845

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	356	7120
Magnesium	(Mg^{+2})	56.0	680
Sodium	(Na^{+1})	3200	73500
Iron (total)	(Fe^{+2})	0.745	20.8
Barium	(Ba^{+2})	0.086	5.90
ANIONS:			
Bicarbonate	(HCO_3^{-1})	2.39	146
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	51.0	2450
Chloride	(Cl^{-1})	3550	126000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	1.4	16

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: JOHNSON B FEDERAL A/C #1 (on 3-8-1991)

	Sample 1
Specific Gravity:	1.130
Total Dissolved Solids:	182031
pH:	6.00
IONIC STRENGTH:	3.598

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	544	10900
Magnesium	(Mg^{+2})	256	3110
Sodium	(Na^{+1})	2380	54800
Iron (total)	(Fe^{+2})	1.61	45.0
Barium	(Ba^{+2})	0.016	1.10
ANIONS:			
Bicarbonate	(HCO_3^{-1})	0.800	48.8
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	24.5	1180
Chloride	(Cl^{-1})	3160	112000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	-0.37	2.2

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-07-1991
Location: JOHNSON B FEDERAL - A/C (HT) - (on 2/9/90)

	Sample 1
Specific Gravity:	1.143
Total Dissolved Solids:	200515
pH:	6.95
Resistivity:	0.047 ohms @ 74°F
IONIC STRENGTH:	4.013

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	600	12000
Magnesium	(Mg^{+2})	360	4370
Sodium	(Na^{+1})	2560	58900
Iron (total)	(Fe^{+2})	2.61	73.0
Barium	(Ba^{+2})	0.013	0.900
ANIONS:			
Bicarbonate	(HCO_3^{-1})	3.80	232
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	20.8	1000
Chloride	(Cl^{-1})	3500	124000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	1.5	1.6

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: STETCO 10 FEDERAL #1 & 3 (on 3-8-1991)

	Sample 1
Specific Gravity:	1.061
Total Dissolved Solids:	85977
pH:	6.60
IONIC STRENGTH:	1.791

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	304	6080
Magnesium	(Mg^{+2})	216	2620
Sodium	(Na^{+1})	1000	23000
Iron (total)	(Fe^{+2})	2.86	80.0
Barium	(Ba^{+2})	0.007	0.500
ANIONS:			
Bicarbonate	(HCO_3^{-1})	3.20	195
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	22.4	1080
Chloride	(Cl^{-1})	1490	53000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	-0.03	-11

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: STETCO FEDERAL 10 FED #2 (on 3-8-1991)

	Sample 1
Specific Gravity:	1.059
Total Dissolved Solids:	82908
pH:	6.40
IONIC STRENGTH:	1.637

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	220	4400
Magnesium	(Mg^{+2})	128	1560
Sodium	(Na^{+1})	1100	25200
Iron (total)	(Fe^{+2})	2.65	74.0
Barium	(Ba^{+2})	0.009	0.600
ANIONS:			
Bicarbonate	(HCO_3^{-1})	2.40	146
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	32.8	1580
Chloride	(Cl^{-1})	1410	50000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	-0.50	-11

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: SHUGART B (on 3-8-1991)

	Sample 1
Specific Gravity:	1.105
Total Dissolved Solids:	146576
pH:	6.30
IONIC STRENGTH:	2.92

		me/liter	mg/liter
CATIONS:			
Calcium	(Ca^{+2})	456	9120
Magnesium	(Mg^{+2})	224	2720
Sodium	(Na^{+1})	1890	43400
Iron (total)	(Fe^{+2})	2.47	69.0
Barium	(Ba^{+2})	0.001	0.100
ANIONS:			
Bicarbonate	(HCO_3^{-1})	1.000	61.0
Carbonate	(CO_3^{-2})	0	0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	27.1	1300
Chloride	(Cl^{-1})	2540	90000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	-0.32	0.12

CITY OF CARLSBAD
- WATER ANALYSIS REPORT -
CARLSBAD CITY LABORATORY
WASTEWATER TREATMENT PLANT
Carlsbad, New Mexico 88220

SAMPLE SENT BY City of Carlsbad ANALYSIS NO. _____

FROM Double Eagle Well Field SAMPLE RECEIVED Jan. 26, 1987

ADDRESS _____ SAMPLE REPORTED Jan. 27, 1987

WATER SOURCE Composite

PHYSICAL CHARACTERISTICS AS RECEIVED

Color _____ Odor _____ Turbidity 0

CHEMICAL CHARACTERISTICS

	PARTS per MILLION	PPM as $CaCo_3$	As $CaCo_3$ GRAINS per Gallon
Alkalinity-M:		148	
Alkalinity-P:		0	
Calcium-Ca:	62	156	9.1
Magnesium-MG:	14	56	3.3
Sodium-Na:			
Sulphates-So4:	46		
Chlorides-Cl:	62		
Sp. Cond.:	375		
Iron-Fe:			
Free Chlorine:			
Fluoride:	0.84		
PH: As received:	8.2		
Aquapoise (PHs) at 70°F:			
TOTAL HARDNESS: (As $CaCo_3$):		212	12.4
TOTAL DISSOLVED SOILDS (As $CaCo_3$):			

Jose A. Renteria

Unichem International

707 North Leech P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: CITY OF CARLSBAD - FRESH WATER (on 3-8-1991)

	Sample 1
Specific Gravity:	1.000
Total Dissolved Solids:	504
pH:	8.60
IONIC STRENGTH:	0.012

CATIONS:		me/liter	mg/liter
Calcium	(Ca^{+2})	2.08	41.6
Magnesium	(Mg^{+2})	3.42	41.6
Sodium	(Na^{+1})	2.75	63.2
Iron (total)	(Fe^{+2})	0.014	0.400
Barium	(Ba^{+2})	0.007	0.500
ANIONS:			
Bicarbonate	(HCO_3^{-1})	2.20	134
Carbonate	(CO_3^{-2})	0.800	24.0
Hydroxide	(OH^{-1})	0	0
Sulfate	(SO_4^{-2})	1.02	49.0
Chloride	(Cl^{-1})	4.23	150

SCALING INDEX (positive value indicates scale)

Temperature		Calcium Carbonate	Calcium Sulfate
86°F	30°C	0.98	-18

WELL DATA

AREA OF REVIEW: PROPOSED TAMANO (BSSC) UNIT

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Yates Energy Thornbush Federal No. 1 330' FSL and 1,980' FWL (N) Section 1, T-18-S, R-31-E	5/25/90	9,060'	7,600'	13-3/8" 8-5/8" 5-1/2"	350' 2,400' 9,058'	405/Circ 1,240/Circ 1,855/Circ	San Andres 4,636-38' Unproductive in the Bone Spring. Old perfs 8,949'-8,963' 8,908'-8,928', 7,931'-7,951'	A 3,200 gals A 4,000 gals A 4,250 gals	Producing in San Andres	Squeezed lowest perfs w/400 sx. CIBP's @ 8,800' & 7,600' w/35 sx on top.
Harvey E. Yates Mesquite "2" State No. 4 1,980' FSL and 660' FEL (I) Section 2, T-28-S, R-31-E	7/2/89	9,092'	8,668'	13-3/8" 8-5/8" 5-1/2"	356' 2,305' 9,092'	385/Circ 900/Circ 800/5,260' Calc	Bone Spring 2nd Sand 8,488'-94', 8,501'-24' 32', 56', 68', 85', 90' 8,600' & 8,351'-8,444' 1st Bone Spring Sand 7,469'-7,533'	A 3,000 gals SWF 100,000 Gals & 250,000# A 5,900 Gals SF 81,000 gals 7 51,000# (All parts)	Producing	
Harvey E. Yates Mesquite "2" State No. 3 1,980' FSL & 1,980' FEL (J) Section 2, T-18-S, R-31-E	1/7/86	9,025'	8,695'	13-3/8" 8-5/8" 5-1/2"	358' 2,275' 9,025'	350/Circ 900/Circ 1,275/2,918' Calc	Bone Spring 2nd Sand Selectively 8,492'-8,596'	A 3,000 SWF 97,500 Gals and 258,000#	Producing	
Harvey E. Yates Mesquite "2" State No. 5 660' FSL & 1,980' FWL (N) Section 2, T-18-S, R-31-E	10/2/90	9,040'	8,990'	13-3/8" 8-5/8" 5-1/2"	359' 2,300' 9,040'	385/Circ 800/Circ 1,720/801' Calc	Bone Spring 7,862'-7,920' 8,074'-8,092'	A 7,500	Producing	
							Bone Spring 8,152'-8,618' Selectively	A 3,500 SF 140,000 Gals & 350,000#		

WELL DATA

AREA OF REVIEW: PROPOSED TAMANO (BSSC) UNIT

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Harvey E. Yates Mesquite "2" State No. 1 660' FSL & 1,980' FEL (O) Section 2, T-18-S, R-31-E	3/19/85	9,065'	8,833'	13-3/8" 8-5/8" 5-1/2"	618' 2,650' 9,065'	500/Circ 1,225/Circ 1,375/2,479' Calc	Bone Spring 8,124'-8,646' Selectively	A 2,500(8,124'-8,467') SWF 70,000 gals & 150,000# A 4,000 (8,564'-8,646') SWF 100,000 gals & 209,000#	Producing	
Harvey E. Yates Mesquite "2" State No. 2 660' FSL & 660' FEL (P) Section 2, T-18-S, R-31-E	8/15/85	9,086'	9,040'	13-3/8" 8-5/8" 5-1/2"	450' 2,364' 9,086'	450/Circ 1,200/Circ 1,505/1,877' Calc	Bone Spring 2nd Sand 8,584'-8,660' Selectively	A 2,500 SF 75,000 gals & 180,000#	Producing	
Harvey E. Yates Mesquite "3" Federal No. 3 900' FSL & 990' FEL (P) Section 3, T-18-S, R-31-E	5/15/90	10,400'	8,450'	13-3/8" 8-5/8" 5-1/2"	350' 2,316' 10,400'	375/Circ 800/Circ 600/6,000' CBL	Bone Spring 2nd Sand 8,314',24',28',36' 42',47',61',65' 70',80',86',91',8,412' 22', 30'	A 5,200 SWF 120,000 gals & 171,250#		
Marathon Stetco "10" Federal No. 2 2,310' FNL & 660' FE" (H) Section 10, T-18-S, R-31-E	9/29/90	8,700'	8,617'	13-3/8" 8-5/8" 5-1/2"	756' 2,335' 8,700'	447/Circ 647/Circ 1,370/Circ	Bone Spring 2nd Carb 8,020'-8,100'	A 6,000 20% HCl & 31,800 20% Gelled Acid	Producing	

WELL DATA

AREA OF REVIEW: PROPOSED TAMANO (BSSC) UNIT

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Marathon Stetco "10" Federal No. 1 1,950' FSL & 410' FEL (I) Section 10, T-18-S, R-31-E	8/16/90	8,800'	8,495'	13-3/8" 8-5/8" 5-1/2"	755' 2,445' 8,800'	835/Circ 1,150/Circ 1,625/1,016' Calc	Bone Spring 2nd Carb 8,041'-8,170'	A 8,200 gals	Producing	
Harvey E. Yates Hudson "11" Federal No. 5 990' FNL & 760' FEL (A) Section 11, T-18-S, R-31-E	10/25/89	8,916'	8,910'	13-3/8" 8-5/8" 5-1/2"	350' 2,354' 8,910'	375/Circ 900/Circ 1,450/1,946' Calc	Bone Spring 2nd Carb 8,048'-8,109'	A 3,200 SWF 20,000 gals & 30,000#	Producing	
Harvey E. Yates Hudson Federal No. 1 660' FNL & 1,980' FEL (B) Section 11, T-18-S, R-31-E	Original P&A 3/26/70 Re-entered & Junked & abandoned 12/15/84	11,500'		13-3/8" 8-5/8"	747' 4,375'	750/Circ 300/3,673' Calc	NA	NA	P&A	See Wellbore Schematic
Harvey E. Yates Hudson "11" Federal No. 3 990' FNL & 1,980' FEL (B) Section 11, T-18-S, R-31-E	4/3/89	9,034'	8,793'	13-3/8" 8-5/8" 5-1/2"	354' 2,318' 9,034'	350/Circ 1,600/Circ 2,150'/2,310' CBL	Bone Spring 2nd Sand & 2nd Carb. 8,040'-70', 8,102'-25' 8,178'-8,224', 8,624'-55'	A 24,400 SF 334,000 gals & 217,500#	Producing	
Marathon Johnson "B" Federal A/C 1 No. 3 660' FNL & 1,980' FWL (C) Section 11, T-18-S, R-31-E	2/20/86	8,830'	8,793'	13-3/8" 8-5/8" 5-1/2"	598' 2,700' 8,828'	700/Circ 2,700/Circ 1,494/5,976' CBL	Bone Spring 2nd Sand & 2nd Carb. 8,416'-8,644' Selectively	A 5,500 SF 80,000 Gals & 174,000#	Producing	

WELL DATA

AREA OF REVIEW: PROPOSED TAMANO (BSSC) UNIT

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Marathon Johnson "B" Federal A/C 1 No. 9 2,310' FNL & 600' FWL (E) Section 11, T-18-S, R-31-E	7/11/90	8,816'	8,723'	13-3/8" 8-5/8" 5-1/2"	755' 2,430' 8,816'	635/Circ 1,100/Circ 1,720/2,974' CBL	Bone Spring 2nd Carb. 8,048'-8,130'	A 6,000	Producing	
Marathon Johnson "B" Federal A/C 1 No. 7 2,310' FNL & 2,160' FWL (F) Section 11, T-18-S, R-31-E	7/16/88	9,000'	8,925'	13-3/8" 8-5/8" 5-1/2"	796' 2,702' 9,000'	536/Circ 1,350/Circ 1,490/1,862' Calc	Bone Spring 2nd Carb 8,070'-8,160'	A 200	Producing	
Harvey E. Yates Hudson "11" Federal No. 2 1,930' FNL & 660' FEL (H) Section 11, T-18-S, R-31-E	9/5/87	8,813'	8,771'	13-3/8" 8-5/8" 5-1/2"	350' 2,356' 8,813'	350/Circ 1,000/Circ 1,985/<500' Calc	Bone Spring 2nd Carb. 7,934'-7,998'	A 26,000	Producing	
Harvey E. Yates A. J. "11" Federal No. 2 1,650' FSL & 660 FEL (I) Section 11, T-18-S, R-31-E	10/7/85	8,966'	8,260'	13-3/8" 8-5/8" 5-1/2"	360' 2,350' 8,966'	375/Circ 1,200/Circ 1,425/2,140' Calc	Bone Spring 2nd Carb. 7,995'-8,126'	A 15,000	Producing	
Marathon Johnson "B" Federal No. 5 2,260' FSL & 1,980' FEL (J) Section 11, T-18-S, R-31-E	5/29/88	8,967'	8,861'	13-3/8" 8-5/8" 5-1/2"	754' 2,706' 8,950'	635/Circ 1,350/Circ 1,750/2,200' CBL	Bone Spring 2nd Carb. 8,082'-8,140'	A 2,650	Producing	

WELL DATA

AREA OF REVIEW: PROPOSED TAMANO (BSSC) UNIT

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Marathon Johnson "B" Federal No. 4 1,980' FSL & 1,980' FWL (K) Section 11, T-18-S, R-31-E	1/14/88	9,522'	9,479'	13-3/8" 8-5/8" 5-1/2"	671' 2,728' 9,522'	700/Circ 1,450/Circ 1,450/3,560' CBL	Bone Spring 2nd Carb. 8,060'-8,150'	A 5,000	Producing	
Marathon Shugart "B" No. 2 1,800' FSL & 760' FWL (L) Section 11, T-18,S, R-31-E	4/27/90	8,670'	8,553'	13-3/8" 8-5/8" 5-1/2"	755' 2,715' 8,670'	485/Circ 775/Circ 1,745/Circ	Bone Spring 2nd Carb. 8,056'-8,178'	A 8,600	Producing	
Marathon Johnson "B" Federal No. 6 660' FSL & 1,980' FWL (N) Section 11, T-18-S, R-31-E	6/27/88	8,998'	8,919'	13-3/8" 8-5/8" 5-1/2"	760' 2,752' 8,998'	835/Circ 1,380/Circ 1,500/Circ	Bone Spring 2nd Carb. 8,078'-8,204'	A 4,000	Producing	
Marathon Johnson "B" Federal No. 8 510' FSL & 2,030 FEL (O) Section 11, T-18-S, R-31-E	10/25/88	9,000'	8,918'	13-3/8" 8-5/8" 5-1/2"	800' 2,706' 9,000'	500/Circ 1,046/Circ 1,625/1,216' Calc	Bone Spring 2nd Carb. 8,115'-8,200'	A 300	Producing	
Harvey E. Yates Taylor Deep "12" Federal No. 5 990' FNL & 660' FWL (D) Section 12, T-18-S, R-31-E	7/14/90 P&A	8,902		13-3/8" 8-5/8"	350' 2,360'	375/Circ 1,300/Circ	NA	NA	P&A	See Wellbore Schematic

WELL DATA

AREA OF REVIEW: PROPOSED TAMANO (BSSC) UNIT

OPERATOR-WELL NAME LOCATION	COMPLETION DATE	TD	PBTD	CASING SIZE	CASING DEPTH	CEMENT SACKS/TOP	PRODUCING INTERVAL	STIMULATION	CURRENT STATUS	REMARKS
Harvey E. Yates Taylor Deep "12" No. 1-Y 2,235' FSL & 2,235' FWL (K) Section 12, T-18-S, R-31-E	7/26/89	9,500'	9,460'	13-3/8" 8-5/8" 5-1/2"	350' 2,410' 9,500'	350/Circ 948/Circ 2,175/Circ	Bone Spring 3rd Sand 9,424'-9,432'	A 500	Producing	
Harvey E. Yates Taylor Deep "12" No. 2 660' FSL & 330' FWL (M) Section 12, T-18-S, R-31-E	7/25/89 P&A	8,933'		13-3/8" 8-5/8"	348' 2,345'	350/Circ 1,350/Circ	NA	NA	P&A	See Wellbore Schematic
Read & Stevens Marion Federal No. 1 600' FNL & 2,100' FEL (B) Section 14, T-18-S, R-31-E		8,842'		13-3/8" 8-5/8" 5-1/2"	402' 2,408' 8,842'	500/Circ 1,300/Circ 2,230/Circ	8,043'-8,294' Unproductive In Bone Spring	A 37,800 X-Linked Gelled Acid	TA	
Read & Stevens Jamie Federal No. 1 330 FNL & 1,920' FWL (C) Section 14, T-18-S, R-31-E		9,190'	4,500' (8,192' Orig)	13-3/8" 8-5/8" 5-1/2"	415' 2,397' 9,190'	500/Circ 1,250/Circ 1,965/<500' Calc	9,136'-9,154' 8,092'-8,178' Unproductive in Bone Spring	A 1,000 20% Acid A 5,000 20% Acid	Producing in Grayburg	Plugged back to Grayburg CIBP @ 9,100' W 10 sx CIBP @ 8,000'.

TOC EQN: TOC = CSG DEPTH - (AVE YIELD FT^3/SX) (ANNULAR HEIGHT FT/FT^3) (#SX) (SF)

AVE YIELD = 1.66 FT^3/SX (Based on volume weighted average yield of filler and neat slurries, Class "H", all production strings.

AVE YIELD = 1.19 FT^3/SX (Based on Class "C" Neat on surface and intermediate casing strings)

SF = 50% (Safety Factor)

Annular height based on Halliburton Cementing Table data, assuming OD hole equals drilled hole size.