

MUD COLUMN CHARACTERISTICS AND CONDITIONS IN THE CHENEY RANCH FIELD

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1.0 MUD COLUMN CHARACTERISTICS AND CONDITIONS IN THE CHENEY RANCH FIELD

1.1 SUMMARY

Responsive to EPA's December 3, 2019 letter Underground Injection Control (UIC) Permit Renewal Application Class 1 Non-Hazardous (NH) Permit No. R9 UIC-CA1-FY17-2R Technical Review Enclosure Item 1D, PEC has conducted further investigation of mud conditions in the nearby oil and gas wells. Well records on file at the California Geologic Energy Management Division's (CalGEM) online mapping application were obtained and reviewed for documentation of encountered mud conditions found during either well construction or plugging activities. Cheney Ranch Field is located north of PEC, near the periphery of the Area of Review. Records for every well that penetrated the Panoche Injection Interval were reviewed (23 wells). Details of well drilling and completion and plugging chronologies were generally included within the CalGEM public records. Some of the chronologies are very detailed while other records are "broad brush" summaries of general drilling activities.

Several of the detailed CalGEM chronologies present documentation of encountered mud conditions and properties in the local area. These details corroborate expectations from laboratory studies of mud properties and select well sampling of wells during reentry activities in other parts of the United States (see Appendix 4). In these cases, and as substantiated in the Cheney Ranch Field wells, the encountered static muds show the presence of stiff, thick muds in the wells. These mud have set up such that they are difficult to circulate and handle. As such, they will provide significant impairment to the emplacement of formation fluid or the advancing injectate into the wellbore and vertical displacement of the wellbore material. Therefore, these Cheney Ranch wells do not constitute a possible threat under the nonendangerment standard to human health or the environment as currently abandoned.

1.2 ENCOUNTERED MUD CONDITIONS

Well records on file at the California Geologic Energy Management Division's (CalGEM) online mapping application (<https://maps.conservation.ca.gov/doggr/wellfinder/#openModal>) were obtained for the Cheney Ranch Field. Well-specific chronologies were reviewed for documentation of encountered mud conditions either during well construction or plugging activities within the field. Information is included for three wells identified during records review. The location of the wells is presented in Figure 1 and the CalGEM records are contained in Appendices 1 through 3. The following information was found for three of the installed and abandoned wells:

- Lockhart England 1-31 (Appendix 1) – This well was spudded in December 1950 and drilled to a total depth of 10,357 feet in March 1951 with oil and gas shows observed below a depth of 10,000 feet. A production casing string (5-1/2 inch) was set to 10,038 feet and cemented with 300 sacks of cement. The oil and gas show interval from 10,038 feet and 10,169 feet (plugged back total well depth) were tested by displacing the drilling mud with fresh water and then swabbing the well. Results were inconclusive and operations on the well were suspended by setting a cement plug in the 5-1/2 inch protection casing from 9,880 to 10,169 feet and filling the well with “heavy drilling mud”. The top of the casing was also plugged with 10 feet of cement and was capped with a welded steel plate. The details are documented reported on Notice of Intention to Abandon Well - Form 108 (dated August 9, 1952). The abandonment was approved was approved by the Division of Oil and Gas on October 27, 1952.

A Supplementary Notice – Form 123 was filed on August 28, 1964, with the intent of salvaging as much of the 5-1/2-inch production casing as possible from the well. The Division of Oil and Gas approved the plan on Report of Proposed Operations – Form 111, also dated August 28, 1964. A hand-written note dated 9/21/64 on this Report of Proposed Operations, indicates that very heavy mud was encountered during a bailer run at a depth of 1,045 feet, with the bailer becoming “stuck” in the heavy mud. The bailer was worked free and recovery of casing and final well plugging operations were conducted. The Special Report on Operations Witnessed – Form 109-D (prepared by Division of Oil and Gas Inspector F. L. Hill and dated September 25, 1964) indicates that the well was cleaned out to 1,045 feet where very heavy mud was encountered. Six sacks of cement were dumped at that point and additional plugs were placed at 987 to 1,045 feet (6 sacks), 744

to 794 feet (26 sacks), 552 to 629 feet (33 sacks), and 5 to 15 feet (14 sacks), with 5-1/2-inch production casing recovered from a depth of 792 feet in the well.

Work on the well had originally been suspended on March 19, 1952, so the encountered mud during final abandonment had been in place for approximately 12 years. The gel strength of the 12 year old column of mud was such that a bailer on wireline could not be advanced deeper than a depth of 1,045 feet let alone to the shallowest cement plug depth of 9,880 feet in the casing string.

- American Hunter Souza 1 (Appendix 2) – The well was drilled to a total depth of 7,332 feet in November/ December 1983, using Benex mud (BENEX is an organic polymer designed for use as a bentonite extender and selective flocculant in freshwater drilling muds) with a final density of 11.2 pounds/gallon and a funnel viscosity of 37 seconds. Production casing (5-1/2 inch) was run to 10,213 feet and cemented 2,287 cubic feet of cement. The drilling rig was released in mid-December 1983.

A completion rig was set up at the end of March 1984, three and one-half months following completion of drilling activity. The well history attached to the Well Summary Report notes that the drilling mud had to be reversed out w/fresh water every 1,000 feet below a depth of 8,400 feet and every 6 joints below a depth of 9,000 feet with "thick drilling mud" being circulated from the well.

- Bender Silver Creek 57X-18 (Appendix 3) – The well was initially drilled to a total depth of 7,500 feet in May 2, 1973, using Lignosulfonate mud with a weight of 74 pounds per cubic foot and a funnel viscosity 51 seconds. Following evaluation of the original borehole, the operator made a request on May 3, 1973, to sidetrack the well from a depth of 4,100 feet and redrill the open hole to approximately 7,300 feet. This request was approved by the by Division of Oil and Gas on May 4, 1973 (Report on Proposed Operations (Form 111)).

The well was sidetracked with a kickoff plug set at 4,300' feet with 100 sacks of cement. After setting the cement kickoff plug, the rig ran in the well to 3,700 feet but could not break circulation at that depth (History of Oil or Gas Well – Form 103, Page 2) due to the combination of the weight of the static mud column and the additive pressure due to the gel strength of the mud (i.e., could not displace the mud from that depth with the rig pumps). This demonstrates that the mud “set” quickly as the kickoff plug had only been set the previous day. The drill pipe was moved up to the shallower depth of 3,560 feet,

where pump pressures were sufficient to break the mud column and establish circulation. The drill string was then staged in hole to the top of the kickoff plug while conditioning and increasing the mud to a higher weight.

These area-specific well records of encountered mud conditions confirm the longevity and efficacy of static mud columns within wells in and near the Area of Review for PEC. The CalGEM records document that encountered static mud columns are stiff and thick, having set up such that they are difficult to circulate and handle. These static clay-based muds provide significant resistance to inter-formational fluid flow through an abandoned well.

FIGURES

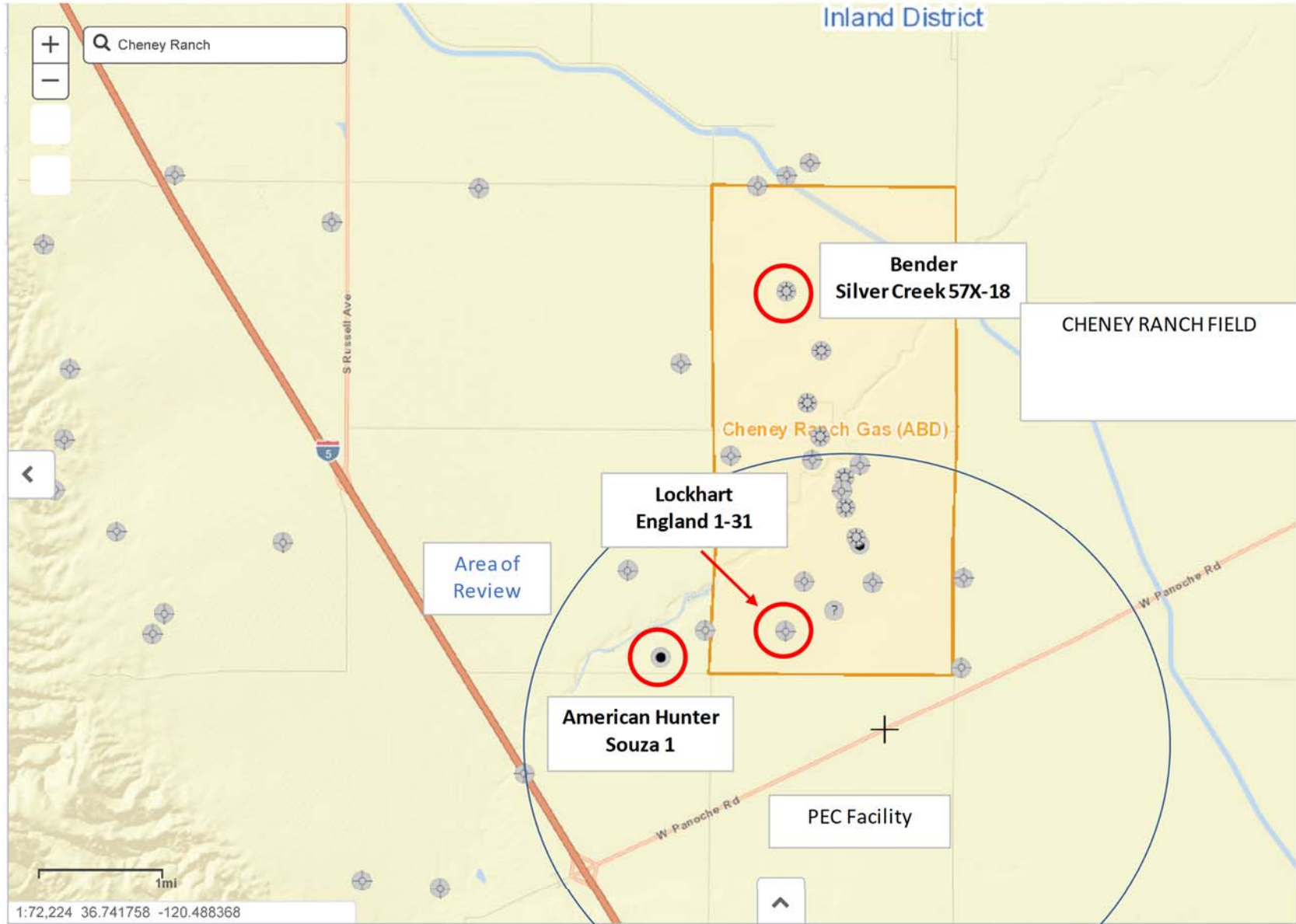


Figure 1 - Location map for Cheney Ranch Field - Wells with Documentation of Mud Characteristics

APPENDICES

APPENDIX 1

CALGEM RECORDS - LOCKHART ENGLAND 1-31

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

4

REPORT OF WELL ABANDONMENT

OPEN TO INSPECTION

Coalinga California

September 29, 1964

Mr. P D Elliston
P O Box 536
Avenal California
Agent for ELLISTON OIL WELL SERVICING CO.

OPEN TO INSPECTION

DEAR SIR:

L. M. LOCKHART

Your report of abandonment of Well No. "England" 1-31,
Sec. 31, T. 14 S., R. 13E, M D B. & M., Cheney Ranch field,
Fresno County, dated September 24, 1964, has been
examined in conjunction with records filed in this office.

A review of the reports and records shows that the requirements of this Division,
which are based on all information filed with it, have been fulfilled.

No Bond Required
FLH:fd
cc: Conservation Committee

E. R. MURRAY-AARON, Jr.
~~E. H. MUSSER~~
State Oil and Gas Supervisor

By C. J. Corwin
Deputy Supervisor

MAP & BOOK

S T A T U S

Completed Producing _____
 Recompleted Producing _____
 Completed Abandoned _____
 Uncompleted Abandoned ✓ _____
 Idle _____

R E C O R D S

Received _____ Needed ✓

Well Summary _____
✓ History _____
 Log & Core _____
 Lge Sm Elec. Log(s) Lge Sm _____
 Direct. Survey _____
 Other _____

Location _____
 Elevation _____
 Release Bond No Bond Required
 Hold Bond Reason _____
 Final letter ✓ 9/28/64
 150b _____
 170 _____
✓ 121 _____
 card _____

OK ON MAP
 9-25-64
 Z.S.

SUBMIT IN DUPLICATE
STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR L. M. LOCKHART FIELD Cheney Ranch
Well No. "England" 1-31, Sec. 31, T. 14 S., R. 13 E., M. D. B. & M.
Date September 24, 1964 Signed P. D. Ellerton
Title Contractor
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date	
1964	
Sept. 22	The 5½" casing was cleaned out to 1045', where the bailer encountered heavy mud.
Sept. 22	6 sacks of cement was dumped into the hole beginning at 1045', calculated to fill to 987'±.
	The 5½" casing was shot at 792' and pulled to 782'.
	26 sacks of cement was dumped into the hole beginning at 794', calculated to fill to 744'±.
	The 5½" casing was pulled from the hole.
Sept. 23	33 sacks of cement was dumped into the hole beginning at 629', filling to 552'.
	The 14" casing was filled with dirt from 552' to 15'.
	A total of 14 sacks of cement was mixed and dumped on the bridge at 15', filling to 5'.

DIVISION OF OIL AND GAS
RECEIVED

SEP 25 1964

COALINGA, CALIFORNIA

CALIFORNIA RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Special Report on Operations Witnessed

No. T 564-256Mr. P D Elliston
P O Box 536
Avenal, California
Agent for ELLISTON OIL WELL SERVICING CO.Coalinga Calif.
September 25 1964DEAR SIR: L. M. Lockhart
Operations at well No. "England" 1-31, Sec. 31, T. 14 S., R. 13 E., N.D. B & M.
Cheney Ranch Field, in Fresno County, were witnessed
on September 24, 1964. Mr. F. L. Hill, representative of the supervisor was present
from 9:30 a.m. to 10:30 a.m.. There were also present P. D. Elliston, ContractorPresent condition of well: 14" cem. 609'; 5 1/2" cem. 10,038', four holes 10,017' W.S.O.:
shot and recovered from 792'. T.D. 10,357'. Plugged with cement 10,236'-9880',
1045'-987', 794'-744', 629'-552', and 15'-5'.The operations were performed for the purpose of plugging the hole in the process of abandonment.

Mr. _____ reported:

Inspector Hill was present at the well from 11:00 a.m. to 2:00 p.m., on September 23, 1964, and Mr. Elliston reported:

1. The 5 1/2" casing was cleaned out to 1045' where very heavy mud was encountered.
2. On September 21, 1964, 6 sacks of cement was dumped into the hole beginning at 1045', calculated to fill to 987'.
3. The 5 1/2" casing was shot at 792', and was pulled up to 782'.
4. A wooden plug was driven to 794'.

The Inspector noted that 26 sacks of cement was dumped into the hole beginning at 794', calculated to fill to 744'.

Inspector Hill was again present at the well from 9:30 a.m. to 10:30 a.m., on September 24, 1964, and Mr. Elliston reported that on September 24, 1964, 33 sacks of cement was dumped into the hole beginning at 629', filling to 552'.

The Inspector noted:

1. The bailer was spudded on a plug at 552' and brought up a sample of set cement.
2. The 14" casing was filled with dirt from 552' to 15'.
3. A total of 14 sacks of cement was mixed and dumped on the bridge at 15', filling to 5'.

THE CEMENTING OPERATIONS ARE APPROVED.

FLH:ef

E. R. MURRAY-AARON
State Oil and Gas SupervisorBy C. J. Connor Deputy
115

STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P 561-310

Mr. P D Elliston
P O Box 536
Avenal California 93204
Agent for ELLISTON OIL WELL SERVICING CO.

Coalinga Calif.
August 28 1964

DEAR SIR:

L. M. Lockhart

Your ~~supplementary~~ proposal to ~~abandon~~ / Well No. "England" 1-31
Section 31, T. 14S., R. 13E., M.D.B. & M., Cheney Ranch Field, Fresno County,
dated ~~Aug. 28, 1964~~, received ~~Aug. 28, 1964~~, has been examined in conjunction with records filed in this office.
Present conditions as shown by the records and the proposal are as follows:

THE NOTICE STATES:

"The present condition of the well is as follows:

Total depth 10,357', plugged with cement 10,357'-9,880', and 10'-surface.

Complete casing record including plugs.

14" cem. 609'.

5 1/2" cem. 10,038', four 3/8" holes 10,017' W.S.O. "

PROPOSAL:

"We now propose

Pull 5 1/2" casing from as deep as possible.

If recovered from below 1400', place cement plug 1400'-1300'.

" " " above 1400', place 100' cement plug on the stub.

Cap 14" casing at the surface with 10' of cement."

DECISION:

THE PROPOSAL IS APPROVED.

9/21/64 Elliston/Corwin

C.O. 1045', encountered very heavy mud.

Stuck bitler, but finally worked loose.

Will dump box before shooting off 5 1/2" casing.

No Bond Required

CHC:ef

2 cc: P D Elliston

E. R. MURRAY-AARON, State Oil and Gas Supervisor

By C. H. Corwin, Deputy

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

Supplementary Notice

Coalinga Calif. August 28 1964

DIVISION OF OIL AND GAS

Coalinga Calif.

A notice to you dated August 9, 19 92, stating the intention to

abandon / L. M. Lockhart well No. "England" 1-31

(Drill, deepen, redrill, abandon)

Sec. 31, T. 14 S., R. 13 E., M. D. B & M *Cherry Park* Field,

Fresno County, should be amended because of changed conditions.

The present condition of the well is as follows:

Total depth 10,357', plugged with cement 10,357'-9,880', and 10'-surface.

Complete casing record including plugs.

- 14" cem. 609'.
- 5 1/2" cem. 10,038', four 3/8" holes 10,017' W.S.O.

We now propose

- Pull 5 1/2" casing from as deep as possible.
- If recovered from below 1400', place cement plug 1400'-1300'.
- " " " above 1400', place 100' cement plug on the stub.
- Cap 14" casing at the surface with 10' of cement.

Reference to file of data

Map	FORMS	
	114	121
	✓	

orig & 2cc to Elliston

(Address)

Elliston Oil Well Servicing Co.

(Name of Operator)

By *P. D. Elliston*

(Telephone No.)

ADDRESS ONE COPY OF NOTICE TO DIVISION OF OIL AND GAS IN DISTRICT WHERE WELL IS LOCATED

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

REPORT OF CORRECTION OR CANCELLATION

Coalinga California

May 22 1957

MR. P D Elliston
P O Box 536
Avenal California
For ELLISTON OIL WELL SERVICING CO.

Dear Sir

In accordance with your letter dated May 20, 1957,

the following change pertaining to your well No. L. M. Lockhart well No. "England" 1-31,
Sec. 31, T. 14 S., R. 13 E., M. D. B. & M., ----- field,
Fresno County, District No. 5, is being made in our records:

The corrected location is _____

The corrected elevation is _____

Report No. _____, dated _____, has been
corrected as follows: _____

^{supplementary} Your/notice to abandon dated May 6, 1953,
(Drill, abandon, etc.)
and our report No. P 553-128, issued in answer thereto, are hereby cancelled
inasmuch as the work will not be done. If you have a drilling bond on file covering this
notice it will be returned. No request for such return is necessary.

Other: _____

1952 Wildcat List

E. H. MUSSER
State Oil and Gas Supervisor

By C. H. Corwin
Deputy Supervisor

cc: Mrs J O England
Dept of Water Resources

108 ✓
111 ✓
121 ✓

ELLISTON OIL WELL SERVICING CO.

201 WEST STANISLAUS
AVENAL, CALIFORNIA

May 20, 1957

Division of Oil & Gas
California Department of Natural Resources
Coalinga, California

Gentlemen:

In answer to your letter of May 16, 1957 regarding my notice dated May 6, 1953 to pull casing from abandoned L.M. Lockhart well No. "England" 1-31, Sec. 31, T 14S., R 13 E., M.D.B. & M, Fresno County, I would like to cancel this request temporarily, as I am planning to submit a request to do some exploratory work in that well prior to pulling the casing, provided I can get a lease.

I will contact your office prior to my doing any work on the well.

Very truly yours,

Elliston Oil Well Servicing Co.

by P. D. Elliston

P. D. Elliston

RECEIVED
MAY 21 1957

COALINGA, CALIFORNIA

Coalinga California

May 16 1957

Mr P D Elliston
Elliston Oil Well Servicing Co
P O Box 536
Avenal California

Dear Sir

Please refer to your notice dated May 6, 1953, to pull casing from abandoned L. M. Lockhart well No. "England" 1-31, Sec. 31, T. 14 S., R. 13 E., M. D. B. & M., Fresno County.

In the event that this work has not been started, and you do not plan to commence the work immediately, please furnish this office with a letter requesting cancellation of the notice.

Yours truly

C. H. Corwin

C H CORWIN
Deputy Supervisor

*5/17/57 Elliston phoned. Plan to go into well soon. Estate problems.
Will send in letter requesting cancellation.*

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS

No. P 553-128

Coalinga Calif. May 15 19 53

Mr. P D Elliston

P O Box 536 Avenal Calif.

Agent for ELLISTON OIL WELL SERVICING CO.

DEAR SIR:

L. M. Lockhart

Your supplementary proposal to abandon Well No. "England" 1-31

Section 31, T. 14S., R. 13E., M. D.B. & M., Field, Fresno County,

dated May 6, 19 53, received May 14, 19 53, has been examined in conjunction with records filed in this office.

Present conditions as shown by the records and the proposal are as follows:

THE NOTICE STATES:

"The present condition of the well is as follows:

- 1. Total depth. 10,357', plugged with cement 10,357'-9,880', and 10'- surface.
- 2. Complete casing record.
 - 14" cem. 609'
 - 5 1/2" cem. 10,035', four 3/8" holes 10,017' W.S.O."

PROPOSAL:

"The proposed work is as follows:

- Pull 5 1/2" casing from as deep as possible.
- If recovered from below 1400', place cement plug 1400'-1300'.
- " " " above 1400', place 100' cement plug on the stub.
- Cap 14" casing at the surface and turn well over to landowner for use as a water well."

DECISION:

THE PROPOSAL IS APPROVED PROVIDED THAT this Division shall be notified to witness the placing and location and hardness of the cement plug.

Location: 660 feet South and 660 feet East from center of Section 31.
The landowner, Mrs. John O. England, 649-45th Avenue, San Francisco 21, California, to whom the well has been quitclaimed, has requested in writing that the well be left in condition to convert to water.

No Bond Required

GGP:ef

cc: Mrs J O England
Division of Water Resources

R. D. BUSH

State Oil and Gas Supervisor

By

[Handwritten Signature]

Deputy

work not yet done 6-29-54
still plan to do it.

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Notice of Intention to Abandon Well

This notice must be given at least five days before work is to begin; one copy only

Coalinga Calif. May 6 19 53

DIVISION OF OIL AND GAS

Coalinga Calif.

In compliance with Secs. 3228, 3229, 3230, 3231 and 3232, Ch. 93, Stat. 1939, notice is hereby given

L. M. Lockhart

that it is our intention to abandon well No. "England" 1-31

Sec. 31, T. 14 S., R. 13 E., M. D. B. & M. Field,

Fresno County, commencing work on the

of 19

The present condition of the well is as follows:

1. Total depth. 10,357', plugged with cement 10,357'-9,880', and 10'- surface.

2. Complete casing record.

14" cem. 609'.

5 1/2" cem. 10,038', four 3/8" holes 10,017' W.S.O.

3. Last produced.

Date Nept Oil Gravity Cut

The proposed work is as follows:

Pull 5 1/2" casing from as deep as possible.

If recovered from below 1400', place cement plug 1400'-1300'.

" " " above 1400', place 100' cement plug on the stub.

Cap 14" casing at the surface and turn well over to landowner for use as a water well.

w/ 10' of cement

Cancelled
5/22/53
5-22-53

Reference to file of data

Map			

DIVISION OF OIL AND GAS
RECEIVED
MAY 14 1953

COALINGA, CALIFORNIA

Elliston Oil Well Servicing Co.
(Name of Operator)

By *P. J. Elliston*

May 4, 1953.

Division of Oil and Gas -- Attention Mr. Peirce:-
Elm Street
Coalinga, California

Dear Sir:-

We are owner of (Sec $\frac{1}{4}$) of Sec 31- Township 14, South-
Range 13 East. Mr. Lockhart has quick claimed the property
back to us- "England No.#1."

We are selling the salvage- casing in the hole to Mr.
Elliston's Company, the Oil Well Servicing Co. We want the well
left in such condition so we can use it as a water well.

We appreciate Mr. Ellistons interest and thank you for
any consideration in this matter.

Yours very truly,

John O. England
Mrs. John O. England
649-45th Avenue
San Francisco, 21
California.

DIVISION OF OIL AND GAS
RECEIVED

MAY 5 1953

COALINGA, CALIFORNIA

STATE OF CALIFORNIA
 DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF OIL AND GAS

REPORT OF WELL ABANDONMENT

Coalinga, California, October 27, 1952

Mr M H Fuller Agent
 L. M. Lockhart
 Box 165
 Burrel California

Dear Sir

Your report of abandonment of Well No. "England" 1-31, Sec. 31, T. 14 S., R. 13 E., M. D. B. & M., oil field, Fresno County, dated October 11, 1952, has been examined in conjunction with records filed in this office.

A review of the reports and records shows that the requirements of this Division, which are based on all information filed with it, have been fulfilled.

Reference to file of data

Map	FORMS	
	114	121
10-27-52 GH		✓

RECEIVED DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF OIL AND GAS
 OCT 28 1952

GWH:ef
 Orig: Company, L.A.
 cc: Mr M H Fuller

R. D. BUSH
 State Oil and Gas Supervisor

By G. G. Terrell
 Deputy Supervisor

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

LOG OF OIL OR GAS WELL

Operator L. M. LOGKHART Field PANOCHAE CREEK AREA, FRESNO COUNTY

Well No. "ENGLAND" 1-31 Sec. 31, T. 14 S., R. 13 E., M. D. B. & M.

Location 660' S. AND 660' E. FROM CENTER OF SECTION 31-14/13. Elevation of ~~casual floor~~ ground above sea level 406.6 feet. K.B. 419.1'

In compliance with the provisions of Chapter 93, Statutes of 1939, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

Date October 11, 1952

Glenn M. Earl
(Engineer or Geologist)

M. H. FULLER
(Superintendent)

Signed [Signature]
Title Auditor
(President, Secretary or Agent)

Commenced drilling Nov. 27 - 1950 Completed drilling MARCH 19 - 1951 Drilling tools Rotary

Total depth 10,357 Plugged depth SURFACE GEOLOGICAL MARKERS DEPTH

Junk

Commenced producing No PRODUCTION (date) Flowing/gas lift/pumping (cross out unnecessary words)

NOTE: WELL SUSPENDED @ 4-17-51. (SEE SUPPLEMENTARY NOTICE TO D.O.G. DATED 4-10-51). Initial production

Production after 30 days

Clean Oil bbl. per day	Gravity Clean Oil	Per Cent Water including emulsion	Gas Mcf. per day	Tubing Pressure	Casing Pressure

CASING RECORD (Present Hole)

Size of Casing (A. P. I.)	Depth of Shoe	Top of Casing	Weight of Casing	New or Second Hand	Seamless or Lapweld	Grade of Casing	Size of Hole Casing landed in	Number of Sacks of Cement	Depth of Cementing if through perforations
14"	609'	SURFACE	47.5A #	NEW	SMLS.	SJ	20"	700	
5-1/2"	10,038'	"	20 # 8	"	"	N-80 8	7-5/8"	300	
			17 #			J-55			

PERFORATIONS

Size of Casing	From AT	To	Size of Perforations	Number of Rows	Distance Between Centers	Method of Perforations
5-1/2"	10,017 ft.	ft.	4-3/8" holes gun perforated for W.S.O.			Cmtd. Off.

Electrical Log Depths RECORDED FROM 10,359' - 609' (Attach Copy of Log)

DIVISION OF OIL & GAS
HISTORY OF OIL OR GAS WELL

Operator: L.M. Lockhart
Well: "England" 1-31
Date: October 11, 1952

Panoche Creek Area - Fresno County
Sec. 31 - T14S - R13E - MDB&M.
Signed: Glenn M. Earl
Title: ENGINEER

Location: 660' S. and 660' E. from center of Section 31-14/13.

NOTE: All depth measurements from Kelly Bushings.
Elevations: Ground 406.6' (Surveyed). K.B. 419.1'

Glenn M. Earl, Engr. - M. H. Fuller, Lockhart Supt.
Fowler Drilling Co., Contractor - O.D. Chase, Supt. - Waldrip Mast.

Casing & Hole Record:

14" 47.54[#] New Smls. SJ Csg. cmt'd. w/700 sax cmt. at 609' in 20" hole.
10-⁵/₈" hole 609' - 7425'. (Changed from 4-¹/₂" to 3-¹/₂" drill-pipe at 7425')
9-⁷/₈" hole 7425' - 10,033'.
7-⁵/₈" hole 10,033' - 10,357' (Total Depth)
5-¹/₂" 20[#] N-80 & 17[#] J-55 New Smls. Csg. cmt'd. w/300 sax cmt. at 10,033'.

DATE
1950

REMARKS

11-11 Surveyed Location - Andersen Surveyors, Fresno.
11-16 Grading out sump; digging cellar; building road.
11-17 Pouring concrete for cellar. Laying concrete mat for sub-base and Waldrip Mast. Lee Boyd, Contractor. 22" conductor pipe. 80 yards concrete.
11-20 Installed water line. Sump completed.
11-22 Moving Fowler Drilling Co. equipment from Burrel to location "England" 1-31.
11-23 Finished moving equipment from well "Burrel" 1-28. Rigging up.
11-24 Rigging up. Installed water pump.
11-25 Rigging up. Hauled 661' of 14" 47.54[#] surface csg. (16 joints). 14" Bradenhead.
11-26 Rigging up.

L.M. Lockhart "England" 1-31

WELL HISTORY (Cont'd.)

1950

11-27

Drilled rat-hole in sticky clay. Spudded in at 2:00 P.M., Nov. 27, 1950.

Drilled 20" hole to 255' with Smith Reamer Bit.	EASTMAN Single Shot Survey at 100' @ 1/4°.
	" " " " " 200' @ 1/4°.

11-28

Drilled 20" hole 255' to 609'. Survey at 300' @ 1° 00'

" " 400' @ 0° 50'

" " 500' @ 1° 00'

" " 600' @ 1° 30'

Started to run 14" surface csg. but pipe would not go after 2 joints run. Pulled the 2 joints of casing - balled up with mud at shoe. Ran in hole with 20" Smith Reamer, reamed hole to bottom, and conditioned mud.

11-29

Ran 15 joints of 14" 47.54 # new seamless slip-joint casing equipped with Halliburton Float Shoe. Total pipe 613'. Casing landed at 609' and cemented with 700 sack Permanente Type-C Construction Cement treated with 2 sack Flocele. Mixing time 23 minutes. Displaced cement with 585 cu. ft. drilling fluid. Displacement time 38 minutes. Recovered approximately 120 sack cement to surface. Rotated casing thruout cementing operations. Halliburton Power Equipment and bulk cement. Job completed 2:45 A.M.

Standing cmtd. Landed 14" surface csg. and installed Shaffer B.O.P. equipment. Tested Double Control Shaffer Gate w/1000 # for 5 minutes. OK.

11-30

Ran in hole with 10-5/8" bit on 4-1/2" drill-pipe and found top of cement in 14" csg. at 597'. Drilled out cmt. plug, and shoe at 609'. Tested B.O.P. with 1000 # for 15 minutes. Test OK. Changed mud.

Drilled 10-5/8" hole 609' - 1218'. Survey at 750' @ 1° 30'

" " 850' @ 1° 00'

" " 980' @ 1° 30'

" " 1090' @ 0° 45'

12-1

Drilled 10-5/8" hole 1218' - 1511'. Survey at 1280' @ 0° 10'

" " 1380' @ 0° 30'

Jumped a pin at 1511' and left a sub and two 6-3/4" drill-collars in hole. Ran Baash-Ross Socket and recovered fish on 3rd run.

Started taking Shaker Screen Samples at 1500' - every 30 feet.

L.M. Lockhart "England" 1-31WELL HISTORY (Cont'd.)1950

12-2

Drilled 10- $\frac{5}{8}$ " hole 1511' - 2084'. Survey at 1480' @ 1° 00'
 " " 1580' @ 0° 50'
 " " 1680' @ 0° 50'
 " " 1780' @ 1° 00'
 " " 1900' @ 0° 30'
 " " 2025' @ 0° 35'

Pulled out of hole at 2084' to run 12- $\frac{1}{4}$ " Hole Opener and open hole from 10- $\frac{5}{8}$ " to 12- $\frac{1}{4}$ " so that 8- $\frac{5}{8}$ " casing could be run. Security 12- $\frac{1}{4}$ " Hole Opener would not go thru nipple above B.O.P. Tried 12- $\frac{1}{4}$ " Security rock bit and it would not go thru.

Ran in with 10- $\frac{5}{8}$ " bit and drilled 2084' - 2088'.

12-3

Drilled 10- $\frac{5}{8}$ " hole 2088' - 2835'. (Taking drift shots inside drill-pipe with Eastman Single Shot Survey Instrument approximately every 100'.)

Survey at 2125' @ 0° 35'
 " " 2230' @ 0° 45'
 " " 2335' @ 0° 45'
 " " 2445' @ 0° 30'
 " " 2595' @ 0° 45'
 " " 2744' @ 0° 30'

Used four 10- $\frac{5}{8}$ " rock bits from 609' to 2775'.

NOTE: Began making Time Log at 2730': minutes per 10' of hole drilled.

12-4

Drilled 10- $\frac{5}{8}$ " hole 2835' - 3224'. Survey at 2835' @ 0° 45'
 " " 2963' @ 0° 45'
 " " 3063' @ 0° 50'
 " " 3180' @ 1° 20'

12-5

Drilled 10- $\frac{5}{8}$ " hole 3224' - 3470'. Survey at 3296' @ 1° 00'.
 " " 3400' @ 1° 15'.

Used seven 10- $\frac{5}{8}$ " rock bits from 609' to 3470'; from shoe of surface casing to approximate Top Kreyenhagen Shale.

12-6

Drilled 10- $\frac{5}{8}$ " hole 3470' - 3597'. Survey at 3500' @ 1° 05'.
 Took CORE No. 1 from 3597' - 3615'; Dunlap Conventional Core Barrel; 8- $\frac{1}{2}$ " Drag Head. Reamed out 8- $\frac{1}{2}$ " rat-hole to 10- $\frac{5}{8}$ " from 3597' to 3615'.

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- 12-7 Drilled 10- $\frac{5}{8}$ " hole 3615' - 4020'. Survey at 3620' @ 1° 00'
 " " 3734' @ 1° 00'
 " " 3836' @ 0° 50'
 " " 3940' @ 0° 55'
- Taking Shaker Screen Samples every 30 feet.
- 12-8 Drilled 10- $\frac{5}{8}$ " hole 4020' - 4350'. Survey at 4075' @ 1° 00'
 Mud weight 75 - 77 # " " 4185' @ 1° 15'
 Viscosity 43 - 45 " " 4300' @ 0° 55'
- 12-9 Drilled 10- $\frac{5}{8}$ " hole 4350' - 4630'. Survey at 4405' @ 1° 00'
 Mud weight 75 - 78 # " " 4510' @ 0° 35'
 Viscosity 43 - 48 " " 4608' @ 0° 55'
 Sand Content 2 to 3%
- 12-10 Drilled 10- $\frac{5}{8}$ " hole 4630' - 4754'. Survey at 4710' @ 0° 35'.
 Cored 8- $\frac{1}{2}$ " hole 4754' - 4774' with Duplex Conventional Bbl. @ 4-way drag head.
- Drilling with two 6- $\frac{3}{4}$ " and two 7- $\frac{3}{4}$ " drill-collars; total length 164.74'.
 Weight on bit 3 to 4 tons; 175 - 200 r.p.m.; 800-900 psi pump pressure.
 4- $\frac{1}{2}$ " full-hole drill-pipe. Hughes OSC-3 and Smith 2-conc bits.
- 12-11 Cored 8- $\frac{1}{2}$ " hole 4774' - 4787' with same tools as above.
 Opened up 8- $\frac{1}{2}$ " rat-hole 4754' - 4787' to 10- $\frac{5}{8}$ ".
 Drilled 10- $\frac{5}{8}$ " hole 4787' - 4950'. Survey at 4820' @ 1° 00'.
- 12-12 Drilled 10- $\frac{5}{8}$ " hole 4950' - 5150'. Survey at 4950' @ 1° 00'.
 Measured out of hole. Corrected " " 5073' @ 0° 50'.
Measurements 5143'. Ran in hole
 with new 10- $\frac{5}{8}$ " rock bit; found tight hole at 4970'; reamed to bottom @ 5143'.
- 12-13 Drilled 10- $\frac{3}{8}$ " hole 5143' - 5387' (244'). Survey at 5182' @ 0° 45'.
 " " 5300' @ 1° 30'.
- 12-14 Drilled 10- $\frac{5}{8}$ " hole 5387' - 5451.55'. Survey at 5413' @ 0° 30'.
- Ran Schlumberger Electrical Log and checked bottom @ 5451', and
 recorded from 5450' - 609'. Ran Schlumberger Sidewall Sampler;
 recovered 16 samples from interval 5350' - 2695'.
- Drilled 10- $\frac{5}{8}$ " hole 5451' - 5480'.

L. M. Lockhart "England" 1-31WELL HISTORY (Cont'd.)

- 1950
- 12-15 Drilled 10- $\frac{5}{8}$ " hole 5460' - 5636' (156'). Survey at 5514' @ 1° - 30'.
" " 5636' @ 0° - 40'
- 12-16 Drilled 10- $\frac{5}{8}$ " hole 5636' - 5895' (259'). Survey at 5713' @ 0° 00' (?).
" " 5844' @ 1° 00'.
- 12-17 Drilled 10- $\frac{5}{8}$ " hole 5895' - 6110' (215'). Survey at 5953' @ 0° 35'.
" " 6085' @ 0° 00'.
- 12-18 Drilled 10- $\frac{5}{8}$ " hole 6110' - 6140'. Cored 8- $\frac{1}{2}$ " hole from 6140' - 6172'.
Coring with Dunlap Wire-line core barrel, 8- $\frac{1}{2}$ " four-way drag head.
- 12-19 Cored 8- $\frac{1}{2}$ " hole 6172' - 6202'. Opened up 8- $\frac{1}{2}$ " rat-hole 6140' to 6202'
to 10- $\frac{5}{8}$ ". Drilled 10- $\frac{5}{8}$ " hole 6202' - 6263'. Survey at 6263' @ 2° 00'.
- 12-20 Drilled 10- $\frac{5}{8}$ " hole 6263' - 6410' (147'). Survey at 6380' @ 2° 10'.
Ran in hole with Hughes Two-Cone bit at 6387' in endeavor to straighten
hole after above coring.
- 12-21 Drilled 10- $\frac{5}{8}$ " hole 6410' - 6556' (146'). Survey at 6500' @ 2° 30'.
- 12-22 Drilled 10- $\frac{5}{8}$ " hole 6556' - 6647' (91'). Survey at 6598' @ 1° 30'.
Using Hughes LW3 Two-Cone bit.
- 12-23 Drilled 10- $\frac{5}{8}$ " hole 6647' - 6704' (57'). Survey at 6686' @ 1° 30'.
- Installed Model-B Automatic Well Gas Detector in flow line. (Mfg. by Petroleum
Instrument Co., 2200 W. Alabama, Houston, Texas.) Welded Detector to flow line.
- Maeco mud tests at 6686': Weight 74- $\frac{1}{2}$ "[#]; Viscosity 55; Filtrate @ 30 minutes
@ 7.2 c.c. water loss; Filter cake $\frac{7}{32}$ "; Shear -
Initial 0, Shear - 10 minute 7; Sand Content @
% x Volume 1.5. Mud has good test properties.
- 12-24 Drilled 10- $\frac{5}{8}$ " hole 6704' - 6730'. Shut down rig at 8:00 A.M. @ X-MAS.
- 12-25 Depth 6730'. Rig shut down. Watchman mixed mud and kept hole
full.

L.M. Lockhart "England" 1-31WELL HISTORY (Cont'd.)1950

12-26

Started operating rig at 8:00 A.M. Went in hole with Smith K2-P rock bit; circulated and conditioned mud; reamed tight spots; reamed 300' of tight hole at bottom with the Smith cross-section bit; circulated and conditioned mud from bottom at 6730'.

Drilled 10-5/8" hole 6730' - 6733' in 2-1/2 hours before midnight.

Adjusted Gas Detector and started it operating.

12-27

Drilled 10-5/8" hole 6733' - 6791' (58').

Replaced Emsco Tail Clutch.

12-28

Drilled 10-5/8" hole 6791' - 6938' (147'). Survey at 6800' @ 1° 05'.
" " 6920' @ 1° 00'.

12-29

Drilled 10-5/8" hole 6938' - 7070' (132'). Survey at 7030' @ 0° 55'.

Macco mud tests at 6979': Weight 75#; Filtrate @ 30 minutes @ 8.5 c.c. water loss; Filter cake 2/32"; Shear - Initial 0, Shear 10 minutes 6; Sand Content 1.7%. Sulphates in drilling water 50 g/g, Salt 20 g/g.

12-30

Drilled 10-5/8" hole 7070' - 7090'. Circulated and checked intensity reading on Gas Detector. Measured out of hole: Corrected Measurement 7091.68'.

Ran 2nd Run Schlumberger Electrical Log and could not get below 6976'. Recorded from 6975' to 5450'.

Ran in hole with Dunlop wire-line core barrel equipped with Hughes 8-1/2" rock head. Cored 8-1/2" hole 7091' - 7111'.

12-31

Cored 8-1/2" hole 7111' to 7124'. Pulled out to make Open Hole Formation Test of interval 7112' - 7124' in 8-1/2" rat-hole. Depth of well @ 7124'.

(7112'-7124') FORMATION TEST NO. 1. Ran Johnston Formation Tester on 4-1/2" full-hole drill-pipe. Tester equipped with 4-1/2" Sulliff Hydraulic Jars and Homco 4-1/2" Safety Joint. Used 2 - 8" x 2 7/8" x 30" straight wall packers. Set packers at 7103' and 7112' with 12' of 5-1/2" anchor. No water cushion used. Tester valve with 1/2" bean opened at 12:01 p.m. & remained open for 40 minutes. 1/4" bean at top. Packers held OK with only 1-1/2" loss of fluid during test. There was a medium steady blow of air after 1 minute, which continued with gas to surface in 14 minutes, which continued during the remaining 25 min. of test with no increase in blow. Recovered a fluid rise of 15', consisting of slightly gas-cut medium drilling fluid. No salt water. The 2 pressure bomb charts indicated tool operated properly, the tester valve being open during the entire test. Pulled tester and ran back with Dunlop 8-1/2" wire-line core-bbl. with new Hughes rock head.

Cored 8-1/2" hole 7124' - 7126'.

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WELL HISTORY (Cont'd.)

1951

- 1-1 Cored 8-1/2" hole 7126'-7150'. Pulled out of hole to make Open Hole Formation Test of interval 7104'-7150' in 8-1/2" rat-hole. Depth of well @ 7150'.
(7104'-7150') FORMATION TEST NO. 2. Ran Johnston Formation Tester on 4-1/2" full-hole drill-pipe. Used Sutliff Hydraulic Jars & 4-1/2" Hamco Safety Joint. Two 8" x 2-7/8" x 30" straight wall packers were set at 7095' & 7104' with 46' of 5-1/2" anchor. No water cushion used. Tester valve with 3/4" bean was opened at 4:00 p.m. Flow period @ 1 hour. Shut-in period @ 15 minutes. Packers set 1 hour & 15 min. & held OK. There was a medium, steady blow for 1 hour. Gas to surface in 22 minutes and continued for remainder of the hour. Recovered 2000 feet of fluid of which the top 180' was slightly gas-cut medium drilling fluid, and the remaining 1820' consisting of salt water. The 2 pressure bomb charts indicated the tool operated properly. The charts showed a flow pressure of 1000* at the end of the 1 hour flow period. During the 15 min. shut-in period, the pressure rose abruptly to 3100* and had fairly well leveled off at 3300* at the end. Pulled & broke down Tester Tools. Ran in hole w/8-1/2" Dunlap w/L Core Bbl. Reamed and cleaned out from 7140'-7150'.
- 1-2 Cored 8-1/2" hole 7150' - 7240'.
- 1-3 Ran in hole with 10-5/8" rock bit and opened up 8-1/2" core-hole to 10-5/8" from 7091' to 7240'.
Survey at 7240' @ 1° 00'.
Drilled 8-1/2" hole with Hughes OSC-3 rock bit 7240' - 7299'.
- 1-4 Drilled 8-1/2" hole 7299' - 7344'.
Ran 3rd Run Schlumberger Electrical Log and found bottom at 7339'. Recorded from 7338' to 6975'. Ran Schlumberger Sidewall Sampler and recovered 10 samples from interval 7303'-5488'.
Installed heavy duty Rotary Table, and put in new floor around table.
Ran in hole with Hughes 10-5/8" OSC-3 bit and opened up 8-1/2" hole from 7240' to 7262'.
- 1-5 Finished opening up 8-1/2" hole @ 7262' - 7344'. Drilled 10-5/8" hole @ 7344' - 7425'.
Survey at 7384' @ 1° 05'.
Started laying down 4-1/2" drill-pipe.
- 1-6 Finished laying down 4-1/2" drill-pipe. Made up string of 3-1/2" Reed & Hydrill drill-pipe and ran in hole with 9-7/8" Hughes OSC-3 bit.
Drilled 9-7/8" hole 7425' - 7435'. Hole reduced from 10-5/8" to 9-7/8" at 7425'.
- 1-7 Drilled 9-7/8" hole 7435' - 7500'. Pulled out. Changed drill-pipe rams from 4-1/2" to 3-1/2" on B.O.P. Picked up 8-1/2" Dunlap wire-line core bbl. and started measuring in hole.

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1-8 Finished measuring in hole. Corrected measurement @ 7499'.
 Could not break circulation to core. Pulled pipe and found inner barrel stuck in the 3-1/2" Hydrill drill-pipe. Layed down w/l core bbl.

Ran in hole with 8-1/2" Dunlop Conventional Core Barrel with rock head. Cored 8-1/2" hole @ 7499'-7519'. Core No. 33.
 Pulled pipe. Depth of well 7519'.

1-9 (7480'-7519') FORMATION TEST No. 3 (MIS-RUN)

Ran in hole with Johnston Formation Tester on 3-1/2" Reed drill-pipe to make Open Hole Formation Test of interval 7480'-7519'. The 9" packer stopped 50' off bottom at 7469'. Pulled J.F.T. Ran in 9-7/8" bit and reamed tight hole 7450'-7499'. Opened up 8-1/2" core-hole 7499'-7519' to 9-7/8". Circulated hole clean and conditioned mud. Pulled pipe and made up J.F.T. to test interval 7480'-7519'. Depth of well 7519'.

1-10

FORMATION TEST No. 3-A (7480'-7519')

Ran Johnston Formation Tester on Reed 3-1/2" I. F. drill-pipe. Sutliff Hydraulic Jars & Homco Safety Joint. Two 9" x 2-7/8" x 30" straight wall packers. Set packer at 7480' w/39' of 5-1/2" drill-collar anchor to 7519'. No water cushion used. Tester valve with 3/4" bean was opened at 2:15 AM. Packers set 2 hours, 30 minutes. Flow period 2 hrs., 15 min. Shut-in period 15 min. There was a light blow of air to surface in 1 minute, which continued in a light steady blow from 2:16 AM to 2:45 AM. At 2:45 AM, gas to surface in a light blow; gas burned with a 2-foot flame; continuous light blow of gas with weak heads from 2:45 AM to 3:45 AM. At 3:45 AM, fluid to surface, consisting of medium drilling-mud fluid flowing in regular heads. Well flowed fluid in regular heads at estimated 125 1/4 rate from 3:45 AM to 4:30 AM. At 4:30 AM, fluid had thinned down to watery drilling fluid and muddy water, and was beginning to taste salty (estimated @ 400 g/g). Made shut-in pressure test from 4:30 AM to 4:45 AM.

Pulled tester. The 2 pressure bomb charts indicated tool operated properly.

Ran in hole w/Hughes OSC bit, reamed to bottom, and drilled 9-7/8" hole @ 7519'-7586'.

1-11 Drilled 9-7/8" hole @ 7586'-7685' (99').

1-12 Drilled 9-7/8" hole @ 7685'-7775' (90').

1-13 Drilled 9-7/8" hole @ 7775'-7843' (68'). Survey at 7813' @ 1°00'.

1-14 Drilled 9-7/8" hole @ 7843'-7896' (53'). Survey at 7896' @ 1°00'.

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- 1-15 Drilled 9-7/8" hole 7896' - 7899' (3').
Rotary table broke down; bearing race retainer broken. Pulled out of hole at 7:30 A.M. Dismantled and repaired rotary table. Started in hole at 10:00 P.M. with Smith 2-Cone bit.
- 1-16 Drilled 9-7/8" hole 7899' - 7955' (56'). Smith 2-cone bit drilled from 7896' - 7930' (34') and was pulled dull. Ran in at 7930' with Reed LT Type rock bit.
- 1-17 Drilled 9-7/8" hole 7955' - 8107' (152'). Survey at 8107' @ 1° 00'.
- 1-18 Drilled 9-7/8" hole 8107' - 8274' (167').
- 1-19 Drilled 9-7/8" hole 8274' - 8377' (103'). Survey at 8277' @ 0° 35'.

Macco mud analysis by Clem Thompson:

Depth: 8280' (Reaming to bottom at time of test).

Weight: 80-1/2 lbs/cu.ft.

Viscosity: 1500/cp. @ 130 (Mud had not been conditioned).

Filtrate: 30 min. @ 10.5 c.c. water loss.

Filter cake 3/32"

Shear: Initial 0

" : 10 min. 6.5

Sand Content: 4.5%

Salt: 150 gr./gal.

NOTE: Sand content is up. Salt content is up from 20 gr./gallon @ Jan. 5, 1951 to 150 gr./gal. today.

- 1-20 Drilled 9-7/8" hole 8377' - 8442' (65'). Measured out of hole @ 8406'; used corrected measurement @ 8411'. Re-lined brakes.
- 1-21 Drilled 9-7/8" hole 8442' - 8513'. Made Run No. 4 @ Schlumberger Electrical Log to 8503', & recorded 8502' - 7338'. No side wall samples taken.
Drilled 9-7/8" hole 8513' - 8518'.
- 1-22 Drilled 9-7/8" hole 8518' - 8593'. Made trip & changed bits.
- 1-23 Drilled 9-7/8" hole 8593' - 8637'. Survey at 8637' @ 1° 00'.
- 1-24 Drilled 9-7/8" hole 8637' - 8704'.
- 1-25 Drilled 9-7/8" hole 8704' - 8760'.

L. M. Lockhart "England" 1-31WELL HISTORY (Cont'd.)1951

- 1-26 Drilled 9-7/8" hole 8760' - 8795'. Survey at 8781' @ 1°30'.
- 1-27 Drilled 9-7/8" hole 8795' - 8833'.
- 1-28 Drilled 9-7/8" hole 8833' - 8857'.
- 1-29 Drilled 9-7/8" hole 8857' - 8909'.
- 1-30 Drilled 9-7/8" hole 8909' - 8954'. Survey at 8921' @ 1°45'
- 1-31 Drilled 9-7/8" hole 8954' - 8985'. Took wire-line cores in interval 8985' - 8995'.
- 2-1 Cored 7-9/8" hole 8995' - 9007'. Reamed core-hole (8985' - 9007') to 9-7/8" & drilled 9-7/8" hole 9007' - 9022'.
- 2-2 Drilled 9-7/8" hole 9022' - 9068'.
- 2-3 Drilled 9-7/8" hole 9068' - 9125'.
- 2-4 Drilled 9-7/8" hole 9125' - 9165'. Survey at 9165' @ 1°45'.
- 2-5 Drilled 9-7/8" hole 9165' - 9209'.
- 2-6 Drilled 9-7/8" hole 9209' - 9261'.
- 2-7 Drilled 9-7/8" hole 9261' - 9305'. Survey at 9305' @ 1°00'.
- 2-8 Drilled 9-7/8" hole 9305' - 9351'.
- 2-9 Drilled 9-7/8" hole 9351' - 9413'. Flow-line mud temperature @ 138°.
- 2-10 Drilled 9-7/8" hole 9413' - 9474'. Eastman D.P.S.S. Survey @ 9426' @ 0°30'.
- 2-11 Drilled 9-7/8" hole 9474' - 9511'. Measured out of hole: Corrected Measurement 9504'. Ran Run No. 5 @ Schlumberger Electrical Log & found bottom at 9504'. Recorded from 9503' up to 8502'.
- 2-12 Drilled 9-7/8" hole 9504' - 9558'.
- 2-13 Drilled 9-7/8" hole 9558' - 9590'. Survey at 9570' @ 1°00'.
- 2-14 Drilled 9-7/8" hole 9590' - 9635'.
- 2-15 Drilled 9-7/8" hole 9635' - 9674'.
- 2-16 Drilled 9-7/8" hole 9674' - 9707'.
- 2-17 Drilled 9-7/8" hole 9707' - 9738'. Survey at 9711 @ 1°00'.
- 2-18 Drilled 9-7/8" hole 9738' - 9784'.

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- 2-19 Cored 7- $\frac{5}{8}$ " hole 9784' - 9807'. Dunlap wire-line; Hunt Bbl; 7- $\frac{5}{8}$ " Hughes rock head.
- 2-20 " " " 9807' - 9827'. " " " " " " " "
- 2-21 " " " 9827' - 9836'. " " " " " " " "
- Ran in hole w/Hughes 7- $\frac{5}{8}$ " rock bit & drilled @ 9836' - 9849'.
- 2-22 Drilled 7- $\frac{5}{8}$ " hole 9849' - 9903'.
- 2-23 Cored 7- $\frac{5}{8}$ " hole 9903' - 9938'. Dunlap w/L; Hunt Bbl.; Hughes rock head.
- 2-24 " " " 9938' - 10,002'. " " " " " " " "
- 2-25 " " " 10,002' - 10,011' as above. Pulled out of hole to run Schlumberger and found 7- $\frac{5}{8}$ " rock core head badly worn and all 4 cutters missing.
- Ran Ran No. 6 Schlumberger Electrical Log & found bottom @ 10,008'.
Recorded 10,007' - 9503'. Ran M^c Cullough Magnetic Fishing Tool to recover rollers from core head. Stuck tool coming out of hole at 6594'. Pulled wire-line loose and came out of hole; leaving body of Magnet, approximately 3' in length, in hole.
- 2-26 Installed new drilling line and measured in hole w/M^c Cullough overshot. Tool would not go below 3000'; hole too tight. Pulled out & ran Security 9- $\frac{7}{8}$ " Hole Opener to 6592' where top of fish located. Tried to knock magnet loose, where apparently key-seated where hole has greatest deviation of 2- $\frac{1}{2}$ ". Hole rough. Pulled pipe. Made up Baker Expansion Scraper with 12- $\frac{1}{2}$ " blades.
- 2-27 Ran in hole w/scraper and was unable to open same. Pulled out and made up new scraper. Ran in and scraped above fish and below fish to 6599'. Pulled out & made up Security Hole Opener. Ran hole opener to 6600', cleaned out bridge 6600' to 6620', and reamed 9- $\frac{7}{8}$ " hole to 7704'.
- 2-28 Reamed 9- $\frac{7}{8}$ " hole 7704' - 9784'. Opened up 7- $\frac{5}{8}$ " rat-hole 9784' - 9835' to 9- $\frac{7}{8}$ " w/Security Hole Opener. Fish apparently dropped to bottom.
- 3-1 Opened 7- $\frac{5}{8}$ " hole to 9- $\frac{7}{8}$ " from 9835' to 9857'. Pulled out and ran back with 9- $\frac{7}{8}$ " Hughes OSC-2 bit.
- 3-2 Opened 7- $\frac{5}{8}$ " hole to 9- $\frac{7}{8}$ " from 9857' to 9995'. 9- $\frac{7}{8}$ " X 7- $\frac{5}{8}$ " shoulder at 9995'.
- 3-3 Pulled out of hole and ran back with M^c Cullough Socket. Fishing for M^c Cullough Magnet at 10,006'. Pulled out of hole. Recovered Magnet. Broke down M^c Cullough Tools. Made up ^{7- $\frac{1}{8}$ "}Globe Basket and ran in hole to fish for cutters from Core Bbl. head.
- 3-4 Reamed down to 10,007' with Basket & tried to pick up cones. Pulled out. No recovery. Ran in w/Hughes 7- $\frac{5}{8}$ " bit & reamed tight hole 10,000' - 10,007'. Conditioned mud & pulled out. Made up 7- $\frac{1}{4}$ " Globe Junk Basket & ran in hole. Drilled 10,007' - 10,008 w/Basket. Pulled out. No recovery cones or core.

WELL HISTORY (Cont'd.)1951

- 3-5 Serviced Basket & ran back in hole. Drilled 10,008' - 10,009.50' with Basket. Recovered 2-1/2 cones. Ran in w/ Hughes OSC 7-5/8" bit and hit junk at 10,010'.
Found 2 pieces of junk above bit cones.
- 3-6 Drilled & worked junk w/ 7-5/8" bit 10,010' - 10,013' and pulled out. Ran in hole w/ 7-1/4" Globe Junk Basket, and cored 10,013' - 10,015' with Basket. Pulled Basket & recovered 1.5' hard gray sandstone. (See Core No. 69-A). Made up 7-5/8" Dunlop Wire-Line Core Bbl. and ran in hole. Conditioned mud.
- 3-7 Cored 7-5/8" hole 10,015' - 10,025'. Cored on junk first 5' (10,015' - 10,020'). Pulled core-bbl & ran 7-5/8" Hughes OSC bit. Drilled 7-5/8" hole 10,025' - 10,036'.
- 3-8 Drilled 7-5/8" hole 10,036' - 10,085'.
- 3-9 Drilled 7-5/8" hole 10,085' - 10,125'. Ran Dunlop 7-5/8" Core Barrel and cored from 10,125' - 10,145'. (Wire-line, rock head).
- 3-10 Cored 7-5/8" hole 10,145' - 10,165'. Made trip.
- 3-11 Cored 7-5/8" hole 10,165' - 10,202'. Circulated & conditioned hole for Electrical Log. Ran Schlumberger & checked Drillers' bottom @ 10,202'. Recorded from 10,201' up to 10,007' @ Schlumberger Run No. 7. Ran Schlumberger Microlog and recorded from 10,200' up to 9730'. Device did not register properly. Results N.G. Did not re-run Microlog.
- 3-12 Ran to bottom w/ 7-5/8" bit. Struck bridge at 10,147' and cleaned out to bottom @ 10,202'. Circulated & conditioned mud. Pulled out. Ran Homco Sidewall Sampler and took sidewall samples in interval 10,119' - 10,088'.
- 3-13 Took Homco side-wall samples in intervals 10,082' - 10,045' & 10,177' - 10,124'.
Ran in hole w/ 7-5/8" Dunlop Core Bbl. Circulated and cleaned out 10,164' - 10,202' (bottom). Circulated, added new mud, and conditioned hole for formation test. Pulled pipe. Depth of well @ 10,202'. To make open hole formation test in 7-5/8" rat-hole of interval @ 10,142' - 10,202'.

3-14

FORMATION TEST No. 4 (10,142' - 10,202')

Ran Johnston Formation Tester on Reed 3-1/2" I.F. drill-pipe. 4-1/2" Sutliff Hydraulic Jars & 4-1/2" Homco Safety Joint. Two 7" x 2-7/8" x 30" straight wall packers set at 10,133' & 10,142' with 60' of 4-1/4" drill collar anchor to 10,202'. Used 1200' of fresh water cushion. Tester valve with 1/2" bean was opened at 11:14 AM and remained open 1 hour. There was an immediate weak steady blow decreasing to dead in 9 minutes @ 11:23 AM. Dead for 5 minutes. At 11:28 AM, a weak steady blow of air again, increasing to a fair steady blow at 11:35 AM. From 11:35 AM to 12:14 PM, a fair blow with long heads. No gas to surface. Recovered 240 net rise of medium, gassy drilling fluid; no free water. The 2 pressure bomb aberts indicated tool operated properly.

L. M. Lockhart "England" 1-31WELL HISTORY (Cont'd.)

1951

- 3-15 Ran in w/ Dunlap 7-5/8" wire-line core-bbl. and cored interval 10,202'-10,253'.
- 3-16 Cored 7-5/8" hole @ 10,253' - 10,297'. Conditioned mud & hole for formation test of interval 10,202' - 10,297'. Pulled pipe.

3-17

FORMATION TEST No. 5 (10,202' - 10,297')

Ran Johnston Formation Tester on 3-1/2" full-hole D.P. 4-1/2" Suttiff Hydraulic jars & 4-1/2" Hamco Safety Joint. 1300' of fresh-water cushion. Set two 7" x 2-7/8" x 30" straight wall packers at 10,193' & 10,202' with 95' of anchor to bottom @ 10,297'. Tester valve with 1/2" bean on bottom was opened at 7:42 AM. There was a medium, steady blow for 5 minutes; then fluid began dropping in annulus as packer started to leak. Attempted to re-set packer during which time (7:47 AM to 7:50 AM) fluid went away at an increased rate; may have opened equalizing valve in this operation. At 7:50 AM closed shut-in valve to take B.H. closed-in pressure. Let stand 5 minutes. At 7:55 AM opened equalizing valve; and then pulled packers loose, requiring a 160 ton pull. Charts indicated a 5 minute flow period with a pressure rise to 950^{psi} during that interval. (700^{psi} p. @ water cushion indicated on charts.) Packers may have been set in fractured rock and fluid leaked around packers thru fractures.

Recovered a net rise of 660' of very gas-cut fluffy oily mud. Gas bubbled and fumed at top of fluid and blew mud fluid out of drill-pipe, cleaning out 1-1/2 to 2 stands at a time. No free or salt water in net rise in drill-pipe or in tool.

Ran in hole with 7-5/8" Dunlap wireline core-bbl. Conditioned mud.

- 3-18 Cored 7-5/8" hole @ 10,297' - 10,342'.
- 3-19 Cored 7-5/8" hole @ 10,342' - 10,357'. TOTAL DEPTH OF WELL @ 10,357'. Conditioned mud and hole. Pulled out. Tested B.O.P. - OK. To make open-hole formation test of interval 10,297' - 10,357' in 7-5/8" rat-hole.

FORMATION TEST No. 6 (10,297' - 10,357')

Ran Johnston Formation Tester on 3-1/2" F.H. drill-pipe, equipped as above. 1500' fresh-water cushion. Set double straight hole packer at 10,297' & 10,288' with 60' of 4-1/4" drill-collar anchor to bottom at 10,357'. Tester valve with 1/2" bean was opened at 6:05 PM & remained open 1 hour. There was a medium steady blow for 13 minutes, then dead for 5 min., then a light steady blow for remainder of test. Closed valve at 7:05 PM and took SHUT-IN pressure for 10 minutes. Packers set 1 hour, 10 min. Recovered 4-1/2 stands (405') net rise of gas-cut drilling fluid. Medium salty taste; tested 750 grains per gallon. Pressure bomb charts indicated tool operated properly and did not plug.

L. M. Lockhart "England" 1-31WELL HISTORY (Cont'd.)1951

3-20 Ran to bottom w/7- $\frac{5}{8}$ " bit. Circulated and conditioned mud for Electrical Log. Salinity of mud @ 50 grains per gallon.

Made Schlumberger Electrical Log Run No. 8. Recorded from 10,359' to 9,960' (See Field Print).

TOTAL DEPTH OF WELL @ Schlumberger 10,360'.
" " " " @ Driller 10,357'.

Started back in hole w/open-end drill-pipe to place cement plug in bottom.

3-21 Ran open-end drill-pipe to 10,297'. Circulated & conditioned mud for plug job. With open-end drill-pipe hanging at 10,286' - mixed and pumped in 50 sack Permanente Hi-Temp. Cement, using 50 cu. ft. water ahead and 10 cu. ft. water behind. Displaced cement with 420 cu. ft. of drilling fluid. Halliburton Power Equipment. Job completed at 10:00 AM. Pulled out of hole. Ran in hole w/drill-collar and Hughes 7- $\frac{5}{8}$ " OSC rock bit. After 12 hours felt for plug with bit at 10:00 PM. Found cement stringers at 10,123'; took 2 to 3 tons weight. Found set cement at 10,135'; took 6 tons weight.

3-22 FORMATION TEST No. 7 (10,034'-10,135') MIS-RUN

Circulated & conditioned mud from 10' above plug for open-hole formation test in 7- $\frac{5}{8}$ " rat-hole from 10,034' to top of cement plug at 10,135'.

Ran Johnston Tester on 3- $\frac{1}{2}$ " F.H. drill-pipe. 1200' fresh-water cushion. Used double straight hole packer with bottom of packer at 10,034'. 101' of anchor to 10,135'. Tried to set packer at 10,034'. Dropped bar to open valve and cement plug gave way when valve opened. Packer slid down hole & would not hold. Pulled tester.

3-23 Ran in hole w/drill-pipe & 7- $\frac{5}{8}$ " bit & cleaned out cement from 10,129' to 10,203'. Circulated and conditioned mud & hole for another plug job. Pulled pipe.

With open-end drill-pipe hanging at 10,203', pumped in and displaced 25 sack modified cement with Halliburton Power Equipment. Cement in place 3:00 P.M. Standing cemented.

3-24 Ran in hole with two 5- $\frac{3}{4}$ " drill-collars & 7- $\frac{5}{8}$ " Hughes OSC rock bit. At 3:00 AM felt for plug. Found cement at 10,140' which pumped away. Cleaned out to 10,150'. At 7:00 P.M. set weight on cement plug at 10,150'. Held 25,000#.

WELL History (Cont'd.)1951

3-28 In hole w/9-7/8" bit. Reamed tight hole 7450' - 7709'.
Reamed 9-7/8" hole to 8372'.

3-29 Reamed tight 9-7/8" hole 8372' - 8491'. Opened up 7-5/8" hole
from 9995' to 10,033'. Circulated & conditioned mud to
run 5-1/2" casing.

" Ran 231 Joints 5-1/2" Casing as follows:

1966' of 20* N-80 8TR on Bottom.
8076' of 17* J-55 8TR including 1 Jt. 20* N-80 on top.
10,042' = Total Pipe on Hook with shoe at 10,038'.
Float Collar at 9993'

3-30 Cemented with 300 sax Permanente Modified Cement.
Mixing Time 16 minutes. Used 2 Top Rubber plugs.
Displaced with 1293 cubic feet drilling fluid. Displaced
93 cubic feet over normal computed displacement.
Displacement time 39 minutes. Final Pressure 500*.
Job completed 1:45 AM, 3-30-51. Halliburton Power Equip-
ment and Bulk Cement. Casing Centralizing Guides were
set at 10,029.50', 10,008.80', and 9992.00'.

3-31 Standing Cmt'd. Landed 5-1/2" csg. Installed B.O.P.

4-1 Laying down 3-1/2" drill-pipe. Making up 2-3/8" tubing.

4-2 Ran in hole with 4-1/2" Hughes Tricone Bit on 2-3/8" fbg. Broke circ.
at 3900', 6400', & 7400'. Found rubber plugs at 9992'. Drilled
out plugs and F.G. to 9994'. Drilled out cement to 10,030'.
Tested casing & B.O.P. with 800# for 15 minutes. OK.

4-3 Shot 4-3/8" holes at 10,017' in 5-1/2" csg. w/McCullough 3-1/2" Mech.
Gun perforator. for W.S.O. Test.

W.S.O. TEST: Ran Johnston Formation Tester on 2-3/8" tubing with
1395' of fresh-water cushion. Packer was set at 9947' w/tailpiece
to 9964'. Tester valve with 1/2" bean was opened at 7:29 AM and
remained open 1 hour. There was a light steady blow for 16 minutes,
and then light heads for the remainder of test. Recovered a
net rise of 3099' of gassy drilling fluid. Fluid was very gassy
and would occasionally unload, blowing 60 to 70 feet into the
air. The pressure bomb charts indicated the tester valve was
open during the entire test. Water shut-off test was witnessed
and approved by Mr. G.W. Hunter of the Division of Oil & Gas,
Cooling.

WELL HISTORY (Cont'd.)1951

- 4-3 (Cont'd.) Ran in hole w/ 1-1/2" Hughes Tricone rock bit on 2-3/8" tbg. Found top cmt. at 10,029'. Drilled out cmt. to shoe found at 10,038'. 2' of cmt. below shoe. Cleaned out to top of cement plug (new bottom) which was located at 10,169'. Circulated & conditioned mud.
- 4-4 Circ. & conditioned mud midnight to 8:00 A.M. Ran 2-3/8" tbg. & landed shoe at 10,020'. Removed B.O.P. and installed X-mas tree. Changed mud to fresh water. Circulated well with fresh water.
- 4-5 Swabbed well beginning at 10:00 A.M. At 5:00 P.M. swabbing from 5960'; fluid level 4760'; no fluid rise. Removed X-mas tree; flanged up B.O.P.; checked open hole to bottom w/ tubing - OK. Removed B.O.P. and installed X-mas tree. Swabbing.
- 4-6 Swabbed from midnight to 9:30 A.M. when fluid level 4474' & swabbing from 5474'. Removed X-mas tree & flanged up B.O.P. Changed water to mud. Hung open-end tbg. at 10,167'. Mixed and pumped in 50 sack modified cement. Displaced with 214 cu. ft. drilling fluid. Top of plug approx. 9880'. Job completed 7:30 P.M. by Halliburton Cementers.
- 4-7 Left 5-1/2" casing in place as cemented with Braden-head level with top of cellar. Hole filled w/ heavy drilling fluid from 9880' to surface.
- 4-12-51 Bolted steel plate over top of casing at surface. Suspended well in above condition.
- 2-21-52 Plugged top 10' of casing with cement. Welded steel plate over top of casing.
- 10-11-52 Well is abandoned.

L. M. Lockhart "England" 1-31
WELL HISTORY (Cont'd.)

1951

3-25

FORMATION TEST No. 8 (10,049' - 10,150') MIS-RUN

Ran Johnston Formation Tester on 3-1/2" I.H. drill-pipe to make open hole test in 7-5/8" rat-hole. 1200' fresh-water cushion. 2 side-wall packers at 10,040' & 10,049' with 101' of D.C. anchor to top of cmt. plug at 10,150'. Packers failed to hold.

"

FORMATION TEST No. 9 (10,041' - 10,150') MIS-RUN

Ran J.F.T. as above. 1200' fresh water cushion. 2 side-wall packers at 10,032' & 10,041' with 109' of D.C. anchor to top of cement plug at 10,150'. Plug slid down to 10,166'; then packers failed to hold.

3-26

Ran in hole w/7-5/8" bit to 10,166'. Conditioned mud & hole:—
Mud Weight 85-88#. Viscosity 60-75 seconds.
Sand Content 2%. Water Loss 8 c.c. Cake Thickness 2/32.

"

FORMATION TEST No. 10 (10,013' - 10,166') MIS-RUN

Ran J.F.T. on 3-1/2" D.P. 1200' fresh-water cushion. 2 side-wall packers at 10,004' & 10,013' with 153' of D.C. anchor to top of cmt. plug at 10,166'. Packers failed to hold. Pulled tester.

3-27

Ran in hole w/7-5/8" bit & conditioned mud to 85# & 50 Vis. Measured in and found top of cement plug at 10,163' Corr. Meas.

"

FORMATION TEST No. 11 (10,002' - 10,163') MIS-RUN

Ran J.F.T. on 3-1/2" D.P. 1/2" bean. 1200' fresh water cushion. 2 side-wall packers at 9993' & 10,002' with 161' of D.C. anchor to top of cement plug at 10,163' (Corrected Measurement). Fluid dropped in annulus. Packers would not hold.

L.M. LOCKHART

"England" #1-31

Section 31-14S/13E (MDM)
Panoche Creek-Cheney Ranch Area

Location: 660' S. and 660' E. of center of Section

Elevation: 419 (K.B.)

CORE DESCRIPTION

Core #1
3597-3615
19'

Rec. 19'

Siltstone, medium brown, hard, weathers to crumbly, medium gray poker-chip shale, rough hackly fracture, massive, rare light brown inclusions, indicating $+6^\circ$ dips, common forams, Dentalina, et al, scattered fish scales, rare echinoid spines, no petroleum shows.

Core #2
3615-4774

Missing.

Core #3
4774-4787
6"

Rec. 2'

Sandstone, medium gray, fine grained, massive, very hard, cemented, very common micas, tight, no petroleum shows.

1'6"

Silt, light-medium gray, very coarse, massive, very soft, friable, micro-micaceous, scattered larger crenulated biotite, very poor porosity and permeability, no petroleum shows.

4787-6140

Core gap - drilled.

Core #4
6140-6150
2'

Rec. 5'

Sand, very light grey, fine grained, very silty, kaolinitic, massive, firm-friable, fairly poor porosity and permeability, no petroleum shows.

3'

Shale, medium to dark brownish grey, soft, very brittle and easily fragmented into wafer thin fragments, very silty, rare pyrite, forams.

Core #5
6150-6160
6"
9'6"

Rec. 10'

Sand, as in last core but mixed with drilling mud.

Shale, as in base last core, rare well preserved plant remains, local numerous large forams, Siphogenerinoides, scattered small forams, one possible ostracod valve.

Core #6
6160-6170
10'

Rec. 10'

Shale, same, with rare 3"-4" Sand (same) streak with rare 57° dipping calcite veins. Sand is friable, very light to light grey with brownish cast, no petroleum shows, poor porosity and permeability.

Core #7
6170-6180
10'

Rec. 10'

Shale, same.

Core #8
6180-6190
9'

Rec. 9'

Shale, same.

Core #9
6190-6200
10'

Rec. 10'
Shale, similar to above, medium-dark brown to brownish grey, platy to locally wafer parting, floods of large forams (?), local common *Dentalina* to nearly 1/2" long, scattered large fish scales and remains, rare sandy streaks showing 4' dips.

Core #10
6200-6202
1'

Rec. 1'
Shale, same.

6202-7091

Drilled interval, core gap.

Core #11
7091-7096

Rec. Frags.
Fragments Sand, light grey, scattered medium, friable, very silty, scattered biotite, poor porosity and permeability, no petroleum shows.

Core #12
7096-7106
9'

Rec. 9'
Sand, medium to light grey, firmly friable to hard, fine grained, fair sorting, local scattered medium and rare coarse grains, silty, massive, fairly poor sorting, sub-angular grains, quartzose, scattered crenulated biotite, rare pyrite, fairly low porosity and permeability, no petroleum shows.

Core #13
7106-7116
9'

Rec. 9'
Sand, medium grey, fine with scattered medium grained, very silty, difficultly friable to firm-friable, massive with local interbeds of siltstone, dark grey, biscuit parting, to 5° poor dips, common forams, hard, poor porosity and permeability, no odor, stain or cut.

Core #14
7116-7124
8'

Rec. 8'
Sand, as above.

Core #15
7124-7129
5'

Rec. 5'
Sand, same.

Core #16
7129-7134
5'

Rec. 5'
Sand, same, becoming friable, kaolinitic, very poor porosity and permeability.

Core #17
7134-7139
6'

Rec. 6'
Sand, same.

Core #18
7139-7144
6'

Rec. 6'
Sand, same, friable to hard, local very carbonaceous streaks with fairly good 10° dips, no shows.

Core #19
7144-7150
6'

Rec. 6'
Sand, same, with local interbeds to 1' of siltstone, as above, fair 5° dips, no shows.

- Core #20
7150-7155 Missing.
- Core #21
7155-7160 Rec. 5'
5' Sand, same, no siltstone, no shows.
- Core #22
7160-7165 Rec. 3'
3' Ditto.
- Core #23
7165-7170 Rec. 3'
3' Ditto.
- Core #24
7170-7175 Rec. 5'
5' Ditto.
- Core #25
7175-7180 Rec. 2½'
2½' Ditto, becoming slightly coarser grained and cleaner, fairly poor porosity and permeability.
- Core #26
7180-7185 Rec. 5'
5' Sand, same as cores above - Core #26 (7180-7185)
- Core #27
7185-7195 Rec. 10'
10' Sand, same, with rare interbeds of very hard carbonaceous siltstone, dirty dark brown to black, fracture surfaces show 80% of surface - carbonaceous fragments to 3/8" rounded and to 1/8" elongate fragments with matrix of sandy silt, cemented, massive, scattered to locally abundant micro-micaceous, Sand - very low porosity and permeability, no shows.
- Core #28
7195-7205 Rec. 10'
10' Sand, as in above cores, rare streaks of siltstone, dark grey, massive, dipping 6-8°; becoming very kaolinitic and altered biotite, very poor porosity and permeability, no shows.
- Core #29
7205-7215 Rec. 7'
7' Sand, same, local biscuit parting.
- Core #30
7215-7220 Rec. 6'
1½' Sandstone Shell.
4½' Sand, same.
- Core #31
7220-30 Rec. 11'
11' Sand, same with local interbeds and laminations of siltstone, dark gray, micro-micaceous, dips very wavy, nearly flat, no shows.
- Core #32
7230-7240 Sand and Silt interbeds, same, Siltstone locally shows common fish scales and arenaceous forams.

7240-7499 Core gap - drilled.

Core #33
7499-7519
6'

Rec. 6'

Sand, light grey, medium and fine grained, difficultly friable to local hard, massive, broken, silty, fairly poor sorting, sub-angular grains, scattered biotite and green grains, rare small clot dark brown petroleum residue, fairly tight, no odor, stain or cut.

Cores #34 & #35 - Missing.

Core #36
8995-8997

Rec. Frags.

Fragments Sand, light grey, very fine, very firm, silty, well sorted, fairly tight and siltstone, medium grey.

Core #37
8997-9002
1'
2'

Rec. 3'

Sand, as last core.

Siltstone, as last core, medium grey, hard, fragmented, rare forams?

Core #38
9002-9007

Rec. Frags.

Fragments Siltstone, same.

Core #39
9007-9787

Missing.

Core #40
9787-9793

Rec. Fragments

Fragments Siltstone, dark grey, very hard, locally very fine sandy, wavy laminations.

Cores #41 thru #44 - Missing.

Core #45
9810-9813
3'

Rec. 3'

Laminated Sand, stone light grey, very fine grained, nearly silt, finely laminated with nearly black carbonaceous material, wavy dips give 0° to 5° dips, very hard, very tight, no shows.

Core #46
9813-9816
3'

Rec. 3'

Laminated Sandstone, same, dips nearly flat to locally nearly 20°, tight.

Core #47
9816-9821

Missing.

Core #48
9821-9827
3'

Rec. 3'

Siltstone, dark gray, massive with local wavy laminations $\pm 4^\circ$, very hard to locally crumbly.

Core #49
9827-9830
2'

Rec. 2'

Siltstone, same, laminations are very fine sand, light grey, as in Cores #45 & #46.

Core #50
9830-9836
5'

Rec. 5'
Ditto.

Cores #51 & #52 Missing

Core #53
9912-9915
1'

Rec. 1'
Sand, light to medium grey, fine with scattered medium, silty, massive, local thin beds siltstone as above, tight.

Core #54 Missing.

Core #55
9920-9925
1'

Rec. 1'
Sand, medium grey, fine and scattered medium, massive, difficultly friable to hard, very common biotite crenulated, rare white muscovite, fairly poor sorting, sub-angular grains, silty, tight, no shows.

Core #56
9925-9930
2'

Rec. 2'
Sand, same.

Core #57 Missing.

Core #58
9935-9938
2'

Rec. 2'
Sand, same.

Core #59
9938-9940
1'

Rec. 1'
Sand, same but friable.

Core #60
9940-9946
6'

Rec. 6'
Sand, same, but very fine grained and fine, firm-friable to hard, locally very common crenulated biotite, rare streaks dark brown siltstone, tight.

Core #61
9946-9956
4'

Rec. 4'
Siltstone, dark grey, hard, brittle, massive, scattered brown biotite, rare streaks light grey sand as above, dips nearly flat.

Core #62
9956-61
3'

Rec. 3'
Sand, as above cores with rare streaks siltstone.

Core #63 Missing.

Core #64
9966-9971
5'

Rec. 5'
Sand, same.

Core #65 Missing.

Core #66
9978-9988
5'

Rec. 5'
Sand, similar to above, medium grey, fine with medium grains, difficultly friable to hard, massive with rare wavy nondiagnostic dip, very biotite, tight, locally somewhat cemented, no shows.

- Core #67
 9988-9998
 1' Rec. 1'
Sand, same, one silty streak gives poor 4-8° dip.
- Core #68
 9998-10,008
 4' Rec. 4'
Siltstone, dark grey, very hard, locally sandy, very gilsonitic locally, rare amber material, locally very wavy streaks of light grey coarse siltstone, dips very poor +8-10° - locally interbedded with sand, medium grey, fine with scattered medium, very firm to hard, somewhat silty, massive, very common biotite, very low porosity and permeability, no petroleum shows.
- Core #69
 10008-10011 Rec. frags.
Sand and Siltstone, as above.
- Core #70 Missing.
- Core #71
 10020-10025 Rec. 1'
 1' Siltstone, medium grey, hard, dense, with rare fragments sand, same as Core #68.
- 10025-10125 Core gap - drilled.
- Core #72
 10125-10130 Rec. 3'
 3' Sand, as above but hard, nearly tight.
- Core #73
 10130-10135 Rec. 5'
 5' Sand, same.
- Core #74
 10135-10145 Rec. 3'
 3' Sand, same but locally difficultly friable, interbedded locally with silt, same.
- Core #75
 10145-10150 Rec. 3'
 3' Sandstone, as above but very hard, cemented, tight, core flashed for 3 seconds, one foot flash.
- Core #76
 10150-10155 Rec. 3'
 3' Sand, same.
- Core #77
 10155-10165 Rec. 8'
 8' Sand, same but not cemented, very poor porosity and permeability with local interbeds of siltstone, dark grey - (see above). 10" flash 4 sec. burn.
- Core #78
 10165-10175 Rec. 2'
 2' Laminated Sand and Silt, same, but tight.
- Core #79
 10175-10182 Rec. 1'
 1' Ditto, tight, 25 sec. 2' flash, poor 5° dips.

Core #8010182-10187

Rec. 3'

3'

Sand, medium gray, fine grained with scattered medium, fairly poor sorting, sub-angular grains, massive, hard, very common crenulated biotite, rare beds siltstone, dark gray, hard, massive, very fine abundant micro-micaceous, no petroleum shows except good flash.

Core #8110187-10197

Rec. 3'

3'

Sand, same, with local siltstone streaks, same, good dips = 5°, rare clots siltstone, same, good 15 sec. flash, no other shows.

Core #8210197-10202

Rec. 3'

3'

Sand and Silt, same, no flash, one yellow stain at bottom of core.

Cores #83, 84 - Missing.

Core #8510217-10218

Rec. 1'

1'

Siltstone, dark grey, very hard, massive, very micro-micaceous, local sand grains, good 15 second flash.

Core #8610218-10223

Rec. 4½'

4½'

Siltstone, same, no flash.

Core #8710223-10232

Rec. 8'

1'

Sand, light grey to medium brown where very biotitic, silty, very fine grained, locally approaching silt, hard, massive but locally very wavy, dips average about 10°, hard, difficultly friable, kaolinitic, very poor porosity and permeability.

4'

Siltstone, as above cores, local 10° partings.

1'

Siltstone, light grey, coarse, approaches very fine sand, kaolinitic, hard to difficultly friable, very biotitic, local scattered pink and green grains, tight, no odor, stain or cut.

2'

Siltstone, same as 4' above, no flash.

Core #8810232-10242

Rec. 8'

8'

Interbedded dark grey siltstone and light grey coarse siltstone to very silty sand, very kaolinitic, local dips appear fair, to 8°, locally core is very carbonaceous, locally clotted light and dark gray silt. Bottles containing very fine silty sand, same, at 10234, 10236 and 10240, no odors, 15 sec. flash, no petroleum odor or stain.

Core #8910242-10252

Rec. 5'

5'

Ditto, as above, one bottle of fine silty sand from 10251, no odor, 25 sec. flash, no petroleum odors or stain.

Core #9010252-10253

Rec. 2' (Pickup ?)

2'

Sandstone, light-medium gray, fine grained, cemented, massive, very hard, 10 sec. flash.

Core #9110253-10258

Rec. 1'

1'

Siltstone, dark gray, local carbonaceous, micro-micaceous, hard, massive. no flash.

Core #92
 10258-10264 Rec. 2'
 2' Sand, with local beds siltstone, same as Core #88 (10232-42),
 no flash.

Core #93
 10264-10274 Rec. 4'
 4' Sand, same, flashed.

Core #94
 10274-10279 Rec. 1'
 1' Sand, same.

Core #95
 10279-10289 Rec. 5'
 5' Ditto.

Core #96
 10289-10297 Rec. 1'
 1' Ditto.

Core #97
 10297-10302 Rec. frags.
 Sand, same.

Core #98 Missing.

Core #99
 10307-10309 Rec. frags.
 Ditto.

Core #100
 10309-10317 Rec. 3'
 3' Ditto.

Core #101
 10317-10327 Rec. 6"
 6" Ditto.

Core #102
 10327-10332 Rec. 1"
 1" Nubbins, ditto.

Core #103
 10332-10342 Rec. 3'
 3' Ditto, with rare beds siltstone, same.

Core #104
 10342-10352 Rec. 6'
 6' Sand, ditto, with interbeds of Siltstone, same, light 10 sec. flash.

Core #105
 10352-10357 Rec. 2'
 2' Siltstone, with rare beds light greyish silt, 20 sec. flash, bottled
 streak sand at bottom Core #105 in bottle (10357), no odor.

HOMCO SIDEWALL SAMPLES

(No petroleum shows unless otherwise indicated)

#11	10,045	R. 3" fine gray silty sand, no odor.
#10	10,059	Rec. 3" Ditto
#9	10,064	Rec. 5" fine, silty, medium grey sand, <u>good kerosene odor</u> , no apparent stain.
#8	10,070	Rec. 3" fine silty medium grey sand, no odor.
#7	10,075	Rec. 2½" Ditto.
#6	10,082	Rec. 3" Ditto.
#5	10,088	Rec. 3" Ditto, sand, hard, very tight.
#4	10,096	Rec. 3" Ditto, as above.
#3	10,100	Rec. 2½" Sand, fine medium grey, same, no odor.
#2	10,115	Rec. 3" Sand, same.
#1	10,119	Rec. 3" Sand, same.
A-3	10,124	Rec. 5" Sand, same, fair <u>Kerosene odor</u> .
A-2	10,143	Rec. 3" Ditto, <u>faint kerosene to light petroleum odor</u> .
A-1	10,177	Rec. 5" Sand, same, faint to doubtful odor.

SCHLUMBERGER SIDEWALL SAMPLES

- 2695 Rec. $\frac{1}{2}$ " silty clayey Sand, medium green, no petroleum odor.
- 2732 Silty Sand, very fine grained, light-medium green, well sorted, pebbly, firm, very low porosity and permeability, no shows.
- 2737 Ditto, last above.
- 2778 Silty Sand, greenish, mixed with limonitic brown silt.
- 3200 Siltstone, medium grey, firm-friable.
- 3225 Siltstone, medium brown.
- 4304 Sand, light grey, fine grained, scattered rounded coarse, very friable, fair porosity and permeability, silty, no odor.
- 4330 Siltstone, light greenish grey, massive.
- 4508 Medium-dark green glauconite Siltstone, very fine grained.
- 4735 Medium-dark green glauconite Sand, fine-grained.
- 4831 Medium gray Siltstone, friable, very abundant altered biotite.
- 4832 Ditto, as above, but slightly coarser grained.
- 4896 Siltstone, medium grey, friable.
- 5140 Siltstone, light grey, otherwise as above.
- 5165 Ditto - very common biotite.
- 5350 Sand, light grey, silty, fine grained, low porosity and permeability, firm-friable.
-
- 5488 Rec. 2" Silty Sand, light grey, very fine grained, no odor.
- 7050 Rec. 1" Silty Sand, same, no odor.
- 7059 Rec. 1" Ditto.
- 7245 Rec. 1" Ditto.
- 7255 Sample gone
- 7269 Rec. $\frac{1}{2}$ " Ditto.
- 7285 Rec. 1" Sand, light grey, very kaolinitic, no odor.
- 7296 Rec. 1" Sand, as last above.
- 7299 Rec. $\frac{1}{2}$ " Ditto.
- 7303 Rec. $\frac{1}{2}$ " Ditto.

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCESDIVISION OF OIL AND GAS
REPORT ON PROPOSED OPERATIONS

No. P 552-308

Coalinga Calif. October 14 19 52

Mr. M. H. Fuller

Box 165, Burrel, Calif.

Agent for L. M. LOCKHART

DEAR SIR:

Your proposal to abandon Well No. "England" 1-31,

Section 31, T. 14S., R. 13E., M.D. B. & M., Field, Fresno County,

dated August 9, 19 52, received October 9, 19 52, has been examined in conjunction with records filed in this office.

Present conditions as shown by the records and the proposal are as follows:

RECORDS IN ADDITION TO OR AT VARIANCE WITH THOSE SHOWN IN THE NOTICE:

5-1/2" cem. 10,038', four 3/8" holes 10,017', W.S.O.

THE NOTICE STATES:

"The present condition of the well is as follows:

1. Complete casing record.

14" 47.54# New Smls. SJ Casing cmtd. to surface w/700 sax at 609'.

5-1/2" 20# N-80 & 17# J-55 New Smls. Csg. cmtd. w/200 sax at 10,038'.

Total Depth 10,357'.

2. Last produced. No Production

3. Condition of hole:

Hole is plugged with cement from bottom @ 10,357' up to 10,169'.

Hole is plugged with cement from 10,169' up to approximately 9880', which cements off all of the zone tested and the W.S.O. holes in the 5-1/2" casing at 10,017'.

The 5-1/2" casing is in place as cemented, with the bradenhead about level with the top of the cellar.

The top of the casing is plugged with 10' of cement, and a steel plate welded over top of same.

All unplugged portions of hole are filled with heavy drilling fluid."

PROPOSAL:

"The proposed work is as follows:

We propose to abandon well in above condition."

DECISION:

THE PROPOSAL IS APPROVED.

Bond No. 965734

GGP:ef

Orig: Company, L.A.

cc: Mr M H Fuller

R. D. BUSH

State Oil and Gas Supervisor

By  Deputy

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS
RECEIVED
AUG 24 1952

DIVISION OF OIL AND GAS

Notice of Intention to Abandon Well

This notice must be given at least five days before work is to begin; one copy only

LOS ANGELES Calif. AUGUST 9 19 52

COALINGA, CALIFORNIA

DIVISION OF OIL AND GAS

COALINGA Calif.

In compliance with Secs. 3228, 3229, 3230, 3231 and 3232, Ch. 93, Stat. 1939, notice is hereby given

that it is our intention to abandon well No. "ENGLAND" 1-31

Sec. 31, T. 14 S., R. 13 E., M.D. B. & M. PANOCHE CREEK AREA Field,

FRESNO County, commencing work on the 10TH day

of APRIL 19 51.

The present condition of the well is as follows:

- 1. Complete casing record.

14" 47.54 # NEW SMLS. SJ CASING CMTD. TO SURFACE W/700 SAX AT 609'.

5-1/2" 20# N-80 & 17# J-55 NEW SMLS. CSG. CMTD. W/200 SAX AT 10,038'.

TOTAL DEPTH 10,357'.

- 2. Last produced.

Date

No PRODUCTION

Net oil

Gravity

Cor

~~The proposed work is as follows:~~

- 3. Condition of hole:

HOLE IS PLUGGED WITH CEMENT FROM BOTTOM @ 10,357' UP TO 10,169'.

HOLE IS PLUGGED WITH CEMENT FROM 10,169' UP TO APPROXIMATELY 9880', WHICH CEMENTS OFF ALL OF THE ZONE TESTED AND THE W.S.O. HOLES IN THE 5-1/2" CASING AT 10,017'.

THE 5-1/2" CASING IS IN PLACE AS CEMENTED, WITH THE BRADENHEAD ABOUT LEVEL WITH THE TOP OF THE CELLAR.

THE TOP OF THE CASING IS PLUGGED WITH 10' OF CEMENT, AND A STEEL PLATE WELDED OVER TOP OF SAME.

ALL UNPLUGGED PORTIONS OF HOLE ARE FILLED WITH HEAVY DRILLING FLUID.

- 4. WE PROPOSE TO ABANDON WELL IN ABOVE CONDITION.

Reference to file of 444.

EDP
E14

By: L.M. LOCKHART
(Name of Operator)
Auditor

ADDRESS NOTICE TO DIVISION OF OIL AND GAS IN DISTRICT WHERE WELL IS LOCATED

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCESDIVISION OF OIL AND GAS
REPORT ON PROPOSED OPERATIONS

No. P 5-9132

Coalinga, Calif. April 12, 19 51

Mr. M. H. Fuller

Box 165, Burrel, Calif.

Agent for L. M. LOCKHART

DEAR SIR:

Your supplementary proposal to drill Well No. "England" 1-31,
 Section 31, T. 14S., R. 13E., M.D.B. & M., Field, Fresno County,
 dated April 10, 19 51, received April 12, 19 51, has been examined in conjunction with records filed in this office.

Present conditions as shown by the records and the proposal are as follows:

THE NOTICE STATES:

"The new conditions are as follows:

- Hole plugged from bottom 10,357' up to 10,169'.
- 5-1/2" casing cemented at 10,038' with 300 sax cement.
- W.S.O. test made through 4 - 3/8" holes shot at 10,017' - OK.
- Oil and gas shows between 10,038' and 10,169' were tested by displacing the drilling fluid and circulating with fresh water, and by swabbing.
- Results inconclusive."

PROPOSAL:

"We now propose

- To plug with cement from 10,169' up to 10,000', which will cement off all of zone tested and cover the W.S.O. holes in the 5-1/2" casing at 10,017'.
- To leave the 5-1/2" casing in place as cemented, with the Bradenhead about 2' below top of cellar and with a steel plate bolted over top of same.
- To leave hole full of drilling mud from 10,000' to surface.
- To suspend well in above condition."

DECISION:

THE PROPOSAL IS APPROVED.

Bond No. 965734

GGP:ef

Orig: Company, L.A.

cc: Mr. M. H. Fuller

R. D. BUSH

State Oil and Gas Supervisor

By G. G. Ferrel Deputy

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Supplementary Notice

Los Angeles Calif. April 10 19 51

DIVISION OF OIL AND GAS

Coalinga, Calif.

Our notice to you dated March 28, 19 51, stating our intention to

Cement 5-1/2" casing in well No. "England" 1-31
(Drill, deepen, redrill, abandon)

Sec. 31, T. 14S, R. 13E, M. D. B. & M. Panoche Area, XXXX Field,

Fresno County, must be amended on account of changed or recently

discovered conditions.

The new conditions are as follows:

- Hole plugged from bottom @ 10,357' up to 10,169'.
- 5-1/2" casing cemented at 10,038' with 300 sax cement.
- W.S.O. test made through 4 - 3/8" holes shot at 10,017' - OK.
- Oil and gas shows between 10,038' and 10,169' were tested by displacing the drilling fluid and circulating with fresh water, and by swabbing.
- Results inconclusive.

We now propose

To plug with cement from 10,169' up to 10,000', which will cement off all of zone tested and cover the W.S.O. holes in the 5-1/2" casing at 10,017'.

To leave the 5-1/2" casing in place as cemented, with the Bradenhead about 2' below top of cellar and with a steel plate bolted over top of same.

To leave hole full of drilling mud from 10,000' to surface.

To suspend well in above condition.

RECEIVED
APR 13 1951

APPROVED BY THE DIVISION

DATE	APPROVED	REMARKS	INITIALS

L. M. LOCKHART
(Name of Operator)
By *L. M. Lockhart*
Engineer

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Report on Test of Water Shut-off
(FORMATION TESTER)

No. T 5-5435

Coalinga, Calif. April 9, 19 51

Mr. M. H. Fuller
Box 165, Burrel, Calif.
Agent for L. M. LOCKHART

DEAR SIR:

Your well No. "England" 1-31, Sec. 31, T. 14 S., R. 13 E., M. D. B & M.
Field, in Fresno County, was tested for water shut-off
on April 3, 19 51. Mr. G. W. Hunter, designated by the supervisor,
was present as prescribed in Secs. 3222 and 3223, Ch. 93, Stat. 1939; there were also present M. H. Fuller, Supt.
and Glenn H. Earl, Engineer.

Shut-off data: 5-1/2 in. 12 & 20 lb. casing was cemented at 10,038 ft.
on March 30, 19 51 in 9-7/8 in. hole with 300 sacks of cement
of which 5 sacks was left in casing.
Casing record of well: 14" cem. 609'; 5-1/2" cem. 10,038', four 3/8" holes 10,017' W.S.O.

(10,038 (10,030
Present depth 10,357 ft. Bridged with cement from 10,357 ft. to 10,163 ft. Cleaned out to 10,030 ft. for test.
A pressure of 1000 lb. was applied to the inside of casing for 15 min. without loss after cleaning out to 10,030 ft.
A Johnston tester was run into the hole on 2-3/8 in. drill pipe-tubing,
with 1395 ft. of water-cushion, and packer set at 9947 ft. with tailpiece to 9964 ft.
Tester valve, with 1/2 in. bean, was opened at 7:29 a.m. and remained
open for 1 hr. and min. During this interval there was a light steady blow for 16
minutes and then a light heading blow for the remainder of the test.

THE INSPECTOR WAS PRESENT AT THE WELL FROM 11:00 a.m. TO 12:15 p.m. AND MR. EARL
REPORTED:

1. The 5-1/2" casing was shot-perforated at 10,017' for the test of shut-off.
2. All except 1620' of the tubing was removed and 1395' of water cushion and 1479' of gas cut drilling fluid was recovered.

THE INSPECTOR NOTED:

1. When the remainder of the tubing was removed, 1620' of very gassy drilling fluid was found above the tester valve. The gassy drilling fluid would occasionally unload, blowing 60 or 70 feet into the air.
2. The pressure recorder charts indicated that the tester valve was open during the entire test.

THE SHUT-OFF AT 10,017' IS APPROVED.

GWH:ef

Orig: Company, L.A.
cc: Mr. M. H. Fuller

R. D. BUSH, State Oil and Gas Supervisor

By  Deputy

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCESDIVISION OF OIL AND GAS
REPORT ON PROPOSED OPERATIONS

No. P 5-9110

Coalinga, Calif. March 30, 19 51

Mr. M. H. Fuller

Box 165, Burrel, Calif.

Agent for L. M. LOCKHART

DEAR SIR:

Your supplementary proposal to drill Well No. "England" 1-31
 Section 31, T. 14S., R. 13E., M.D. B. & M., ----- Field, Fresno County,
 dated March 28, 19 51, received March 28, 19 51, has been examined in conjunction with records filed in this office.

Present conditions as shown by the records and the proposal are as follows:

THE NOTICE STATES:

"The new conditions are as follows:

14" cem. 609'. T.D. 10,357', plugged with cement 10,357' to 10,163'.

9-7/8" hole to 10,033'.

7-5/8" " to 10,357'.

Encountered oil and gas shows below 10,000'."

PROPOSAL:

"We now propose

1. Cement 5-1/2" casing at 10,033' to test showings between 10,033' and 10,163'.
2. Notify Division to Witness shut-off test through holes at 10,015'.
3. Test for production."

DECISION:

THE PROPOSAL IS APPROVED PROVIDED THAT this Division shall be notified to witness a test of the 5-1/2" water shut-off through four shot perforations immediately above the cementing point, prior to drilling out the cement below that depth.

Bond No. 965734

GHC:ef

Orig: Company, L.A.

cc: Mr. M. H. Fuller

R. D. BUSH

State Oil and Gas Supervisor

By G. G. Peice Deputy

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

Supplementary Notice

RECEIVED
MAR 2 1951
COALINGA, CALIFORNIA

Coalinga, Calif. March 28, 1951

DIVISION OF OIL AND GAS

Coalinga, Calif.

Our notice to you dated November 22, 1950, stating our intention to

Drill well No. "England" 1-31

(Drill, deepen, redrill, abandon)

Sec. 31, T. 14 S., R. 13 E., M. D. B. & M. Field,

Fresno County, must be amended on account of changed or recently

discovered conditions.

The new conditions are as follows:

14" cem. ~~612'~~^{609'} T.D. 10,357', plugged with cement 10,357' to 10,163'.

9-7/8" hole to 10,033'.

7-5/8" " to 10,357'.

Encountered oil and gas shows below 10,000'.

We now propose

1. Cement 5-1/2" casing at 10,033' to test showings between 10,033' and 10,163'.
2. Notify Division to witness shut-off test through holes at 10,015'.
3. Test for production.

DATE	TIME	OPERATOR	NOTES
			✓
			✓

L. M. LOCKHART

(Name of operator)

By Glen M. Carl
Engineer

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCESDIVISION OF OIL AND GAS
REPORT ON PROPOSED OPERATIONS

No. P 5-9002

Coalinga, Calif. November 24, 19 50

Mr. M. H. Fuller

Box 165, Burrel, Calif.

Agent for L. M. LOCKHART

DEAR SIR:

Your _____ proposal to _____ drill _____ Well No. "England" 1-31
 Section 31, T. 14S., R. 13E., M.D.B. & M., _____ Field, Fresno County,
 dated Nov. 22, 19 50, received Nov. 24, 19 50, has been examined in conjunction with records filed in this office.

Present conditions as shown by the records and the proposal are as follows:

THE NOTICE STATES:

"Legal description of lease S. E. one-quarter of Section 31-14/13
 The well is 660 feet S., and 660 feet E. from center of Sec. 31-14/13
 Elevation of ground above sea level 406.6 feet.
 All depth measurements taken from top of Kelly Bushing, which is 12.5 feet above
 ground.
 We estimate that the first productive oil or gas sand should be encountered at a
 depth of about 7000 feet."

PROPOSAL:

"We propose to use the following strings of casing, either cementing or landing
 them as herein indicated:

Size of Casing, Inches	Weight, Lb. Per Foot	Grade and Type	Depth	Landed or Cemented
14	47.54	Smls. -SJ	600'	Cemented
8-5/8	32	Smls. -T&C-J55	7000'	Cemented

It is understood that if changes in this plan become necessary we are to notify
 you before cementing or landing casing."

DECISION:

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. Water suitable for irrigation shall be protected from contamination.
2. Mud fluid of sufficient weight and proper consistency to prevent blow-outs shall be used in drilling, and the column of mud fluid shall be maintained to the surface at all times, particularly while pulling the drill pipe.
3. Adequate blow-out prevention equipment shall be provided and kept ready for operation at all times.
4. The 14" casing shall be cemented with sufficient cement to fill back of this casing from the shoe to the ground surface.
5. THIS DIVISION SHALL BE NOTIFIED:
 - (a) Before landing or cementing any casing below the surface casing.
 - (b) To witness a test of each possible water shut-off.

Bond No. 965734

CHC:ef

Orig: Company, L.A.

cc: Mr. M. H. Fuller

R. D. BUSH

State Oil and Gas Supervisor

By G. G. Perich Deputy

DIVISION OF OIL AND GAS
RECEIVED
NOV 24 1950
COALINGA, CALIFORNIA

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

019 00193

Notice of Intention to Drill New Well

This notice must be given and surety bond filed before drilling begins

Los Angeles Calif. November 22 19 50

DIVISION OF OIL AND GAS

Coalinga Calif.

In compliance with Section 3203, Chapter 93, Statutes of 1939, notice is hereby given that it is our intention to commence the work of drilling well No. "England" 1-31, Sec. 31, T. 14S., R. 13E., M.D. B. & M., Panoche Creek Area Field, Fresno County.

Legal description of lease S. E. one-quarter of Section 31-14/13

The well is 660 feet ~~N~~ or S., and 660 feet E. of ~~W~~ from center of Sec. 31-14/13
(Give location in distance from section corners or other corners of legal subdivision)

Elevation of ground above sea level 406.6 feet.

All depth measurements taken from top of Kelly Bushing, which is 12.5 feet above ground.

We estimate that the first productive oil or gas sand should be encountered at a depth of about 7000 feet.

We propose to use the following strings of casing, either cementing or landing them as herein indicated:

Size of Casing, Inches	Weight, Lb. Per Foot	Grade and Type	Depth	Landed or Cemented
14	47.54	Smls. -SJ	600'	Cemented
8-5/8	32	Smls. - T&C - J55	7000'	Cemented

It is understood that if changes in this plan become necessary we are to notify you before cementing or landing casing.

Address 824 Wilshire Boulevard
Los Angeles 17, California
Telephone number TRinity 1588

L. M. LOCKHART
(Name of Operator)
By L M Lockhart

ADDRESS ONE COPY OF NOTICE TO DIVISION OF OIL AND GAS IN DISTRICT WHERE WELL IS LOCATED

Block	Map	Cross Section	Grade	Perms
11/24/50			14	13

Recent to
Pliocene

Miocene?

Kreyenhagen

Eocene

Domengine

Eocene and
Paleocene

Lodo

Paleocene

Martinez

Cretaceous

Moreno

Panoche

Brown Mt. Sd.

Ragged Valley Silt

Joaquin Ridge S.S.

7142

419

6723

7527

424

6825

6380

432

5948

APPENDIX 2

CALGEM RECORDS - AMERICAN HUNTER SOUZA 1

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT OF WELL ABANDONMENT

Coalinga, California

January 29, 1986

Jeff Greening, Agent
AMERICAN HUNTER EXPLORATION, LTD.
306 Pescado Circle
Rancho Murieta, CA 95683

Your report of abandonment of well "Souza" 1
(Name and number)

A.P.I. No. 019-21924, Section 36, T. 14S, R. 12E, M.D. B. & M.,
field, Fresno County,

dated July 5, 1984, received July 13, 1984, has been
examined in conjunction with records filed in this office, and we have determined that all of
the requirements of this Division have been fulfilled.

GWM/bcm
cc: Conservation
Company, Canada

M.G. MEFFERD, State Oil & Gas Supervisor
State Oil and Gas Supervisor

By *Richard F. Curtin*
Deputy Supervisor

Richard F. Curtin

DIVISION OF OIL AND GAS

CHECK I - RECORDS RECEIVED AND WELL STATUS

Company American Hunter Well No. "Souza" 1
 API No. 019-21924 Sec. 36, T. 14, R. 12, B.&M.
 County _____ Field _____

RECORDS RECEIVED	DATE
Well Summary (Form OG100)	✓
History (Form OG103)	✓
Core Record (Form OG101)	
Directional Survey	
Sidewall Samples	✓
Other	
Date final records received	
Electric logs:	

STATUS	STATUS
Producing - Oil	Water Disposal
Idle - Oil	Waterflood
Abandoned - Oil	Steamflood
Drilling - Idle	Fire Flood
Abandoned - Dry Hole	Air Injection
Producing - Gas	Gas Injection
Idle - Gas	CO2 Injection
Abandoned - Gas	LPG Injection
Gas-Open to Oil Zone	Observation
Waterflood Source	
DATE _____ "E" well	Yes <input type="checkbox"/> No <input type="checkbox"/>

ENGINEER'S CHECK LIST

- Summary, History, & Core record (dupl.) ✓
- Electric Log ✓
- Operator's Name ✓
- Signature ✓
- Well Designation ✓
- Location ✓
- Elevation ✓
- Notices ✓
- "T" Reports ✓
- Casing Record ✓
- Plugs ✓
- Surface Inspection 11-1-84 TSB 4-7-85
- Production -
- E Well on Prod. Dir. Sur. -

CLERICAL CHECK LIST

- Location change (F-OGD165)
- Elevation change (F-OGD165)
- Form OGD121 ✓ 1/29/86
- Form OG159 (Final Letter) 1/29/86
- Form OGD150b (Release of Bond)
- Duplicate logs to archives
- Notice of Records due (F-OGD170)
- EDP (F-OGD42A-1, 2)

- with Gamma Ray ✓
- High Res Dipmeter ✓
- DIL/SPL Elec prop ✓
- with Den-comp mat. ✓
- Cyberlook ✓ 2+5
- DIL/SPL ✓
- Borehole com/sonic ✓
- microlas ✓
- Borehole com/sonic ✓ 5+2
- microlas ✓
- Sidewall Sample Log ✓
- with Gamma Ray ✓
- DIL 2+5 ✓

~~need duplicate copies~~

See Attached

RECORDS NOT APPROVED

Reason: needs more logs succ ok 11/1/84 TSB
needs duplicate logs

RECORDS APPROVED GW 10-16-85

RELEASE BOND /

Date Eligible _____
 (Use date last needed records were received.)

MAP AND MAP BOOK W3-8 10-16-85

83-10217

CHECK LIST - RECORDS RECEIVED AND WELL S. US

Well No. _____

API No. _____ Sec. _____, T. _____, R. _____ B.&M.

WORK PERFORMED

STATUS

DATE

Drill _____ Redrill _____ Deepen _____

Producing _____ "E" well Yes No

Plug _____ Alter Casing _____

Recompleted Producing _____

Waterflood _____ Water Disposal _____

Waterflood _____

Abandon _____

Water Disposal _____

Other _____

Abandoned _____

Other _____

MAP AND BOOK _____ Engineer _____

RECORDS FILED AND DATE Clerk _____

RECORDS & REQUIREMENTS CHECKED Engineer _____

Summary _____

Log and Core _____

History _____

E-log _____

Directional Survey _____

Other _____

(Check records for signature and correct name of operator or well, section, township, range, and field.)

Surface Inspection _____

Data Needed _____

Location _____ Notice states _____

Request Records _____ OGD170 _____

Correct records _____ OGD165 _____

(Specify) _____

EDP _____ (OGD42A-1, 2) _____

CARDS _____

Elevation _____ Notice states _____

BOND _____

Hold _____ Reason _____

Release _____ Date Eligible _____ OGD150 _____

Production Reports _____

End premium year _____

Release requested _____

Bond superseded _____ (Check One)

Well abandoned _____

(If production reports not received, make notation and inform Senior Stenographer when received.)

Environmental Inspection _____ Engineer _____

FINAL LETTER _____ OGD159 _____

and _____

File cleared _____ OGD121 _____

RECEIVED

JUL 13 1984 API No. 019-21924

WELL SUMMARY REPORT DIVISION OF OIL & GAS
COALINGA

Operator AMERICAN HUNTER EXPLORATION LTD.		Well SOUZA #1				
Field -----		County Fresno	Sec. 36	T. 14S	R. 12E	B.&M. M.D.
Location (Give surface location from property or section corner, street center line and/or California coordinates) 657.38' East along section line and 654.18' North at right angles to said line from S/4 Sec. 36			Elevation of ground above sea level 423.8 ft.			
Commenced drilling (date) 83-11-04	Total depth			Depth measurements taken from top of:		
Completed drilling (date) 83-12-13	(1st hole) 10,217'	(2nd)	(3rd)	<input type="checkbox"/> Derrick Floor	<input type="checkbox"/> Rotary Table	<input checked="" type="checkbox"/> Kelly Bushing
Commenced producing (date) N/A	Present effective depth WELL ABANDONED			Which is 26 feet above ground		
<input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas lift	Junk N/A			GEOLOGICAL MARKERS		
Name of producing zone(s) N/A	Note: 12 1/4" hole - 1709' 8 3/4" hole - T.D.			DEPTH		
				See Attachment #1		
				Formation and age at total depth Lathrop		

	Clean Oil (bbl per day)	Gravity Clean Oil	Percent Water including emulsion	Gas (Mcf per day)	Tubing Pressure	Casing Pressure
Initial Production	N/A					
Production After 30 days	N/A					

CASING RECORD (Present Hole)								
Size of Casing (API)	Top of Casing	Depth of Shoe	Weight of Casing	Grade and Type of Casing	New or Second Hand	Size of Hole Drilled	Number of Sacks or Cubic Feet of Cement	Depth of Cementing (if through perforations)
9 5/8"	Surface	1709'	36#	K55, LT&C	New	12 1/4"	459 cu.ft. 337 cu.ft.	lead slurry tailed
5 1/2"	Surface	10213'	20#	AC-80, LT&C	New	8 3/4"	1532 cu.ft. 755 cu.ft.	lead slurry tailed

PERFORATED CASING (Size, top, bottom, perforated intervals, size and spacing of perforation and method.)

See Attachment #2

Was the well directionally drilled? If yes, show coordinates at total depth
 Yes No

Electrical log depths
See Attachment #3

Other surveys

In compliance with Sec. 3215, Division 3 of the Public Resources Code, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

Name Don L. Myers	Title Senior Drilling Engineer
Address 500, 435 Fourth Avenue S.W.	City Calgary, Alberta, CANADA
Telephone Number (403) 260-1740	Signature <i>Don L. Myers</i>
	Date July 5/84
	Zip Code T2P 3A8

WELL SUMMARY REPORT

Attachment #1

Souza #1 - Fresno County, California

FORMATION TOPS

(KB 452)

FormationSample topE-log topSub-sea
(E-log)

(Spud in Quaternary beds)

Pliocene

(In surface hole)

Miocene(?)

2578

2574

- 2122

Kreyenhagen

2977

2992

- 2540

Domengine

3654

3655

- 3203

Glaucconitic

4185

4192

- 3740

Upper Dos Palos

4596

4598

- 4146

Cima

4658

4662

- 4210

Lower Dos Palos

5126

5130

- 4678

Dosados

5906

5909

- 5457

Blewett (*moreno*)

6512

6512

- 6060

Ragged Valley

7341

7342

- 6890

Tracy

7435

7440

- 6988

Sawtooth

7987

7990

- 7538

Lathrop

9156

9157

- 8705

Total Depth

10,217

10,212

(Driller)

(Logger)

LOGGING SUMMARY

(Logging by Schlumberger)

RUN NO. 1 (at 7332')

Dual Induction - SFL

7298 - 1709

BHC Sonic Log

7304 - 145

Litho-Density - Compensated Neutron

7304 - 145

History of Oil or Gas Well
Attachment #1
Drilling History

RECEIVED

JUL 13 1984

DIVISION OF OIL & GAS
COALINGA

DRILLING HISTORY

AMERICAN HUNTER/SOUZA #1 SW 1/4, SE 1/4, SEC 36, T14S, R12E MDB & M FRESNO CO CALIFORNIA

83-11-03		Rigging up. Rig to raise derrick. Estimate spud tomorrow - P.M.	(MONT. 19)
83-11-04		Rig to Spud. Rigging up - 18 hrs.	(MONT. 19) (63,289)
83-11-05 (1)	1602 Ft Surface	SPUD TIME: 08:30 Hrs 83-11-04 Progress: 1602 Ft.	(MONT #19) (71,374)
83-11-06 (2)	1652 Ft Surface	Wait on Casing. Progress: 50 Ft	(MONT # 19) (78,612)
83-11-07 (3)	1709 Ft Surface	W.O.C. Progress: 57 Ft Run 44 jts, 9 5/8" 36#, K-55, LT&C casing. Cemented w/ 82 bbls 2:1:2 poz, tailed in w/ 60 bbls "G" + 2% CaCl ₂ . Plug down Time: 01:30 Hrs 83-11-07. Total Length of csg run 1713 '. Set @ 1709' KB.	(MONT # 19) (99,972)
83-11-08 (4)	1731 Ft Surface	Drilling Progress: 22 Ft	(MONT. 19) (109,486)
83-11-09 (5)	2809 Tremblay	Drilling Progress: 1078 2339 - 1 1/4°	(MONT. 19) (159,532)
83-11-10 (6)	4004 Ft Eogene	Drilling Progress: 1195 Ft	(MONT. 19) (169,460)
83-11-11 (7)	4911 Ft C/Sand	Drilling. Progress: 907 Ft	(MONT. 19) (183,948)
83-11-12 (8)	5758 Ft M/Shale	Drilling. Progress: 847 Ft 5661 - 1°	(MONT. 19) (193,450)
83-11-13 (9)	6061 Ft M/ Shale	Ream to Bottom Progress: 303 Ft 6061 - 2°	(MONT. 19) (207,230)
83-11-14 (10)	6249 Ft Dosado/S	POH for DST. Progress: 188 Ft	(MONT. 19) (217,811)

DRILLING HISTORY

AMERICAN HUNTER/SOUZA #1 SW 1/4, SE 1/4, SEC 36, T14S, R12E MDB & M FRESNO CO CALIFORNIA

83-11-15 (11) 6373 Ft Blui++ Circ. sample (MONT. 19)
Progress: 124 Ft (228,763)
DST # 1: (6249 - 6202) 10/60/90/180
Results to follow.

83-11-16 (12) 6373 Ft Blui++ RIH with bit. (MONT. 19)
Progress: Nil (242,579)
6373 - 2°

DST # 1: (6201.5' - 6249') 10/60/90/180
PF: Strong air blow - NGTS
ISI: GTS after 10 mins. 5' flare
VO: GTS immediately - 6' flare, decreasing to 1' flare
in 25 mins and steady - Charts show plugging.
REC: 5' thick drilling mud
IHP 3003 PSI PFP 22 - 22 PSI ISIP 1506 PSI
3003 FP 22 - 22 1506

DST # 2: (6308' - 6373') 10/60/60/120
PF: GTS - 4 mins, est. 750 MCF
VO: GTS immediately - max. 682 MCF, levels off to 435
MCF - stabilized.
REC: 15' thick slightly gassy cut drlg mud.
IHP 3108 PSI PFP 208 - 167 PSI ISIP 2747 PSI
3108 146 - 62 2641
Charts show slight plugging.
BHT: 152° F

83-11-17 (13) 6512 Ft. Blui++ POH with DST # 3 (MONT. 19)
Progress: 139 Ft. (252,041)
6512' - 2°

DST # 3: 6463' - 6512' 10/60/90/180
Results to follow.

DST # 3: 6463' - 6512' 10/60/90/180
PF: GTS - 4 mins, 15-20' flare, est. 400 MCF decreasing
to 10' at end.
VO: 10' flare decreasing to 3' in 40 mins - stabilizing
REC: Nil
PF 66 - 55 IHP 3183 ISIP 1195
FF 22 - 22 3183 1195
BHT - 162° F
Charts indicated plugging.

DRILLING HISTORY

AMERICAN HUNTER/SOUZA #1 SW 1/4, SE 1/4, SEC 36, T14S, R12E MDB & M FRESNO CO CALIFORNIA

83-11-18 (14)	6915 Ft Bluff	Drilling Progress: 403 Ft	(MONT. 19) (264,159)
83-11-19 (15)	7286 Ft Bluff	Drilling Progress: 371 Ft 6940 - 1 1/2° BGG - 20 units	(MONT. 19) (281,755)
83-11-20 (16)	7332 Ft D/Valley	Ream to Btm. Progress: 48 Ft 7332 - 2°	(MONT. 19) (317,933)
83-11-21 (17)	7699 Ft Tracy	Drilling Progress: 367 Ft	(MONT. 19) (326,396)
83-11-22 (18)	8080 Ft SWTH/Sh	Drilling Progress: 381 Ft BGG - 20 units.	(MONT. 19) (337,108)
83-11-23 (19)	8525 Ft SWTH/Sh	Drilling Progress: 445 Ft 8402 - 2°	(MONT. 19) (347,476)
83-11-24 (20)	8615 Ft. SWTH/Sh	Wash to bottom. Progress: 90 Ft. 8615 Ft - 2°	(MONT. 19) (359,091)
83-11-25 (21)	8730 Ft Sawtooth	POH. Progress: 115 Ft	(MONT. 19) (371,759)
83-11-26 (22)	8815 Ft Sawtooth	Drilling. Progress: 85 Ft 8730' - 2°	(MONT. 19) (386,589)
83-11-27 (23)	9019 Ft Sawtooth	Drilling Progress: 204 Ft	(MONT. 19) (395,574)
83-11-28 (24)	9159 Ft Lathrop	POH to core Progress: 140 Ft	(MONT. 19) (405,333)
83-11-29 (25)	9200 Ft Lathrop	POH w/ DST Progress: 41 Ft CORE # 1: Lathrop 9159' - 9200' Rec: 40 1/2' Core. 9159' - 2°	(MONT. 19) (416,024)

DRILLING HISTORY

AMERICAN HUNTER/SOUZA #1 SW 1/4, SE 1/4, SEC 36, T14S, R12E MDB & M FRESNO CO CALIFORNIA

83-11-30 (26)	Lathrop 9200 Ft	POH w/Test tools. Progress: Nil DST # 4: 9156' - 9200' (Lathrop Sand) PF WAB - inc. SAB Lost packer seat in 2 mins Used and recovered 1200' water cushion & 523' drlg. mud. DST # 5: 9160' - 9200' (Lathrop Sand) Used 2000' water cushion Bottom hole conventional PF: Lost packer seat immediately, attempt to reset, lost packer seat again.	(MONT. 19) (426,089)
83-12-01 (27)	9317' Lathrop	Circ. sample Progress: 117'	(MONT. 19) (439,527)
83-12-02 (28)	9433' Lathrop	Pick up DST # 6. Progress: 116 Ft. DST #5: Used and rec. 2000' water cushion IHP 5287 PSI 5213 Misrun, lost packer seat immediately.	(MONT. 19) (450,672)
83-12-03 (29)	9480 Ft Lathrop	Drilling Progress: 47 Ft DST # 6: 9382' - 9433' (M/Lathrop) Used 2700' water cushion 10/60/75/180 PF: VWAB VO: NGTS Rec. 2700' Water Cushion 2700' Gassy cut water cushion 150' Thick drlg mud (smells gassy) PF 1287 PSI IHP 5535 PSI ISIP 4460 PSI IF 1287 PSI 5424 4664 1287	(MONT. 19) (469,803)
83-12-04 (30)	9726 Ft Lathrop	RIH to Core. Progress: 246 Ft. 9689' - 3 3/4° CORE # 2: 9726' - 9778' (L/Lathrop) Cut 54' Rec - 45'	(MONT. 19) (478,458)
83-12-05 (31)	9778 Ft Lathrop	POH w/test tools. Progress: 52 Ft DST # 7: Results to follow.	(MONT. 19) (488,584)

DRILLING HISTORY

AMERICAN HUNTER/SOUZA #1 SW 1/4, SE 1/4, SEC 36, T14S, R12E MDB & M FRESNO CO CALIFORNIA

83-12-13 (39) 10,217' TD Tear out BOP's (MONT. 19)
Progres: Nil (830,653)
Ran 257 jts 5 1/2", AC-80, 20#, LT&C csg. Landed @ 10,213'KB.
Followed by 1532 cu ft. + .8% D-60, + .3% D-13, +.3% D46,
followed by 755 cu ft. + .2% D-46 + .2% D-60. PDT: 0310 Hrs
83-12-13.

83-12-14 (40) Tear out BOP's and cut casing. (MONT. 19)
RIG RELEASE: 16:00 Hrs 83-12-13
STATUS: POTENTIAL GASWELL (851,516)

History of Oil or Gas Well
Attachment #2
Completion History

AMERICAN HUNTER SOUZA # 1

84-03-30 (1)	Rigging up. Move in rig and equipment. Rigging up.	(GAMACHE # 1) (7,180)
84-03-31 (2)	Run tubing. Finish rigging up. Unload 2 3/8" N80 tubing. Cut off casing. Install BOP. Fill tanks with 800 bbls fresh water.	(GAMACHE # 1) (51,517)
84-04-01 (3)	Run tubing. RIH with 25 joints 2 3/8" tubing with 4 5/8" bit. Reverse out drilling mud with fresh water. High winds and heavy rain.	(GAMACHE # 1) (56,434)
84-04-02 (4)	Run tubing. RIH with bit to 8400'. Circulate out drilling mud with fresh water every 1000'.	(GAMACHE # 1) (60,232)
84-04-03 (5)	RIH with scraper. RIH with bit to 10165'. Break circulation every 6 joints below 9000'. Circulate down to PBTD at 10177'. Circulated out thick drilling mud. POH. RIH with bit and scraper on 40 jts tubing. Gray oil tool arrived with primary seal. POH. Pick up BOP and tubing spool. Install primary seal and tubing seal. Pressure seals to 5000 PSI. Held good.	(GAMACHE # 1) (63,708)
84-04-04 (6)	Logging. RIH with bit and scraper to PBTD. Displace to 3% KCL. POH. Rig Schlumberger. Run CBL-VDL-CNL-GR log from PBTD to 2400 ft.	(GAMACHE # 1) (68,198)
84-04-05 (7)	Run tubing. Ran CBL-VDL log at 1700 psi from PBTD to 2400 ft. Ran CET-GR-CCL log and TDT logs from PBTD to 2400 ft. Bond logs indicate no cement behind casing.	(GAMACHE # 1) (71,909)
84-04-06 (8)	Pressure test casing. RIH to PBTD with tubing. Haul in chemicals to mix mud.	(GAMACHE # 1) (110,073)
84-04-07 (9)	Displace to mud. Mix 400 bbls 9.2 lb/gal mud.	(GAMACHE # 1) (113,633)

AMERICAN HUNTER SOUZA # 1

- 84-04-08 (10) Est. circ between perfs. (GAMACHE # 1)
Pressure test casing to 5000 psi for 15 mins. Held O.K. Displace hole to 11.2#/gal gel mud. POH w/tbg. Fill hole. Perforate intervals 10060 - 10061 and 9870 - 9871' w/ 4" HSC casing gun @ 90° phasing w/ big hole charges @ 4 SPF. RIH with 4 jts tubing, retrievable packer and 2 3/8" tubing. Set packer @ 9915' KB. Pump down tubing @ 1/6 BPM @ 3000 psi w/returns up annulus. Pump 1/2 bbl. S.I.F.N. (124,143)
- 84-04-09 (11) Run tubing and stinger. (GAMACHE # 1)
Pump mud down annulus and up tubing starting @ 1/6 BPM @ 3300 psi. Pump total of 95 bbls. Final rate of 3/4 BPM @ 2800 psi. Recovered small amounts of gas and solids. No loss to formation. Unseat packer and lower tail pipe to 10112' KB. Reverse circ hole clean w/ 50 bbls mud. POH w/tubing and packer. Rig Schlumberger and set EZ drill cement retainer @ 10056' KB. Pick up stinger and RIH w/ 206 jts tubing. S.I.F.N. (130,270)
- 84-04-10 (12) Running free point. (GAMACHE # 1)
Finish RIH w/tubing and stinger. Stab retainer and pressure test to 1000 PSI. Est. circ rate of 3/4 BPM @ 1800 PSI w/8 bbls mud. Rig Howco to cement w/65 sxs Class "G" + 30% silica flour + 5% KCL + 1/4#/sxs D-Air + 0.1% HR-7 + 0.75% FDTC - 322. Pull out of retainer. Circ 10 bbls mud flush, 17.7 bbls slurry, 2 bbls fresh water and 7 bbls mud to bottom of tubing. Stab retainer and displace w/27.5 bbls mud @ 1 BPM @ 3000 PSI. Bleed off tubing and casing pressure. Pull out of stinger and pull 10 jts tubing to 9745'KB. Reverse circ clean w/61 bbls mud. Recovered 11 bbls cement. Start cement @ 1205 hrs. Finish reverse circ @ 1350 hrs. Attempt to pull tubing. Would not move. Work tubing - no movement. Circ mud for 30 mins @ 1.5 BPM @ 1200 PSI for 3 hrs. Pull tubing to 80,000# - no movement. Land tubing in slips and pressure casing to 500 PSI. S.I.F.N. (137,136)
- 84-04-11 (13) Bleed off 500 PSI wellhead pressure. Rig Schlumberger and run free point tool. Found free point @ 9360'KB. Reverse circ hole to fresh water. SIFN. (145,456)
- 84-04-12 (14) Pull tubing. (GAMACHE #11)
Rig Halliburton and circ 750 gals 15% HCL + inhibitor down tubing and up casing annulus. Wash acid past tubing by alternately pumping down tubing and casing. Work tubing, no movement. Backwash acid w/fresh water. Acid partly spent w/ small volume of acid gas. Rig McCullough and cut tubing @ 9355' KB w/ chemical cutter. Pull tubing w/drag on first joint then pulled free. Pull 200 jts tubing. SIFN. (154,516)

AMERICAN HUNTER SOUZA # 1

- 84-04-13 (15) Pull washover pipe. (GAMACHE#11)
Pull remainder of tubing and lay down cut off joint. Pick up 4" washover mill and 217' of 4" x 3 3/8" washpipe, jars, bumper sub and RIH on 2 3/8" tubing. Tag obstruction @ 8936' KB. Rig Power Swivel and mill out cement stringers to 9226' KB. Pipe torquing up. Circ. hole clean. Start POH w/washover pipe. (158,676)
- 84-04-14 (16) Washing over tubing. (GAMACHE#11)
POH with remaining tubing and washpipe. Pick up 4 5/8" bit and RIH to 9226' KB. Rig up power swivel and ream out cement to top of fish at 9355' KB. Circulate hole clean. POH with tubing and bit. Pick up washover mill, 245' washpipe, jars and bumper sub and RIH to 9355' KB. Rig up power swivel and washover fish to 9460' KB. Fine ground cement returns. (165,250)
- 84-04-15 (17) POH with washpipe.
Washover fish to 9600' KB. Circulate clean. POH with tubing and washpipe. Pick up tubing cutter and grapple and RIH with tubing. Made cut at 9572' KB. POH and lay down 7 joints tubing and 2 cut off stubs. RIH with washover mill and washpipe to 9600' KB. Washover fish to 9745' KB. No progress in 20 mins. Should be at top of cement stinger. Circulate hole clean. (170,790)
- 84-04-16 (18) Drilling on cement retainer.
POH with tubing and washpipe. Pick up overshot. RIH and latch fish at 9572' KB. POH with tubing and overshot and recovered 6 joints tubing and retainer stinger. Pick up 4 5/8" bit, six 3 1/2" drill collars. RIH and tag cement at 9745' KB. Drill through cement to 9885' KB. Pressure test upper perms to 2000 psi. Held O.K. Run down and tag cement at 10,051' KB. Drill through cement and tag retainer at 10,056' KB. Drill on retainer. (176,150)
- 84-04-17 (19) Rigging out Schlumberger. (GAMACHE # 11)
Drill out cement retainer and cement to 10,062'KB. Clean out to 10,177'KB. Circ hole clean. Pull tbg and lay down DC's. Pick up casing scraper and RIH to 10,177'KB. Work scraper from 8920 - 10,070'KB. PT csg to 2000 PSI. Held O.K. Displace hole to 3% KCL water. POH. Rig Schlumberger and run CBL-VDL-CCL and CET-CCL from PBD to 9200'KB. Made 2 passes with zero pressure and 2000 PSI (181,510)

AMERICAN HUNTER SOUZA # 1

- 84-04-18 (20) Lathrop Pull FWG plug. (GAMACHE #11)
Pick up Van gun assembly, firing head, 4' x 2 3/8" pup, 2 3/8" tubing release w/1.81" latch, 10' x 2 3/8" pup, 1.81 "F" nipple, 2 3/8" x 10' pup, 2 3/8" x 10' pup, 2 3/8" flow disc assembly, Brown Hughes M-1 packer, 2 3/8" x 2' pup, Baker EL-2 on-off tool w/1.875 profile w/blanking plug in place, 1 jt 2 3/8" tubing, RA Marker Collar, 6' pup and RIH w/ 2 3/8" tubing and space out pups. Position gun w/Schlumberger GR tool. Set packer in 9000# compression. Re-check position w/GR tool. Release and re-set packer @ 9924' KB w/gun positioned to perforate Lathrop formation intervals 10,035 - 10,045', 10,014' - 10,026', 9990 - 9999', 9975 - 9986', 9967 - 9971'. Pressure test packer to 500 psi. Held O.K. Remove BOP's and install wellhead. Rig Baker to pull FWG plug. (221,742)
- 84-04-19 (21) Lathrop Assemble guns. (GAMACHE#11)
Pull equalizing prong and Mandril from EL-2 profile @ 9920' KB. Drop detonating bar to fire guns. No positive indication of firing. Slight air blow up tubing. PT annulus. Circ hole @ 1.5 BPM @ 200 PSI. Indication of packer failure. Rig wireline and attempt to pull detonating bar. No success. Install BOP's. Unseat packer and POH. Top 3 sections of gun fired at low order detonation. Bottom 2 did not fire. Order new guns, install new FWG plug in EL-2 on-off connector. Redress packer.
- 84-04-20 (22) Lathrop Rig up braided line. (GAMACHE# 11)
RIH w/ new gun assembly, 2 3/8" x 10' pup, 2 3/8" x 4' pup, tubing release, 2 3/8" x 4' pup, 1.81 "F" nipple, 1 jt 2 3/8" tbg. Fill disc assembly, M-1 packer, 2 3/8" x 2' pup, EL-2 on-off tool with FWG plug in place, 1 jt 2 3/8" tubing, RA marker collar, 2 3/8" x 6' pup on 2 3/8" tubing. Position gun with Schlumberger. Set packer @ 9905' KB. Re-check depth with wireline. O.K. PT annulus to 500 PSI. O.K. Install wellhead. Rig Baker and pull equalizing prong from FWG plug. RIH and latch plug. Unable to pull plug. Attempt to shear from pulling tool. W/L parted @ surface. Fish wire and drop cutter bar to cut @ rope socket. Rig out slick line. (234,397)
- 84-04-21 (23) Lathrop Pulling tubing. (GAMACHE#11)
Rig up braided line. RIH and recover cutter bar. RIH and latch FWG plug. Jarred for 3 hrs. Unable to pull plug. Pulled out of rope socket and rig out braided line. Remove WH and install BOP's. Unseat packer. POH w/tubing and assembly. Dogs on FWG plug were broken. RIH w/open ended tubing to PBSD. Rig Howco N₂ unit and blow hole dry w/N₂. Start POH w/tubing. (247,898)

AMERICAN HUNTER SOUZA # 1

- 84-04-22 (24) Lathrop Swabbing. (GAMACHE#11)
0800 hrs (10 hrs S.l.). No measurable pressure on wellhead. Bleed off - very light gas flare to pit. Well dead. Pick up and RIH w/the following: 1.79 Otis "XN" nipple, 1 jt tubing, 1.87 Otis "X" nipple, 2 3/8" x 4' pup, M-1 packer, 2 3/8" x 2' pup, Otis tubing seal divider w/1.87 profile and 2 3/8" tubing to surface. Set packer @ 9902.6' KB w/XN nipple @ 9940.3'KB. Fill annulus w/3% KCL water and PT to 500 PSI for 30 mins. Held O.K. Rig to swab. IFL @ 8600'KB. Pulled 2 swabs to 9890' to recover 3 bbls mud and muddy water. FFL @ 9600'. S.l. @ 1400 hrs.
(260,310)
- 84-04-23 (25) Lathrop Swabbing. (GAMACHE#11)
0700 hrs (17 hrs S.l.) No measurable pressure on Wellhead. Rig to swab. IFL @ 8300'. Pulled 3 swabs over 9 hrs to recover 6 bbls water. No gas flow. Salinity by refractometer 9600 PPM. S.l. @ 1700 hrs.
(263,190)
- 84-04-25 (26) Lathrop Swab testing. (GAMACHE #11)
0700 hrs (14 hrs S.l.) No measurable pressure on wellhead. Rig to swab. IFL @ 8950'. Swab total of 6 bbls water throughout day. No gas flow. FFL @ 9875'. Total new fluid recovered 15 bbls. S.l. @ 1700 hrs.
(265,750)
- 84-04-26 (27) Lathrop Swab testing. (GAMACHE#11)
700 hrs 14 hrs S.l.) SITP 15 PSI. Bleed off gas head. Rig to swab. IFL @ 9500' KB. Swab a total of 3.1 bbls water throughout day. FFL @ 9800'KB. Total new water swabbed to date: 18.1 bbls. S.l. @ 1700 hrs.
(268,310)
- 84-04-27 (28) Lathrop Running tbg ostinger. (GAMACHE#11)
0700 hrs (14 hrs S.l.) SITP: 10 psi. Bleed off and rig to swab. IFL @ 9000'. Pull 2 swabs to recover 1 bbl water. FFL @ 9400'. Fill tbg w/ KCl water. Press tbg to 4500 psi. No feed. Remove wellhead and install BOP's. Unseat packer and POH w/ tubing and packer. Rig Schlumberger and set EZ drill cement retainer @ 9862'KB. SIFN.
(271 070)

AMERICAN HUNTER SOUZA # 1

- 84-04-28 (29) Lathrop Running tubing and packer. (GAMACHE #11)
Pick up stinger and RIH on 2 3/8" tubing. Stab retainer and Rig Howco and establish feed rate of 1 BPM @ 8200 PSI w/3 bbls water. Pull out of retainer and batch mix 50 sxs cement. Circ. to bottom and sting into retainer. Squeeze 6 bbls cement to perms to max. pressure of 9000 PSI. Bleed off to 4000 PSI and pull out of retainer. Backwash excess cement. Rig in N₂ unit and blow hole dry. POH w/ tubing and stinger. Rig Schlumberger and perforate the following w/4" csg gun @ 2 SPF: 9828 - 9832', 9821 - 9826', 9816 - 9819', 9798 - 9811', 9784 - 9791', 9768 - 9783', 9740 - 9752', 9723 - 9735', 9707 - 9712', 9698 - 9705'. Total of 172 shots. Slight air blow after perforating. S.l. well @ 2400 hrs. (298,353)
- 84-04-29 (30) Lathrop Swab testing. (GAMACHE#11)
0700 hrs (7 hrs S.l.) SIWHP 5 PSI. Bleed off gas head to pit. Pick up and RIH w/ the following" 1.79 Otis "XN" nipple, 1 jt 2 3/8" tubing, 1.875 Otis "X" nipple, 2 3/8" x 4' pup, Otis Permalatch packer, 2 3/8" x 2' pup, 1.87 tubing seal divider on 2 3/8" tubing. Set packer @ 9630' KB w/ "XN" nipple @ 9672.5 m, "X" nipple @ 9640.0' KB, tubing seal divider @ 9625.8' KB. Fill annulus and PT packer to 500 PSI for 30 mins. Held O.K. Rig to swab. IFL @ 6800' KB. Pulled 7 swabs over 3 hrs to recover 21 bbls gas cut water. FFL @ 9200'. Salt content by refractometer 9600 PPM. S.l. @ 1700 hrs. (304,127)
- 84-04-30 (31) Lathrop Swab testing. (GAMACHE #11)
0700 hrs no pressure on W.H. Rig to swab. IFL @ 3800' KB. Swab total of 34.7 bbls formation water throughout day. 9600 PPM salt by refractometer. Slight trace of gas breaking out of water. FFL @ 9400'. S.l. @ 1700 hrs. Total New Fluid Recovered: 55.7 bbls. (306,687)
- 84-05-01 (33) Lathrop Pressure test bridge plug. (GAMACHE #11)
0700 hrs SITP 5 PSI. Rig to swab. IFL @ 4300'. Pull 5 swabs to recover 18.5 bbls formation water. Total new fluid recovered: 74.2 bbls. Fill tubing and establish feed rate of 0.2 BPM @ 4000 PSI. Pressure bled to 2500 PSI in 3 mins. Unseat packer and POH. Rig Schlumberger and set bridge plug @ 9670' KB. SIFN. (309,247)

AMERICAN HUNTER SOUZA # 1

- 84-04-02 (34) Lathrop Circ. hole. (GAMACHE#11)
Press test BP to 5000 psi for 15 mins. Held OK. Rig Schlumberger and perforate intervals 9467 - 68 and 9351 -52 w/4" HSC csg qun @ 90 degrees phasing, Big hole charges @ 5 shots/interval. Pick up retrievable packer and RIH on 2 3/8 tbg. Circ hole to 3% KCL water. Set packer @ 9375'KB. Break circ down tbg @ 2500 psi. Attempt to circ down annulus w/no success. Re-establish circ down tbg @ 2.1 - 2.8 BPM @ 2500 - 3000 psi. Circ. hole for 6 hrs until clean. Recovered sand, shale, and cement. Unseat packer and pull above top perms. SIFN (314,687)
- 84-05-03 (35) Lathrop 0700 hours SIWHP: 1100 psi. Bleed off to recover 1/2 BBL water. Circ hole clean. POH w/ tbg & packer. Rig Schlumberger & set cement retainer @ 9460' KB. Pick up stinger & RIH w/tbg & stab into retainer & establish circ. Mix 50 sxs cement (13.3 BBLS slurry) & displace between 2 sets of perms w/KCl water @ 3.5 BPM @2800 psi. Pull out of retainer to 9210' KB & backwash excess cement. Pull tbg to 8960' KB & press up wellbore to 2000 psi. S.l. well. (334,129)
- 84-05-04 (36) Lathrop 0700 hours SIWHP: 1300 psi. Bleed off & POH w/tubing and stinger. Pick up 4 5/8" bit and drill collars and RIH to tag top of cement @ 9226'KB. Rig up power swivel and drill out cement and stringers to top of retainer @ 9460' KB. Circ hole clean. Press test upper perms to 2500 psi. Held O.K. SIFN. (337,289)

AMERICAN HUNTER SOUZA # 1

- 84-05-05 (37) Lathrop Running tubing.
0700 hrs SIWHP: 1350 psi. Bleed off to recover 1 bbl KCl water. POH w/ tubing & lay down DC's. Press test upper perms (9351-52) to 5000 psi. Press bled off to 4800 psi in 15 mins. Pick up bit & csg scraper & RIH to top of retainer @ 9460'KB. Reverse circ hole clean. POH w/ tbg & scraper. SIFN. (340 349)
- 84-05-06 (38) Lathrop RIH w/ seal assembly.
0700 hrs SIWHP: 600 psi. Bleed off water head & RIH w/ 2 3/8" tbg to 9457'KB. Rig up Howco N₂ unit & blow hole dry w/ N₂. POH w/ tbg. Rig Schlumberger and perforate Lathrop interval 9380-9423 w/ 4" HSC csg gun @ 2 SPF. Total of 86 shots. 5 min air blow after shooting lower 23' and 5 min air blow after shooting upper 20'. Pick up 1.79 Otis "XN" nipple, 2 3/8 x 10' pup, 2 3/8 x 4' pup, Otis permatrieve packer & set packer on W/L @ 9357'KB. "XN" nipple @ 9378'KB. SIFN. (360 690)
- 84-05-07 (39) Lathrop Swabbing.
0800 hrs no press on WH. RIH w/ Otis anchor seal assembly 6' x 2 3/8 pup, tubing seal divider w/ 1.875 "X" profile. Latch packer, space out and land dognut. Fill annulus w/ 150 bbis water & press test to 500 psi for 15 mins. Held OK. Rig to swab. IFL @ 8550'KB. Pulled 2 swabs from 9350 to recover 1.75 bbis water. FFL @ 9000'. S.l. @ 1600 hrs. No trace of gas. (363 609)
- 84-05-08 (40) Lathrop Swabbing.
0700 hrs SITP: 0 psi. Rig to swab. IFL @ 6460'KB. Pulled 9 swabs throughout day from 9350'KB to recover 12.5 bbis water. Trace of gas with swabs. FFL @ 8200'. Difficulty swabbing dry due to swab cups wearing out. Water salinity by refractometer 9600 ppm. Total new fluid recovered 14.25 bbis. S.l. @ 1700 hrs. (366 709)
- 84-05-09 (41) Lathrop Swabbing.
0700 hrs SITP: 25 psi. Rig to swab. IFL @ 6600' K.B. Pulled 9 swabs over 9 1/2 hrs from 9330' K.B. to recover 7.5 bbis water. Trace of gas w/ swabs. FFL @ 8600' K.B. S.l. @ 1700 hrs. New fluid recovered: 21.75 BBLS. (369,809)
- 84-05-10 (42) Lathrop Swabbing.
0700 hrs SITP: 10 psi. Bleed off and rig to swab. IFL: 7920'KB. Pulled 5 swabs over 10 hrs from 9330'KB to recover 3.75 bbis water. FFL @ 9000'KB. Total new fluid recovered 25.5 bbis. S.l. @ 1700 hrs. (372,709)

AMERICAN HUNTER SOUZA # 1

- 84-05-11 (43) Lathrop Pull tubing.
0730 hrs no measurable pressure on wellhead. SICP remaining @ 170 psi. Bleed off annular pressure. Fluid at surface. Re-test to 500 psi. No leak off. Rig to swab. IFL @ 7920'KB. Swab total of 3.75 bbis water throughout day. FFL @ 9100'KB. Total new fluid swabbed: 29.25 bbis. Fill tubing with KCl water. Pressure tubing to 4500 psi. Annular pressure started increasing indicating we have broken down cement between main perms and upper squeeze perms @ 9350-51'. Bleed off pressure and prepare to pull tubing. (375,709)
- 84-05-12 (44) Lathrop Cement squeeze.
Pull anchor seal assembly from packer & POH. RIH w/ packer releasing stinger to top of packer. Circ hole, latch packer & unseat & POH w/ packer and tailpipe. Rig Schlumberger & set EZ drill cement retainer @ 9340'KB. PT to 3000 psi. Pick up stinger & RIH w/ 2 3/8" tbg. SIFN. (384 509)
- 84-05-13 (45) Lathrop Perforating.
Sting into retainer @ 9340'KB. Est. feed rate of 1 BPM @ 5800 psi. Pull out of retainer. Mix 50 sxs cement - total of 10 bbis slurry - circ cement to bottom of tbg & sting into retainer. Pump 5 bbis slurry @ 1 BPM @ 6100 psi. Stage squeeze 1 bbl slurry to standing pressure of 6500 psi. Pull out of retainer and backwash excess slurry. Rig Howco N₂ unit & blow hole dry w/ N₂. POH w/ tbg. (394 649)
- 84-05-14 (46) Lathrop Pulling tbg & packer.
Rig Schlumberger & perforate Lathrop intervals 9192-9199, 9182-9185, 9159-9176'KB w/ 4" HSC csg gun @ 2 SPF. Total of 57 shots. Weak air blow after shooting 9192-99 & 9182-85 and fair blow after shooting 9159-9176. Pick up tailpipe & packer & RIH on 2 3/8" tbg. Attempt to set packer several times without success. Start POH w/ tbg & packer. (402 349)
- 84-05-15 (47) Lathrop Swabbing
0700 hrs (13 hrs S.I.) Well head press: 40 psi. Bleed off pressure w/ lazy 2 - 3' flare. POH w/ remaining tbg and packer. Re-dress pkr & RIH w/ 1.79 "XN" nipple, 1 jt 2 3/8 tbg, 1.87 "X" nipple, 2 3/8 x 4' pup, OTIS premalatch packer, 2 3/8 x 6' pup, On - Off tool w/ 1.87 "X" profile on 2 3/8 tbg. Set packer @ 9081' w/ "XN" nipple @ 9123', X nipple @ 9091', and On-Off tool @ 9073'KB. Fill annulus w/ 80 bbis KCL water & press test packer to 500 psi. Held OK. Rig to swab. IFL @ 4850' KB. Pulled 7 swabs over 4 hrs. to recover 16 bbis water. FFL @ 8500'KB. Trace of gas w/ swabs. S.I. @ 1700 hrs. (407,854)

AMERICAN HUNTER SOUZA # 1

- 84-05-16 (48) Lathrop Swabbing
0700 hrs SITP: 300 psi. Bleed off gas head. Rig to swab. IFL @ 2060' KB. Pulled 14 swabs over 10 1/2 hrs to recover 46 bbls water. Trace of gas with swabs. No gas flow after swabs. FFL @ 8000' KB. S.l. @ 1700 hrs. Total new fluid recovered: 62 bbls.
(414,154)
- 84-05-17 (49) Lathrop Swabbing
0700 hrs SITP: 145 psi. Bleed off and rig to swab. IFL @ 3000' KB. Pulled 16 swabs over 10 1/2 hrs from 9050' to recover 38.2 bbls water. Trace of gas with swabs. No after flow. FFL @ 7900'. S.l. @ 1800 hrs. Total new fluid recovered: 100.2 bbls.
(414,354)
- 84-05-18 (50) Lathrop Pull packer.
SITP 120 psi. SICP 100 psi. Pressure annulus to 500 psi for 15 mins. Bled annulus down to 175 psi. Bled off tubing. Rig to swab. Fluid level at 3300 ft. Pulled 16 swabs over 10 hrs to 9050 ft to recover 38.85 bbls of gassified water. No gas after swabs. Final fluid level at 8400 ft. New fluid recovered 138.85 bbls. Shut in at 1800 hrs.
(417,454)
- 84-05-19 (51) Lathrop Set packer. (GAMACHE #11)
0700 SITP 150 psi. SICP 150 psi. Bled off tubing. Fill tubing with 16 bbls 3% KCl water. Unseat packer. Circulate hole. Pull and lay down 85 joints of tubing. POH. Lay down packer. Rig Schlumberger. Set Halliburton bridge plug at 9145 ft. Pressure test plug to 3500 psi for 20 mins. Held good. Perforate intervals 6552-6553' and 6410-6411' at 4 SPF with 4" HSC gun using 22 gm charges. RIH with packer to 6329'.
(426,454)
- 84-05-20 (52) Pull packer. (GAMACHE #11)
0700 SITP and SICP 640 psi. Bled off. Circulate with 3% KCl. Well flowing. Mix 200 bbls 7% KCl. Displace hole. RIH and set packer at 6425'. Squeeze 10 bbls down annulus at 1/2 BPM at 2200 psi with no returns. Squeeze 12 bbls down tubing at 3/4 BPM at 2200 psi with no returns.
(431,554)
- 84-05-21 (53) Cement squeeze. (GAMACHE #11)
0700 SITP 580 psi. SICP 380 psi. Bled off. Unseat packer. Pull 2 joints. Circulate hole. POH. Lay down packer. Rig Schlumberger. Set Halliburton EZ-SV cement retainer at 6545'. RIH with stinger on 2 3/8" tubing and set into retainer.
(438,954)

AMERICAN HUNTER SOUZA # 1

84-05-22 (54)

W.O.C. (GAMACHE #11)
0700 SITP 400 psi. SICP 100 psi. Bled off.
Rig Halliburton. Establish feed rate down tubing
at 1/2 bbl/min at 3600 psi with 3 bbls. Pull
out of retainer. Mix 50 sxs oilwell class "G"
cement plus additives. Slurry volume 10 bbls.
Circulate to bottom. Stage squeeze 7 bbls to
formation to standing pressure of 2250 psi.
Pull out of retainer. Backwash excess cement.
Pull to 6398'. Establish feed rate into
perforations at 6410-6411' at 1/2 bbl/min at
2100 psi. Mix 50 sxs of same cement as above.
Slurry volume 10 bbls. Circulate cement to bottom.
Pull tubing to 5775'. Stage squeeze 8 bbls to
2200 psi. Shut in on squeeze at 1600 hrs. (445,754)

84-05-23 (55)

Pull tubing.
WOC. SIP 1950 psi at 1800 hrs.
(448,454)

84-05-24 (56)

Finish pulling tubing.
0700 hrs. SIP 1800 psi. Bleed off. POH. RIH with bit and
drill collars on 2 3/8 tubing. Tag cement @ 6338 feet. Drill
out cement and clean out to top of retainer at 6545 feet.
Circulate clean. Pressure squeeze to 2000 psi for 20 minutes.
Hold good. POH. SDFN with 10 joints of tubing and drill collars
and bit left to lay down.
(451,454)

84-05-25 (57)

Pick up tubing.
Finish POH. Lay down drill collars. Unload new 2 3/8" N80
EUE tubing. RIH with bit and scraper. Tag top of retainer.
POH laying down tubing. Lay down bit and scraper. Pick
up and run 130 joints new tubing.
(454 554)

84-05-26 (58) Moreno

Fishing casing gun.
Continue running in hole with new tubing.
Land tubing at 6543'. Displace to nitrogen.
POH. Rig Schlumberger. RIH with 4" HSC csg
gun with 25' at 2 SPF. Log gun into position
to cover interval 6466-6491'. Shot interval
6491-6481' with good kick. Gun did not appear
to fire over interval 6481-6466'. Tool stuck.
Worked for 1 hour. Pulled line off at gun.
POH. Bottom of line covered with cement, colored
material. Ordered out fishing tools. RIH w/
grapple overshot with jars and bumper sub on tbg.
Took weight at 6245'. Worked down and latch onto
fish at 6462'. Unable to hold onto latch onto
fish. Pull 20 jts. Pump 32 bbls down tubing.
SDFN. (458,554)

AMERICAN HUNTER SOUZA # 1

- 84-05-27 (59) Moreno Run packer.
0700 SIP 50 psi. Circulate out sand and mud from 6245' to top of fish at 6461'. Latch onto fish and pull loose with 8000 lbs. POH. Lay down fishing tools and perforating gun. Gun had completely fired. RIH with tubing to 6545'. Circulate clean with 7% KCl water. POH. RIH w/ 1.79 "XN" nipple + 1 joint tubing + 1.875 "X" nipple + 4' pup joint + Perma-latch packer + 6' pup + 1.875 on-off tool on 105 joints tubing. SDFN.
(497,045)
- 84-05-28 (60) Moreno Swabbing.
0730 SIP zero. RIH with packer. Unable to set packer. POH. Lay down packer. RIH w/ 1.79 "XN" nipple + 1 joint tubing + 1.875 "X" nipple + 6' pup joint + Guiberson Uni-V packer on 2 3/8" tubing. Set packer at 6367' with XN nipple at 6408'. Land tubing in dognut. Pressure annulus to 1000 psi. Held good. SDFN. Temp. 95 °F.
(504,115)
- 84-05-29 (61) Moreno Swab test
0830 SITP 50 psi. Rig to swab. Fluid level at surface. Pull 13 swabs over 4 1/2 hrs to 6300 feet to recover 28.8 bbls. Final fluid level at 5500 feet. Runs 9 to 13 had swab problems due to heavy drilling mud. Gas blow after swabs 9 to 13. New fluid 2.8 bbls. RIH with sinker bars to 6000 feet. POH. Tools covered with heavy drilling mud and sand. SDFN at 1630 hrs
(506,915)
- 84-05-30 (62) Moreno Run coiled tubing.
0730 SITP 480 psi. Bled off. Rig to swab. RIH and tag fluid. Level at 5500'. Unable to go deeper. Pump in 3 bbls KCl water. RIH with swab bar and work bar from 5000 to 6300'. Pull 3 swabs to 6000'. Final fluid level at 5900'. RIH with sinker bars to 6500'. POH. Tools covered with viscous drilling mud. Pulled 5 dry swabs. SI.
(510 915)

AMERICAN HUNTER SOUZA # 1

84-05-31 (63) Moreno

Swabbing
0700 hrs SITP: 380 psi. Bleed off & rig in OTIS coiled tbg unit RIH to 6540' KB while pumping N₂. Very little fluid returns. Nitrogen appears to be by-passing fluid. Pull coiled tbg to 5000' & fill hole w/ KCL water. Break circ w/ KCL water & clean out to 6540' KB until clean returns. Rec'd approx. 5 bbis thick mud with traces of sand. Pull coiled tbg to 6493' & spot 500 gal 15% MCA to perms. Pull coiled tbg & squeeze acid to perms @ 2.5 BPM @ 2450 psi. ISIP: 1750 psi bleeding to 1250 psi in 15 min. Open well to tank to recover 1.5 bbis KCL water in 30 mins. Leave open to tank w/ slight flow of water. (521,430)

84-06-01 (64) Moreno

Swabbing
0700 hrs rig to swab. IFL @ surface. Pulled 13 swabs over 9 1/2 hrs. from 6300' to recover 26.5 bbis KCL water and acid water. FFL @ 6000'. Waited 1 hr between swabs 9 and 13. Fair gas blow after swab #12. No blow after swab 13. S.l. @ 1700 hrs. LFLTR: 9.7 bbis.

(525,180)

84-06-02 (65) Moreno

Swabbing.
0700 hrs SITP: 240 psi. Bleed off and rig to swab. IFL @ 4800'. Pull 5 swabs over 2 hrs from 6300' to recover 4.25 bbis fluid. Good gas blow after 5th swab. Unable to get past 5200' on swab #6. RIH w/ sinker bar and unable to get past 5200'KB. Fill hole w/ KCl water. Unseat packer and reverse circ hole clean to bottom @ 6545'KB. Recover thick mud with sand and silt. Reset packer @ 6367' with tailpipe @ 6408'KB. Press test packer to 1000 psi for 15 mins. Held OK. Rig to swab. Pull 4 swabs to recover 13.75 bbis KCl water. LFLTR: 13 bbis. SI @ 1945 hrs.

(528 530)

84-06-03 (66) Moreno

Swabbing.
0700 hrs SITP: 340 psi. Blow down and rig to swab. IFL @ 2700'KB. Pull 9 swabs throughout day from 6000' to recover 16.5 bbis fluid. Good gas blow after swab #3. Unable to get past 4700' on swab #4. Pump 3 bbis KCl water down tbg & work sinker bar from 4000-6000'. Re-run swab. Recovering very thick muddy fluid. FFL @ 4900'. S.l. @ 1700 hrs. New fluid recover: 3.5 bbis.

(GAMACHE #11)

(531,830)

AMERICAN HUNTER SOUZA # 1

84-06-04 (67) Moreno

Swabbing (GAMACHE #11)
0730 hrs SITP: 650 psi. Blow down & rig to swab. IFL @ 3900'. Unable to get down w/ swab and sinker bar. Pump 3 bbls KCl water down tbg & work sinker bar from 3900-6300'. Re-run swab. Recovered 7 bbls fluid in 4 runs. Fluid gassy w/ after blow. Unable to get down on swab #7. Pump 6 bbls KCl water down tbg. Unseat packer & circ hole w/ 2% KCl water to 6520'KB to recover heavy mud. Re-set packer @ 6376'KB. Press test packer to 1000 psi for 15 mins. Held O.K. Rig to swab. Pulled 5 swabs to recover 15.5 bbls KCl water. FFL @ 3600'. S.l. @ 1830 hrs. New fluid recovered prior to filling hole 7.5 bbls.

(534,830)

84-06-05 (68) Moreno

Swabbing.
0700 hrs SITP: 400 psi. Bleed off & rig to swab. IFL @ 2700' Pull 5 swabs over 2 hrs to 5500' to recover 10 bbls KCl water & mud. Unable to get past 5500'. Pump 10 bbls KCl water down tbg. Unseat packer and rig to swab. Pull 21 swabs over 8 hrs to recover 90 bbls. KCl water, mud and sand. Mud is dark grey with sand in suspension. Wt. 11.9 #/gal. FFL @ 5200'. S.l. @ 1900 hrs. LFLTR: 29 bbls.

(537,645)

84-06-06 (69) Moreno

Rig N₂ unit
0700 hrs SITP: 95 psi, SICP: 115 psi. Bleed off tbg & rig to swab. IFL @ 4600'. Pull 6 swabs over 2 hrs to 6300' to recover 15 bbls muddy water w/ trace of sand. FFL @ 5600' very little gas. Pump 10 bbls KCl water down csg annulus. New FL @ 5000'. Pull 14 swabs over 7 hrs from 6300' to recover 15 bbls muddy water. RIH w/ sinker bar to 6540'. No fill. FFL @ 5800'. Very little gas S.l. @ 1700 hrs. LFLTR: 9 bbls

(540,305)

AMERICAN HUNTER SOUZA # 1

84-06-07 (70) Moreno

Displace hole with N₂
0700 SICP: 245 psi, tbg press 0 psi (tbg left open for nite). RIH w/ swab to tag fluid @ 5700'KB. Lower tbg to 6498'. Rig N₂ & reverse circ hole to recover 7 bbls heavy mud and sand. Continue pumping N₂ w/ no fluid recovery. Pull up & set packer so tailpipe at 6408'. Inject 20000 SCF N₂ to formation to 4500 psi. ISIP 4400 psi bleeding to 3100 psi in 15 mins. Open on 1/4" choke and recovered large amounts of sand. Tubing plugged off. Fill annulus w/ KCl water. Release packer and reverse circ hole with water. Recover 5 bbls heavy mud & sand. Re-set packer. Pull 2 swabs and flared gas for 30 mins with fair gas blow and tbg plugged off. Release packer & reverse w/ N₂ to recover 3 bbls heavy mud and sand. Ran out of N₂. Set packer. Swab water from tbg. Good gas blow for 15 mins then tbg plugged off again. Left tbg open to tank for nite. New fluid recovered to date 6 bbls.
(543 670)

84-06-08 (71) Moreno

Circulate hole w/ N₂
Tubing unloaded 5 bbls mud & sand @ 0400 hrs. Faint blow of gas. RIH w/ sinker bar & unable to pass 100'KB. Unseat packer & reverse hole w/ N₂ to recover 5 bbls mud & sand. Lower tbg to 6490'KB & reverse out 2 bbls mud w/ N₂. Set packer @ 6458' & pump 50 MCF N₂ to perfs @ 4500 psi. Open to flow on 1/8" choke @ 1120 hrs. Pressure dropping steadily w/ trace of gas mixed w/ N₂. At 1800 hrs TFP 180 psi. Open on 1" choke. Well periodically died & flowed muddy water till 2300 hrs. S.l. @ 2300 hrs. Approx. new fluid rec'd today: 17 bbls.
(555 941)

AMERICAN HUNTER COMPLETION REPORTS

AHEL SOUZA #1 - FRESNO COUNTY, CALIFORNIA

(GAMACHE #11)

84-06-09 (72) Moreno

SI for B.U.
0700 hrs SITP: 614 psi (8 hrs S.l.) Blow down on 1" choke for 2 hrs to recover approx. 3 bbls watery mud & sand with trace of condensate. S.l. for 1 hr. Tbg built to 155 psi. Blow down on 1" choke unseat packer and reverse hole w/ N₂ to recover 2 bbls watery mud. Reset packer leaving 960 psi N₂ pressure on annulus. Leave tbg open on 1" choke. TFP less than 10 psi, est. rate 50-75 MCFD. S.l. @ 1330 hrs & record surface B.U. pressure as follows:

30 mins - 120 psi	9 hr - 585 psi
1 hr - 190 psi	10 hr - 630 psi
2 hr - 275 psi	11 hr - 675 psi
3 hr - 310 psi	12 hr - 690 psi
4 hr - 390 psi	13 hr - 730 psi
5 hr - 445 psi	14 hr - 750 psi
6 hr - 490 psi	15 hr - 790 psi
7 hr - 530 psi	16 hr - 800 psi
8 hr - 550 psi	17 hr - 820 psi
	18 hr - 840 psi

(559 286)

84-06-10 (73) Moreno

Running tbg. (GAMACHE #11)
Well S.l. total of 19.5 hrs. SITP: 890 psi. Blow down on 1" choke. No fluid recovered. Unseat packer & blow hole around w/ annular N₂ pressure. No fluid recovered. Reverse circ hole w/ 2% KCl water. POH w/ tbg. Rig Schlumberger & set EZ Drill BP @ 6400.7'KB. PT to 2500 psi. Held OK. (562 251)

84-06-11 (74) Moreno

RIH w/ overshot. (GAMACHE #11)
RIH w/ tbg to 6400'. Rig Howco & blow hole dry w/ N₂. POH w/ tbg. Rig Schlumberger & position gun to shoot 6315-6330'KB. Pressure csg to 1000 psi w/ N₂. Gun misfired. Reposition gun and shoot interval 6310-6315' @ 4 SPF. Unable to pull gun free. Bleed off pressure and gun pulled free. Gun covered w/ mud. Had small trace of gas at surface. Re-run gun and shoot interval 6315-6330' @ 4 SPF. Gun blew uphole and sheared off line leaving gun in hole. Gas blow increased after shooting 6315-6330'. Flow well up casing on 1/8" prover plate. Well died off in 1 hour. S.l. (574 086)

AMERICAN HUNTER COMPLETION REPORTS

HEL SOUZA #1 - FRESNO COUNTY, CALIFORNIA

(GAMACHE #11)

- 84-06-12 (75) Moreno Running Overshot
0700 hrs SITP: 15 psi. Bleed off to 0 psi. Pick up
overshot & RIH on 2 3/8 tbg. Tag obstruction @ 6250' KB
POH. No fish. Re-run overshot & circ. w/ KCL water to
6314' KB. Recovered mud & sand. POH. No Fish.
Recovered strands of wire. RIH w/ barbed spear. POH, no fish
(578,813)
- 84-06-13 (76) Moreno Running tbg.
0800 hrs no press on WH. RIH with concave mill & mill
over fish to cut line. Circ bottoms up. Recover pieces
of electric line and gassy fluid. POH w/ tubing. Pick
up overshot & RIH w/ 60 jts tbg. S.l. well to change
out drilling line. (581 539)
- 84-06-14 (77) Moreno Clean up well.
RIH w/ overshot. Attempt to latch fish without success.
POH & recover pieces of wire. RIH w/ overshot & jar
down onto fish. POH w/ fish. RIH w/ Otis "XN" nipple,
1 jt tbg, Otis X nipple & reverse circulation hole w/
2% KCl water to PBTD @ 6400' to recover mud & sand.
Reland tbg @ 6285'. Rig in N₂ & displace hole with
nitrogen. Open well to tank @ 2100 hrs. (589 222)
- 4-06-15 (78) Moreno Clean up well.
0700 Gas TSTM. SICP 15 psi. Blow down with nitrogen.
Recovered trace of mud. Displace 60,000 ft³ nitrogen
into formation at 3700 SCF/min at 3800 psi. ISIP 3750 psi
bleeding to 3510 psi in 15 mins. Bled down tubing. No
flow from tubing when annulus pressure down to 250 psi.
No formation gas. Bled off annulus. Unable to lower
tubing. Pull 4 joints tubing with 40,000 lbs over string
weight. Fill hole with KCl water. Clean out to 6350'.
Unable to go deeper. PBTD at 6400'. Steady gas to
surface while reversing out sand, mud and drill cuttings.
Land tubing at 6100'. Displace with nitrogen. Inject
10,000 ft³ to formation at 3600 psi. Open on 1 inch
choke. No fluid recovered. Tubing plugged off with
400 psi on annulus. Pressure annulus to 2500 psi. No
flow. Left tbg open for night. (592 402)

AMERICAN HUNTER COMPLETION REPORTS

LAHEL SOUZA #1 - FRESNO COUNTY, CALIFORNIA

84-06-21 (84)

Well plugged and abandoned. (GAMACHE # 11)
Remove BOP's and tubing spool. Cut off 9 5/8 and 5 1/2 casings
6' below ground. Weld plate on casings. Dug out conductor pipe
and fill cellar. Rig out rig. Transfer 231 jts tubing, packers
and nipples to R&R Transport and transfer wellhead and casing
bowl to Gray tool. Clean up location. Well abandoned.
FINAL REPORT. (641,000)

DRILLING HISTORY

AMERICAN HUNTER/SOUZA #1 SW 1/4, SE 1/4, SEC 36, T14S, R12E MDB & M FRESNO CO CALIFORNIA

83-12-06 (32)	9778 Ft. Lathrop	POH w/DST # 8 Progress: Nil DST # 7: 9694' - 9777' (L/Lathrop) Times: 10/60 VO: 45 mins - lost packer seat - Misrun Used and rec. 3000' water cushion 1500' gas cut drlg. mud. PF 1380 PSI IHP 5461 PSI ISIP 5590 PSI IF 1398 PSI 5238 1586 Leaking at end. BHT - 227 ° F.	(MONT. 19) (497,424)
83-12-07 (33)	9819 Ft Lathrop	Cut Core # 3 Progress: 41 Ft. CORE #3: Results to follow. DST # 8: 9652' - 9778' (L/Lathrop) Used 3000' water cushion, lost packer seat immed. on preflow MISRUN. Rec: 3000' water cushion 793' gassy cut mud. IHP 5498 PSI 5350 Trip gas after 8 mins was 9300 units.	(MONT. 19) (512,923)
83-12-08 (34)	10,000 Ft Lathrop	Drilling. Progress: 181 Ft. CORE # 3: 9778' - 9838' (L/Lathrop) Cut 60 Ft Rec. 60 ft	(MONT. 19) (535,256)
83-12-09 (35)	10,217' TD Lathrop	Rig to log. Progress: 217 Ft. 10,217' - 4 3/4°	(MONT. 19) (546,571)
83-12-10 (36)	10,217 Ft Lathrop	Logging. Progress: Nil	(MONT. 19) (554,104)
83-12-11 (37)	10,217 Ft Lathrop	Side cores. Progress: Nil	(MONT. 19) (564,676)
83-12-12 (38)	10,217 Ft Lathrop	Lay down drill string. Progress: Nil	(MONT. 19) (619,742)

WELL SUMMARY REPORT

Attachment #3

Souza #1 - Fresno County, California

ELECTRICAL LOGS

<u>DATE</u>	<u>RUN NO.</u>	<u>HOLE DEPTH</u>	<u>LOGS RUN</u>
<u>Drilling Depth - 7332 ft.</u>			
Nov. 19/83	1	145 - 7257'	BHCS
Nov. 19/83	1	1709 - 7298'	DI-SFL
Nov. 19/83	1	145 - 7301'	LD-CN
<u>Drilling Depth - 10,217 ft.</u>			
Dec. 8/83	2	5900 - 10171'	BHCS
Dec. 8/83	2	1709 - 10137	NGR
Dec. 8/83	2	5900 - 10206	DI-SFL, DI-Linear Correlation Log
Dec. 8/83	2	5900 - 10203	LD-CN, Down Mud Log
Dec. 8/83	2	1709 - 10208	Dipmeter
Dec. 8/83	2	2400 - 10170	Microlog
Dec. 8/83	2	1709 - 10165	Electromagnetic Propagation Log
<u>Drilling Depth - 10,177 ft.</u>			
Apr. 3/84	1	2400 - 10149	CBL w./Neutron Waveforms
Apr. 3/84	1	2400 - 10149	CBL w./Neutron Variable Density
Apr. 4/84	2	2400 - 10149	CBL(B.I. + Waveforms)
Apr. 4/84	2	2400 - 10149	CBL(Amplitude + VDL)
Apr. 4/84	3	2400 - 10154	Acoustic Caliper Log w./Gamma Ray
Apr. 4/84	3	2400 - 10154	Cement Evaluation Log w./Gamma Ray
Apr. 4/84	4	2400 - 10153	Thermal Neutron Decay Time Log
Apr. 5/84	1	2400 - 10137	CNL
Apr. 10/84	1	8000 - 9800 (Depth-Driller 9800')	Free Point Indication Log
Apr. 14/84	4	2400 - 10153	TDT Quicklook
Apr. 16/84	3	9195 - 10150	CB-VD Waveforms
Apr. 17/84	3	9196 - 10150	Cement Evaluation Log/Acoustic Calipers

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AMERICAN HUNTER EXPLORATION, LTD

Well: SOUZA #1
Field: Wildcat
Drillings Fluid: Gel-Chem

State: California
County: Fresno
Location: Sec 36-T14S-R12E

Date: 01 Jan 1984
ITCS File #: 423
Elevation: 451.8 KB

019-21924

DEAN-STARK PLUG ANALYSIS

Sample Number	Depth (feet)	Permeability		OB Perm 4500 PSI (md)	Porosity (%)		Saturation (%)		Grain Density (gm/cc)	Lithology
		Horz (md)	Vert (md)		Oil (%)	H2O (%)				
1	9159.0-60.0	3.7	2.6	0.36	14.5	8.8	61.8		2.65	Sd,vf-ms,slty,mic
2	9160.0-61.0	3.7	2.8	1.6	14.0	6.3	68.3		2.65	Sd,vf-ms,slty,mic
3	9161.0-62.0	2.0	1.7	0.78	13.5	4.4	71.6		2.65	Sd,vf-ms,slty,mic
4	9162.0-63.0	0.88	0.81	0.39	13.6	0.0	77.7		2.65	Sd,vf-fs,slty,mic
5	9163.0-64.0	2.0	1.3		14.1	0.0	72.8		2.65	Sd,vf-ms,slty,mic
6	9164.0-65.0	1.2	0.41		14.6	0.0	82.0		2.66	Sd,vf-fs,slty,mic
7	9165.0-66.0	1.5	0.82		14.0	0.0	74.0		2.65	Sd,vf-fs,slty,mic
8	9166.0-67.0	2.1	1.0		14.7	0.0	78.1		2.65	Sd,vf-fs,slty,mic
9	9167.0-68.0	3.8	1.9	1.8	15.0	0.0	74.4		2.65	Sd,vf-ms,slty,mic
10	9168.0-69.0	4.0	2.9		15.5	0.0	77.0		2.65	Sd,vf-ms,slty,mic
11	9169.0-70.0	2.9	2.0		14.9	0.0	76.4		2.65	Sd,vf-ms,slty,mic
12	9170.0-71.0	0.69	0.07		13.5	0.0	81.7		2.69	Sd,vf-fs,slty,mic,sl/shy
13	9171.0-72.0	2.6	1.8	1.3	15.0	0.0	79.3		2.65	Sd,vf-ms,slty,mic
14	9172.0-73.0	1.2	0.80		13.7	0.0	79.1		2.66	Sd,vf-ms,slty,mic
15	9173.0-74.0	1.5	1.2	0.53	13.5	0.0	77.6		2.65	Sd,vf-ms,slty,mic
16	9174.0-75.0	1.2	0.84		13.0	0.0	79.1		2.65	Sd,vf-ms,slty,mic
17	9175.0-76.0	0.01	<0.01		1.8	0.0	83.2		2.72	Sd,vf,lm,slty,mic

LATHROP FORMATION

1	9159.0-60.0	3.7	2.6	0.36	14.5	8.8	61.8		2.65	Sd,vf-ms,slty,mic
2	9160.0-61.0	3.7	2.8	1.6	14.0	6.3	68.3		2.65	Sd,vf-ms,slty,mic
3	9161.0-62.0	2.0	1.7	0.78	13.5	4.4	71.6		2.65	Sd,vf-ms,slty,mic
4	9162.0-63.0	0.88	0.81	0.39	13.6	0.0	77.7		2.65	Sd,vf-fs,slty,mic
5	9163.0-64.0	2.0	1.3		14.1	0.0	72.8		2.65	Sd,vf-ms,slty,mic
6	9164.0-65.0	1.2	0.41		14.6	0.0	82.0		2.66	Sd,vf-fs,slty,mic
7	9165.0-66.0	1.5	0.82		14.0	0.0	74.0		2.65	Sd,vf-fs,slty,mic
8	9166.0-67.0	2.1	1.0		14.7	0.0	78.1		2.65	Sd,vf-fs,slty,mic
9	9167.0-68.0	3.8	1.9	1.8	15.0	0.0	74.4		2.65	Sd,vf-ms,slty,mic
10	9168.0-69.0	4.0	2.9		15.5	0.0	77.0		2.65	Sd,vf-ms,slty,mic
11	9169.0-70.0	2.9	2.0		14.9	0.0	76.4		2.65	Sd,vf-ms,slty,mic
12	9170.0-71.0	0.69	0.07		13.5	0.0	81.7		2.69	Sd,vf-fs,slty,mic,sl/shy
13	9171.0-72.0	2.6	1.8	1.3	15.0	0.0	79.3		2.65	Sd,vf-ms,slty,mic
14	9172.0-73.0	1.2	0.80		13.7	0.0	79.1		2.66	Sd,vf-ms,slty,mic
15	9173.0-74.0	1.5	1.2	0.53	13.5	0.0	77.6		2.65	Sd,vf-ms,slty,mic
16	9174.0-75.0	1.2	0.84		13.0	0.0	79.1		2.65	Sd,vf-ms,slty,mic
17	9175.0-76.0	0.01	<0.01		1.8	0.0	83.2		2.72	Sd,vf,lm,slty,mic

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CALIFORNIA

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AMERICAN HUNTER EXPLORATION, LTD
Well: SOUZA #1

Date: 01 Jan 1984

TTCOS File #: 423

DEAN-STARK PLUG ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Permeability Vert (md)	OB Perm 4500 PSI (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
18	9176.0-77.0	<0.01	0.01		1.4	0.0	86.8	2.71	Sd,vf,s,lmy,slty,mic
19	9177.0-78.0	1.5	0.26		13.2	0.0	79.9	2.65	Sd,vf-mg,slty,mic
20	9178.0-79.0	0.56	0.35	0.15	12.3	0.0	78.9	2.65	Sd,vf-fg,slty,mic,sl/lmy
21	9179.0-80.0	0.64	0.40		13.5	0.0	82.8	2.65	Sd,vf-fg,slty,mic
22	9180.0-81.0	1.2	2.2		14.3	0.0	79.0	2.65	Sd,vf-fg,slty,mic,sl/lmy
23	9181.0-82.0	2.0	1.5		14.4	0.0	76.1	2.64	Sd,vf-mg,slty,mic
24	9182.0-83.0	2.1	1.5		14.0	0.0	75.4	2.64	Sd,vf-mg,slty,mic
25	9183.0-84.0	1.8	1.4		13.8	0.0	79.9	2.65	Sd,vf-mg,slty,mic
26	9184.0-85.0	0.87	0.78		12.6	0.0	77.9	2.65	Sd,vf-mg,slty,mic
27	9185.0-86.0	0.03	0.06		2.1	0.0	92.9	2.69	Sd,vf-fg,slty,mic,lmy
28	9186.0-87.0	0.31	0.34		8.6	0.0	93.0	2.66	Sd,vf-fg,slty,mic,sl/lmy
29	9187.0-88.0	0.12	0.09	0.02	13.4	0.0	82.2	2.65	Sd,vf-fg,slty,mic
30	9188.0-89.0	0.61	0.31		11.2	0.0	81.7	2.66	Sd,vf-fg,slty,mic
31	9189.0-90.0	0.10	0.18		7.2	0.0	92.3	2.67	Sd,vf-fg,slty,mic
32	9190.0-91.0	0.07	0.07		6.8	0.0	93.7	2.67	Sd,vf-fg,slty,mic
33	9191.0-92.0	0.84	0.72		11.4	0.0	74.0	2.65	Sd,vf-fg,slty,mic
34	9192.0-93.0	0.93	0.69		11.8	0.0	73.0	2.65	Sd,vf-fg,slty,mic
35	9193.0-94.0	0.25	0.13	0.05	11.2	0.0	83.4	2.68	Sd,vf-fg,slty,mic
36	9194.0-95.0	0.99	0.45		11.1	0.0	78.2	2.65	Sd,vf-mg,slty,mic
37	9195.0-96.0	1.4	1.1		12.4	0.0	77.5	2.65	Sd,vf-mg,slty,mic
38	9196.0-97.0	0.83	1.0		12.7	0.0	76.1	2.65	Sd,vf-fg,slty,mic
39	9197.0-98.0	1.4	1.5		13.5	0.0	76.1	2.65	Sd,vf-mg,slty,mic

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AMERICAN HUNTER EXPLORATION, LTD
Well: SOUZA #1

Date: 01 Jan 1984

TICS File #: 423

DEAN-STARK PLUG ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Permeability Vert (md)	OB Perm 4900 PSI (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
9198.0 - 9200.0									Shale
9200.0 - 9726.0									Drilled Interval
40	9726.0-27.0	0.43	0.33		12.4	0.0	72.4	2.65	Sd,f-ms,slty,mic
41	9727.0-28.0	1.0	1.1		12.1	0.0	82.7	2.64	Sd,f-ms,slty,mic
42	9728.0-29.0	1.3	1.4		11.7	0.0	79.7	2.63	Sd,f-ms,slty,mic
43	9729.0-30.0	1.7	1.7	0.12	12.1	0.0	85.3	2.63	Sd,f-ms,slty,mic
44	9730.0-31.0	0.49	0.41		12.0	0.0	79.9	2.64	Sd,f-ms,slty,mic
45	9731.0-32.0	1.0	0.79		12.1	0.0	80.6	2.63	Sd,f-ms,slty,mic
46	9732.0-33.0	1.2	0.97		11.8	0.0	82.8	2.64	Sd,f-ms,slty,mic
47	9733.0-34.0	0.05	0.05	< 0.01	12.2	0.0	75.0	2.67	Sd,f-s,slty,mic
48	9734.0-35.0	0.03	0.01		11.1	0.0	87.6	2.69	Sd,f-s,slty,mic,sl/shy
49	9735.0-36.0	0.08	0.06		11.7	0.0	86.5	2.66	Sd,f-ms,slty,mic
50	9736.0-37.0	0.21	0.03	0.01	12.9	0.0	84.8	2.66	Sd,f-ms,slty,mic
51	9737.0-38.0	0.12	0.12		12.3	0.0	85.0	2.66	Sd,f-ms,slty,mic
52	9738.0-39.0	5.5	5.1		13.0	0.0	84.1	2.62	Sd,f-cs,slty,mic
53	9739.0-40.0	4.8	4.4		13.1	0.0	84.0	2.62	Sd,f-cs,slty,mic
54	9740.0-41.0	4.7	6.3		13.1	0.0	85.1	2.62	Sd,f-cs,slty,mic
55	9741.0-42.0	7.4	6.1	0.59	12.6	0.0	86.1	2.60	Sd,f-cs,slty,mic
56	9742.0-43.0	9.0	6.0		13.2	0.0	81.2	2.62	Sd,f-cs,slty,mic
57	9743.0-44.0	5.8	6.2		12.4	0.0	82.8	2.62	Sd,f-cs,slty,mic
58	9744.0-45.0	5.3	4.5		12.5	0.0	82.8	2.62	Sd,f-cs,slty,mic
59	9745.0-46.0	3.4	3.3	0.17	12.1	0.0	85.4	2.62	Sd,f-cs,slty,mic

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AMERICAN HUNTER EXPLORATION, LTD
Well: SOUZA #1

Date: 01 Jan 1984

TICS File #: 423

DEAN-STARK PLUG ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Permeability Vert (md)	OB Perm 4900 PSI (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
60	9746.0-47.0	1.5	1.2		12.3	0.0	83.2	2.63	Sd,f-ms,slty,mic
61	9747.0-48.0	1.6	1.0		11.4	0.0	87.2	2.62	Sd,f-ms,slty,mic
62	9748.0-49.0	1.8	0.55		12.3	0.0	91.9	2.62	Sd,f-ms,slty,mic
63	9749.0-50.0	3.6	3.8		12.1	0.0	87.6	2.62	Sd,f-ms,slty,mic
64	9750.0-51.0	3.0	2.3		11.8	0.0	86.3	2.62	Sd,f-ms,slty,mic
65	9751.0-52.0	2.5	2.1		11.5	0.0	89.2	2.62	Sd,f-ms,slty,mic
66	9752.0-53.0	0.49	0.44	0.03	11.6	0.0	86.3	2.65	Sd,f-ms,slty,mic
67	9753.0-54.0	0.44	0.37		11.5	0.0	88.0	2.65	Sd,f-ms,slty,mic
68	9754.0-55.0	0.08	0.07		10.9	0.0	89.4	2.67	Sd,f-ms,slty,mic
69	9755.0-56.0	0.12	0.06		12.2	0.0	86.3	2.66	Sd,vf-fs,slty,mic,sl/shy
70	9756.0-57.0	0.12	0.22		12.6	0.0	90.2	2.66	Sd,fs,slty,mic
71	9757.0-58.0	0.77	0.72		12.7	0.0	83.3	2.64	Sd,f-ms,slty,mic
72	9758.0-59.0	1.1	0.93	0.06	12.5	0.0	81.2	2.64	Sd,f-ms,slty,mic
73	9759.0-60.0	0.68	0.67		12.2	0.0	83.5	2.64	Sd,f-ms,slty,mic
74	9760.0-61.0	1.6	1.5		12.9	0.0	86.8	2.63	Sd,f-ms,slty,mic
75	9761.0-62.0	0.55	0.27		12.7	0.0	85.8	2.65	Sd,f-ms,slty,mic
76	9762.0-63.0	<0.01	<0.01		5.2	0.0	90.5	2.66	Sd,vf-fs,slty,mic,shy
77	9763.0-64.0	0.50	0.36		10.5	0.0	94.2	2.63	Sd,f-ms,slty,mic,sl/liq
78	9764.0 - 9767.0								Shale
	9767.0-68.0	0.07	0.09	0.01	14.0	0.0	88.2	2.66	Sd,fs,slty,mic
79	9768.0-69.0	0.12	0.06		12.5	0.0	85.7	2.65	Sd,fs,slty,mic
80	9769.0-70.0	0.08	0.10		11.0	0.0	93.4	2.67	Sd,fs,slty,mic,sl/shy

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AMERICAN HUNTER EXPLORATION, LTD
Well: SOUZA #1

Date: 01 Jan 1984

TTCs File #: 423

DEAN-STARK PLUG ANALYSIS

Sample Number	Depth (feet)	Permeability Horz (md)	Permeability Vert (md)	OB Perm 4900 PSI (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
81	9770.0-71.0	6.8	2.9		13.9	0.0	95.5	2.62	Sd,f-cs,slty,mic
	9771.0 - 9778.0								Not Recovered
82	9778.0-79.0	0.73	0.62	0.07	12.7	0.0	78.1	2.64	Sd,f-md,slty,mic
83	9779.0-80.0	0.58	0.05		12.7	0.0	79.2	2.64	Sd,f-md,slty,mic
84	9780.0-81.0	26+	3.0		13.0	0.0	88.9	2.62	Sd,f-md,slty,mic
85	9781.0-82.0	6.7	6.8		13.7	0.0	80.8	2.63	Sd,f-md,slty,mic
86	9782.0-83.0	5.2	5.9	0.55	13.0	0.0	80.4	2.63	Sd,f-md,slty,mic
87	9783.0-84.0	0.21	0.34		12.7	0.0	73.1	2.65	Sd,f-g,slty,mic,sh lam
88	9784.0-85.0	0.48	0.35		13.5	0.0	71.9	2.65	Sd,f-g,slty,mic
89	9785.0-86.0	0.08	0.05		12.9	0.0	80.7	2.67	Sd,f-g,slty,mic
90	9786.0-87.0	0.14	0.07		12.5	0.0	73.2	2.65	Sd,f-g,slty,mic
91	9787.0-88.0	0.76	0.50		12.7	0.0	70.2	2.64	Sd,f-md,slty,mic
92	9788.0-89.0	1.6	1.6	0.13	12.7	0.0	70.3	2.64	Sd,f-md,slty,mic
93	9789.0-90.0	0.65	0.48		12.5	0.0	70.2	2.65	Sd,f-md,slty,mic
94	9790.0-91.0	0.04	0.04		10.9	0.0	89.1	2.67	Sd,vf-fg,slty,mic
95	9791.0-92.0	0.49	0.60		12.2	0.0	76.8	2.64	Sd,f-md,slty,mic
96	9792.0-93.0	0.83	0.45		12.1	0.0	75.7	2.64	Sd,f-md,slty,mic
97	9793.0-94.0	0.30	0.23	0.03	11.4	0.0	76.4	2.65	Sd,f-g,slty,mic
98	9794.0-95.0	0.13	0.13		9.8	0.0	82.4	2.66	Sd,f-g,slty,mic
99	9795.0-96.0	0.24	0.27		6.3	0.0	89.7	2.66	Sd,vf-fg,slty,mic,lmy
100	9796.0-97.0	0.02	0.02		1.8	0.0	72.3	2.70	Sd,vf-fg,slty,mic,v/lmy,sh lam
101	9797.0-98.0	0.02	0.02		2.3	0.0	84.2	2.69	Sd,vf-fg,slty,mic,v/lmy

+ Horizontal dehydration crack

Terra Tek Core Services®

University Research Park - 360 Wakara Way - Salt Lake City, Utah 84108 - (801) 584-2480 - TWX 910-925-5284
 AMERICAN HUNTER EXPLORATION, LTD
 Well: SOUZA #1

Date: 01 Jan 1984

TICS File #: 423

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DEAN-STARK PLUG ANALYSIS

Sample Number	Depth (feet)	Permeability (md)		OB Perm 4900 PSI (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
102	9798.0-99.0	1.0	0.62	0.12	13.5	0.0	72.5	2.64	Sd,fs,slty,mic
	9799.0 - 9800.0								Sh,sd stks
103	9800.0-01.0	2.9	3.9		13.1	0.0	73.7	2.63	Sd,f-mg,slty,mic
104	9801.0-02.0	2.5	1.9		12.9	0.0	74.7	2.64	Sd,f-mg,slty,mic
105	9802.0-03.0	2.4	2.3		13.4	0.0	80.7	2.63	Sd,f-mg,slty,mic
106	9803.0-04.0	1.8	2.3		13.4	0.0	75.5	2.64	Sd,f-mg,slty,mic
107	9804.0-05.0	2.2	1.6		13.0	0.0	76.9	2.63	Sd,f-mg,slty,mic
108	9805.0-06.0	0.43	0.37		13.0	0.0	74.0	2.64	Sd,f-mg,slty,mic
109	9806.0-07.0	2.8	0.04	0.15	11.8	0.0	80.0	2.62	Sd,f-mg,slty,mic
110	9807.0-08.0	1.9	2.3		12.3	0.0	84.6	2.64	Sd,f-mg,slty,mic
111	9808.0-09.0	3.7	3.8		13.4	0.0	86.1	2.63	Sd,f-mg,slty,mic
112	9809.0-10.0	3.6	2.7	0.23	13.2	0.0	84.5	2.63	Sd,f-mg,slty,mic
113	9810.0-11.0	4.3	4.1		13.1	0.0	85.9	2.62	Sd,f-mg,slty,mic
114	9811.0-12.0	0.53	0.46		12.9	0.0	70.6	2.64	Sd,fs,slty,mic
115	9812.0-13.0	0.38	0.27		12.4	0.0	81.5	2.64	Sd,fs,slty,mic
116	9813.0-14.0	2.1	2.0		12.1	0.0	89.2	2.62	Sd,f-mg,slty,mic,sl/lmy
117	9814.0-15.0	0.13	0.13	0.015	13.2	0.0	81.4	2.64	Sd,fs,slty,mic,sh stk
118	9815.0-16.0	0.27	0.24		13.2	0.0	81.7	2.64	Sd,fs,slty,mic
119	9816.0-17.0	0.06	0.08		12.5	0.0	91.4	2.67	Sd,vf-fs,slty,mic,sh stks
120	9817.0-18.0	0.02	0.02		11.2	0.0	92.8	2.67	Sd,vf-fs,slty,mic,sh lam & stks
121	9818.0-19.0	1.5	1.2		13.0	0.0	79.7	2.62	Sd,f-mg,slty,mic,sh stks
122	9819.0-20.0	5.0	4.9		11.9	0.0	81.3	2.61	Sd,f-mg,slty,mic

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AMERICAN HUNTER EXPLORATION, LTD
Well: SOUZA #1

Date: 01 Jan 1984

ITCS File #: 423

DEAN-STARK PLUG ANALYSIS

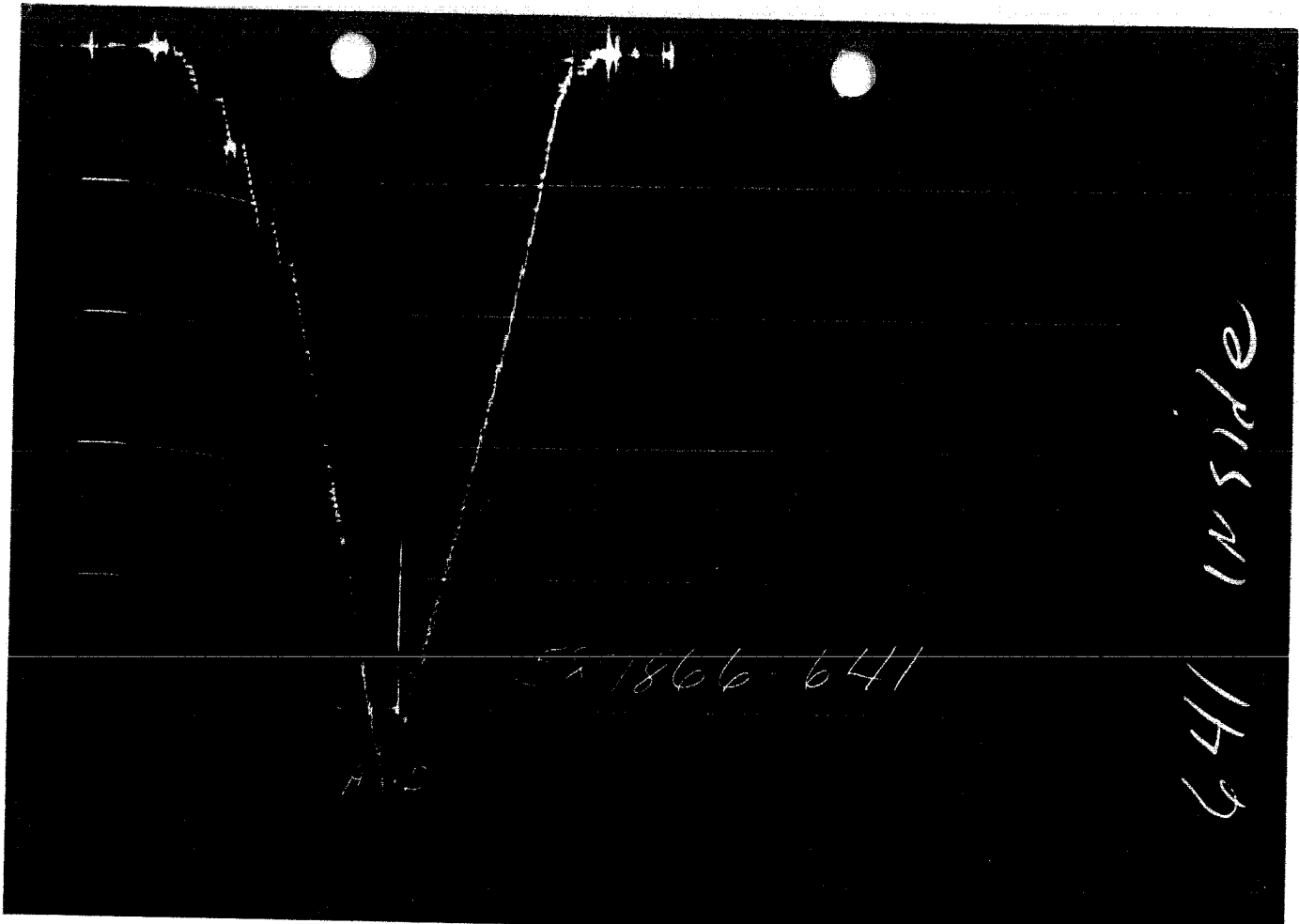
Sample Number	Depth (feet)	Permeability Horz (md)	Permeability Vert (md)	DB Perm 4900 PSI (md)	Porosity (%)	Saturation Oil (%)	Saturation H2O (%)	Grain Density (gm/cc)	Lithology
123	9820.0-21.0	4.3	4.3	0.58	13.4	0.0	81.2	2.62	Sd,f-ms,slty,mic
	9821.0 - 9823.0								Sh,sl/sdy
124	9823.0-24.0	9.8	9.7		13.2	0.0	89.5	2.61	Sd,f-cg,slty,mic
125	9824.0-25.0	27	28		13.8	0.0	85.3	2.61	Sd,f-cg,slty,mic
126	9825.0-26.0	26	6.4	1.5	12.8	0.0	88.4	2.60	Sd,f-cg,slty,mic
127	9826.0-27.0	3.1	3.0		12.7	0.0	79.8	2.63	Sd,f-ms,slty,mic
128	9827.0-28.0	0.49	0.62		11.6	0.0	82.7	2.65	Sd,f-ms,slty,mic
129	9828.0-29.0	0.10	0.09		12.1	0.0	91.0	2.65	Sd,f-g,slty,mic
130	9829.0-30.0	0.06	0.08		11.2	0.0	91.9	2.66	Sd,f-g,slty,mic
131	9830.0-31.0	10	10	0.51	12.2	0.0	90.8	2.61	Sd,f-cg,slty,mic,sl/lmy
132	9831.0-32.0	2.0	2.6		11.8	0.0	92.4	2.62	Sd,f-ms,slty,mic
133	9832.0-33.0	0.74	0.90		12.0	0.0	88.0	2.64	Sd,f-ms,slty,mic
134	9833.0-34.0	0.10	0.08		11.7	0.0	93.0	2.66	Sd,f-g,slty,mic
135	9834.0-35.0	0.13	0.12		12.0	0.0	87.7	2.65	Sd,f-g,slty,mic
136	9835.0-36.0	0.03	0.06		11.5	0.0	92.9	2.67	Sd,vf-fg,slty,mic
137	9836.0-37.0	2.1	2.2	0.11	12.4	0.0	88.6	2.63	Sd,f-ms,slty,mic
138	9837.0-38.0	0.31	0.36		11.5	0.0	83.4	2.65	Sd,f-ms,slty,mic

5 87266 7511

7511 inside D.P.

GAUGE NO: 7511 DEPTH: 9618.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	FINAL HYDROSTATIC					



GAUGE NO: 641 DEPTH: 9634.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5469	5419.4			
B	FINAL HYDROSTATIC	5250	5419.4			

24
E

1090 outside

587266-1090

GAUGE NO: 1090 DEPTH: 9770.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5455	5484.4			
B	FINAL HYDROSTATIC	5308	5484.4			

2154700
7512
outside

527966 7512

GAUGE NO: 7512 DEPTH: 9774.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5498	5485.0			
B	FINAL HYDROSTATIC	5350	5485.0			

EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: _____
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): 8.750
 ELEVATION (ft): 0
 TOTAL DEPTH (ft): 9778.0
 PACKER DEPTH(S) (ft): 9646.9652
 FINAL SURFACE CHOKE (in): 0.250
 BOTTOM HOLE CHOKE (in): 0.750
 MUD WEIGHT (lb/gal): 10.40
 MUD VISCOSITY (sec): 38
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 120 @ 9777.0 ft

TICKET NUMBER: 58786600
 DATE: 12-6-83 TEST NO: 8
 TYPE DST: OPEN HOLE
 HALLIBURTON CAMP:
BAKERSFIELD
 TESTER: R.D. LYONS
 WITNESS: WALT ZURBA
 DRILLING CONTRACTOR:
MONTGOMERY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg AT SURFACE: _____
 cu.ft. OF GAS: _____
 cc OF OIL: _____
 cc OF WATER: _____
 cc OF MUD: _____
 TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ @ _____ °F
 GAS/OIL RATIO (cu.ft. per bbl): _____
 GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
WATER (FEET)	<u>3000.0</u>	<u>8.33</u>
_____	_____	_____

RECOVERED:

3000 FEET OF WATER CUSHION
 393 FEET OF DRILLING MUD

MEASURED FROM TESTER VALVE

REMARKS:

LOST PACKER SEAT

↑
120°

587866- TE 68

TE 68 Temp
89.31

WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637 Q_g T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_f r_w^2} + 3.23 \right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_f}}$	ft



TICKET NO. 58786500
15-DEC-83
BAKERSFIELD

RECEIVED

APR 23 1984

DIVISION OF OIL & GAS
COALINGA

FORMATION TESTING SERVICE REPORT

SOJZR
LEASE NAME _____ WELL NO. _____ TEST NO. 7
LEGAL LOCATION _____ 36-145-12E
SEC. - TRP. - RNG. _____
FIELD BRER CHANNEY RANCH
COUNTY FRESNO
STATE CALIFORNIA SM
TESTED INTERVAL 9694.1 - 9778.1
AMERICAN HUNTER EXPLORATION LIMITED
LEASE OWNER/COMPANY NAME

587865-7511

Inside Drill Pipe

GAUGE NO: 7511 DEPTH: 9660.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW	1323	1294.2			
C	FINAL FIRST FLOW	2021	1294.2	10.0	10.6	F
C	INITIAL FIRST CLOSED-IN	2021	1294.2			
D	FINAL FIRST CLOSED-IN		1339.1	60.0	59.4	C
E	INITIAL SECOND FLOW		1339.1			
F	FINAL SECOND FLOW		1508.7	45.0	39.1	F
G	FINAL HYDROSTATIC					



GAUGE NO: 641 DEPTH: 9676.0 BLANKED OFF: NQ HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5543	5463.4			
B	INITIAL FIRST FLOW	1345	1387.6			
C	FINAL FIRST FLOW	1345	1381.7	10.0	10.6	F
C	INITIAL FIRST CLOSED-IN	1345	1381.7			
D	FINAL FIRST CLOSED-IN	5561	5575.9	60.0	59.4	C
E	INITIAL SECOND FLOW	1364	1399.4			
F	FINAL SECOND FLOW	1530	1580.2	45.0	39.1	F
G	FINAL HYDROSTATIC	5177	5132.4			

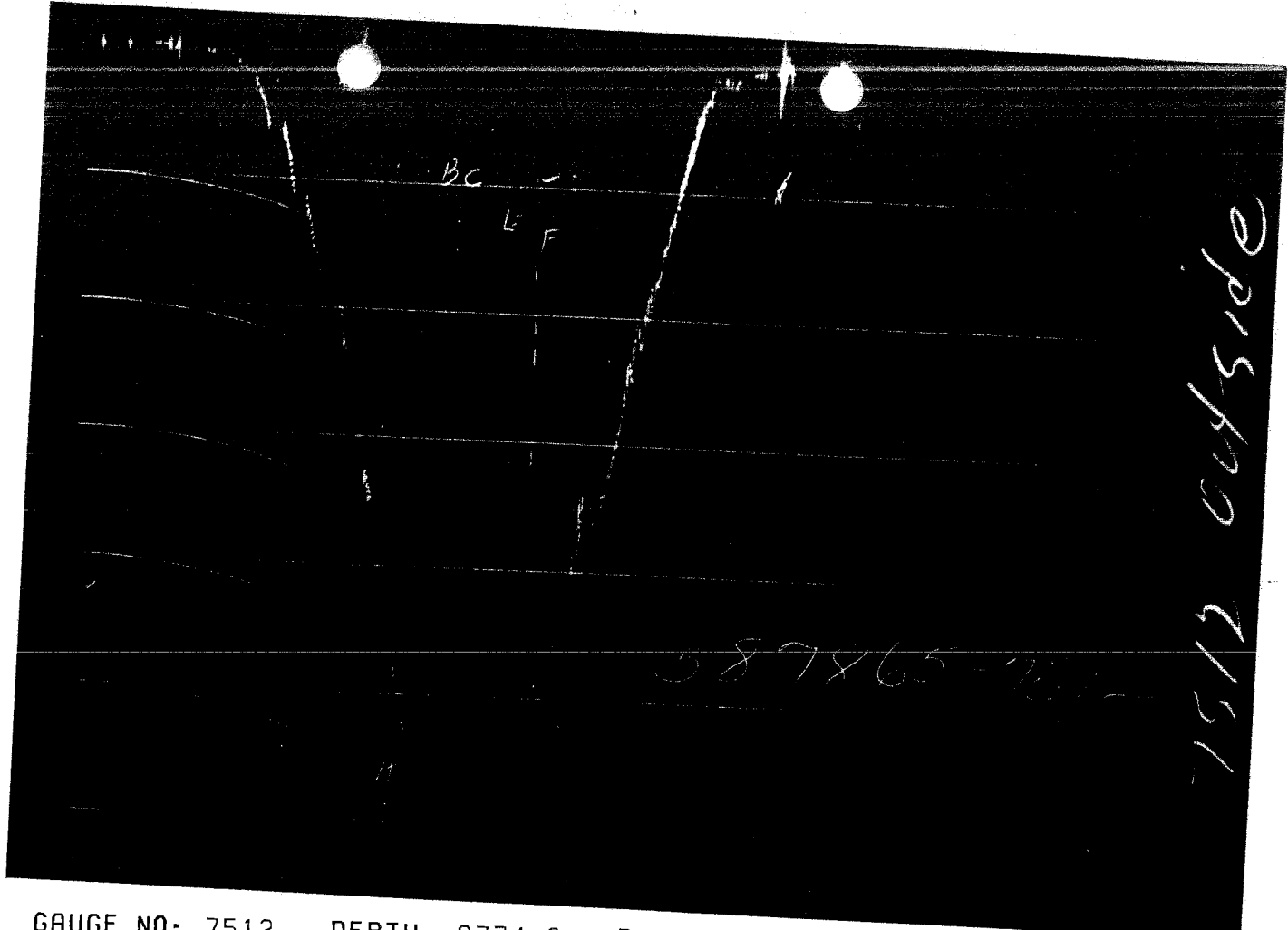
BCE

1090 - outside

587865-1090

GAUGE NO: 1090 DEPTH: 9770.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5455	5463.4			
B	INITIAL FIRST FLOW	1371	1469.4			
C	FINAL FIRST FLOW	1371	1415.2	10.0	10.6	F
C	INITIAL FIRST CLOSED-IN	1371	1415.2			
D	FINAL FIRST CLOSED-IN	5566	5586.4	60.0	59.4	C
E	INITIAL SECOND FLOW	1389	1434.7			
F	FINAL SECOND FLOW	1575	1625.8	45.0	39.1	F
G	FINAL HYDROSTATIC	5235	5136.2			



GAUGE NO: 7512 DEPTH: 9774.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5461	5463.5			
B	INITIAL FIRST FLOW	1380	1476.2			
C	FINAL FIRST FLOW	1380	1422.1	10.0	10.6	F
C	INITIAL FIRST CLOSED-IN	1380	1422.1			
D	FINAL FIRST CLOSED-IN	5590	5585.9	60.0	59.4	C
E	INITIAL SECOND FLOW	1398	1443.8			
F	FINAL SECOND FLOW	1586	1633.7	45.0	39.1	F
G	FINAL HYDROSTATIC	5238	5144.6			

EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: _____ 84.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): _____ 8.750
 ELEVATION (ft): _____ 0
 TOTAL DEPTH (ft): _____ 9778.0
 PACKER DEPTH(S) (ft): 9688, 9694
 FINAL SURFACE CHOKE (in): _____
 BOTTOM HOLE CHOKE (in): _____ 0.750
 MUD WEIGHT (lb/gal): _____ 10.40
 MUD VISCOSITY (sec): _____ 38
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 227 @ 9778.0 ft

TICKET NUMBER: 58786500
 DATE: 12-5-83 TEST NO: 7
 TYPE DST: OPEN HOLE
 HALLIBURTON CAMP: _____
BAKERSFIELD
 TESTER: _____ R.D. LYONS
 WITNESS: _____ WALT ZURBA
 DRILLING CONTRACTOR: _____
MONTGOMERY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg AT SURFACE: _____
 cu.ft. OF GAS: _____
 cc OF OIL: _____
 cc OF WATER: _____
 cc OF MUD: _____
 TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ @ _____ °F
 GAS/OIL RATIO (cu.ft. per bbl): _____
 GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
<u>WATER (FEET)</u>	<u>3000.0</u>	<u>8.33</u>

RECOVERED:

3000 FEET OF WATER CUSHION
 1500 FEET OF MUD

MEASURED FROM TESTER VALVE

REMARKS:

LOST PACKER SEAT DURING SECOND FLOW PERIOD.

TICKET NO: 58786500

CLOCK NO: 28224 HOUR: 24



GAUGE NO: 7511

DEPTH: 9660.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
-----	---------	----------	----	--	--------------------------------------

FIRST FLOW

B	1	0.0	1294.2		
C	2	10.6	1294.2	0.0	

FIRST CLOSED-IN

C	1	0.0	1294.2		
D	2	59.4	1339.1	45.0	9.0 0.071

SECOND FLOW

E	1	0.0	1339.1		
	2	5.0	1361.2	22.1	
	3	10.0	1368.2	7.0	
	4	15.0	1398.1	29.8	
	5	20.0	1422.3	24.2	
	6	25.0	1438.0	15.7	
	7	30.0	1461.0	23.1	
	8	35.0	1480.8	19.8	
F	9	39.1	1508.7	27.9	

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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REMARKS:
THIS GAUGE RAN ABOVE HYDROSPRING TESTER VALVE.

TICKET NO: 58786500

CLOCK NO: 26221 HOUR: 24



GAUGE NO: 641

DEPTH: 9676.0

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	1387.6			
2	2.0	1387.2	-0.4		
3	4.0	1384.3	-3.0		
4	6.0	1382.8	-1.5		
5	8.0	1382.8	0.0		
6	10.0	1382.8	0.0		
C 7	10.6	1381.7	-1.1		

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST CLOSED-IN					
C 1	0.0	1381.7			
2	5.0	4049.5	2667.8	3.4	0.492
3	10.0	4555.2	3173.5	5.1	0.313
4	15.0	4865.1	3483.4	6.2	0.231
5	20.0	5064.0	3682.3	6.9	0.184
6	25.0	5196.9	3815.2	7.4	0.153
7	30.0	5295.6	3913.9	7.8	0.131
8	35.0	5368.4	3986.7	8.1	0.114
9	40.0	5424.3	4042.6	8.4	0.102
10	45.0	5473.1	4091.4	8.6	0.091
11	50.0	5514.8	4133.1	8.7	0.083
12	55.0	5550.3	4168.6	8.9	0.076
D 13	59.4	5575.9	4194.2	9.0	0.071

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW					
E 1	0.0	1399.4			
2	5.0	1403.1	3.7		
3	10.0	1413.5	10.4		
4	15.0	1459.1	45.7		
5	20.0	1482.1	22.9		
6	25.0	1507.4	25.3		
7	30.0	1522.4	15.0		
8	35.0	1542.9	20.5		

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
(Empty table area)					

REMARKS:

TICKET NO: 58786500

CLOCK NO: 26228 HOUR: 24



GAUGE NO: 1090

DEPTH: 9770.0

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	1469.4			
2	2.0	1438.6	-30.8		
3	4.0	1421.7	-16.9		
4	6.0	1418.4	-3.3		
5	8.0	1418.0	-0.4		
6	10.0	1415.4	-2.6		
C 7	10.6	1415.2	-0.2		
FIRST CLOSED-IN					
C 1	0.0	1415.2			
2	5.0	4198.0	2782.8	3.4	0.496
3	10.0	4642.9	3227.7	5.1	0.313
4	15.0	4912.2	3496.9	6.2	0.232
5	20.0	5089.2	3673.9	6.9	0.184
6	25.0	5215.6	3800.4	7.4	0.153
7	30.0	5312.1	3896.9	7.8	0.131
8	35.0	5382.2	3967.0	8.1	0.114
9	40.0	5441.0	4025.8	8.4	0.102
10	45.0	5489.2	4073.9	8.5	0.092
11	50.0	5529.0	4113.8	8.7	0.083
12	55.0	5563.4	4148.2	8.9	0.076
D 13	59.4	5586.4	4171.2	9.0	0.071
SECOND FLOW					
E 1	0.0	1434.7			
2	5.0	1435.1	0.4		
3	10.0	1443.2	8.2		
4	15.0	1495.4	52.1		
5	20.0	1511.1	15.8		
6	25.0	1548.1	36.9		
7	30.0	1560.5	12.4		
8	35.0	1579.6	19.1		
F 9	39.1	1625.8	46.2		

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
[Empty Data Section]					

REMARKS:

TICKET NO: 58786500

CLOCK NO: 13826 HOUR: 24



GAUGE NO: 7512

DEPTH: 9774.0



















REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	1476.2			
2	2.0	1448.3	-27.9		
3	4.0	1430.5	-17.8		
4	6.0	1425.1	-5.4		
5	8.0	1424.9	-0.2		
6	10.0	1421.5	-3.4		
C 7	10.6	1422.1	0.6		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST CLOSED-IN					
C 1	0.0	1422.1			
2	5.0	4047.3	2625.2	3.4	0.496
3	10.0	4552.1	3130.0	5.1	0.313
4	15.0	4869.2	3447.1	6.2	0.232
5	20.0	5066.7	3644.6	6.9	0.184
6	25.0	5200.9	3778.8	7.4	0.153
7	30.0	5298.0	3875.9	7.8	0.131
8	35.0	5375.0	3952.9	8.1	0.114
9	40.0	5436.1	4014.0	8.4	0.102
10	45.0	5485.2	4063.1	8.6	0.091
11	50.0	5525.9	4103.8	8.7	0.083
12	55.0	5562.2	4140.1	8.9	0.076
D 13	59.4	5585.9	4163.8	9.0	0.071

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW					
E 1	0.0	1443.8			
2	5.0	1439.9	-3.9		
3	10.0	1451.7	11.8		
4	15.0	1502.4	50.7		
5	20.0	1523.4	21.0		
6	25.0	1555.1	31.6		
7	30.0	1574.0	18.9		
8	35.0	1583.0	9.0		
F 9	39.1	1633.7	50.7		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
(Empty table area)					

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	5.000	4.276	9393.0	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	9382.0
3		DRILL COLLARS.....	6.000	3.000	273.0	
5		CROSSOVER.....	6.000	3.000	0.9	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	2.250	4.6	
80		AP RUNNING CASE.....	5.000	3.000	4.2	9660.0
13		DUAL CIP SAMPLER.....	5.000	0.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	9671.0
80		AP RUNNING CASE.....	5.000	3.000	4.2	9676.0
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9688.0
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9694.0
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.250	4.2	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	65.0	
81		BLANKED-OFF RUNNING CASE.....	5.000		4.6	9770.0
81		BLANKED-OFF RUNNING CASE.....	5.000		3.9	9774.0
82		TEMPERATURE RUNNING CASE.....	5.000		4.1	9778.0
TOTAL DEPTH						9778.0

EQUIPMENT DATA



TICKET NO. 72613300

13-DEC-83

BAKERSFIELD

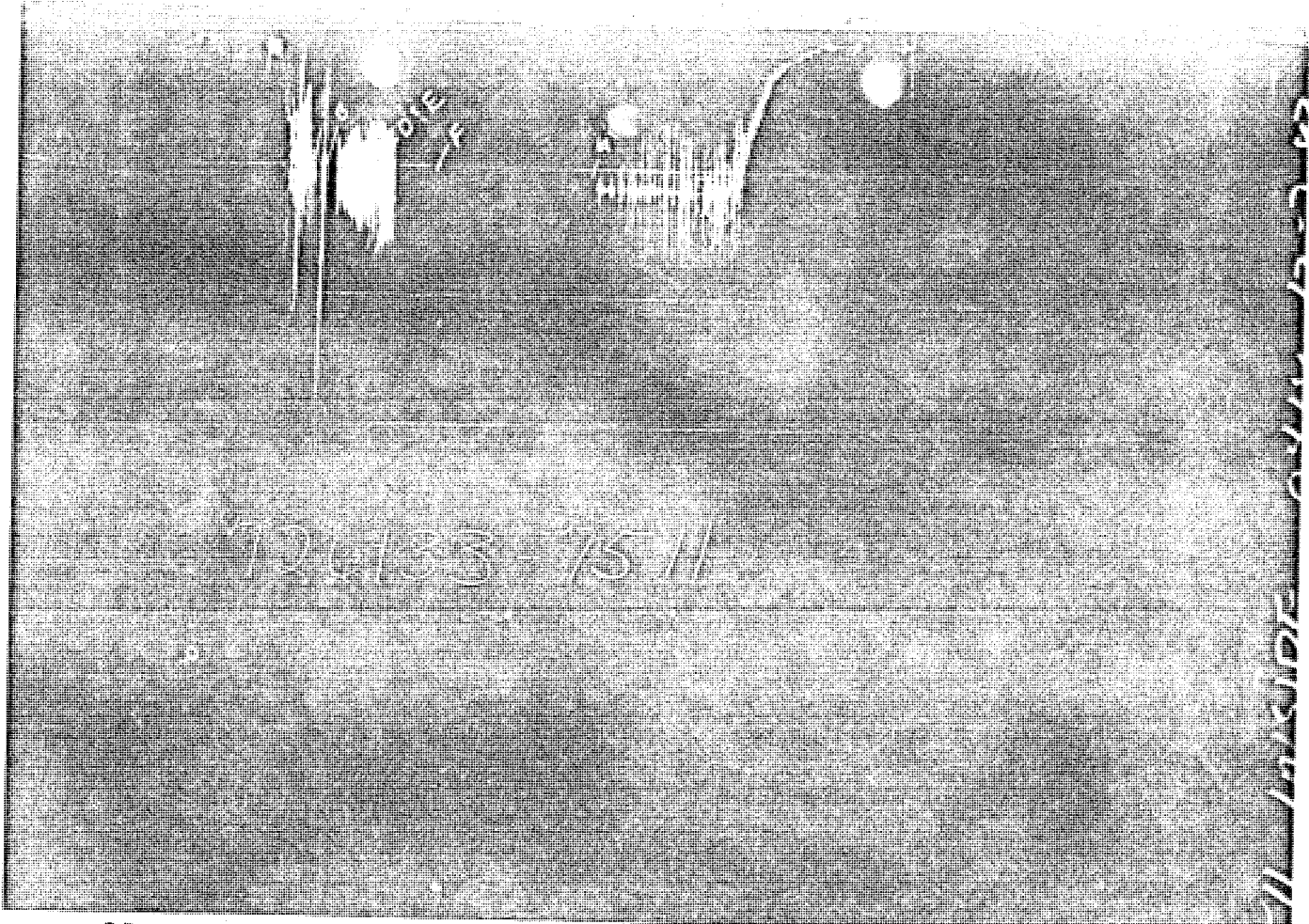
019-21924

RECEIVED
R APR 09 1984 D

DIVISION OF OIL & GAS
COALINGA

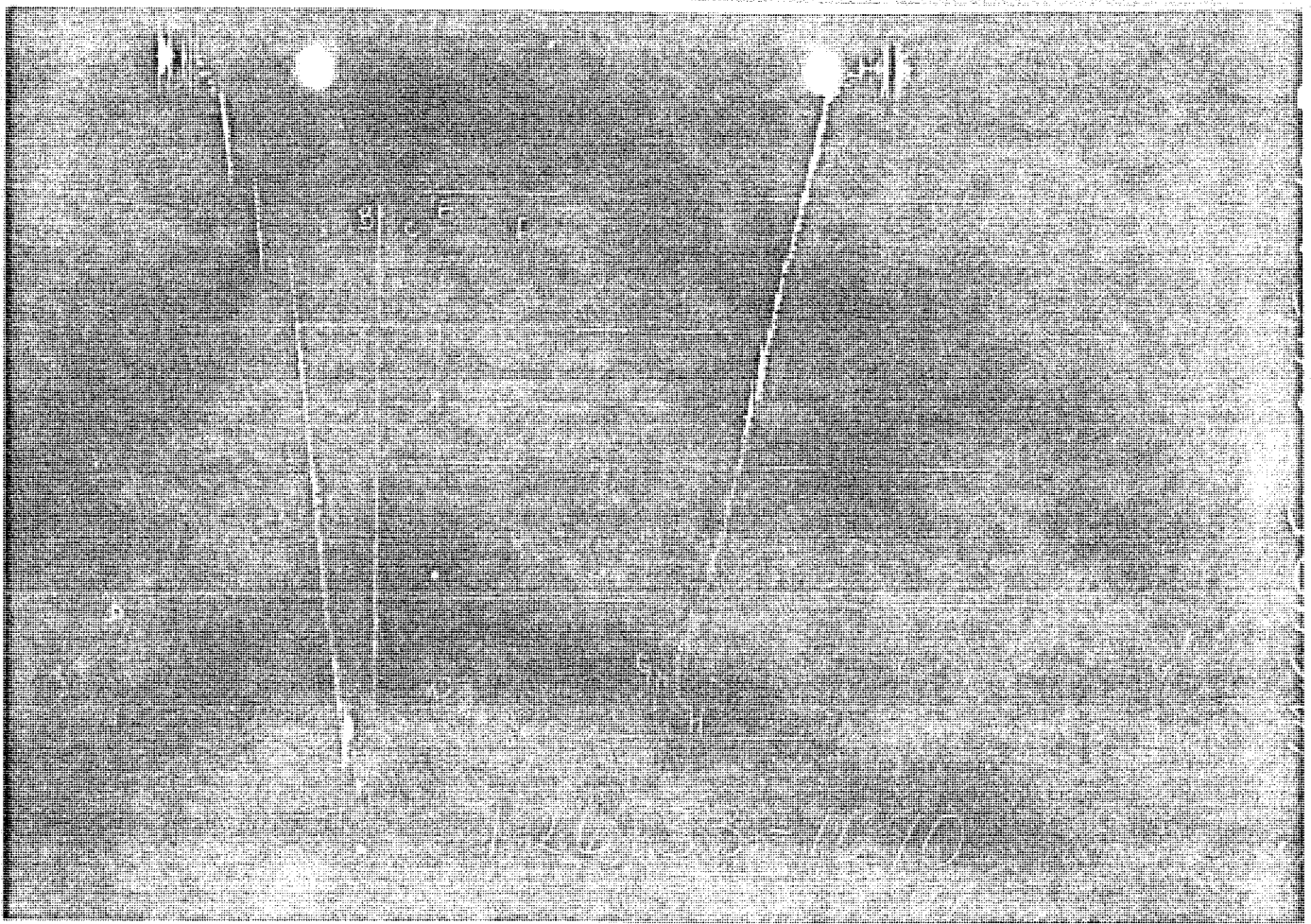
FORMATION TESTING SERVICE REPORT

SECT. - IMP. - RING. 36-148-12E
FIELD 8350
CHANNERY RANCH
COUNTY
FRESNO
STATE CALIFORNIA 8C



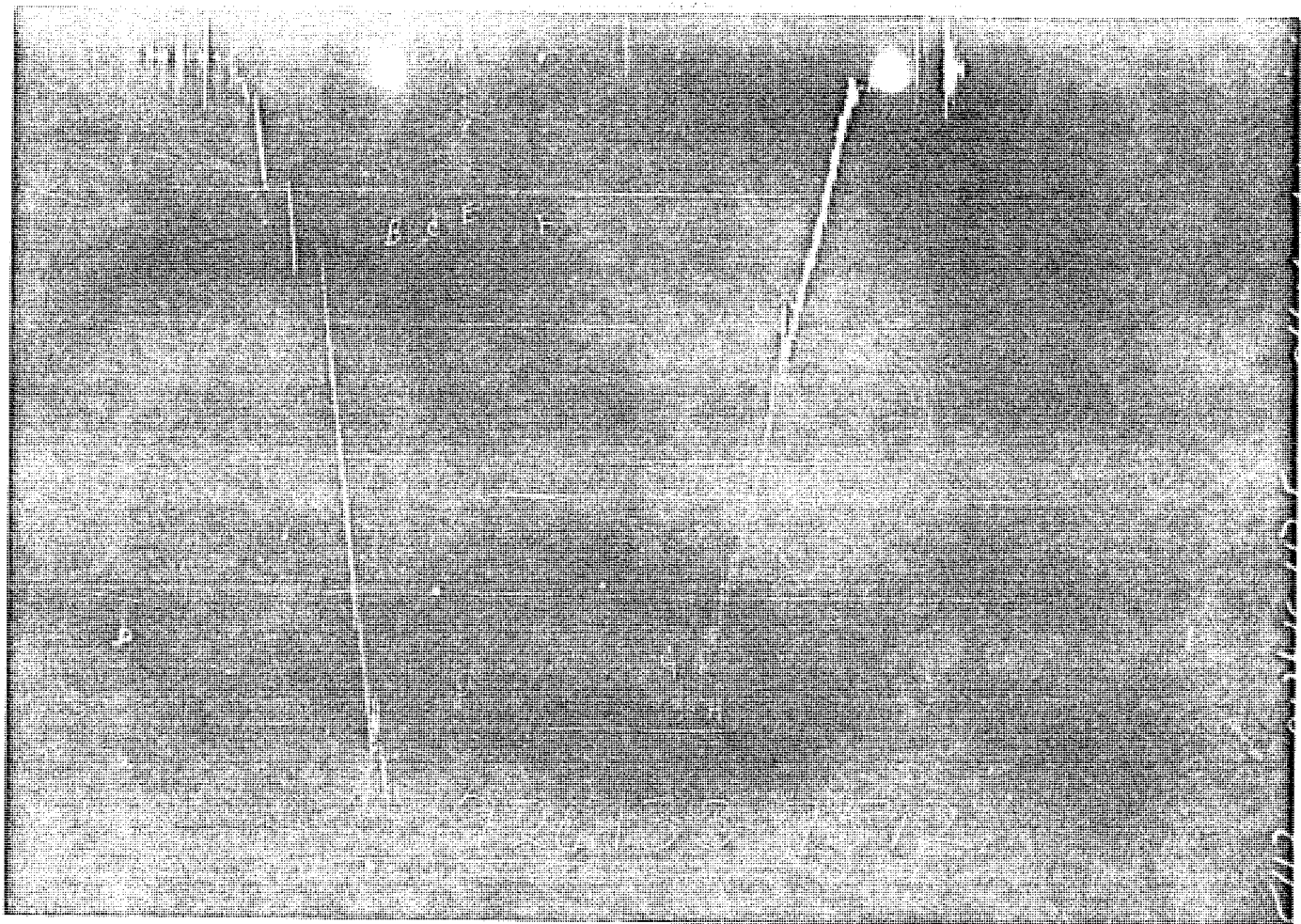
GAUGE NO: 7511 DEPTH: 9342.7 BLANKED OFF: NO HOUR OF CLOCK: 2

ID	DESCRIPTION	PRESSURE		TIME		TYP
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW		1088.8			
C	FINAL FIRST FLOW		1096.7	11.0	11.1	F
C	INITIAL FIRST CLOSED-IN		1096.7			
D	FINAL FIRST CLOSED-IN		1103.9	60.0	59.8	C
E	INITIAL SECOND FLOW		1103.9			
F	FINAL SECOND FLOW		1122.5	72.0	73.0	F
F	INITIAL SECOND CLOSED-IN		1122.5			
G	FINAL SECOND CLOSED-IN		1139.3	180.0	179.0	C
H	FINAL HYDROSTATIC					



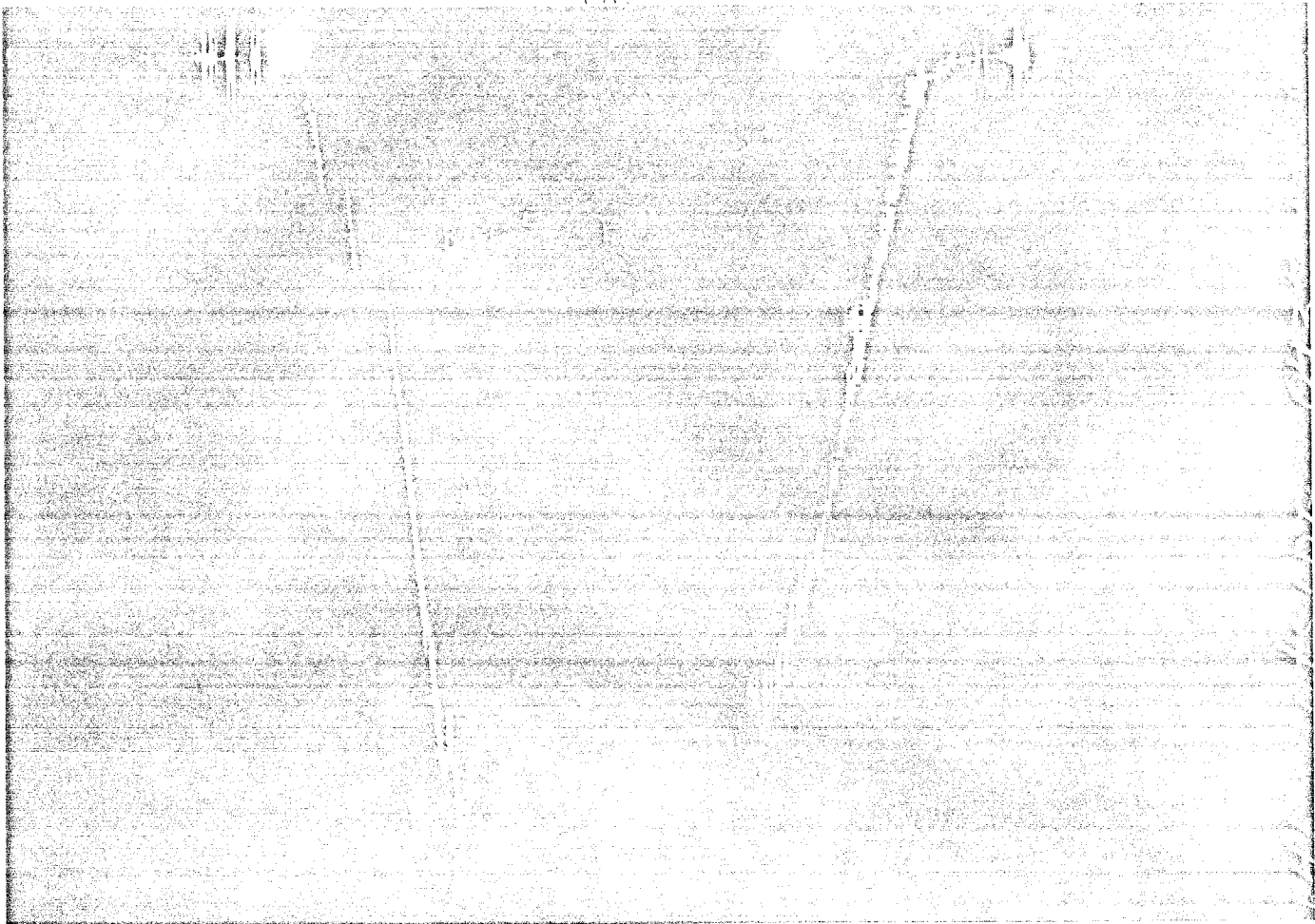
GAUGE NO: 1090 DEPTH: 9358.8 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5548	5344.7			
B	INITIAL FIRST FLOW	1260	1232.5			
C	FINAL FIRST FLOW	1260	1232.5	11.0	11.1	F
C	INITIAL FIRST CLOSED-IN	1260	1232.5			
D	FINAL FIRST CLOSED-IN	4499	4457.1	60.0	59.8	C
E	INITIAL SECOND FLOW	1278	1254.4			
F	FINAL SECOND FLOW	1278	1243.0	72.0	73.0	F
F	INITIAL SECOND CLOSED-IN	1278	1243.0			
G	FINAL SECOND CLOSED-IN	4683	4661.7	180.0	179.0	C
H	FINAL HYDROSTATIC	5419	5086.0			



GAUGE NO: 7512 DEPTH: 9422.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5535	5390.6			
B	INITIAL FIRST FLOW	1287	1297.6			
C	FINAL FIRST FLOW	1287	1271.2	11.0	11.1	F
C	INITIAL FIRST CLOSED-IN	1287	1271.2			
D	FINAL FIRST CLOSED-IN	4460	4473.7	60.0	59.8	C
E	INITIAL SECOND FLOW	1287	1304.9			
F	FINAL SECOND FLOW	1287	1274.5	72.0	73.0	F
F	INITIAL SECOND CLOSED-IN	1287	1274.5			
G	FINAL SECOND CLOSED-IN	4664	4683.9	180.0	179.0	C
H	FINAL HYDROSTATIC	5424	5127.2			



24

GAUGE NO: 641 DEPTH: 9425.9 BLANKED OFF: YES HOUR OF CLOCK: 24

PE

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5543	5405.9			
B	INITIAL FIRST FLOW	1290	1289.1			
C	FINAL FIRST FLOW	1290	1272.5	11.0	11.1	F
C	INITIAL FIRST CLOSED-IN	1290	1272.5			
D	FINAL FIRST CLOSED-IN	4481	4496.0	60.0	59.8	C
E	INITIAL SECOND FLOW	1272	1300.2			
F	FINAL SECOND FLOW	1272	1275.8	72.0	73.0	F
F	INITIAL SECOND CLOSED-IN	1272	1275.8			
G	FINAL SECOND CLOSED-IN	4540	4701.7	180.0	179.0	C
H	FINAL HYDROSTATIC	5433	5141.0			

EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: _____ 53.4
 ALL DEPTHS MEASURED FROM: _____ KB
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): _____ 8.750
 ELEVATION (ft): _____ 0
 TOTAL DEPTH (ft): _____ 9433.0
 PACKER DEPTH(S) (ft): _____ 9374, 9380
 FINAL SURFACE CHOKE (in): _____
 BOTTOM HOLE CHOKE (in): _____ 0.750
 MUD WEIGHT (lb/gal): _____ 10.50
 MUD VISCOSITY (sec): _____ 46
 ESTIMATED HOLE TEMP. (°F): _____ 220
 ACTUAL HOLE TEMP. (°F): _____ @ _____ ft

TICKET NUMBER: 72613300
 DATE: 12-2-83 TEST NO: 6
 TYPE DST: OPEN HOLE
 HALLIBURTON CAMP: BAKERSFIELD
 TESTER: DUNLAP KOUTROULIS
 WITNESS: ZURBA
 DRILLING CONTRACTOR: MONTGOMERY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES	
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm

SAMPLER DATA

Pstg AT SURFACE: _____
 cu.ft. OF GAS: _____
 cc OF OIL: _____
 cc OF WATER: _____
 cc OF MUD: _____
 TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ @ _____ °F
 GAS/OIL RATIO (cu.ft. per bbl): _____
 GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
WATER (FT.)	2700.0	8.53

RECOVERED:

2700' OF CUSHION
 150' OF DRILLING MUD ABOVE CUSHION

REMARKS:

CLOCK ON TE-68 SLIPPED AND WOULD NOT RECORD. CHART NOT SENT IN FOR PROCESSING.

MEASURED FROM TESTER VALVE

TYPE & SIZE MEASURING DEVICE:

TICKET NO: 72613300

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
12-2-83					
0530					MADE UP TOOLS
0700					RAN IN HOLE
1045	1/4" BH				OPENED TOOL WITH A FAINT BLOW
					FOR 2 MINUTES, THEN DIED.
1056					CLOSED TOOL
1156	1/4" BH				OPENED TOOL WITH NO BLOW
1308					CLOSED TOOL
1608					CLOSED BY-PASS AND PULLED OUT OF
					HOLE.

TICKET NO: 72613300

CLOCK NO: 9661 HOUR: 24



GAUGE NO: 1090

DEPTH: 9358.8

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	1232.5		
	2	2.0	1234.0	1.5	
	3	4.0	1239.0	5.0	
	4	6.0	1239.0	0.0	
	5	8.0	1239.0	0.0	
	6	10.0	1234.1	-4.8	
C	7	11.1	1232.5	-1.7	
FIRST CLOSED-IN					
C	1	0.0	1232.5		
	2	4.0	1601.1	368.6	2.9 0.580
	3	8.0	1939.7	707.2	4.7 0.378
	4	12.0	2285.4	1052.9	5.8 0.286
	5	16.0	2635.4	1402.9	6.6 0.229
	6	20.0	2930.4	1697.9	7.1 0.192
	7	24.0	3217.6	1985.1	7.6 0.165
	8	28.0	3440.2	2207.7	8.0 0.145
	9	32.0	3644.1	2411.6	8.3 0.130
	10	36.0	3812.0	2579.6	8.5 0.117
	11	40.0	3951.3	2718.8	8.7 0.107
	12	44.0	4084.7	2852.2	8.9 0.098
	13	48.0	4190.8	2958.3	9.0 0.091
	14	52.0	4291.5	3059.1	9.2 0.084
	15	56.0	4380.3	3147.8	9.3 0.079
D	16	59.8	4457.1	3224.6	9.4 0.074
SECOND FLOW					
E	1	0.0	1254.4		
	2	10.0	1255.8	1.5	
	3	20.0	1251.4	-4.5	
	4	30.0	1242.5	-8.9	
	5	40.0	1240.8	-1.7	
	6	50.0	1243.8	3.0	
	7	60.0	1243.8	0.0	
	8	70.0	1243.8	0.0	
F	9	73.0	1243.0	-0.7	
SECOND CLOSED-IN					
F	1	0.0	1243.0		
	2	10.0	1593.9	350.8	9.0 0.973
	3	20.0	1947.1	704.1	16.1 0.717
	4	30.0	2313.3	1070.3	22.1 0.580
	5	40.0	2664.4	1421.4	27.1 0.492
	6	50.0	2992.6	1749.5	31.3 0.429
	7	60.0	3278.0	2034.9	35.0 0.381
	8	70.0	3535.0	2292.0	38.2 0.343

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
	9	80.0	3738.1	2495.1	41.0 0.312
	10	90.0	3911.7	2668.6	43.5 0.287
	11	100.0	4058.0	2815.0	45.7 0.265
	12	110.0	4175.1	2932.1	47.7 0.247
	13	120.0	4278.8	3035.8	49.5 0.231
	14	130.0	4365.0	3122.0	51.1 0.217
	15	140.0	4440.1	3197.1	52.5 0.204
	16	150.0	4505.7	3262.7	53.9 0.193
	17	160.0	4563.0	3319.9	55.1 0.184
	18	170.0	4617.9	3374.8	56.3 0.175
G	19	179.0	4661.7	3418.7	57.2 0.167

REMARKS:

TICKET NO: 72613300

CLOCK NO: 26221 HOUR: 24



GAUGE NO: 7512

DEPTH: 9422.0

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	1297.6			
2	2.0	1289.0	-8.6		
3	4.0	1291.0	2.1		
4	6.0	1288.8	-2.2		
5	8.0	1283.0	-5.8		
6	10.0	1273.8	-9.2		
C 7	11.1	1271.2	-2.6		
FIRST CLOSED-IN					
C 1	0.0	1271.2			
2	4.0	1636.0	364.8	3.0	0.575
3	8.0	1981.6	710.5	4.6	0.379
4	12.0	2337.3	1066.1	5.8	0.286
5	16.0	2694.2	1423.0	6.6	0.229
6	20.0	3005.6	1734.4	7.1	0.192
7	24.0	3261.6	1990.5	7.6	0.165
8	28.0	3481.4	2210.2	8.0	0.145
9	32.0	3664.8	2393.6	8.3	0.129
10	36.0	3832.2	2561.1	8.5	0.117
11	40.0	3976.0	2704.8	8.7	0.106
12	44.0	4099.4	2828.3	8.9	0.098
13	48.0	4206.3	2935.1	9.0	0.091
14	52.0	4307.2	3036.1	9.2	0.084
15	56.0	4397.0	3125.9	9.3	0.079
D 16	59.8	4473.7	3202.5	9.4	0.074
SECOND FLOW					
E 1	0.0	1304.9			
2	10.0	1287.6	-17.2		
3	20.0	1282.2	-5.4		
4	30.0	1272.1	-10.1		
5	40.0	1270.4	-1.7		
6	50.0	1273.0	2.6		
7	60.0	1273.0	0.0		
8	70.0	1273.0	0.0		
F 9	73.0	1274.5	1.5		
SECOND CLOSED-IN					
F 1	0.0	1274.5			
2	10.0	1595.3	320.8	8.9	0.973
3	20.0	1947.6	673.0	16.2	0.716
4	30.0	2315.9	1041.4	22.1	0.580
5	40.0	2686.5	1412.0	27.1	0.492
6	50.0	3021.6	1747.1	31.3	0.429
7	60.0	3316.2	2041.7	35.0	0.380
8	70.0	3565.0	2290.5	38.2	0.343

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
9	80.0	3762.4	2487.9	41.0	0.312
10	90.0	3933.1	2658.6	43.5	0.287
11	100.0	4072.7	2798.2	45.7	0.265
12	110.0	4188.5	2914.0	47.7	0.247
13	120.0	4293.5	3019.0	49.5	0.231
14	130.0	4384.8	3110.3	51.1	0.217
15	140.0	4462.9	3188.4	52.6	0.204
16	150.0	4531.4	3256.8	53.9	0.193
17	160.0	4589.6	3315.1	55.1	0.183
18	170.0	4643.2	3368.7	56.3	0.175
G 19	179.0	4683.9	3409.3	57.2	0.167

REMARKS:

TICKET NO: 72613300

CLOCK NO: 18754 HOUR: 24





















GAUGE NO: 641

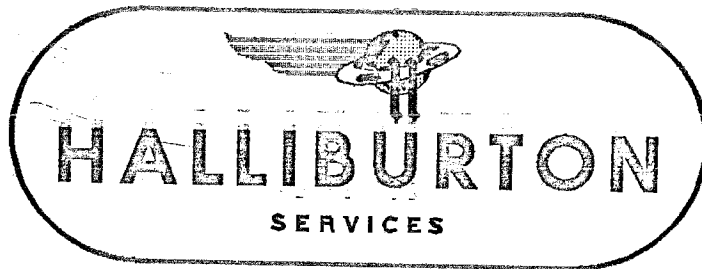
DEPTH: 9425.9

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	1289.1		
	2	2.0	1285.8	-3.3	
	3	4.0	1287.1	1.3	
	4	6.0	1285.4	-1.7	
	5	8.0	1281.0	-4.4	
	6	10.0	1274.3	-6.7	
C	7	11.1	1272.5	-1.8	
FIRST CLOSED-IN					
C	1	0.0	1272.5		
	2	4.0	1618.1	345.7	2.9 0.579
	3	8.0	1973.0	700.6	4.7 0.378
	4	12.0	2317.8	1045.3	5.8 0.284
	5	16.0	2656.5	1384.0	6.6 0.229
	6	20.0	2957.0	1684.6	7.1 0.192
	7	24.0	3245.2	1972.8	7.6 0.165
	8	28.0	3473.0	2200.5	8.0 0.145
	9	32.0	3666.2	2393.7	8.3 0.130
	10	36.0	3845.4	2572.9	8.5 0.117
	11	40.0	3996.9	2724.4	8.7 0.106
	12	44.0	4127.2	2854.7	8.9 0.098
	13	48.0	4240.7	2968.3	9.0 0.090
	14	52.0	4337.8	3065.3	9.2 0.084
	15	56.0	4427.2	3154.7	9.3 0.079
D	16	59.8	4496.0	3223.5	9.4 0.074
SECOND FLOW					
E	1	0.0	1300.2		
	2	10.0	1290.2	-10.0	
	3	20.0	1287.4	-2.8	
	4	30.0	1276.7	-10.7	
	5	40.0	1276.7	0.0	
	6	50.0	1275.4	-1.3	
	7	60.0	1275.4	0.0	
	8	70.0	1275.4	0.0	
F	9	73.0	1275.8	0.4	
SECOND CLOSED-IN					
F	1	0.0	1275.8		
	2	10.0	1606.3	330.5	8.9 0.973
	3	20.0	1973.4	697.6	16.2 0.716
	4	30.0	2351.3	1075.5	22.1 0.580
	5	40.0	2711.1	1435.3	27.1 0.492
	6	50.0	3033.1	1757.3	31.3 0.429
	7	60.0	3321.9	2046.1	35.0 0.381
	8	70.0	3567.5	2291.7	38.2 0.343

REF	MINUTES	PRESSURE	AP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
	9	80.0	3780.7	2504.9	41.0 0.312
	10	90.0	3954.8	2679.0	43.5 0.287
	11	100.0	4095.0	2819.3	45.7 0.265
	12	110.0	4215.2	2939.4	47.7 0.247
	13	120.0	4316.3	3040.5	49.5 0.231
	14	130.0	4403.5	3127.7	51.1 0.217
	15	140.0	4477.1	3201.3	52.6 0.204
	16	150.0	4548.4	3272.7	53.9 0.193
	17	160.0	4604.4	3328.6	55.1 0.184
	18	170.0	4658.2	3382.4	56.3 0.175
G	19	179.0	4701.7	3425.9	57.2 0.167

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	5.000	4.276	9052.1	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	9052.0
3		DRILL COLLARS.....	6.000	2.750	283.0	
5		CROSSOVER.....	6.000	3.000	0.9	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	2.250	4.6	
80		AP RUNNING CASE.....	5.000	3.000	4.2	9342.7
13		DUAL CIP SAMPLER.....	5.000	0.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	9356.6
80		AP RUNNING CASE.....	5.000	3.000	4.2	9358.8
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9373.8
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9379.6
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.250	4.2	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	35.0	
81		BLANKED-OFF RUNNING CASE.....	5.000		4.6	9422.0
81		BLANKED-OFF RUNNING CASE.....	5.000		3.9	9425.9
82		TEMPERATURE RUNNING CASE.....	5.000		4.1	9432.0
TOTAL DEPTH						9433.0



TICKET NO. 58786300

15-DEC-83

BAKERSFIELD

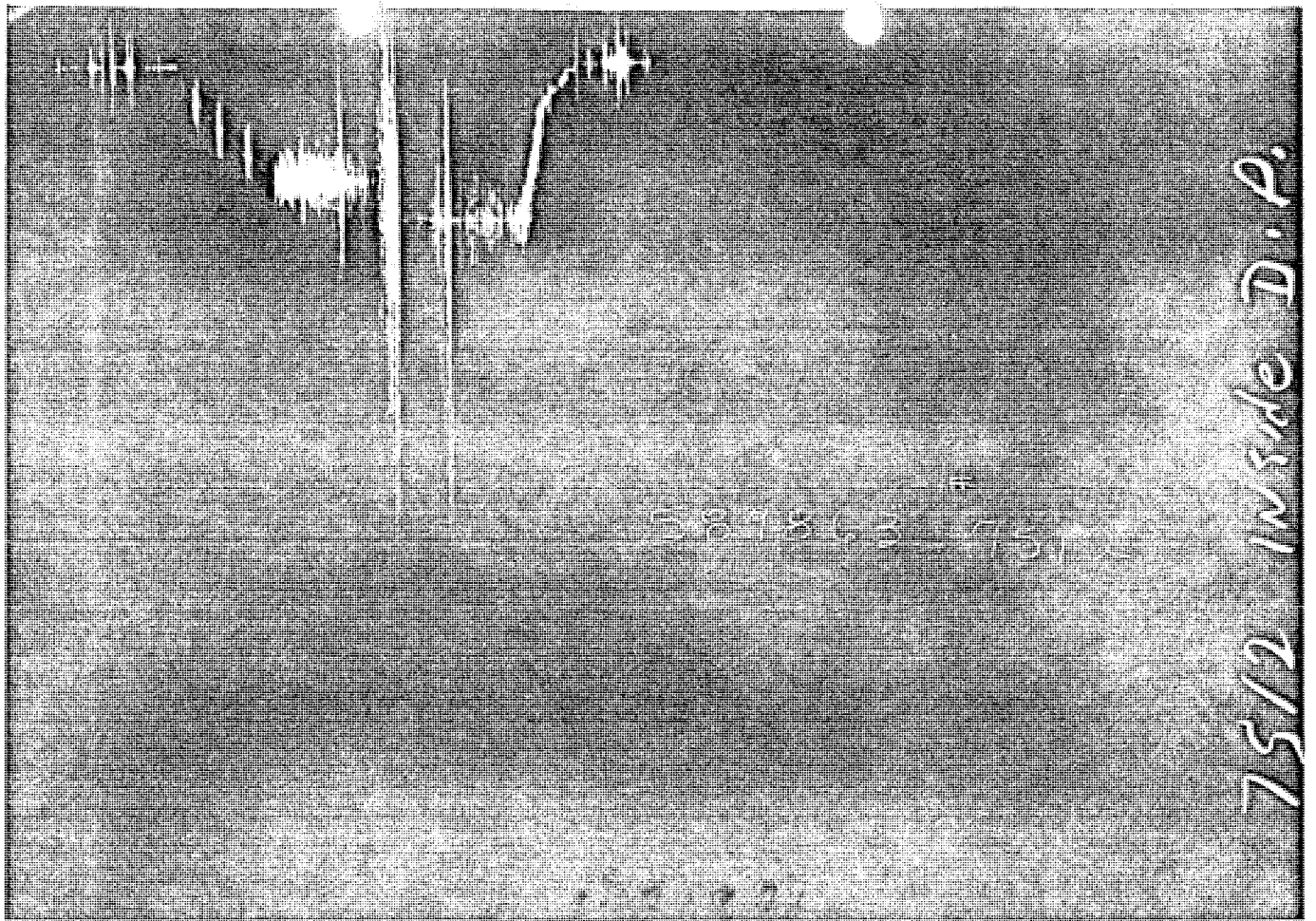
019-21924

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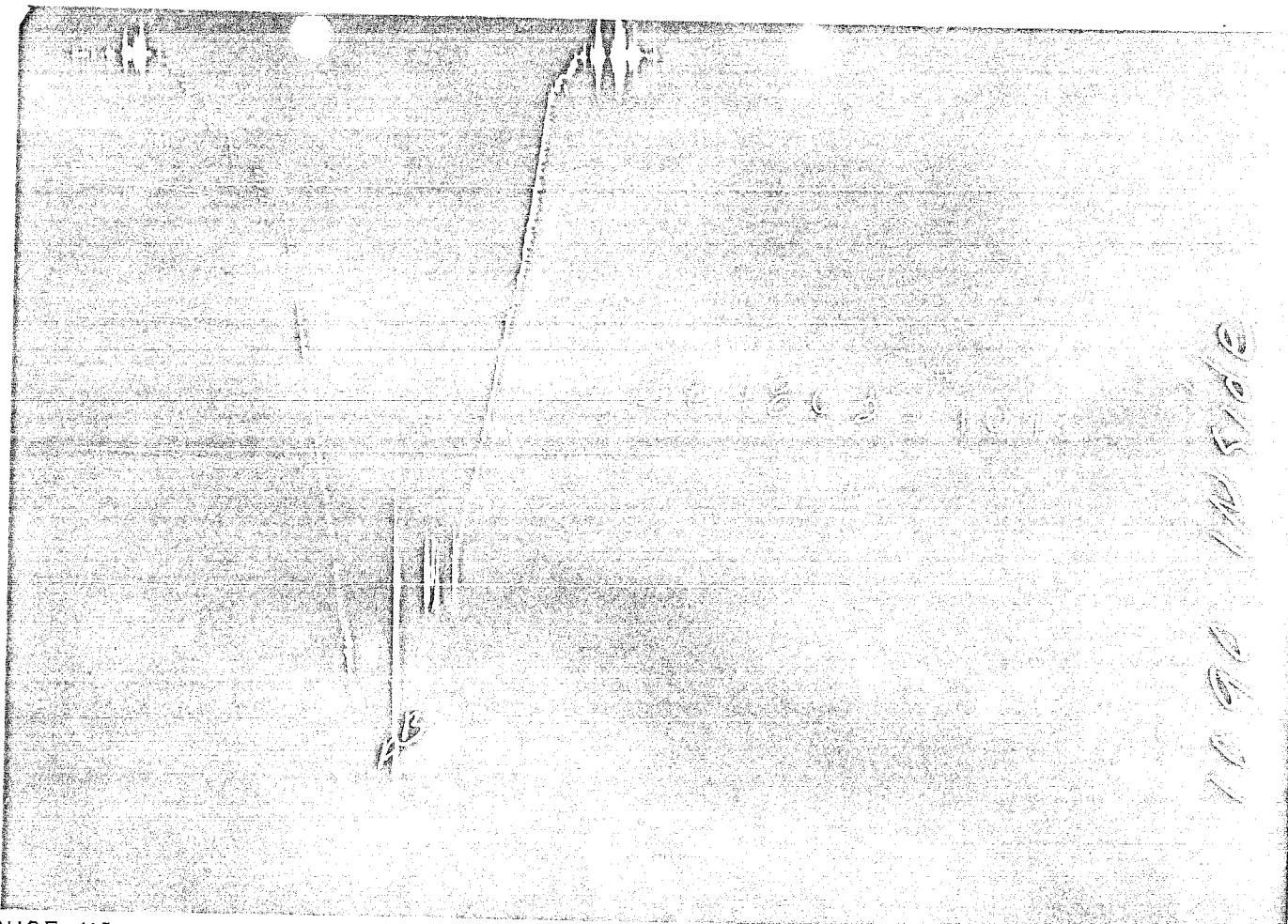
FORMATION TESTING SERVICE REPORT

LEGAL LOCATION SEC. - TWP. - RNG.	36 - 14S - 12E	FIELD AREA	CHANNY RANCH	COUNTY	FRESNO	STATE	CALIFORNIA	NM
LESSOR NAME	SELL NO.	TEST NO.	9180. - 9200. *	AMERICAN HUNTER EXPLORATION, LIMITED				
		5	TESTED INTERVAL	LEASER OWNER/COMPANY NAME				



GAUGE NO: 7512 DEPTH: 9126.0 BLANKED OFF: NO HOUR OF CLOCK: 24

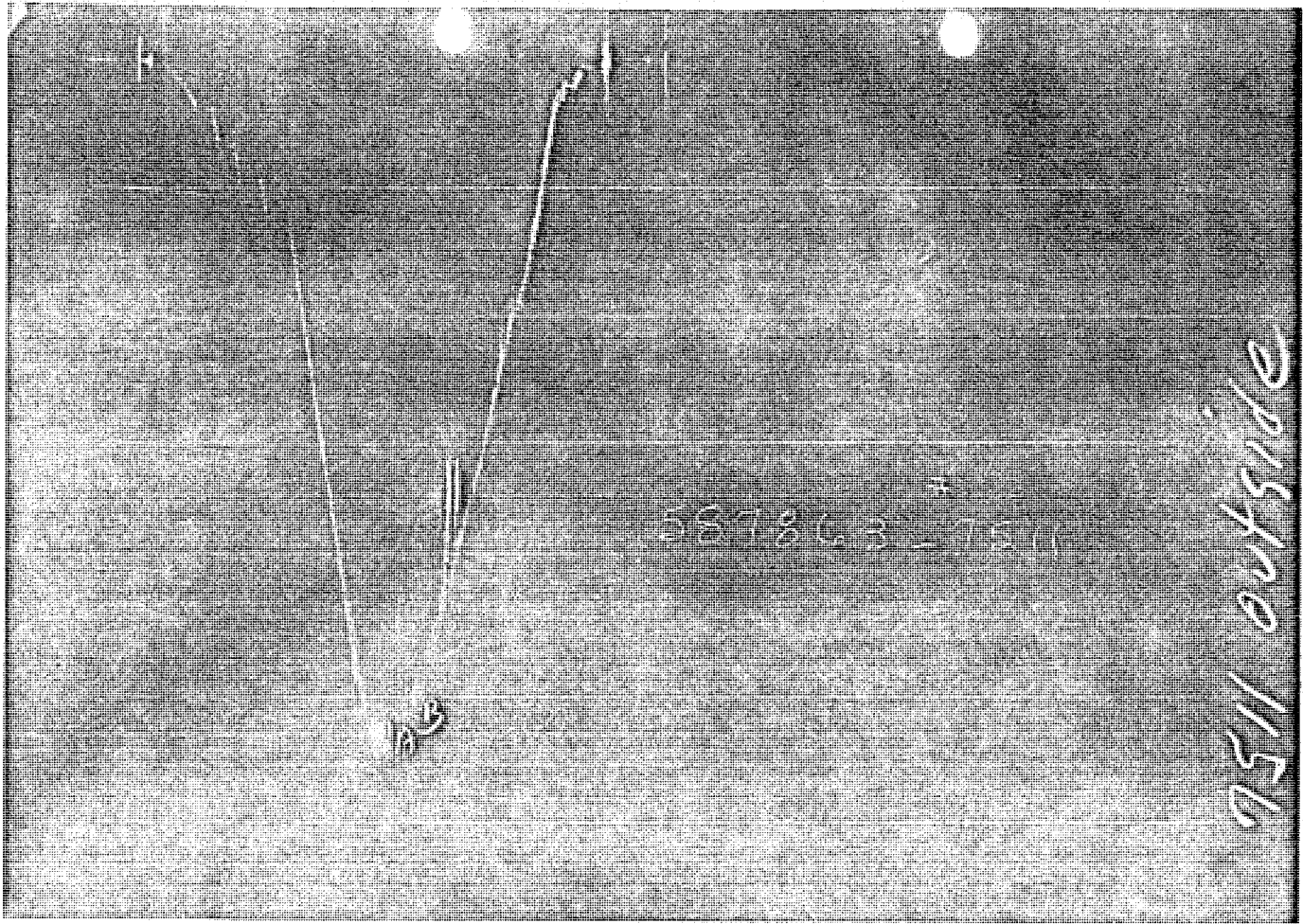
ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	FINAL HYDROSTATIC					



1090 10510

GAUGE NO: 1090 DEPTH: 9142.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5272	5130.7			
B	FINAL HYDROSTATIC	5198	5086.6			

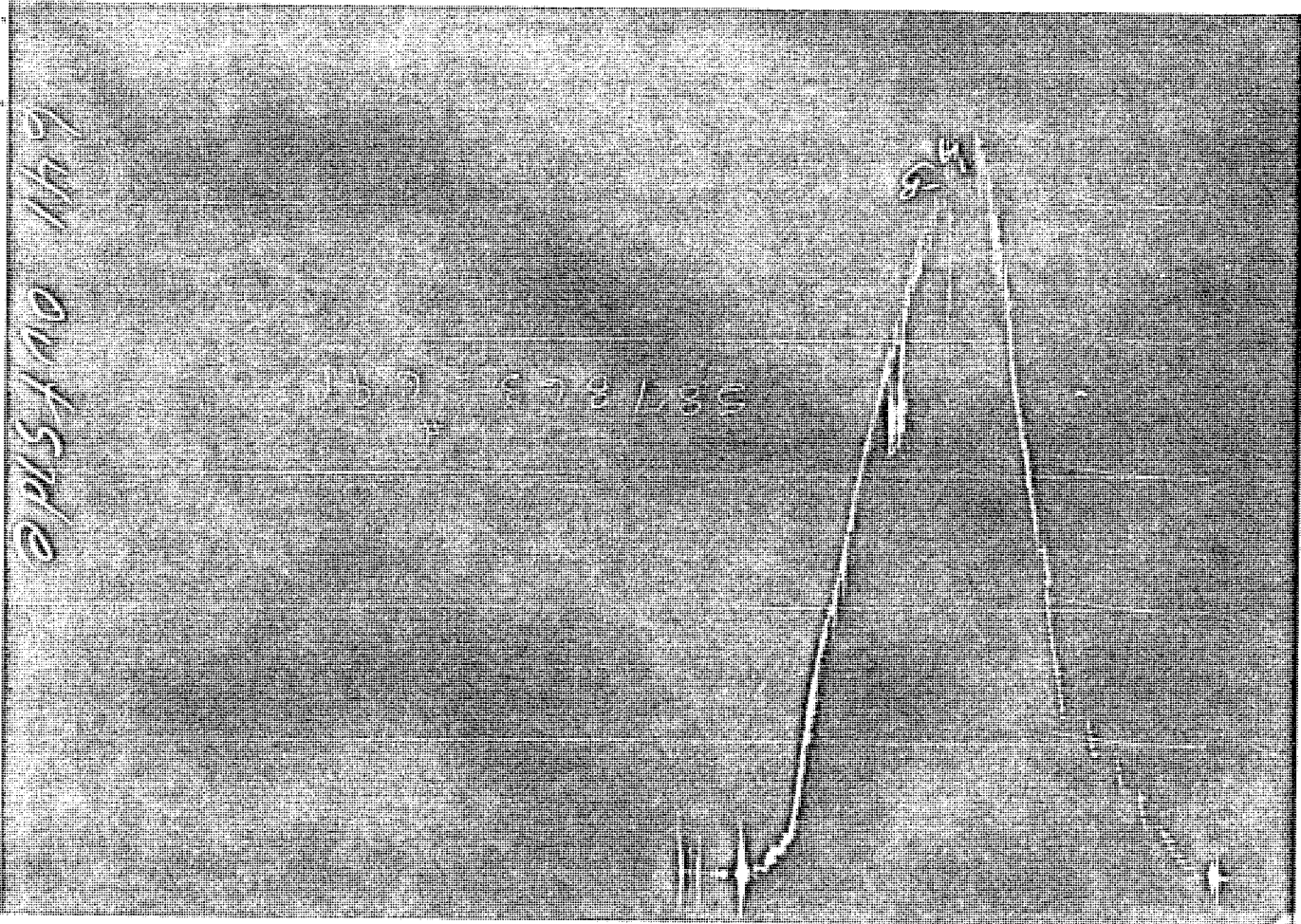


GAUGE NO: 7511 DEPTH: 9192.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5260	5166.5			
B	FINAL HYDROSTATIC	5182	5132.1			

ID	DESCRIPTION	PRESSURE		TIME	TYPE
		REPORTED	CALCULATED		
A	INITIAL HYDROSTATIC	5287	5179.7		
B	FINAL HYDROSTATIC	5213	5159.4		

GAUGE NO: 641 DEPTH: 9196.0 BLANKED OFF: YES HOUR OF CLOCK: 24



EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: _____ 40.0
 ALL DEPTHS MEASURED FROM: KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): _____ 8.750
 ELEVATION (ft): _____ 0
 TOTAL DEPTH (ft): _____ 9200.0
 PACKER DEPTH(S) (ft): 9154, 9160
 FINAL SURFACE CHOKE (in): _____
 BOTTOM HOLE CHOKE (in): _____ 0.750
 MUD WEIGHT (lb/gal): _____ 10.50
 MUD VISCOSITY (sec): _____ 46
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 121 @ 9200.0 ft

TICKET NUMBER: 58786300
 DATE: 11-30-83 TEST NO: 5
 TYPE DST: OPEN HOLE
 HALLIBURTON CAMP:
BAKERSFIELD
 TESTER: R.D. LYONS
 WITNESS: WALT ZURBA
 DRILLING CONTRACTOR:
MONTGOMERY DRILLING COMPANY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES	
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm
_____	_____ @ _____ °F	_____	ppm

SAMPLER DATA

Pstg AT SURFACE: _____
 cu.ft. OF GAS: _____
 cc OF OIL: _____
 cc OF WATER: _____
 cc OF MUD: _____
 TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ @ _____ °F
 GAS/OIL RATIO (cu.ft. per bbl): _____
 GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
<u>WATER (FT)</u>	<u>2000.0</u>	<u>8.33</u>



















RECOVERED:

PULLED TO FLUID.... RECOVERED 2000 FEET OF WATER
 CUSHION AND 523 FEET OF DRILLING MUD

MEASURED FROM
 TESTER VALVE

REMARKS:

LOST PACKER SEAT...

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	5.000	4.276	8854.0	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	8838.0
3		DRILL COLLARS.....	6.000	2.750	283.0	
5		CROSSOVER.....	6.000	3.000	0.9	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	2.250	4.6	
80		AP RUNNING CASE.....	5.000	3.000	4.2	9126.0
13		DUAL CIP SAMPLER.....	5.000	0.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	
80		AP RUNNING CASE.....	5.000	3.000	4.2	9142.0
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9154.0
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9160.0
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.250	4.2	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	21.0	
81		BLANKED-OFF RUNNING CASE.....	5.000		4.6	9192.0
81		BLANKED-OFF RUNNING CASE.....	5.000		3.9	9196.0
82		TEMPERATURE RUNNING CASE.....	5.000		4.1	9200.0
TOTAL DEPTH					9200.0	

EQUIPMENT DATA

Approx. Radius of Investigation

$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}}$$

ft

Indicated Flow Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

MCFD

Indicated Flow Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS}$$

—

Skin Factor

$$S = 1.151 \left[\frac{m}{m(P^*) - m(P_f)} - \text{LOG} \frac{\phi \mu c_t r_w^2}{kt} + 3.23 \right]$$

—

Average Effective Permeability

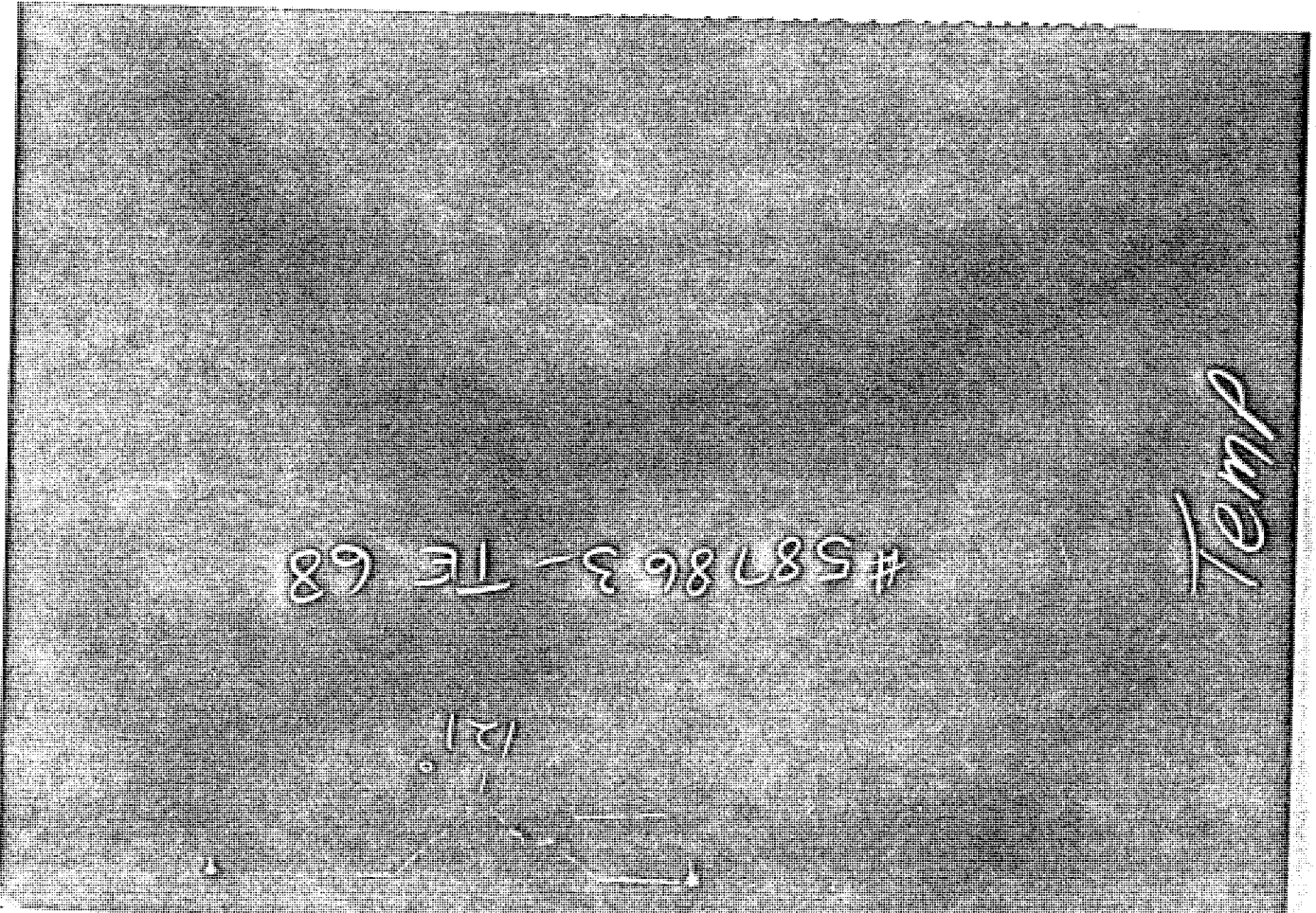
$$k = \frac{h}{kh}$$

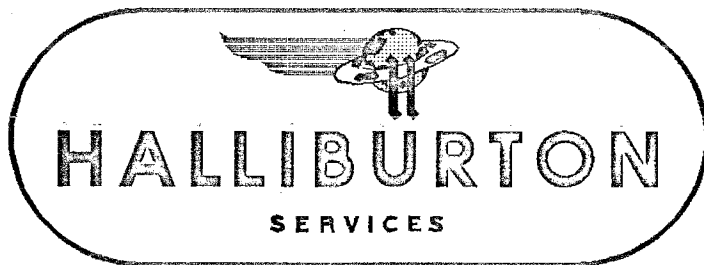
md

Indicated Flow Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft





TICKET NO. 58786200

15-DEC-83

BAKERSFIELD

019-21924

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CALIFORNIA

FORMATION TESTING SERVICE REPORT

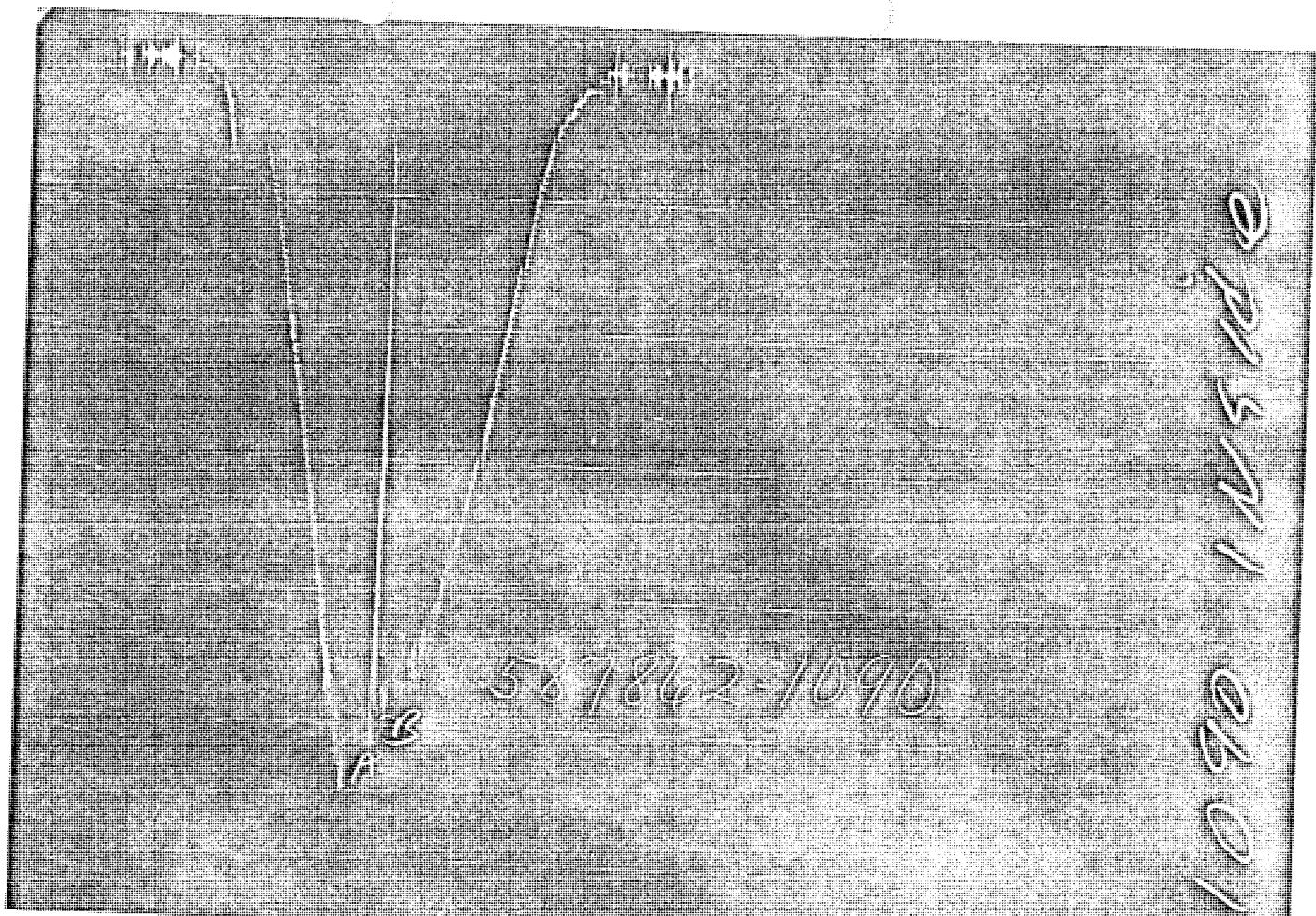
SPUZZO
LEASE NAME
WELL NO. 1
TEST NO. 4
TESTED INTERVAL 9156.1 - 9200.1
FIELD AREA CHANNERY RANCH
COUNTY FRESNO
STATE CALIFORNIA BC
AMERICAN HUNTER EXPLORATION, LIMITED
LEASE OWNER/COMPANY NAME

587862-7512

7512 INSIDE

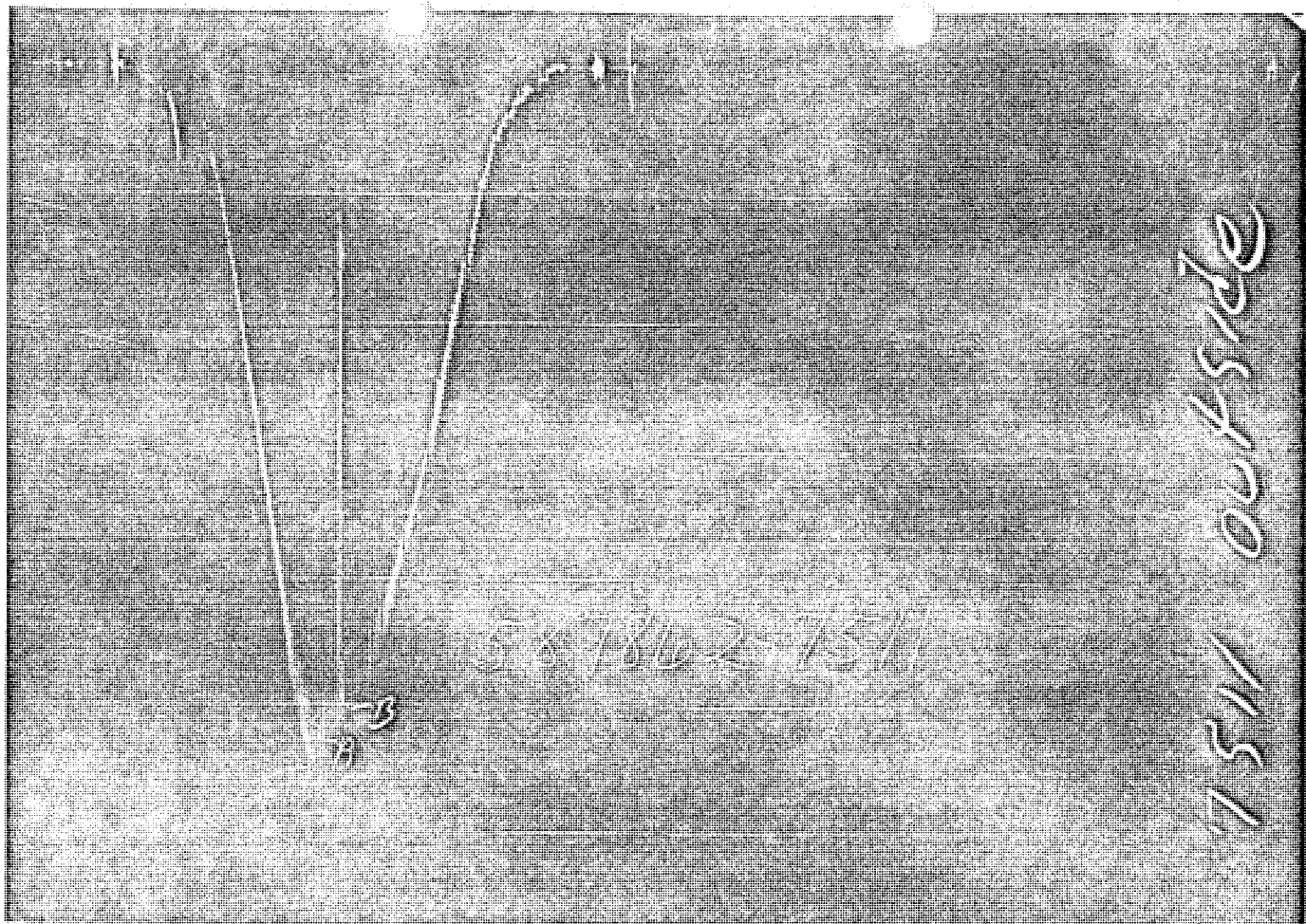
GAUGE NO: 7512 DEPTH: 9122.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	FINAL HYDROSTATIC					



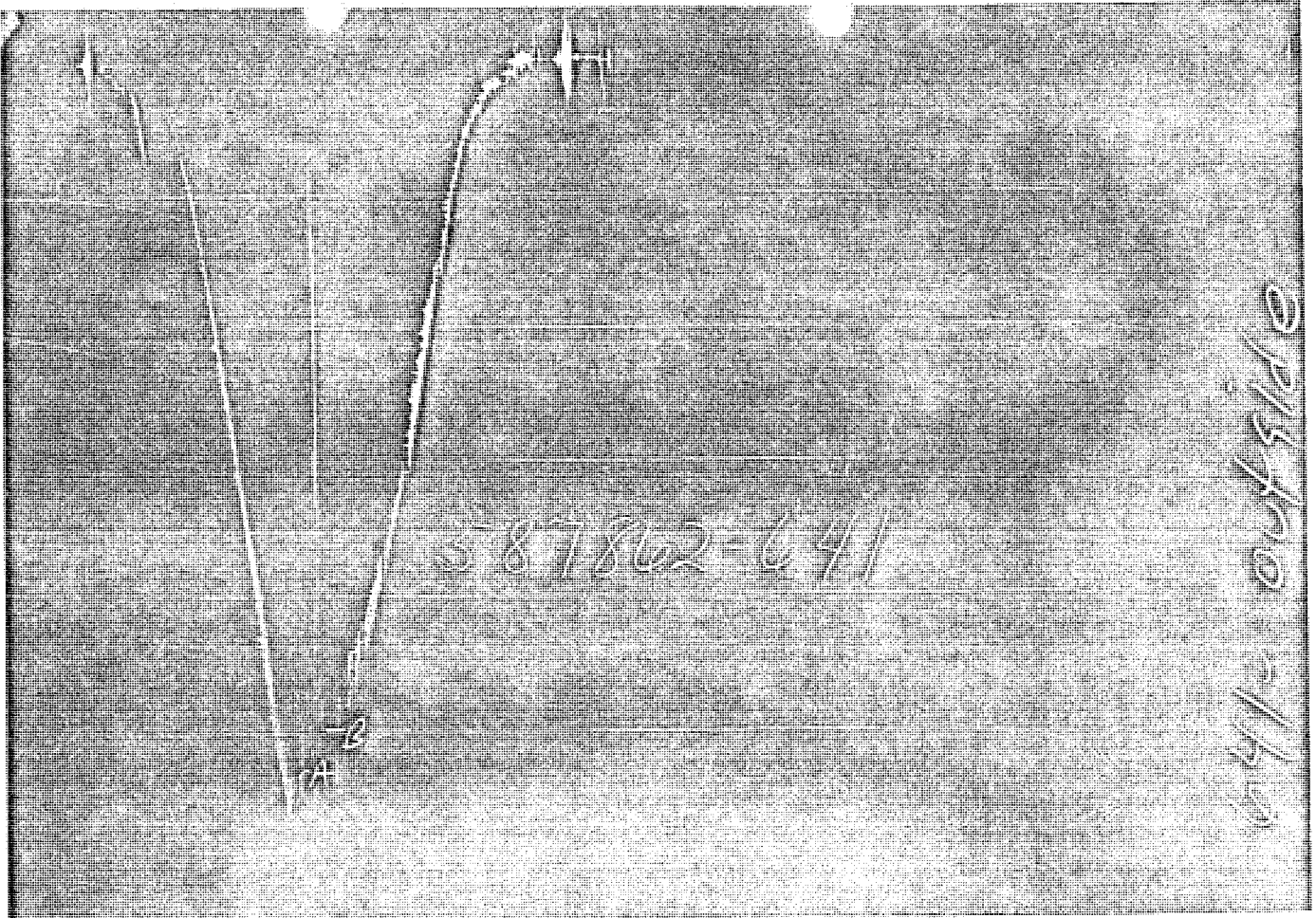
GAUGE NO: 1090 DEPTH: 9138.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		5207.9			
B	FINAL HYDROSTATIC		4877.3			



GAUGE NO: 7511 DEPTH: 9192.0 BLANKED OFF: YES HOUR OF CLOCK:

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5299	5268.1			
B	FINAL HYDROSTATIC	4947	4939.3			



GAUGE NO: 641 DEPTH: 9196.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	5287	5280.4			
B	FINAL HYDROSTATIC	4994	4956.3			

EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: _____
 ALL DEPTHS MEASURED FROM: _____ 44.0
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): _____ 8.750
 ELEVATION (ft): _____ 0
 TOTAL DEPTH (ft): _____ 9200.0
 PACKER DEPTH(S) (ft): 9150, 9156
 FINAL SURFACE CHOKE (in): _____ 0.750
 BOTTOM HOLE CHOKE (in): _____ 10.00
 MUD WEIGHT (lb/gal): _____ 10.00
 MUD VISCOSITY (sec): _____ 40
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 212 @ 9200.0 ft

TICKET NUMBER: 58786200
 DATE: 11-29-83 TEST NO: 4

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
 BAKERSFIELD

TESTER: LYONS

WITNESS: ZURBA

DRILLING CONTRACTOR:
 MONTGOMERY DRILLING COMPANY

FLUID PROPERTIES FOR RECOVERED MUD & WATER SOURCE

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg AT SURFACE: _____
 cu.ft. OF GAS: _____
 cc OF OIL: _____
 cc OF WATER: _____
 cc OF MUD: _____
 TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____
 GAS/OIL RATIO (cu.ft. per bbl): _____
 GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
WATER (FT.)	1188.0	8.33



















RECOVERED:

523' OF HOLE FLUID AND MUD

REMARKS:

LOST PACKER SEAT.

MEASURED FROM
 TESTER VALVE

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	5.000	4.276	8854.0	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	8834.0
3		DRILL COLLARS.....	6.000	2.750	283.0	
5		CROSSOVER.....	6.000	3.000	0.9	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	2.250	4.6	
80		AP RUNNING CASE.....	5.000	3.000	4.2	9122.0
13		DUAL CIP SAMPLER.....	5.000	3.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	
80		AP RUNNING CASE.....	5.000	3.000	4.2	9138.0
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9150.0
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	9156.0
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.250	4.2	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	25.0	
81		BLANKED-OFF RUNNING CASE.....	5.000		4.6	9192.0
81		BLANKED-OFF RUNNING CASE.....	5.000		3.9	9196.0
82		TEMPERATURE RUNNING CASE.....	5.000		4.1	9200.0
		TOTAL DEPTH				9200.0

EQUIPMENT DATA

TEMP

↑
21167

#587862 - TE 68

Indicated Flow Capacity

$$kh = \frac{1637 Q_g T}{m}$$

md-ft

Average Effective Permeability

$$k = \frac{kh}{h}$$

md

Skin Factor

$$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_t r_w^2} + 3.23 \right] \text{ ---}$$

Damage Ratio

$$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS} \text{ ---}$$

Indicated Flow Rate (Maximum)

$$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$$

MCFD

Indicated Flow Rate (Minimum)

$$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$$

MCFD

Approx. Radius of Investigation

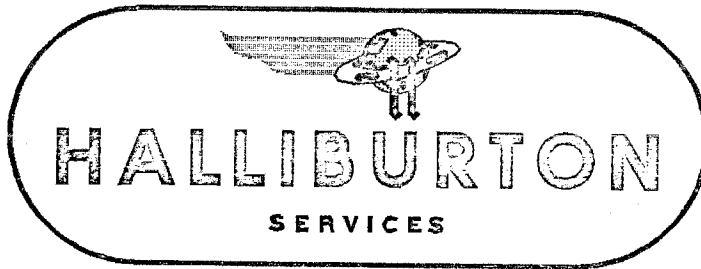
$$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_t}}$$

ft

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DIVISION OF OIL & GAS
COALINGA



TICKET NO. 58786100

28-NOV-83

BAKERSFIELD

LEASE NAME	SOUZA	WELL NO.	1	TEST NO.	3	TESTED INTERVAL	6463.1 - 6512.1	LEASE OWNER/COMPANY NAME	AMERICAN HUNTER EXPLORATION LIMITED
LEGAL LOCATION		FIELD AREA	36 - 14/12	CHANNNEY RANCH				COUNTY	FRESNO
SEC. - TYP. - RNG.								STATE	CALIFORNIA
									IC

019-21924

FORMATION TESTING SERVICE REPORT



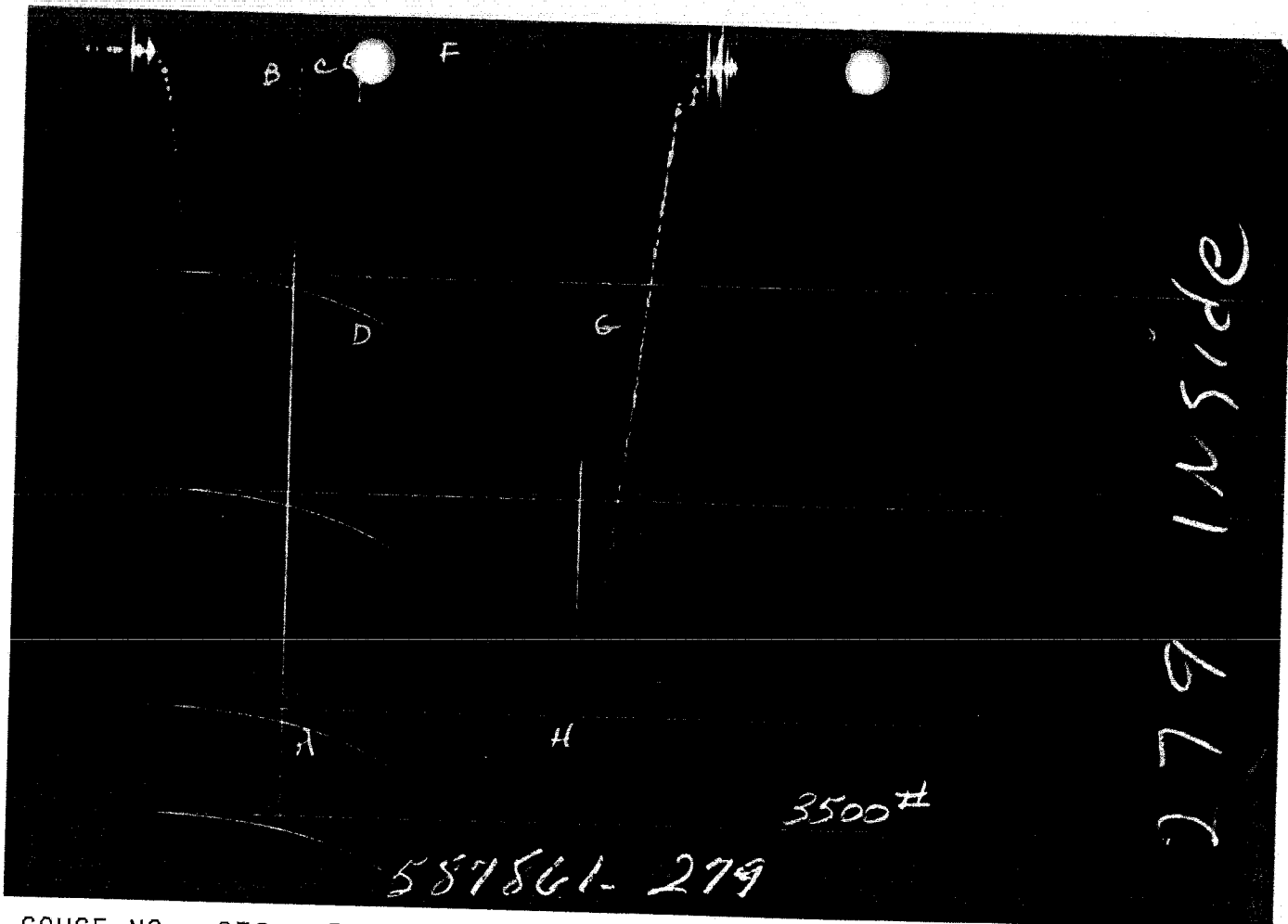
500 #

587861-6179

6179 inside

GAUGE NO: 6179 DEPTH: 6429.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW	31	73.6			
C	FINAL FIRST FLOW	31	21.7	10.0	9.7	F
C	INITIAL FIRST CLOSED-IN	31	21.7			
D	FINAL FIRST CLOSED-IN		32.5	61.0	60.2	C
E	INITIAL SECOND FLOW		21.4			
F	FINAL SECOND FLOW		3.6	91.0	92.9	F
F	INITIAL SECOND CLOSED-IN		3.6			
G	FINAL SECOND CLOSED-IN		3.8	187.0	186.2	C
H	FINAL HYDROSTATIC					

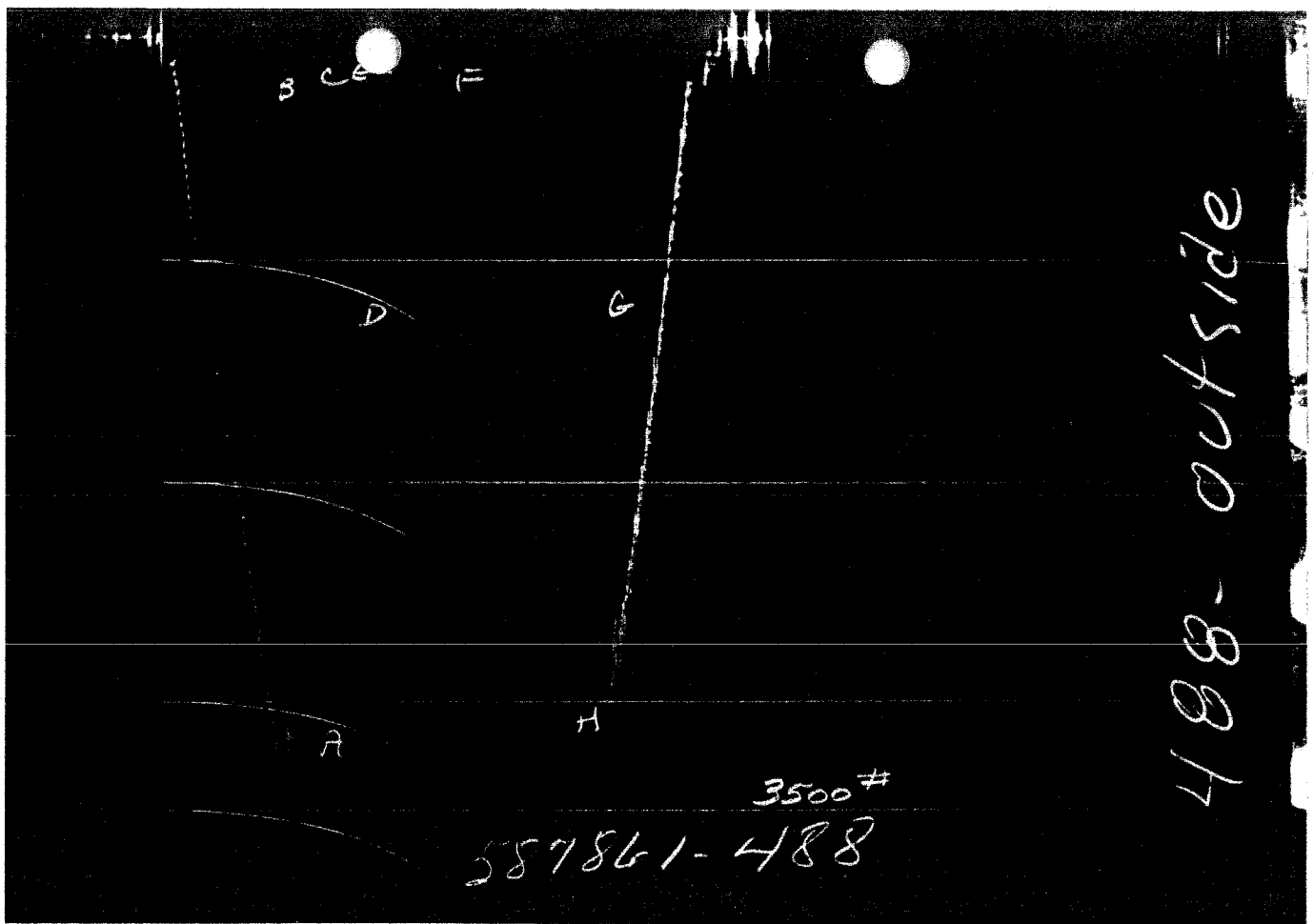


279 Inside

587861-279

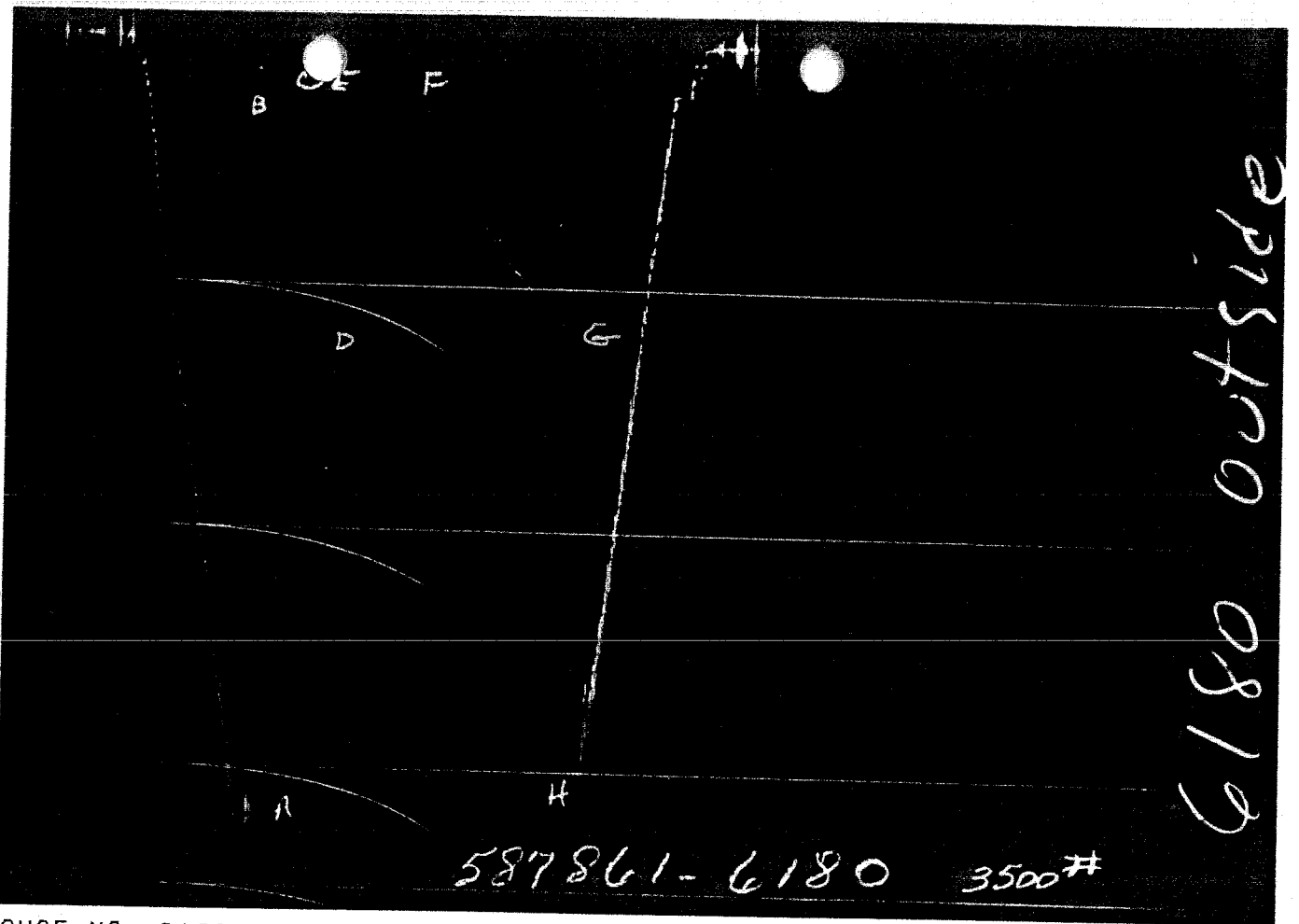
GAUGE NO: 279 DEPTH: 6445.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3183	3142.4			
B	INITIAL FIRST FLOW	66	67.1			
C	FINAL FIRST FLOW	55	36.7	10.0	9.7	F
C	INITIAL FIRST CLOSED-IN	55	36.7			
D	FINAL FIRST CLOSED-IN	1195	1185.1	61.0	60.2	C
E	INITIAL SECOND FLOW	22	39.1			
F	FINAL SECOND FLOW	22	10.3	91.0	92.9	F
F	INITIAL SECOND CLOSED-IN	22	10.3			
G	FINAL SECOND CLOSED-IN	1195	1205.9	187.0	186.2	C
H	FINAL HYDROSTATIC	3183	3042.0			



GAUGE NO: 488 DEPTH: 6504.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3167	3177.4			
B	INITIAL FIRST FLOW	207	264.4			
C	FINAL FIRST FLOW	207	229.9	10.0	9.7	F
C	INITIAL FIRST CLOSED-IN	207	229.9			
D	FINAL FIRST CLOSED-IN	1195	1194.6	61.0	60.2	C
E	INITIAL SECOND FLOW	218	242.2			
F	FINAL SECOND FLOW	286	271.3	91.0	92.9	F
F	INITIAL SECOND CLOSED-IN	286	271.3			
G	FINAL SECOND CLOSED-IN	1195	1212.4	187.0	186.2	C
H	FINAL HYDROSTATIC	3167	3056.4			



GAUGE NO: 6180 DEPTH: 6508.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3193	3179.3			
B	INITIAL FIRST FLOW	250	276.6			
C	FINAL FIRST FLOW	229	236.6	10.0	9.7	F
C	INITIAL FIRST CLOSED-IN	229	236.6			
D	FINAL FIRST CLOSED-IN	1169	1183.0	61.0	60.2	C
E	INITIAL SECOND FLOW	229	254.5			
F	FINAL SECOND FLOW	271	283.8	91.0	92.9	F
F	INITIAL SECOND CLOSED-IN	271	283.8			
G	FINAL SECOND CLOSED-IN	1190	1205.6	187.0	186.2	C
H	FINAL HYDROSTATIC	3193	3050.5			

TICKET NO: 58786100
 CLOCK NO: 28187 HOUR: 24



GAUGE NO: 6179
 DEPTH: 6429.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	73.6		
	2	2.0	52.3	-21.3	
	3	4.0	41.6	-10.7	
	4	6.0	37.2	-4.4	
	5	8.0	32.9	-4.3	
C	6	9.7	21.7	-11.3	
FIRST CLOSED-IN					
C	1	0.0	21.7		
D	2	60.2	32.5	10.9	8.4 0.065
SECOND FLOW					
E	1	0.0	21.4		
	2	10.0	5.0	-16.4	
	3	20.0	4.4	-0.6	
	4	30.0	4.0	-0.4	
	5	40.0	4.0	0.0	
	6	50.0	4.0	0.0	
	7	60.0	4.0	0.0	
	8	70.0	4.0	0.0	
	9	80.0	4.1	0.1	
F	10	92.9	3.6	-0.5	
SECOND CLOSED-IN					
F	1	0.0	3.6		
G	2	186.2	3.8	0.2	66.1 0.191

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
(Empty)					

REMARKS:
 THIS GAUGE WAS RUN ABOVE
 THE TOOL.

TICKET NO: 58786100

CLOCK NO: 28235 HOUR: 24



GAUGE NO: 279

DEPTH: 6445.0

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	67.1			
2	2.0	67.6	0.6		
3	4.0	54.0	-13.6		
4	6.0	46.9	-7.1		
5	8.0	42.0	-4.9		
C 6	9.7	36.7	-5.3		
FIRST CLOSED-IN					
C 1	0.0	36.7			
2	5.0	467.4	430.7	3.3	0.467
3	10.0	639.2	602.5	4.9	0.294
4	15.0	752.1	715.4	5.9	0.216
5	20.0	834.0	797.3	6.5	0.172
6	25.0	897.4	860.7	7.0	0.143
7	30.0	954.1	917.4	7.3	0.122
8	35.0	1001.2	964.5	7.6	0.106
9	40.0	1043.2	1006.5	7.8	0.094
10	45.0	1084.0	1047.3	8.0	0.085
11	50.0	1120.2	1083.5	8.1	0.077
12	55.0	1152.4	1115.7	8.3	0.071
D 13	60.2	1185.1	1148.4	8.4	0.065
SECOND FLOW					
E 1	0.0	39.1			
2	10.0	11.6	-27.5		
3	20.0	11.1	-0.6		
4	30.0	9.9	-1.2		
5	40.0	9.9	0.0		
6	50.0	9.9	0.0		
7	60.0	9.5	-0.3		
8	70.0	9.5	0.0		
9	80.0	10.0	0.4		
F 10	92.9	10.3	0.3		
SECOND CLOSED-IN					
F 1	0.0	10.3			
2	10.0	210.5	200.2	9.1	1.050
3	20.0	333.8	323.5	16.7	0.787
4	30.0	433.8	423.5	23.2	0.645
5	40.0	517.7	507.3	28.8	0.552
6	50.0	590.1	579.8	33.6	0.485
7	60.0	658.2	647.9	37.9	0.433
8	70.0	718.2	707.9	41.6	0.392
9	80.0	774.3	764.0	44.9	0.358
10	90.0	827.2	816.8	47.9	0.330
11	100.0	876.8	866.5	50.6	0.307

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
12	110.0	922.7	912.4	53.1	0.286
13	120.0	966.9	956.6	55.3	0.268
14	130.0	1007.7	997.4	57.3	0.253
15	140.0	1046.4	1036.1	59.2	0.239
16	150.0	1084.0	1073.7	60.9	0.226
17	160.0	1121.4	1111.1	62.5	0.215
18	170.0	1154.6	1144.2	64.0	0.205
19	180.0	1187.7	1177.4	65.4	0.196
G 20	186.2	1205.9	1195.6	66.1	0.191

REMARKS:

TICKET NO: 58786100

CLOCK NO: 26292 HOUR: 24



GAUGE NO: 488

DEPTH: 6504.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	264.4			
2	2.0	251.5	-12.9		
3	4.0	236.6	-15.0		
4	6.0	231.2	-5.3		
5	8.0	228.5	-2.7		
C 6	9.7	229.9	1.4		
FIRST CLOSED-IN					
C 1	0.0	229.9			
2	5.0	501.5	271.6	3.3	0.467
3	10.0	652.8	422.9	4.9	0.295
4	15.0	755.3	525.4	5.9	0.216
5	20.0	835.5	605.6	6.5	0.172
6	25.0	895.1	665.2	7.0	0.142
7	30.0	953.6	723.7	7.3	0.122
8	35.0	998.7	768.8	7.6	0.106
9	40.0	1049.7	819.8	7.8	0.094
10	45.0	1092.7	862.8	8.0	0.085
11	50.0	1129.7	899.8	8.1	0.077
12	55.0	1162.9	933.0	8.3	0.071
D 13	60.2	1194.6	964.7	8.4	0.065
SECOND FLOW					
E 1	0.0	242.2			
2	10.0	242.2	0.0		
3	20.0	251.7	9.5		
4	30.0	258.2	6.4		
5	40.0	259.1	0.9		
6	50.0	266.5	7.4		
7	60.0	268.2	1.7		
8	70.0	269.9	1.6		
9	80.0	274.0	4.1		
F 10	92.9	271.3	-2.7		
SECOND CLOSED-IN					
F 1	0.0	271.3			
2	10.0	284.0	12.7	9.1	1.052
3	20.0	328.3	57.0	16.7	0.787
4	30.0	415.0	143.7	23.2	0.645
5	40.0	497.9	226.6	28.8	0.552
6	50.0	569.3	298.0	33.6	0.485
7	60.0	640.9	369.6	37.8	0.433
8	70.0	706.5	435.2	41.6	0.392
9	80.0	767.6	496.4	45.0	0.358
10	90.0	825.1	553.8	47.9	0.330
11	100.0	877.2	605.9	50.6	0.307

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
12	110.0	921.6	650.4	53.1	0.286
13	120.0	965.9	694.6	55.3	0.268
14	130.0	1008.2	737.0	57.3	0.259
15	140.0	1046.3	775.0	59.2	0.239
16	150.0	1085.5	814.2	60.9	0.226
17	160.0	1121.7	850.4	62.5	0.215
18	170.0	1156.3	885.0	64.0	0.205
19	180.0	1192.1	920.8	65.3	0.196
G 20	186.2	1212.4	941.1	66.1	0.191

REMARKS:

TICKET NO: 58786100
 CLOCK NO: 13680 HOUR: 24





















GAUGE NO: 6180
 DEPTH: 6508.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	276.6		
	2	2.0	259.3	-17.3	
	3	4.0	246.2	-13.0	
	4	6.0	240.2	-6.1	
	5	8.0	235.9	-4.3	
C	6	9.7	236.6	0.7	
FIRST CLOSED-IN					
C	1	0.0	236.6		
	2	5.0	512.1	275.5	3.3 0.468
	3	10.0	652.2	415.6	4.9 0.296
	4	15.0	750.1	513.5	5.9 0.217
	5	20.0	823.5	586.8	6.5 0.172
	6	25.0	887.2	650.5	7.0 0.143
	7	30.0	940.3	703.7	7.3 0.122
	8	35.0	988.4	751.8	7.6 0.106
	9	40.0	1037.0	800.3	7.8 0.094
	10	45.0	1078.8	842.2	8.0 0.085
	11	50.0	1116.7	880.1	8.1 0.077
	12	55.0	1150.1	913.5	8.3 0.071
D	13	60.2	1183.0	946.3	8.4 0.065
SECOND FLOW					
E	1	0.0	254.5		
	2	10.0	253.4	-1.0	
	3	20.0	261.9	8.5	
	4	30.0	267.7	5.8	
	5	40.0	269.8	2.1	
	6	50.0	277.5	7.6	
	7	60.0	278.2	0.7	
	8	70.0	281.6	3.4	
	9	80.0	285.4	3.8	
F	10	92.9	283.8	-1.6	
SECOND CLOSED-IN					
F	1	0.0	283.8		
	2	10.0	296.9	13.0	9.1 1.051
	3	20.0	338.8	55.0	16.7 0.788
	4	30.0	425.4	141.5	23.2 0.646
	5	40.0	507.7	223.9	28.8 0.552
	6	50.0	583.8	300.0	33.6 0.484
	7	60.0	652.1	368.3	37.9 0.433
	8	70.0	713.8	430.0	41.6 0.392
	9	80.0	772.7	488.8	44.9 0.358
	10	90.0	826.0	542.2	47.9 0.330
	11	100.0	877.1	593.3	50.6 0.307

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
12	110.0	924.4	640.6	53.1	0.286
13	120.0	967.5	683.7	55.3	0.268
14	130.0	1010.1	726.3	57.3	0.253
15	140.0	1048.0	764.2	59.2	0.239
16	150.0	1085.1	801.3	60.9	0.226
17	160.0	1120.4	836.5	62.5	0.215
18	170.0	1154.9	871.1	64.0	0.205
19	180.0	1187.1	903.2	65.3	0.196
G	20	186.2	1205.6	921.8	66.1 0.191

REMARKS:

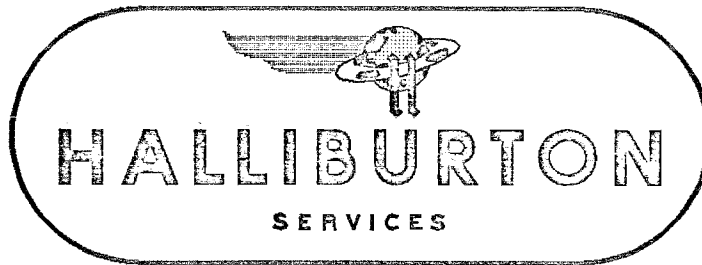
		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	5.000	4.270	6250.0	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	6238.0
3		DRILL COLLARS.....	6.000	3.000	180.0	
5		CROSSOVER.....	6.000	3.000	0.9	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	2.250	4.6	
97		RECORDER ABOVE DCIP VALVE.....	5.000	3.000	4.2	6429.0
13		DUAL CIP SAMPLER.....	5.000	0.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	
80		AP RUNNING CASE.....	5.000	3.000	4.2	6445.0
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	6457.0
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	6463.0
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.250	4.2	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	30.0	
82		TEMPERATURE RUNNING CASE.....	5.000	2.440	4.6	6500.0
81		BLANKED-OFF RUNNING CASE.....	5.000		3.9	6504.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.1	6508.0
TOTAL DEPTH						6512.0

162
 #587861-TE68
 Temp

162°

#587861-TE68

Indicated Flow Capacity	$kh = \frac{1637 Q_g T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^*) - m(P_i)}{m} - \text{LOG} \frac{kt}{\phi \mu c_{fw}^2} + 3.23 \right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_i)}{m(P^*) - m(P_i) - 0.87 mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_i)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_i)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_i}}$	ft



TICKET NO. 58786000
 22-NOV-83
 BAKERSFIELD

"Souza" 1
019-21924

RECEIVED
 APR 09 1984

DIVISION OF OIL & GAS
 COALINGA

FORMATION TESTING SERVICE REPORT

LEGAL LOCATION
 SEC. - TWP. - RVC.

LEASE NAME

WELL NO.

TEST NO.

FIELD AREA

CHANNERY RANCH

COUNTY

FRESNO

STATE CALIFORNIA OR

DATE

TESTED INTERVAL

PROPERTY NUMBER

LEASE OWNER/COMPANY NAME

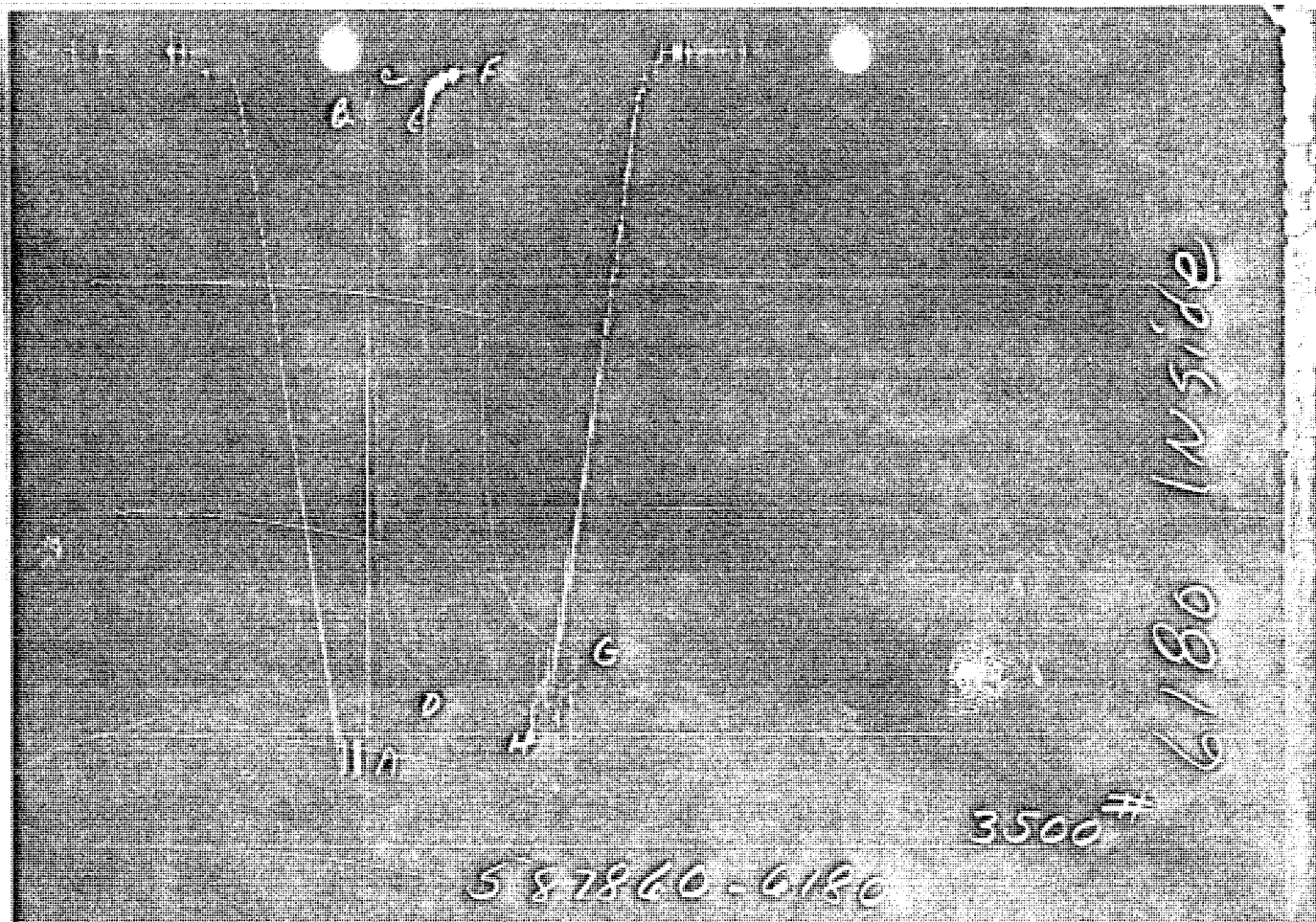
488 - Inside

587860-488

500#

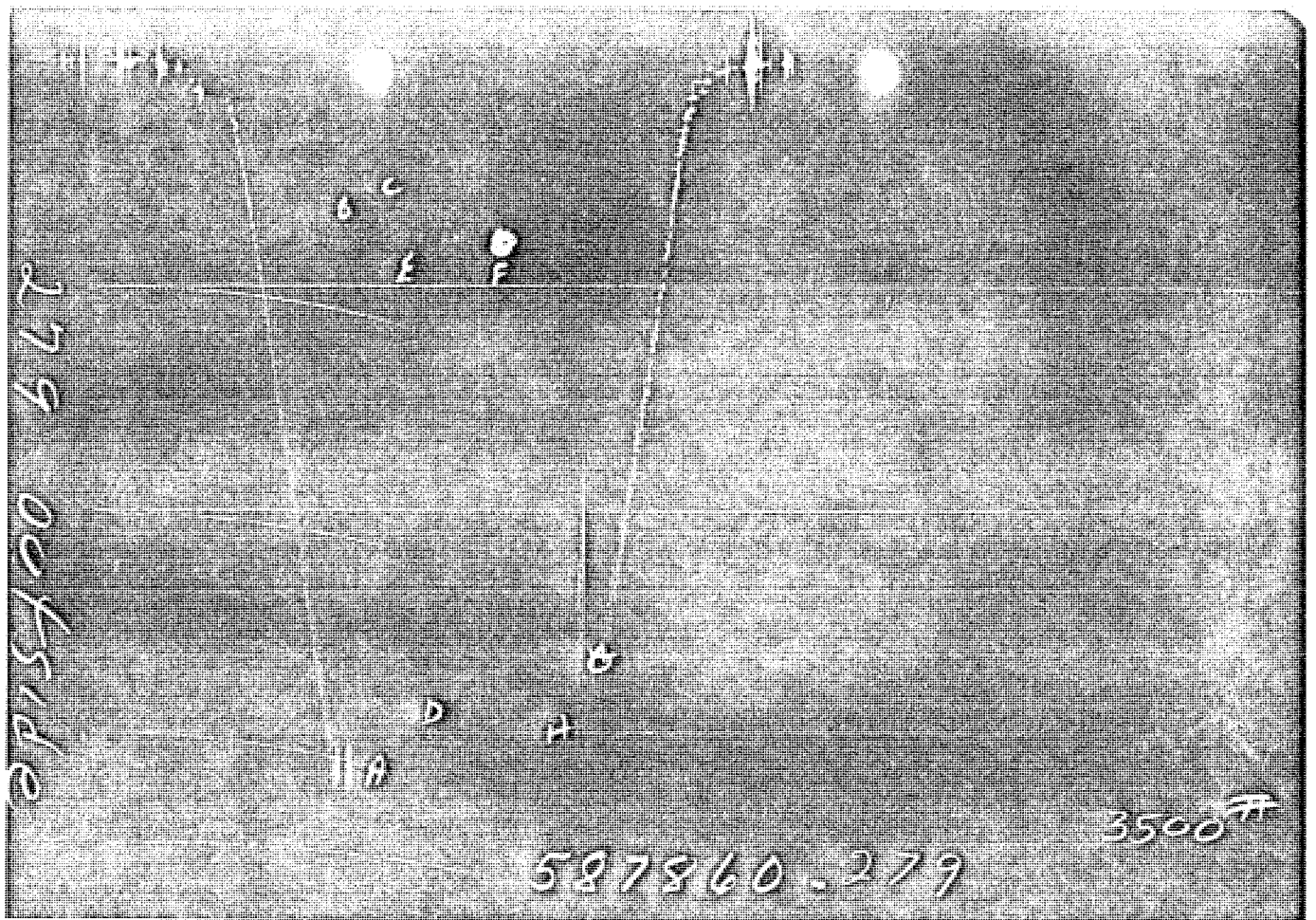
GAUGE NO: 488 DEPTH: 6274.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW	305	132.9			
C	FINAL FIRST FLOW	109	118.1	10.0	8.6	F
C	INITIAL FIRST CLOSED-IN	109	118.1			
D	FINAL FIRST CLOSED-IN	653	104.8	61.0	59.4	C
E	INITIAL SECOND FLOW	43	104.8			
F	FINAL SECOND FLOW		48.7	61.0	64.6	F
F	INITIAL SECOND CLOSED-IN		48.7			
G	FINAL SECOND CLOSED-IN		11.2	120.0	119.3	C
H	FINAL HYDROSTATIC					



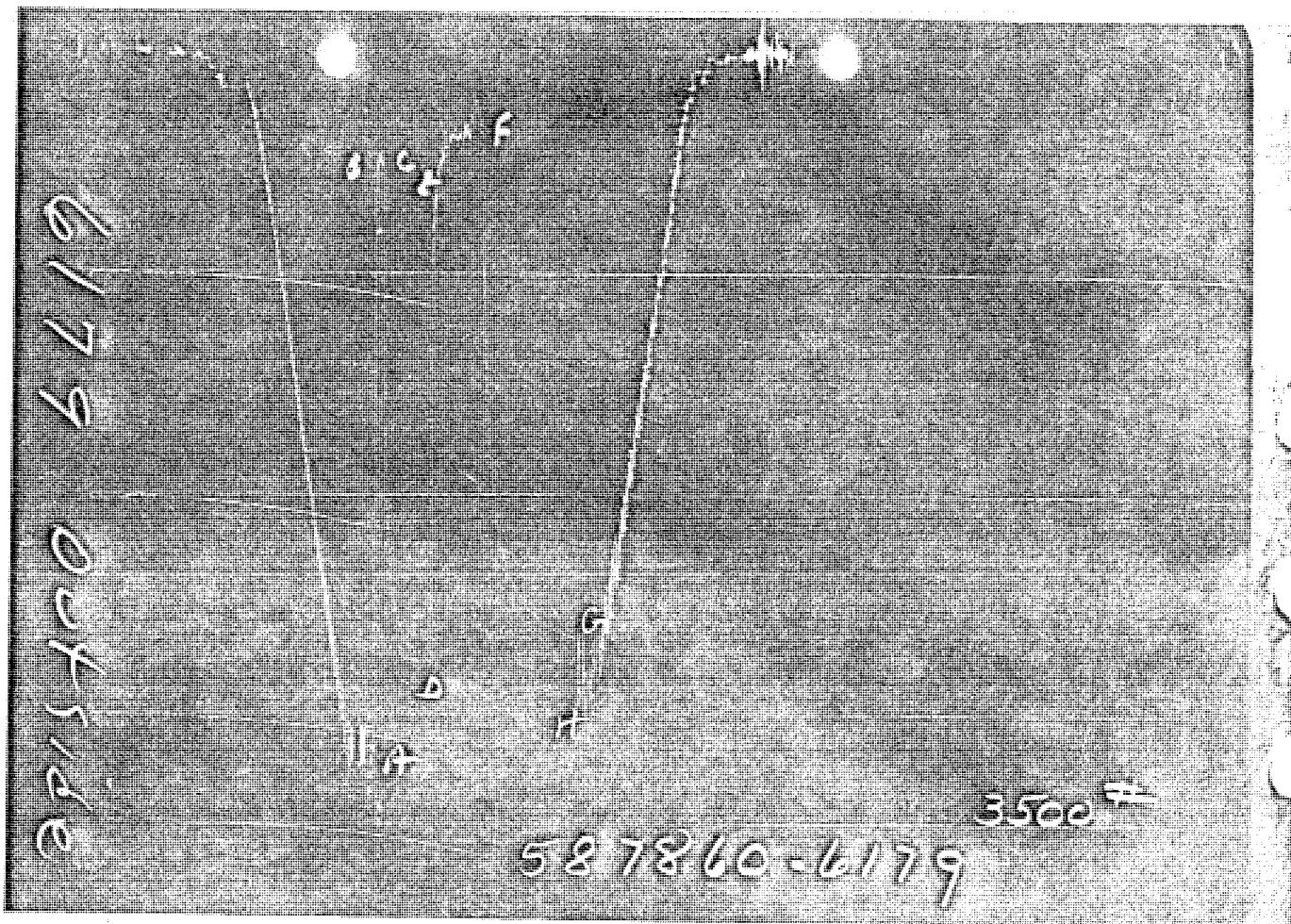
GAUGE NO: 6180 DEPTH: 6290.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3108	3094.3			
B	INITIAL FIRST FLOW	208	313.5			
C	FINAL FIRST FLOW	167	163.8	10.0	8.6	F
C	INITIAL FIRST CLOSED-IN	167	163.8			
D	FINAL FIRST CLOSED-IN	2747	2744.6	61.0	59.4	C
E	INITIAL SECOND FLOW	146	362.6			
F	FINAL SECOND FLOW	62	78.4	61.0	64.6	F
F	INITIAL SECOND CLOSED-IN	62	78.4			
G	FINAL SECOND CLOSED-IN	2641	2639.6	120.0	119.3	C
H	FINAL HYDROSTATIC	3108	2943.9			



GAUGE NO: 279 DEPTH: 6369.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3115	3132.9			
B	INITIAL FIRST FLOW	487	617.1			
C	FINAL FIRST FLOW	576	576.0	10.0	8.6	F
C	INITIAL FIRST CLOSED-IN	576	576.0			
D	FINAL FIRST CLOSED-IN	2757	2772.6	61.0	59.4	C
E	INITIAL SECOND FLOW	841	944.9			
F	FINAL SECOND FLOW	797	817.3	61.0	64.6	F
F	INITIAL SECOND CLOSED-IN	797	817.3			
G	FINAL SECOND CLOSED-IN	2645	2654.4	120.0	119.3	C
H	FINAL HYDROSTATIC	3115	2972.5			



GAUGE NO: 6179 DEPTH: 6373.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3120	3129.9			
B	INITIAL FIRST FLOW	481	559.9			
C	FINAL FIRST FLOW	523	509.3	10.0	8.6	F
C	INITIAL FIRST CLOSED-IN	523	509.3			
D	FINAL FIRST CLOSED-IN	2758	2756.2	61.0	59.4	C
E	INITIAL SECOND FLOW	523	649.4			
F	FINAL SECOND FLOW	314	337.2	61.0	64.6	F
F	INITIAL SECOND CLOSED-IN	314	337.2			
G	FINAL SECOND CLOSED-IN	2630	2650.3	120.0	119.3	C
H	FINAL HYDROSTATIC	3120	2969.2			

EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
 NET PAY (ft): _____
 GROSS TESTED FOOTAGE: _____ 65.0
 ALL DEPTHS MEASURED FROM: _____ KELLY BUSHING
 CASING PERFS. (ft): _____
 HOLE OR CASING SIZE (in): _____ 8.750
 ELEVATION (ft): _____ 0
 TOTAL DEPTH (ft): _____ 6373.0
 PACKER DEPTH(S) (ft): _____ 6302, 6308
 FINAL SURFACE CHOKE (in): _____ 0.750
 BOTTOM HOLE CHOKE (in): _____ 0.750
 MUD WEIGHT (lb/gal): _____ 9.50
 MUD VISCOSITY (sec): _____ 46
 ESTIMATED HOLE TEMP. (°F): _____
 ACTUAL HOLE TEMP. (°F): 152 @ _____ 6365.0 ft

TICKET NUMBER: 58786000

DATE: 11-15-83 TEST NO: 2

TYPE DST: _____ OPEN HOLE

HALLIBURTON CAMP:
 _____ BAKERSFIELD

TESTER: _____ R.D. LYONS

WITNESS: _____ WALT ZURBA

DRILLING CONTRACTOR:
 _____ MONTGOMERY

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm
_____	_____ @ _____ °F	_____ ppm

SAMPLER DATA

Pstg AT SURFACE: _____
 cu.ft. OF GAS: _____
 cc OF OIL: _____
 cc OF WATER: _____
 cc OF MUD: _____
 TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ @ _____ °F
 GAS/OIL RATIO (cu.ft. per bbl): _____
 GAS GRAVITY: _____

CUSHION DATA

TYPE AMOUNT WEIGHT

RECOVERED:

15' OF DRILLING FLUID

MEASURED FROM TESTER VALVE

REMARKS:

TICKET NO: 58786000

CLOCK NO: 13740 HOUR: 24



GAUGE NO: 488

DEPTH: 6274.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	132.9			
C 2	8.6	118.1	-14.7		
FIRST CLOSED-IN					
C 1	0.0	118.1			
D 2	59.4	104.8	-13.3	7.5	0.059
SECOND FLOW					
E 1	0.0	104.8			
2	10.0	103.5	-1.3		
3	20.0	78.5	-25.0		
4	30.0	62.8	-15.7		
5	40.0	54.3	-8.5		
6	50.0	54.3	0.0		
F 7	64.6	48.7	-5.6		
SECOND CLOSED-IN					
F 1	0.0	48.7			
G 2	119.3	11.2	-37.4	45.4	0.208

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
(Empty table area)					

REMARKS:

TICKET NO: 58786000

CLOCK NO: 26292 HOUR: 24



GAUGE NO: 6180

DEPTH: 890.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	313.5			
C 2	8.6	163.8	-149.7		
FIRST CLOSED-IN					
C 1	0.0	163.8			
2	4.0	2005.2	1841.4	2.7	0.501
3	8.0	2286.5	2122.7	4.1	0.318
4	12.0	2429.9	2266.1	5.0	0.235
5	16.0	2515.4	2351.6	5.6	0.187
6	20.0	2575.4	2411.6	6.0	0.156
7	24.0	2614.9	2451.1	6.3	0.133
8	28.0	2646.7	2482.9	6.6	0.117
9	32.0	2669.7	2506.0	6.8	0.104
10	36.0	2687.0	2523.3	7.0	0.093
11	40.0	2701.7	2537.9	7.1	0.085
12	44.0	2715.4	2551.6	7.2	0.078
13	48.0	2724.9	2561.2	7.3	0.072
14	52.0	2733.2	2569.4	7.4	0.067
15	56.0	2740.6	2576.8	7.5	0.062
D 16	59.4	2744.6	2580.8	7.5	0.059
SECOND FLOW					
E 1	0.0	362.6			
2	10.0	162.8	-199.8		
3	20.0	124.2	-38.6		
4	30.0	103.5	-20.7		
5	40.0	95.1	-8.5		
6	50.0	90.4	-4.7		
F 7	64.6	78.4	-12.0		
SECOND CLOSED-IN					
F 1	0.0	78.4			
2	8.0	1683.6	1605.3	7.2	1.005
3	16.0	2018.9	1940.5	13.1	0.747
4	24.0	2204.5	2126.2	18.1	0.608
5	32.0	2319.6	2241.2	22.3	0.517
6	40.0	2394.2	2315.8	25.9	0.452
7	48.0	2446.7	2368.3	29.0	0.403
8	56.0	2486.2	2407.8	31.7	0.363
9	64.0	2519.6	2441.2	34.2	0.331
10	72.0	2546.1	2467.7	36.3	0.305
11	80.0	2567.3	2488.9	38.2	0.282
12	88.0	2588.1	2509.7	40.0	0.263
13	96.0	2603.9	2525.5	41.6	0.246
14	104.0	2618.7	2540.3	43.0	0.232
15	112.0	2630.0	2551.6	44.3	0.219

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
G 16	119.3	2630.0	2561.2	45.4	0.208

REMARKS:

TICKET NO: 58786000

CLOCK NO: 13680 HOUR: 24



GAUGE NO: 279

DEPTH: 6369.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	617.1			
C 2	8.6	576.0	-41.1		
FIRST CLOSED-IN					
C 1	0.0	576.0			
2	4.0	1977.7	1401.7	2.7	0.497
3	8.0	2283.8	1707.7	4.2	0.317
4	12.0	2435.0	1859.0	5.0	0.236
5	16.0	2539.8	1963.8	5.6	0.188
6	20.0	2602.7	2026.6	6.0	0.156
7	24.0	2645.2	2069.1	6.3	0.133
8	28.0	2673.2	2097.1	6.6	0.117
9	32.0	2697.2	2121.2	6.8	0.104
10	36.0	2714.8	2138.7	7.0	0.093
11	40.0	2728.7	2152.7	7.1	0.085
12	44.0	2741.6	2165.6	7.2	0.078
13	48.0	2751.9	2175.9	7.3	0.072
14	52.0	2759.8	2183.8	7.4	0.067
15	56.0	2767.1	2191.1	7.5	0.062
D 16	59.4	2772.6	2196.5	7.5	0.059
SECOND FLOW					
E 1	0.0	944.9			
2	10.0	878.6	-66.3		
3	20.0	873.7	-4.9		
4	30.0	800.9	-72.8		
5	40.0	784.2	-16.7		
6	50.0	794.3	10.0		
F 7	64.6	817.3	23.1		
SECOND CLOSED-IN					
F 1	0.0	817.3			
2	8.0	1746.7	929.3	7.2	1.008
3	16.0	2069.2	1251.9	13.1	0.746
4	24.0	2242.1	1424.7	18.1	0.608
5	32.0	2345.1	1527.7	22.3	0.517
6	40.0	2418.1	1600.8	25.9	0.452
7	48.0	2470.8	1653.5	29.0	0.402
8	56.0	2510.0	1692.6	31.7	0.363
9	64.0	2540.2	1722.8	34.2	0.331
10	72.0	2565.5	1748.2	36.3	0.305
11	80.0	2586.8	1769.5	38.2	0.282
12	88.0	2605.5	1788.2	40.0	0.263
13	96.0	2620.4	1803.0	41.5	0.246
14	104.0	2633.6	1816.2	43.0	0.232
15	112.0	2645.9	1828.5	44.3	0.219

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND CLOSED-IN - CONTINUED					
G 16	119.3	2654.4	1837.0	45.4	0.208

REMARKS:
FLOW READINGS MAY BE QUESTIONABLE

TICKET NO: 58786000

CLOCK NO: 28235 HOUR: 24



GAUGE NO: 6179

DEPTH: 6373.0

t+Δt
Δt

208

REF	MINUTES	PRESSURE	ΔP	$\frac{t+\Delta t}{t-\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
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FIRST FLOW

B	1	0.0	559.9		
C	2	8.6	509.3	-50.5	

FIRST CLOSED-IN

C	1	0.0	509.3		
	2	4.0	2015.9	1506.6	2.7 0.499
	3	8.0	2291.1	1781.8	4.2 0.318
	4	12.0	2443.4	1934.1	5.0 0.235
	5	16.0	2530.5	2021.2	5.6 0.187
	6	20.0	2587.3	2078.0	6.0 0.156
	7	24.0	2626.1	2116.8	6.3 0.134
	8	28.0	2657.7	2148.3	6.6 0.117
	9	32.0	2680.2	2170.8	6.8 0.104
	10	36.0	2698.6	2189.3	7.0 0.093
	11	40.0	2712.7	2203.4	7.1 0.085
	12	44.0	2724.7	2215.4	7.2 0.078
	13	48.0	2736.0	2226.7	7.3 0.072
	14	52.0	2743.6	2234.3	7.4 0.067
	15	56.0	2751.5	2242.2	7.5 0.062
D	16	59.4	2756.2	2246.9	7.5 0.059

SECOND FLOW

E	1	0.0	649.4		
	2	10.0	500.5	-148.8	
	3	20.0	460.5	-40.1	
	4	30.0	385.4	-75.1	
	5	40.0	346.8	-38.6	
	6	50.0	318.5	-28.2	
F	7	64.6	337.2	18.7	

SECOND CLOSED-IN



















F	1	0.0	337.2		
	2	8.0	1690.1	1352.8	7.2 1.009
	3	16.0	2049.0	1711.8	13.1 0.747
	4	24.0	2227.3	1890.1	18.1 0.608
	5	32.0	2336.4	1999.2	22.3 0.517
	6	40.0	2408.7	2071.4	25.9 0.452
	7	48.0	2461.4	2124.2	29.0 0.403
	8	56.0	2502.2	2165.0	31.7 0.363
	9	64.0	2534.6	2197.4	34.2 0.331
	10	72.0	2561.2	2224.0	36.3 0.305
	11	80.0	2581.8	2244.5	38.2 0.282
	12	88.0	2600.2	2263.0	40.0 0.263
	13	96.0	2614.6	2277.4	41.6 0.246
	14	104.0	2629.7	2292.5	43.0 0.232
	15	112.0	2641.2	2303.9	44.3 0.219

REF	MINUTES	PRESSURE	ΔP	$\frac{t+\Delta t}{t-\Delta t}$	$\log \frac{t+\Delta t}{\Delta t}$
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SECOND CLOSED-IN - CONTINUED

G	16	119.3	2650.3	2313.1	45.4 0.208
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REMARKS:
FLOW READINGS MAY BE QUESTIONABLE

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	5.000	4.276	6100.0	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	6089.0
3		DRILL COLLARS.....	6.000	3.000	180.0	
5		CROSSOVER.....	6.000	3.000	0.9	
11		HANDLING SUB & CHOKE ASSEMBLY...	5.750	2.250	4.6	
80		AP RUNNING CASE.....	5.000	3.000	4.2	6274.0
13		DUAL CIP SAMPLER.....	5.000	0.750	7.0	
60		HYDROSPRING TESTER.....	5.000	0.750	5.0	6288.0
80		AP RUNNING CASE.....	5.000	3.000	4.2	6290.0
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	6302.0
70		OPEN HOLE PACKER.....	7.750	1.530	5.8	6308.0
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.250	4.2	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	46.0	
82		TEMPERATURE RUNNING CASE.....	5.000	2.440	4.6	6365.0
81		BLANKED-OFF RUNNING CASE.....	5.000		3.9	6369.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.1	6373.0
TOTAL DEPTH						6373.0

EQUIPMENT DATA

T-3-68 Tama

152°F

587860-TE68

Indicated Flow Capacity	$kh = \frac{1637 Q_g T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG} \frac{kt}{\phi \mu c_f w^2} + 3.23 \right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{kt}{\phi \mu c_f}}$	ft

DIVISION OF OIL AND GAS

Report on Operations

Jeff Greening, Agent
AMERICAN HUNTER EXPLORATION, LTD.
611 E. Clay, P. O. Box 468
Colusa, CA 95932

Coalinga, Calif.
June 25, 1984

Your operations at well "Souza" 1, API No. 019-21924,
Sec. 36, T14S, R. 12E M.D. B. & M. ----- Field, in Fresno County,
were witnessed on 6/19/84. T.S. Boardman, representative of
the supervisor, was present from 1300 to 1900. There were also present Dave Gunderson,
Engineer.

Present condition of well: 9-5/8" cem. 1709'; 5-1/2" 10,213', c.p. 10,061'-10,060', 9871'-
9870', 9468'-9467', 9352'-9351', 6553'-6552', 6411'-6410', 1400', perfs. 10,045'-9967',
9832'-9689', 9423'-9380', 9199'-9159', 6491'-6466', 6330'-6310'. T.D. 10,217'.
Bridge plug 10,177', 9670', 9145', 6401', Retainer 9862', 9460', 6545'. Plugged
w/50 sx of cem. below 9862', 50 sx of cem. below 9460', 50 sx of cem. below 9340'.
Plugged with cem. 6330'-6155', 1400'-1200', 90'--5'.

The operations were performed for the purpose of abandonment.

DECISION: THE PLUGGING AND CEMENTING OPERATIONS AS WITNESSED AND REPORTED ARE APPROVED.

TSB/bcm
cc: Company, Canada

*sure ok
TSB 6/19/84*

DEFICIENCIES -- CORRECTED
None

DEFICIENCIES -- TO BE CORRECTED
None

CONTRACTOR: Ganache Well Service, Inc.

M. G. MEFFERD

State Oil and Gas Supervisor

By *D. E. Don Martin* (for)
Richard F. Curtin - *Deputy Supervisor*

**DIVISION OF OIL AND GAS
Cementing/Plugging Memo**

2950
584-110

Operator American Hunter Explor. LTD Well No. "Souza" 1
 API No. 019 21924 Sec. 36, T. 14S, R. 12E, M.D. B&M
 Field _____, County Fresno. On June 19, 1984,
 Mr. T.S. Boardman, representative of the supervisor was present from 1300 to 1900.
 There were also present Dave Gunderson Engineer

Casing record of well: 9 5/8" cem 1709'; 5 1/2" cem 10213' CP 10061'-10060', 9871'-9870', 9468'-9467', 9352'-9351', 6553'-6552', 6411'-6410' ^{1400'} Perfs 10045'-9967', 9832'-9689', 9423'-9380', 9199'-9159', 6491'-6466' 6330'-6310'. TD 10217'. BP 10172', 9670', 9145', 6401' Retainer 9862', 9460', 6545'. Plugged w/c *

The operations were performed for the purpose of Abandonment
 * 50 sk of cem below 9862', 50 sk of cem below 9460', 50 sk of cem below 9340', Plugged w/cem 6330'-6155', 1400'-1200', 90'-5'

- The plugging/cementing operations as witnessed and reported are approved.
- The location and hardness of the cement plug @ _____' is approved.

Hole size: _____" fr. _____' to _____', _____" to _____' & _____" to _____'

Casing			Cemented				Top of Fill		Squeezed Away	Final Press.	Perfs.
Size	Wt.	Top	Bottom	Date	MO-Depth	Volume	Annulus	Casing			
9 5/8"				6/19/84	**	15 bbls	1200F	1200F	53 CF		In 5 1/2" CS @ 1400'

** Displaced cement from surface with 23 bbls mud

Casing/tubing recovered: _____" shot/cut at _____', _____', _____' pulled fr. _____';
 _____" shot/cut at _____', _____', _____' pulled fr. _____'.

Junk (in hole): _____

Hole fluid (bailed to) at _____'. Witnessed by _____

Mudding	Date	Bbls.	Displaced	Poured	Fill	Engr.
10.8 PPS	6/19/84	75 bbls	TDS @ 6150		1400	T.S. Boardman

Cement Plugs		Placing		Placing Witnessed		Top Witnessed		
Date	Sx./cf	MO & Depth	Time	Engr.	Depth	Wt./Sample	Date & Time	Engr.
6/19/84	6 bbls *	TDS @ 6330'	0930	Rptd by Dave Gunderson	6155	3000 #	6/19/84 1332	T.S. Boardman
6/19/84	15 bbls	fr surface **	1914	T.S. Boardman	1200F	calculated	6/19/84	T.S. Boardman
6/19/84	2 bbls	fr surface	1914	T.S. Boardman	5'	visual	6/19/84 1914	T.S. Boardman

* DACK-scattered 1 bbl out

PERMIT TO CONDUCT WELL OPERATIONS

(field code)

(area code)

Abd.
(new pool code)

(old pool code)

Jeff Greening, Agent
AMERICAN HUNTER EXPLORATION LTD.
306 Pescado Circle
Rancho Murieta, CA 95683

Coalinga, California
January 28, 1986

Your _____ proposal to ABANDON well "Souza" 1,
A.P.I. No. 019-21924, Section 36, T. 14S, R. 12E, M.D. B. & M.,
_____ field, _____ area, _____ pool,
Fresno County, dated 11/12/85, received 1/27/85 has been examined in conjunction with records
filed in this office.

THE PROPOSAL, COVERING WORK ALREADY COMPLETED IN ACCORDANCE WITH PRIOR AGREEMENT, IS
APPROVED.

Blanket Bond
CP/bcm
cc: Company, Canada

M. G. MEFFERD, State Oil and Gas Supervisor

By Richard F. Curtis
Deputy Supervisor

A copy of this permit and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed
or the operations have been suspended.

JAN 27 1986

DIVISION OF OIL AND GAS

DIVISION OF OIL & GAS
CALIFORNIA

Notice of Intention to Abandon Well

This notice must be given at least five days before work is to begin.

FOR DIVISION USE ONLY			
CARDS	BOND	FORMS	
		OGD 14	OGD 12
	<i>B</i>	✓	✓

DIVISION OF OIL AND GAS

In compliance with Section 3229, Division 3, Public Resources Code, notice is hereby given that it is our intention to abandon well AMERICAN HUNTER SOUZA #1, API No. 019-21924,
 Sec. 36, T. 14S, R. 12E, MD B. & M., - Field, FRESNO County,
 commencing work on NOVEMBER 4th, 19 83.

The present condition of the well is: Plugged & Abandoned

Additional data for dry hole (show depths):

- Total depth 10,217
- Complete casing record, including plugs and perforations
 Casing: 9-5/8", 36#/ft, K55, LT&C @ 1709'
5-1/2", 20#/ft, L80, LT&C @ 10213'
 Perfs: Lathrop 9990-9999, 9975-9986, 9967-9971
Set cement retainer @ 9862',
squeeze 6 bbls. cement
Lathrop 9832-9698, 172 shots
Set bridge plug @ 9670'
 cont'd below
- Last produced N/A
(Date) (Oil, B/D) (Gas, Mcf/D) (Water, B/D)
- Last injected N/A
(Date) (Water, B/D) (Gas, Mcf/D) (Surface pressure)

- Oil or gas shows
 DST #1: 6201-6249 Moreno, GTS - 5' flame
 DST #2: 6308-6373 Moreno, GTS - 750 MCF
 DST #3: 6463-6512 Moreno, GTS - 400 MCF
 DST #4, #5: 9156-9200 Lathrop - MR
 DST #6, #7, #8: 9382-9433, 9652-9778 Lathrop-MR
- Stratigraphic markers

Tumey	2572	Moreno Shale	5130
Kreyenhegen	2992	Bluewett	6540
Domengine	3655	Tracey	7437
		Lathrop	9159
- Formation and age at total depth
Lathrop
- Base of fresh water sands 1700'

The proposed work is as follows:

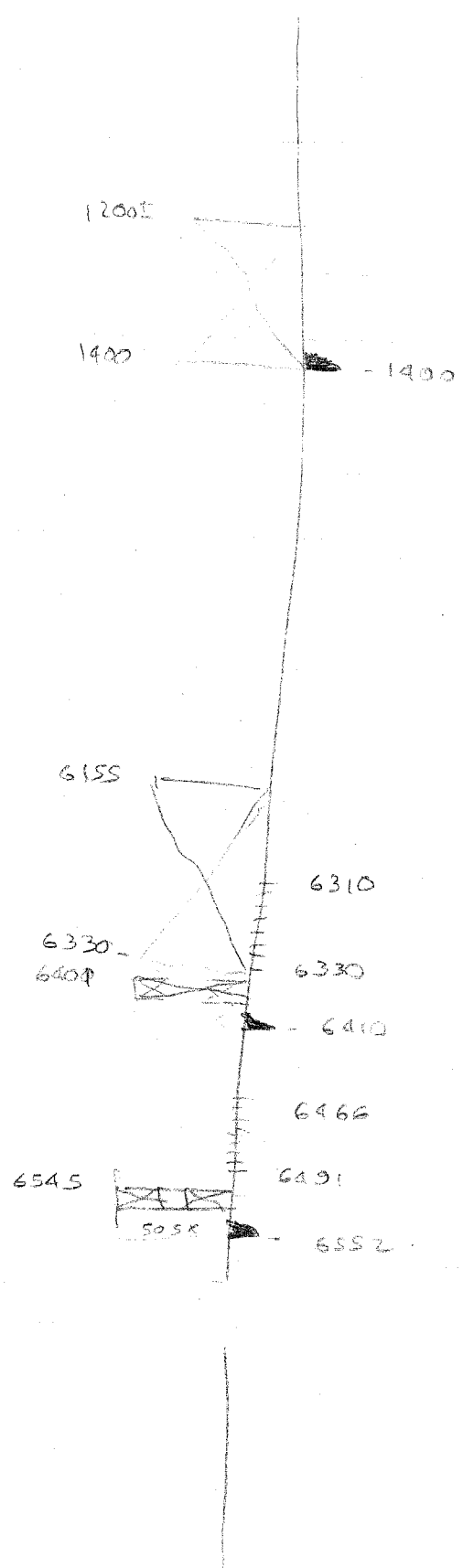
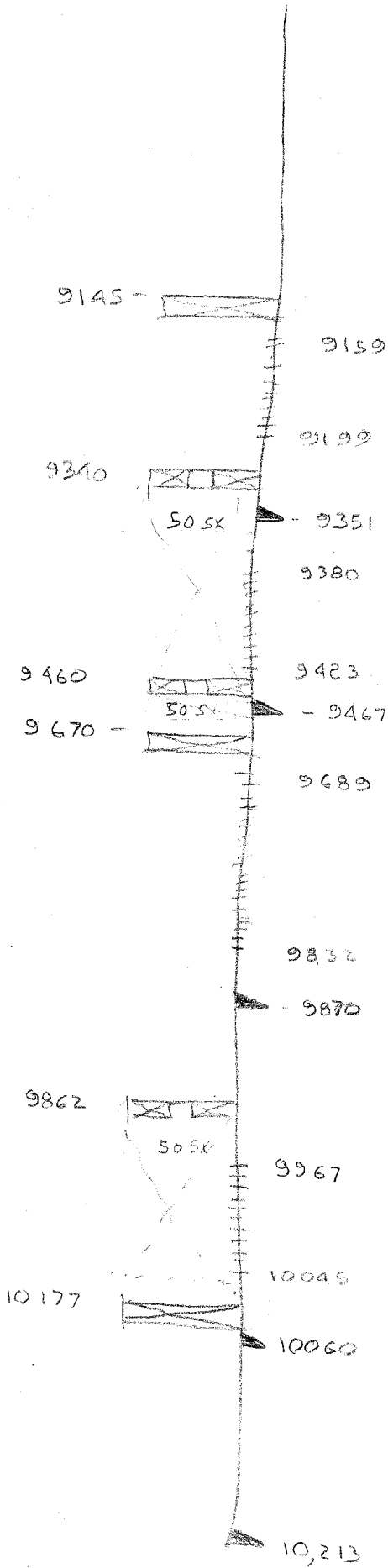
- Perfs: Lathrop 9380-9423, 86 shots
Set cement retainer @ 9340'
Squeeze 50 sks cement
Lathrop 9192-9199, 9182-9185, 9159-9176, 57 shots
Set bridge plug @ 9145'
Moreno 6491-6466
Set bridge plug @ 6401'
Moreno 6310-6330
Spot 6 bbls. cement across perfs.
9-5/8"-5-1/2" Casing Annulus: 1399-1400
Circulate 15 bbls. cement between casings
Inside 5-1/2" Casing: Spot 2 bbls. cement in casing
5' - 30'. Cut off casing 6' below ground level.

It is understood that if changes in this plan become necessary, we are to notify you immediately.

Address 435 - 4th Avenue S.W.
(Street)
Calgary Alberta T2P 3A8
(City) (State) (Zip)
 Telephone Number (403) 260-1824
(Area Code) (Number)

AMERICAN HUNTER EXPLORATION LTD.
(Name of Operator)
 By RAY SHEPERT
(Print Name)
[Signature]
(Signature)
85-11-12
(Date)

2624
E. ...
MT 59701



MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION

COALINGA, Calif.

JUNE 18 1984

Operator AMERICAN HUNTER Well No. "SOUZA" 1

Field FRESNO COUNTY Sec. 36 T. 14S. R. 12E M.D. B&M
personal

A telephone conversation was held, concerning above well, with Mr. DAVE GUNDERSON
9:30 A.M.
for above operator on JUNE 18 1984 at 8:40 A.M.

Details of the conversation were as follows:

PRESENT CONDITION

BRIDGE PLUG @ 9140'

CP @ ± 6510' RETAINER 6520' ?

PERF 6491' - 6466'

BRIDGE PLUG @ 6400'

PERF 6330' - 6310'

WILL NEED FOR ABANDONMENT

PLUG FROM 6330' - 6210' (WITNESS TAG OR IF DONE
W/RETAINER @ 6210 WITNESS THE OPERATION)

WITNESS MUDDING

PERF OR CAVITY @ 1400 (FOR BFW)

CEM BEHIND 5 1/2" FROM 1400 TO 1200'

PLUG INSIDE 5 1/2" FROM 1400 TO 1200'

(IF 5020 U/RETAINER OR BRADEN HEADED WITNESS
OPERATION)

SURF PLUG 5-30 (GR) INCLUDING ANNULUS

CLAD UP LOCATION

SEND NOTICE

(Signed) D. E. Van [Signature]

Title Assoc O & G Engr

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION
(Proposed Well Operations)

Operator _____ Well No. _____

Field _____ Sec. _____ T. _____ R. _____ B&M
personal _____

A telephone conversation was held, concerning above well, with Mr. _____
_____ for above operator _____ 19____, at _____ M.

Details of the conversation were as follows:

Total depth _____ Plugs _____

Casing record _____

Oil or gas showings _____

Results of tests _____

Stratigraphic markers _____

Geologic age at bottom _____ Base of fresh water _____

Operator proposes the following work:

Additional requirements outlined:

Test of W.S.O. to be witnessed by D.O.G. at _____ By operator at _____

Plugs to be located by D.O.G. at _____ By operator at _____

Notice to be filed immediately () Yes () Not necessary

Other data _____

(Signed) _____

Title _____

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION

COALINGA, Calif.
MAY 18 1984

Operator AMERICAN HUNTER Well No. "SOUZA" 1
Field FRESNO COUNTY Sec. 36 T. 14S. R. 12E. M.D. B&M

personal
A telephone conversation was held, concerning above well, with Mr. CHARLEY JACKSON
for above operator on MAY 18 1984 at 8:15 A.M.

Details of the conversation were as follows:

HAVE SQUEEZED LOWER PERFS THRU RETAINER

PRESENTLY HAVE PERFS 9199 TO 9159 AT INTERVALS

PROPOSE TO

ABANDON WITH BRIDGE PWA @ 9140
AND CONTINUE TESTING

APPROVED

(Signed) D. E. Van [Signature]
Title Assoc. O/G Engr.

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION
(Proposed Well Operations)

Operator _____ Well No. _____

Field _____ Sec. _____ T. _____ R. _____ B&M
personal

A telephone conversation was held, concerning above well, with Mr. _____
_____ for above operator _____ 19____, at _____ M.

Details of the conversation were as follows:

Total depth _____ Plugs _____

Casing record _____

Oil or gas showings _____

Results of tests _____

Stratigraphic markers _____

Geologic age at bottom _____ Base of fresh water _____

Operator proposes the following work:

Additional requirements outlined:

Test of W.S.O. to be witnessed by D.O.G. at _____ By operator at _____

Plugs to be located by D.O.G. at _____ By operator at _____

Notice to be filed immediately () Yes () Not necessary

Other data _____

(Signed) _____

Title _____

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION

COALINGA, Calif.

APRIL 26 1984

Operator AMERICAN HUNTER Well No. "SOUZA" 1

Field FRESNO COUNTY Sec. 36 T. 14S. R. 12E. M. D. B&M
personal

A telephone conversation was held, concerning above well, with Mr. DAVE GUNDERSON
for above operator on APRIL 26, 1984 at 8:40 P.M.

Details of the conversation were as follows:

PRESENT WELL CONDITION
9 5/8" CEM 1709'
5 1/2" CEM 10,213 CP 9871
T.D. 10,217
PERF (@ INTERVALS?) 10,045 - 9967

PROPOSE TO
SET RETAINER @ 9862 AND SQUEEZE ABOVE BONE & CP
TEST INTERVAL ABOVE RETAINER.

APPROVED

(Signed) [Signature]
Title ASSOC O & G ENGR.

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION
(Proposed Well Operations)

Operator _____ Well No. _____

Field _____ personal _____ Sec. _____ T. _____ R. _____ B&M

A telephone conversation was held, concerning above well, with Mr. _____
_____ for above operator _____ 19____, at _____ M.

Details of the conversation were as follows:

Total depth _____ Plugs _____

Casing record _____

Oil or gas showings _____

Results of tests _____

Stratigraphic markers _____

Geologic age at bottom _____ Base of fresh water _____

Operator proposes the following work:

Additional requirements outlined:

Test of W.S.O. to be witnessed by D.O.G. at _____ By operator at _____

Plugs to be located by D.O.G. at _____ By operator at _____

Notice to be filed immediately () Yes () Not necessary

Other data _____

(Signed) _____

Title _____

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION

COALINGA, Calif.

DECEMBER 7 1983

Operator AMERICAN HUNTER Well No. "SOUZA" 1

Field FRESNO Co. Sec. 36 T. 14S. R. 12E. M.D. B&M
personal

A telephone conversation was held, concerning above well, with Mr. DON MYER

(403) 260-1740 for above operator on DECEMBER 7 1983 at 3:00 P.M.

Details of the conversation were as follows:

INQUIRE ABOUT CEMENTING OF COMPLETION STRING. 1/2 W.S.O.

PRESENTLY CORING AT 9830 AND HAVE HAD SEVERAL
DST'S.

(Signed) W. E. Van Meter

Title ASSOC O & G ENGR.

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION
(Proposed Well Operations)

Operator _____ Well No. _____

Field _____ Sec. _____ T. _____ R. _____ B&M
personal _____

A telephone conversation was held, concerning above well, with Mr. _____
_____ for above operator _____ 19____, at _____ M.

Details of the conversation were as follows:

Total depth _____ Plugs _____

Casing record _____

Oil or gas showings _____

Results of tests _____

Stratigraphic markers _____

Geologic age at bottom _____ Base of fresh water _____

Operator proposes the following work:

Additional requirements outlined:

Test of W.S.O. to be witnessed by D.O.G. at _____ By operator at _____

Plugs to be located by D.O.G. at _____ By operator at _____

Notice to be filed immediately () Yes () Not necessary

Other data _____

(Signed) _____

Title _____

American Hunter Explora Ltd.
999 18th. Street, Suite 315
Denver, Colorado 80202

american hunter

TRANSMITTAL

TO: State of California
Oil and Gas Commission
P.O. Box 616
Coalburg, CA 93210

DATE: April 19, 1984

RE: WELL NAME: American Hunter Souza #1

Sec 36 T14S R12E, Fresno Co., CA

ENCLOSED PLEASE FIND THE FOLLOWING:

1. copies of A.P.E. for _____
2. copies of Survey Plan
3. copies of Well Licence Application
4. copies of Geological Prognosis and Drilling Program
5. copies of Approved Well Licence
6. copies of Field Prints of Logs
7. copies of Final Prints of Logs
8. 1 copies of DST Charts/Reports
9. 1 copies of Drilling/Completion Report
10. copies of Fluid (gas, water, oil) Analysis
11. copies of Geological Report
12. 1 copies of Core Analysis/Description
13. 1 copies of Vertical Gamma Ray, High Resolution Dipmeter, DIL-SFL, Electromagnetic Prop.
14. copies of Gamma Density-Comp Neut. Log, DIL-SFL, Borchok Compensated Sonic,
15. copies of Neutron, Borehole Comp Sonic, Down Mudlog, Sedwall Sample Log
16. MT. Gamma Ray, RUN 1 - Dual Induction, Cyberlock, Litho Density,
17. Sonic Log

RECEIVED

APR 26 1984

DIVISION OF OIL & GAS
COALBURG, CA

Sent by James M. Parker

REMARKS: The Division of Oil and Gas requires duplicate sets of records,
logs, histories etc. Please send 1 more set of all logs listed above.
Thank you

RECEIVED BY: T.S. Boardman

DATE: 4/26/84

PLEASE ACKNOWLEDGE RECEIPT BY SIGNING AND RETURNING THE
ENCLOSED COPY.

DIVISION OF OIL AND GAS

Report on Operations

Jeff Greening, Agent
AMERICAN HUNTER EXPLORATION, LTD.
611 E. Clay, P. O. Box 468
Colusa, CA 95932

Coalinga, Calif.
November 10, 1983

Your operations at well "Souza" 1, API No. 019-21924,
Sec. 36, T. 14, SR. 12E, M.D. B. & M. Field, in Fresno County,
were witnessed on 11/8/83. C. Parli, representative of
the supervisor, was present from 0130 to 0327. There were also present Joe Lindsey,
Pusher for Montgomery
Present condition of well: 9-5/8" cem. 1709'. T.D. 1709' (standing cemented).

The operations were performed for the purpose of testing the blowout prevention equipment
and installation.

DECISION: THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

CP/bcm
cc: Company, Canada

DEFICIENCIES -- CORRECTED
None

DEFICIENCIES -- TO BE CORRECTED
None

CONTRACTOR: Montgomery Drilling

M. G. MEFFERD
State Oil and Gas Supervisor
By W. E. Van Matre (for)
Deputy Supervisor

Richard F. Curtin -

DEFICIENCIES — TO BE CORRECTED *NONE*

DEFICIENCIES — CORRECTED *NONE*

CONTRACTOR *MONTGOMERY DRILLING*

REPORT ON PROPOSED OPERATIONS

(field code)

--
(area code)

--
(new pool code)

--
(old pool code)

Jeff Greening, Agent
AMERICAN HUNTER EXPLORATION LTD.
P. O. Box 468
Colusa, CA 95932

Coalinga, California
October 13, 1983

Your _____ proposal to _____ drill _____ well "Souza" 1
A.P.I. No. 019-21924, Section 36, T. 14S, R. 12E, M.D. B. & M.,
_____ field, _____ area, _____ pool,
Fresno County, dated 10/6/83, received 10/12/83 has been examined in conjunction with records
filed in this office.

THE PROPOSAL IS APPROVED PROVIDED:

1. Sufficient cement shall be pumped back of the 9-5/8" casing to fill to the surface.
2. Mud fluid of sufficient weight and proper consistency to prevent blowouts shall be used in drilling, and the column of mud fluid shall be maintained to the surface at all times, particularly while pulling the drill pipe.
3. Blowout prevention equipment conforming to Division of Oil and Gas Class III A 3M is installed on the 9-5/8" casing and maintained ready for use at all times.
Copy of requirements is enclosed.
4. Blowout-prevention practice drills are conducted at least weekly and recorded in the log book.
5. Sufficient cement shall be used to fill the annular space behind the 5-1/2" casing to at least 500' above oil and gas zones and excessive pressure intervals.
6. THIS DIVISION SHALL BE NOTIFIED:
 - a. TO WITNESS a pressure test of the blowout-prevention equipment prior to drilling out the shoe of the 9-5/8" casing.
 - b. TO WITNESS a test of the 5-1/2" water shut-off immediately above the objective zone.

NOTE: To contact this Division call (209) 935-2941.

Blanket Bond
VEV/bcm
cc: Company, Canada

M. G. MEFFERD, State Oil and Gas Supervisor

By Richard F. Curtis
Deputy Supervisor

**A copy of this report and the proposal must be posted at the well site prior to commencing operations.
Records for work done under this permit are due within 60 days after the work has been completed
or the operations have been suspended.**

RECEIVED
OCT 12 1983

DIVISION OF OIL AND GAS
Notice of Intention to Drill New Well

DIVISION OF OIL & GAS
COALINGA

C.E.Q.A. INFORMATION			
EXEMPT CLASS <input type="checkbox"/>	NEG. DEC. S.C.H. NO. <input type="checkbox"/>	E.I.R. S.C.H. NO. <input type="checkbox"/>	DOCUMENT NOT REQUIRED BY LOCAL JURISDICTION <input checked="" type="checkbox"/>
See Reverse Side			

FOR DIVISION USE ONLY					
MAP	MAP BOOK	CARDS	BOND	FORMS	
				114	121
W 38	10-11-81	✓	✓	✓	✓

In compliance with Section ~~3203~~ ^{C.U.P. 2016} Division 3, Public Resources Code, notice is hereby given that it is our intention to commence drilling well "SOUZA" 1, API No. 019-21924 (Assigned by Division)
Sec. 36, T. 14S, R. 12E, M.D.B. & M., - Field, Fresno County.
Legal description of mineral-right lease, consisting of 640 acres, is as follows: all of section 36 (Attach map or plat to scale)

Do mineral and surface leases coincide? Yes No If answer is no, attach legal description of both surface and mineral leases, and map or plat to scale.

Location of well 657.38 feet E along section/property line and 654.18 feet N at right angles to said line from the South 1/4 corner of section/property 36 or (Direction) (Cross out one)

Is this a critical well according to the definition on the reverse side of this form? Yes No

If well is to be directionally drilled, show proposed coordinates (from surface location) at total depth: - feet - and - feet - (Direction) (Direction)

Elevation of ground above sea level 423.8 feet.

All depth measurements taken from top of Kelly Bushing that is 26 feet above ground. (Derrick Floor, Rotary Table, or Kelly Bushing)

PROPOSED CASING PROGRAM

SIZE OF CASING INCHES API	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS	CALCULATED FILL BEHIND CASING
9 5/8	36#	K55	Surface	1700'	0 - 1700	800 ft. ³
5 1/2	17#	MN80	Surface	10,200'	10200-6150 3800-1700	1228 ft. ³ 640 ft. ³

(A complete drilling program is preferred and may be submitted in lieu of the above program.)

Intended zone(s) of completion Lathrop (9245'), 4300 psi. (normal H₂O Estimated total depth 10,200' (Name, depth, and expected pressure) 2 grad.)

It is understood that if changes in this plan become necessary we are to notify you immediately.

Name of Operator <u>American Hunter Exploration Ltd.</u>	Type of Organization (Corporation, Partnership, Individual, etc.) <u>Corporation</u>
Address <u>700, 435 Fourth Avenue S.W.</u>	City <u>Calgary, Alberta, Canada</u>
Telephone Number <u>403-260-1847</u>	Zip Code <u>T2P 3A8</u>
Name of Person Filing Notice <u>Don Snyder</u>	Signature <u>[Signature]</u>
	Date <u>83-10-06</u>

This notice and indemnity or cash bond shall be filed, and approval given, before drilling begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.



WAIVER OF APPEAL PERIOD

Application CUP #2016
Date Approved 10/12/83
Required Appeal Period 15 DAYS

The undersigned hereby agrees to meet all the requirements of the above approval, and requests the Director of the Resources and Development Department of the County of Fresno to issue all necessary construction permits and perform the necessary construction inspections to determine Code compliance authorized by the above approval prior to the expiration of the required appeal period.

The undersigned further agrees that should the above application not become effective for any reason, the permittee or owner shall remove any improvements or construction authorized by this application (if in conflict with existing zoning regulations) within 30 days after written notice from the Director of the Department of Resources and Development, and restore said property as nearly as practicable to it's prior condition.

The undersigned further agrees to hold the County of Fresno harmless for any damages incurred in the event the removal of the improvements are required as provided above; the undersigned also agrees to pay all costs of court and counsel incurred in the event legal action is required to enforce the provisions of this waiver.

Owner's Name _____ Permittee's Name AMERICAN HUNTER EXPLORATION LTD.
Signed _____ Signed [Signature]
Date: _____ Date: OCT 12, 1983
Accepted By [Signature] Date: 10/12/83

APPENDIX 3

CALGEM RECORDS - BENDER SILVER CREEK 57X-18

SUBMIT IN DUPLICATE
 RESOURCES AGENCY OF CALIFORNIA
 DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

History of Oil or Gas Well

Operator NAHAMA & WEAGANT ENERGY COMPANY Field CHENEY RANCH GAS County FRESNO
 Well CHENEY RANCH 57X-18 Sec. T9, T 14S., R 13E., MD. B. & M.
 A.P.I. No. 019-20736 Name TRENT ROSENLIEB Title VP. ENGINEERING
 Date JULY 9, 1991 (Person submitting report) (President, Secretary or Agent)

Signature Trent Rosenlieb

602 "H" Street, Bakersfield, CA 93304
 (Address)

(805) 323-9075
 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date

ABANDONMENT HISTORY

RECEIVED

1991

SEP 01 1991

4/30

Road rig to location 3 hrs. Move in and raised hoist. Rig out guy wires, set circ. pump. Set out pump lies & tie to water tank. Pulled 123 7/8" x 30' rods. EOT 7:00 p.m.

5/1

7:00 a.m. removed tee, worked stuck csg. donut loose. Installed BOPE. Attempted to release packer with no results, worked packer to 70,000# (shear 60,000#). Pumped down annulus & pressure to 1000 p.s.i., casing standing full. Worked packer, fluid in annulus dropped. Pumped 70 BW into annulus at 1000 to 1200 p.s.i. No returns SI well, EOT 5:30 p.m.

5/2

Commenced operations 7:00 a.m. Rigged up & ran 1 9/16" over-shot grapple and engaged rod fish @ 3690'. Worked fish, slipping off fish and was unable to get back over. POOH with tools and found grapple bent. RIH with 1 7/16" slips and was unable to get over fish. POOH. RIH with 1 1/2" spiral grapple, engaged fish but was unable to hold on. POOH, SI well, EOT 6:30 p.m.

5/3

Commenced operation @ 7:00 a.m. Ran 1 9/16" overshot with grapple. Engaged fish. Tools slipping off. POOH, SI well & shut down rig 11:00 a.m.

5/6

Commenced operations @ 8:30 a.m. Ran a 1 1/2" O'Bannion overshot grapple. Engaged fish and could hold on. POOH ran a 1 3/8" - 1 1/2" slip type overshot and was unable to engage fish. POOH. Ran a 1 5/8" O'Bannion overshot grapple. Engaged fish but was unable to hold fish. Good bite. POOH, SI well. EOT 6:30 p.m.

Page 2
Cheney Ranch 57X-18
Abandonment

RECEIVED

SEP 01 1991

DIVISION OF OIL & GAS
COALINGA

- 5/7 Commenced operations 7:00 a.m. Ran a 1 9/16" Bowen spiral grapple. Engaged fish, good bite but slipped off. Unable to get back on fish. POOH and found spiral grapple broken and out of overshot barrel. Ran a second 1 9/16" spiral grapple. Engaged fish, tools acted exactly like 1st run and found in same condition when POOH. Ran a 1 5/8" Bowen spiral grapple and engaged fish. Good bite. Increased pull in increments to 30,000# when grapple failed. POOH and found spiral grapple out of overshot.
- Rigged up to attempt jarring packer out of hole. Worked tbg for 1.5 hrs, rotating and jarring packer. Packer came loose @ 5:30 p.m. Pulled tbg to rod fish. SI well, EOT.
- 5/8 Commenced operations 7:00 a.m. Stripped out rods w/ tbg Ran 2" open ended tbg to 7339'. No fill. Pulled 5 stands. SI in well, EOT 4:30 p.m.
- 5/9 Commenced operations @ 7:00 a.m. Ran in 5 stands tbg to 7339' Rigged up Halliburton and pumped in 10 bbls fresh water ahead of 40 c.f. Class "G" cement. Displaced cement with 150 c.f. water. Pulled 10 stands tbg and cleared tbg with water. CIP @ 9:20 a.m. W.O.C. Layed down 7/8" rods. Ran tbg to top of hard cement @ 7124'. The location & hardness of cement plug was witnessed & approved by Glenn Muggelberg, from the D.O.G. Displaced hole fluid with 135 bbls 72#/cf drilling mud. Mud was approved by D.O.G. representative. Layed down 180 jts. of tbg on trailer. Cavity shot at 1400' was witnessed & approved by D.O.G. representative. Rigged out wireline. Ran open-ended tbg to 1399'. Rigged up Halliburton and pumped in 2 bbls water ahead of 26 cf Class "G" cement mixed with 3% CaCl2. Displaced cement with 4.5 bbls water. Pulled 10 stands of tbg & cleared tbg with water. Rigged out Halliburton. Closed well in. EOT 10:00 p.m.
- 5/10 Commenced operations 7:30 a.m. Ran tbg to tag cement plug. The location and hardness of cement plug at 1291' was witnessed and approved by Glenn Muggelberg of the D.O.G. Displaced hole fluid with 72#/cf drilling mud approved by D.O.G. representative. POOH with tbg laying down on trailer. Installed a cmt wiper plug @ 50'. Released rig at 2:30 p.m.
- 5/17 Commenced operations 8:00 a.m. Loaded out rod bundles on Oilfield Express trailer plus miscellaneous wellhead equipment. Cut csg head off 6' below ground level. Dumped ready mix cement in well from 50' to surface. Welded a steel plate with well no. on plate over casing stubs. D.O.G. representative Michael Woods witnessed & approved surface abandonment operations. Operations complete 2:00 p.m.

Report on Operations

Charles F. Green
CENCAL DRILLING INC.
1224 Coast Village Circle
Santa Barbara, CA. 93108

Coalinga Calif.
May 20, 1991

Your operations at well "Silver Creek" 57X, API No. 019-20736,
Sec. 18, T. 14 S, R. 13 E, M.D. B. & M. Cheney Ranch Gas
Field, in Fresno County,
were witnessed on May 17, 1991 by M. Woods, representative of
the supervisor, was present from 1045 to 1110.
There were also present Scotty Helton for Nahama & Weagant Energy Co.
Present condition of well: 16" cem. 30'; 9 5/8" cem. 1693'; 5 1/2" cem. 7357',
perf. 7289' WSO, perf. 7335'-7327'. TD. 7379'. Cav. shot @ 1400'. Plugged
w/cem. 7357'-7352', 7339'-7124', 1402'-1291' & 50'-6'.

The operations were performed for the purpose of abandonment.

DECISION: THE PLUGGING OPERATIONS AS WITNESSED AND REPORTED ARE APPROVED.

UNCORRECTABLE DEFICIENCIES: Used aggregate cement slurry (not sand cement)
for surface plug.

CONTRACTOR: Pride Petroleum Service.

MW/jp

M. G. MEFFERD
State Oil and Gas Supervisor
By Richard F. Curtin
Deputy Supervisor
RICHARD F. CURTIN

DIVISION OF OIL AND GAS
Cementing/Plugging Memo

260

Operator Cencal Drilling Inc Well No. "Silver Creek" 57X
 API No. 019-20736 Sec. 18, T. 14 S, R. 13 E, 40 B&M
 Field Cheney Ranch Gas, County Fresno. On May 17, 1991
 Mr. M. Woods, representative of the supervisor was present from 1045 to 1110.

There were also present Scotty Pellon for Mahan & Wriggall Energy Company
 Casing record of well: 16" cas 20'; 9 5/8" cas 1693'; 5 1/2" cas 7357'; perf 7239'-7327'; TD 7379'; Cased @ 1400'; Plug @ cas 7357'-7358'; 7329'-7124'; 1402'-1291' @ 50'-6'

The operations were performed for the purpose of abandonment

The plugging/cementing operations as witnessed and reported are approved.

The location and hardness of the cement plug @ _____' is approved.

Hole size: _____" fr. _____' to _____', _____" to _____' & _____" to _____'

Casing			Cemented			Top of Fill		Squeezed Away	Final Press.	Perfs.
Size	Wt.	Top Bottom	Date	MO-Depth	Volume	Annulus	Casing			

Casing/tubing recovered: cas " shot/cut at 1400' ^{GLM 5-9-91}, _____', _____' pulled fr. _____';
 _____" shot/cut at _____', _____', _____' pulled fr. _____'.

Junk (in hole): _____

Hole fluid (bailed to) at _____'. Witnessed by _____

Mudding	Date	Bbls.	Displaced	Poured	Fill	Engr.
72 # +	5-9-91	138	Tbg @ 7100'	-	1400' ±	G. Muggelberg
72 # +	5-10-91	30	Tbg @ 1280'	-	Surface	G. Muggelberg

Cement Plugs		Placing	Placing Witnessed		Top Witnessed			
Date	Sx./cf	MO & Depth	Time	Engr.	Depth	Wt/Sample	Date & Time	Engr.
5-9	40cf	Tbg @ 7339'	-	Rpt by S.	7124'	2000*	5-9 1340	G. Muggelberg
5-9	27cf	Tbg @ 1402'	-	"	1291'	All the wt	5-10 0805	G. Muggelberg
5-17	75yd +	Rubber plug @ 50'	1050	M Woods	5'	Visual	5-17 1200	M. Woods

* Cement containing aggregate rocks

UNCORRECTABLE DEFICIENCIES

Used aggregate cement slurry (not sand cement) for surface plug

CONTRACTOR

Priso Petroleum Services



PANOCHÉ CREEK FARMS
FIREBAUGH, CALIFORNIA

February 19, 1993

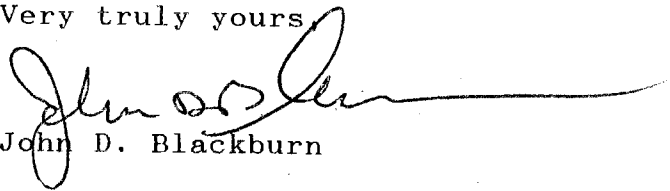
Mr. Roy Houde
Department of Conservation
Division of Oil and Gas
466 North Fifth Street
Coalinga, CA 93210

Dear Mr. Houde:

Attached is a letter dated December 28, 1992 pertinent to CenCal Drilling locations 57x, Sec. 18, 14/13 and 77x, Sec. 19, 14/13.

Please be advised that Panoche Creek Farms is the surface owner of these well locations. Panoche Creek Farms has requested that the tank at well 77x be left for Panoche Creek's use, as well as other equipment mentioned in the letter pertaining to both 77x and 57x. Any equipment or material not used by Panoche Creek Farms will be removed by Panoche Creek Farms.

Very truly yours,



John D. Blackburn

Attachment

PERMIT TO CONDUCT WELL OPERATIONS

134
(field code)
00
(area code)
Abd
(new pool code)
05
(old pool code)

Rocky Rasley, Agent
NAHAMA & WEAGANT ENERGY COMPANY
602 "H" Street
Bakersfield, CA. 93304

Coalinga, California
April 26, 1991

Your _____ proposal to abandon _____ well _____
A.P.I. No. 019-20736, Section 18, T. 14S, R. 13E, MD B. & M.,
Cheney Ranch Gas field, _____ area, (V) Cretaceous pool,
Fresno County, dated 4/24/91, received 4/25/91 has been examined in conjunction with records
filed in this office.

Cencal Drilling, Inc.
"Silver Creek" 57X

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment conforming to CDOG Class II 2M requirements is installed on the 5 1/2" casing and maintained ready for use at all times.
2. All portions of the well not plugged with cement are filled with inert mud fluid having a minimum density of 72 lbs./cu. ft. and a minimum gel-shear strength (10 min) of 20 lbs./100 sq. ft.
3. Freshwater deposits are protected by squeeze-cementing through perforations at 1400' or by placing a cement plug across a cavity shot at that depth. In either case, cement must fill the casing to at least 100' feet above the perforations or cavity shot.
4. The proposed cement plug from 1800' to 1500' extends from 1400' to at least 1300'.
5. THIS DIVISION SHALL BE NOTIFIED:
 - a. To witness the location and hardness of the cement plug from 7340' to 7040'. (7189')
 - b. To witness the mudding of the well.
 - c. To witness the cavity shot ^{of} on squeeze cementing at 1400'.
 - d. To witness the location and hardness of the cement plug from 1400' to 1300'.
 - e. To witness the placing of the cement surface plug from 50' to 5' including all uncemented annuli.
 - f. When the well site has been restored to a condition that will pass environmental inspection.

NOTE: This Division does not pass upon your right to enter the property, but merely approves the proposal as conforming to our requirements.

The base of the usable freshwater.

Engineer Glenn Muggelberg

Phone (209) 935-2941
CC: Cencal Drilling, Inc.

M. G. MEFFERD, State Oil and Gas Supervisor

By V. E. Van Alstede
Deputy Supervisor

(FOR) RICHARD F. CURTIN

A copy of this permit and the proposal must be posted at the well site prior to commencing operations.

Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended.

DIVISION OF OIL AND GAS

Notice of Intention to Abandon Well

FOR DIVISION USE ONLY			
CARDS	BOND	FORMS	
		OGD114	OGD121
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

DIVISION OF OIL AND GAS

In compliance with Section 3229, Division 3, Public Resources Code, notice is hereby given that it is our intention to abandon well Cheney Ranch 57X-19 "Silver Creek" 57X, API No. 019-20736, Sec. 18, T. 14S, R. 13E, M.D. B. & M., Cheney Ranch Gas Field, Fresno County, commencing work on May 1, 19 91.

The present condition of the well is:

- Total depth 7500'
- Complete casing record, including plugs and perforations (present hole)
9 5/8" csg cmt'd @ 1693'
5 1/2" csg cmt'd @ 7357'
4-JHPF 7327'-7335'
- Last produced 9/85 42 581 1100
(Date) (Oil, B/D) (Gas, Mcf/D) (Water, B/D)
or
4. Last injected - - - -
(Date) (Water, B/D) (Gas, Mcf/D) (Surface pressure)

- Additional data for dry hole (show depths):
- Oil or gas shows
 - Stratigraphic markers
 - Formation and age at total depth
 - Base of fresh water sands est. 1650'

9. Is this a critical well according to the definition on the reverse side of this form? Yes No

The proposed work is as follows:

- Place cement plug from 7340' - 7040'.
- Change hole over to 72 pcf drilling mud.
- Place cement plug from 1800' - 1500'.
- Place cement plug from 50' - surface.
- Cut off casing 5 feet below surface, weld steel plate on casing stub.
- Restore location.

RECEIVED
APR 25 1991
DIVISION OF OIL & GAS
COALINGA

It is understood that if changes in this plan become necessary, we are to notify you immediately.

Address 602 "H" Street
(Street)
Bakersfield, CA 93304
(City) (State) (Zip)
Telephone Number (805) 323-9075
(Area Code) (Number)
OC108 (2/84/DWRR/5M)

Nahama & Weagant Energy Company
(Name of Operator)
By Trent Rosenlieb
(Print Name)
Trent Rosenlieb 4/29/91
(Signature) (Date)

PACIFIC GAS AND ELECTRIC CO.
DEPT. OF ENGINEERING RESEARCH

E. A. ... ANALYSIS OF GAS SAMPLE

SAMPLE IDENTIFICATION:
CHENEY RANCH FIELD, SAN JOAQUIN DIVISION
WELLER 57X12

LAB. NO. 73-796

DATE SAMPLED DATE ANALYZED
JUNE 13 1973 JUNE 29 1973

GAS PHASE COMPONENT	VOLUME FRACTION	CALCULATED SPEC. GRAV.	CALCULATED BTU/CU. FT.
CARBON DIOXIDE	0.0037	0.674	1167.1
NITROGEN	0.0149		
METHANE	0.8617		
ETHANE	0.0540		
PROPANE	0.038		
ISO-BUTANE	0.0104		
N-BUTANE	0.0101		
ISO-PENTANE	0.0034		
N-PENTANE	0.0022		
HEXANES	0.0012		
TOTAL	1.0000		

DIVISION OF OIL AND GAS
RECEIVED
JAN 17 1974
WOODLAND, CALIFORNIA

RECEIVED
JAN 21 1974
WOODLAND, CALIFORNIA

C. Stromberg

H. R. Mc Clell
ANALYST H. R. MC CLELL, MECH. ENGR.

DISTRIBUTION:

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RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT OF WELL PLUGGING AND ABANDONMENT

Charles F. Green
CENCAL DRILLING, INC.
1224 Coast Village Circle
Santa Barbara, CA 93108

Coalinga, California
March 1, 1993

Your report of abandonment of well "Silver Creek" 57X,
A.P.I. No. 019-20736, Section 18, T. 14 S, R. 13 E, M.D.B. & M.,
Cheney Ranch Gas field, Fresno County,
dated July 9, 1991, received September 1, 1991, has been examined
in conjunction with operations witnessed and records filed in this office.
We have determined that all of the requirements of this Division have
been fulfilled.

NOTE: Surface plugging completed on May 17, 1991.

CP/kt
cc: Cons. Committee
PI
Well File

WILLIAM F. GUERARD, JR.
ACTING STATE OIL AND GAS SUPERVISOR

By Richard F. Curtin
RICHARD F. CURTIN
DEPUTY SUPERVISOR

RESOURCES DIVISION OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DI VISION OF OIL AND GAS
WELL SUMMARY REPORT

SUBMIT IN DUPLICATE

Operator E. A. Bender, Operator Well No. Silver Creek 57X-18
 Sec. 18, T. 14S, R. 13E, M.D. B. & M. Cheney Ranch Field Fresno County.
 Location 660' North & 1980' West from S.E. Corner of Sec. 18.
(Give location from property or section corner, or street center line.)

Elevation of ground above sea level 357 feet

All depth measurements taken from top of Kelly Bushing which is 16 feet above ground.
(Derrick Floor, Rotary Table or Kelly Bushing)

In compliance with Sec. 3215, of the Public Resources Code, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

Date 8/2/73

Signed [Signature]

Fred Green
(Engineer or Geologist)

(Superintendent)

Title Vice President
(President, Secretary or Agent)

Commenced drilling 4-24-73
 Completed drilling 5-11-73
 Total depth 7500' Plugged depth 4043'
 Junk Redrilled from 4043' to 7359'. 7379'

GEOLOGICAL MARKERS DEPTH

<u>Top Cretaceous Gas Sand</u>	
<u>Original Hole</u>	<u>7210</u>
<u>Redrill Hole</u>	<u>7330</u>

Commenced producing _____ (Date) Flowing/gas lift/pumping Name of producing zone _____
(Cross out unnecessary words)

Geologic age at total depth: _____

Initial production

Production after 30 days

Clean Oil bbl. per day	Gravity Clean Oil	Per Cent Water including emulsion	Gas Mcf. per day	Tubing Pressure	Casing Pressure
<u>10</u>	<u>60°</u>	<u>none</u>	<u>550</u>	<u>2620</u>	<u>2750</u>
<u>Shut in waiting on P.G. & E.</u>					

CASING RECORD (Present Hole)

Size of Casing (A. P. I.)	Depth of Shoe	Top of Casing	Weight of Casing	New or Second Hand	Seamless or Lapweld	Grade of Casing	Size of Hole Drilled	Number of Sacks of Cement	Depth of Cementing if through perforations
<u>5/8"</u>	<u>1693'</u>	<u>Surf.</u>	<u>53.5#</u>	<u>S.H.</u>	<u>Smls</u>	<u>J-55</u>	<u>13-3/4"</u>	<u>905</u>	
<u>1/2"</u>	<u>7357'</u>	<u>"</u>	<u>15.5 & 17#</u>	<u>New</u>	<u>"</u>	<u>K-55</u>	<u>7-7/8"</u>	<u>693CF</u>	

PERFORATED CASING

(Size, top, bottom, perforated intervals, size and spacing of perforation and method.)

5-1/2" Perforated 7289' 1/2", 4 holes per foot - perforated with casing gun.
" 7327-35, 1/2", 4 holes per foot - " " tubing "

2-3/8" tubing, 4.70#, N-80 to 7284'.

Was the well directionally drilled? Yes (Redrill) Schlumberger DI-L Log from 1695-7379
 Electrical Log Depths Welex I-ES 1693-7490'; (Attach Copy of Log)
Jacob Mud Log 6112-7500'

DIVISION OF OIL AND GAS

PAGE #1

History of Oil or Gas Well

OPERATOR E. A. Bender, Operator FIELD Cheney Ranch

Well No. Silver Creek No. 57X-18, Sec. 18, T. 14S, R. 13E, B. & M.

Date _____, 19____ Signed _____

P.O. Box 52,
Bakersfield, Ca. 93302 805-831-7461 Title _____
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date	Depth	Remarks
1973		
4-24	1693'	Tiger Drilling Contractor spudded in at 4:00 AM, with 13-3/4" bit using 4-1/2" drill pipe and water base gel mud. 16" conductor at 30'.
4-25		B-J cementers cemented 45 joints, used 9-5/8" A.P.I. 53.5#, L.T.& C. & Vee thread, range 3, seamless casing, including open guide shoe at 1693' with 390 sacks Class G cement premixed with 390 sacks Diamix A and 8% gel, followed by 125 sacks Class G cement treated with 3% CaCl ₂ . Displaced one top rubber plug with 665 cu.ft. mud. Pumped in 25 sacks Class G cement thru 1" pipe hung at 90' in annulus. Cement in place at 5 AM. Stood cemented 4 hours. Landed casing and tested B P.O.E. to 1500 p.s.i. Approved by D.O.G. Located top of cement 1680' with 7-7/8" bit.
4-26	3782'	Drilled out shoe and drilled ahead with 7-7/8" bit.
4-28	6166'	Drilled 7-7/8" bit. Jacobs Formation logging on at 6112'. Mud 72.5#, Vis. 46.
4-20	7260'	Drilled 7-7/8" hole. Welex logged I-ES 7260-1693'.
5-1	7500'	<u>D.S.T.-7216-7260</u> - Lynes Tester set dual packers 7210-7216 with tail to 7260', using 4-1/2" drill pipe, including 536' drill collars and 500' water cushion and 5/8" bean. Tool opened 1 hours. Gas to surface 5 minutes with medium to fair blow through out test. Recovered 350' net rise slightly gas cut mud. I.S.I.P. 3213 p.s.i., I.F.P. 483 p.s.i., F.F.P. 312 p.s.i., F.S.I.P. 2584 p.s.i.; initial and final hydrostatic 3962 p.s.i. One hour slow down after pulling packer loose. Drilled ahead with 7-7/8" bit. No shows on mud logger 7260-7500'. Welex logged I-ES - 7490'. Mud 74#, Vis 48, W.L. 6.1 cc.

DIVISION OF OIL AND GAS

History of Oil or Gas Well

PAGE #2

OPERATOR E. A. Bender, Operator FIELD Cheney Ranch
 Well No. Silver Creek No. 57X-18 Sec. 18, T. 14S, R. 13E B. & M.
 Date _____, 19____ Signed _____
 P.O. Box 52,
 Bakersfield, Ca. 93302 805-831-7461 Title _____
 (Address) (Telephone Number) (President, Secretary or Agent)

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Date

1973DepthRemarks

5-2

7500'
6930'
Plug

Plugged 7-7/8" open hole with 80 sacks, Class G cement premixed with 80 sacks Diamix A through 4-1/2" drill pipe hung at 7499'. Displaced with 555 cu.ft. mud 30 cu.ft. water ahead and 10 cu.ft. water behind. Cement in place at 8:00 AM. Dowell Cementers. Waited on cement. Location and hardness of plug at 6930' witnessed and approved by Eric Kaarlela, D.O.G. at 1:40 PM. Waiting on orders. New Operations took over at 4:00 PM. Waiting on cement for kick-off plug.

5-3

Filed Form 107 with D.O.G. With opened end drill pipe at 4300' set kick-off plug using 100 sx of class "G" cement with 28% sand, 3% D-33 and 75% D-65 T.I.C. Pumped 100 cu.ft. of water ahead, 132 cu.ft. slurry, 8 cu.ft. of mud, plug in place at 2:30 AM.

5-4

Ran in the hole to 3870 could not break circulation, pulled out to 3560'; circulating and staging in the hole to 3917' and conditioning mud from 70# to 76#; cleaned out from 3917 to 3999 to top of cement, drilled out medium hard cement from 3999 to 4033', faced off cement from 4033-43'. Circulating and conditioning mud for dynadrill. Picked up dynadrill and ran in and oriented dynadrill due east, Eastman is doing the directional work. (See directional survey tabulation.)

5-5

Drilled to 4338'. Survey at 4308' is N85E - drift angle 8°.

5-6

Drilled to 4961'. Survey at 4871' is N80E - drift angle 8°.

5-7

Drilled 668' to 5629'; survey at 5505' is N74E - drift angle 13°.

5-8

Drilled 563' to 6192'; survey at 6194' is N82E - drift angle 10° 30'. Jacob's Formation logging is on at 5920'.

5-9

Drilled 630' to 6812'; survey at 6812' is S81E - drift angle 8° 45'.

5-10

Drilled 576' to 7379'; survey at 7101 is S74E - drift angle 9° 45'.

DIVISION OF OIL AND GAS

PAGE #3

History of Oil or Gas Well

OPERATOR E. A. Bender, Operator

FIELD Cheney Ranch

Well No. Silver Creek No. 57X-18

Sec. 18

T. 14S

R. 13E

M.D.

B. & M.

Date _____, 19____

Signed _____

P.O. Box 52

Bakersfield, Ca. 93302 (805)831-7461

(Address)

(Telephone Number)

Title _____

(President, Secretary or Agent)

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Date

1973

5-10

(Continued)

TD 7379' - circulating and conditioning mud, rigged up Schlumberger, Schlumberger stopped at 6670', ran back in the hole and reamed from 6650' to 6805'; ran back to bottom conditioned mud, circulated, wiped hole 10 stands, ran back to bottom, had 14' of fill, circulated and conditioned mud for 2 hrs., pulled 10 stands and ran back to bottom, found no fill, pulled out, rigged up Schlumberger and ran Borehole Compensated Sonic Log with Caliper and Dual Induction-Laterolog with linear Correlation Log. Ran back to bottom and conditioned mud and circulated for casing; measured casing, casing two joints short. Laid down drill pipe, running casing.

5-11

5-12

Ran differential fillup shoe (2.15), a pup joint (12.10), float collar (1.65), 27 joints of 5-1/2" 17#, K-55, L.T. & C. casing (1157.02) and 143 joints of 5-1/2" 15.50#, K-55, L.T. & C. (6087.37) and two joints of 5-1/2" 17#, K-55, L.T. & C. casing (84.46) and joint of 5-1/2" 15.50#, K-55 casing, casing got stuck at 7357', could not circulate, after three attempts finally broke circulation - circulated for 2 hours and cemented casing with 143 sx of class "G" cement and 1-1 mixture of Pozmix D 6% gel, 18% salt followed with 200 sx of class "G" neat cement, Pozmix mixture yield 3.23 cu.ft./sx of cement - weight 93#/cu.ft. (total 463 cu.ft.) cement 230 weight 115-117#/cu.ft. - displaced with 1040 cu.ft. of water (calculated displacement 983 cu.ft.) - bumped plug with 1800 psi, float held. Waited 8 hours - landed casing with a joint* of 15.50#, K-55 casing, flanged up tubing head and tested casing and released rig.

5-22

Completion

Well pulling crew arrived at 11:00 AM, rigged up pulling unit, picked up 4-3/4" bit and 4, 3-3/16 drill collars and tubing (2-3/8", 4.70#/ft., N-80 EUE).

*12.25'.

DIVISION OF OIL AND GAS

PAGE #4

History of Oil or Gas Well

OPERATOR E. A. Bender Operator FIELD Cheney RanchWell No. Silver Creek No. 57X-18, Sec. 18, T. 14S, R. 13E, M. D. B. & M.

Date _____, 19____ Signed _____

P.O. Box 52,
Bakersfield, Ca., 93302 (805) 831-7461 Title _____

(Address)

(Telephone Number)

(President, Secretary or Agent)

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Date

1973DepthCompletion (Continued)

5-23

Felt soft cement at 7210', rigged up revers circulating unit, drilled to 7351 and rubber plug and found float collar at 7352' - circulated clean.

5-24

Felt for fill, no fill, came out of the hole measuring on the hook, picked up 4-3/4" bit and Baker casing scrapper and 4 drill collars and ran in the hole; scrapped casing using poorboy swivel from 7150 to 7352'.

5-25

Ground gave away on the South side of cellar, moved to the North side, mixed salt water to increase weight to 69#/cu.ft. - displaced fresh water and mud out of the hole.

5-26

Called Schlumberger to shoot WSO holes and Halliburton to test; came out of the hole with scrapper, made up perforating gun, went into hole, collars checked ok, perforated four holes at 7289'. Ran tester with 567' fresh water cushion, set packers at 7242' tail at 7257', opened tester at 4:50 PM, strong blow of gas to surface in 3 minutes, flowed for 2 hours at 2600 psi - 1/4" bean, closed well in over night - 12 hours. Shut in tubing pressure 2720.

5-27

Flowed well through 1/4" choke through a small test separator for two hours, pressure 2600 psi, estimated rate 550 MCF/D. Pulled packers loose. Mixed a batch of 74#/cu.ft. of salt water before starting out of the hole and pumped into well 30-40 bbls at a maximum pressure of 1350 psi at the pump. Started out of the hole keeping hole full with 74# mud, well started gassing up about 2 stands out of the hole, a bubble of gas must have followed packers. Closed tubing rams, bled off gas, pulled tools out of the hole, (recovered 316' of condensate and 62' of condensate cut mud, I.H.P. 3332 psi, I.F. 256 psi, F.F. 3060 psi, F.S.I. 3332 psi, F.H.P. 3332 psi, WSO approved

DIVISION OF OIL AND GAS

PAGE #5

History of Oil or Gas Well

OPERATOR E. A. Bender, Operator FIELD Cheney Ranch
 Well No. Silver Creek No. 57X-18, Sec. 18, T. 14S, R. 13E, M.D. B. & M.
 Date _____, 19____ Signed _____
 P.O. Box 52,
 Bakersfield, Ca. 93302 (805)831-7461 Title Vice President
(Address) (Telephone Number) (President, Secretary or Agent)

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Date

Completion (Continued)

1973

5-27 by Mr. E. V. Kaarlela of DOG), dropped donut into the casing bowl, closed rams and tightened bolts. Bled gas down, pumped in 30 bbls of 74# salt water, pressure at the pump 1000 psi. Closed well in at 9:00 PM.

5-28 Pressure on casing 750 psi - Halliburton arrived with 200 sx of salt and a pump truck; changed valve on tubing and rigged up Halliburton to pump into casing, mixed more 74#/sx of salt water, bled well down, pumped in 30 bbls of salt water, well appears dead. Ran 230 joints of 2-3/8", 4.70#, N-80 EUE tubing to 7284' (Schlumberger measurements), landed tubing, installed Xmas tree. Rigged up to swab. Swabbed 45 bbls of salt water into 340 bbls tank. Shut in over night.

5-29 Tubing pressure and casing pressure about 1270 psi blew down tubing, swabbed 10 times, well started flowing into tank, released pulling rig. Well looks like it is cleaning up, flowing pressure is 1900 psi on 11/64" bean. Shut well in about 9:00 PM.

5-30 Tubing pressure 2500 psi; will production test WSO holes.

5-31 Cleaning up location.

6-13 Shut in tubing pressure 2570 psi, casing pressure 2673 psi. Opened well to determine stablized flow rate at 12:07 PM, well stabilized producing at 1200 Mcf/d rate through 3/16" orifice, tubing pressure 1465 psi, casing pressure 1680 psi. Produced heavy condensate mixed with gas and no apparent water.

6-14 Shut in pressure: tubing 2419; casing 2670.

7-21 Halliburton pumped down casing 60 bbls of salt water while venting gas through tubing.

Silver Creek #57X-1B

BIT RECORD

Bit Number	Size	Make	From	To	Feet	Hours	Remarks
1	13-3/4"	Smith DSJ	0'	1693'	1693'	16-1/2	
2	7-7/8"	Globe SS JJ	1693'	2774'	1081'	11-1/4	
3	7-7/8"	Globe SS SJ	2774'	3832'	1058'	10-1/2	
4	7-7/8"	Globe SS SJ	3832'	4952'	1120'	11-1/4	
5	7-7/8"	Globe SS SJ	4952'	5455'	503'	7	
6	7-7/8"	Globe SS SJ	5455'	6142'	687'	12-1/4	
7	7-7/8"	Globe SS SJ	6142'	6828'	686'	14-3/4	
8	7-7/8"	Globe SS TJJ	6828'	7260'	432'	7-1/2	
9	7-7/8"	Smith DG TJ	7260'	7500'	240'	4-1/4	
10	7-7/8"	Smith DG TJ	3999'	4043'	44'	3/4	Stop for D.S.T.
11	7-7/8"	Smith DG TJ	4043'	4243'	200'	6-1/2	Pulled to Log
12	7-7/8"	Smith DTT J	4243'	4338'	95'	2-3/4	Plug back to 6930'
13	7-7/8"	Smith DGT J	4338'	4490'	152'	2	Plug back to 3999'
14	7-7/8"	Smith DTT J	4490'	4996'	506'	11	Face off cement plug
15	7-7/8"	Smith DTT J	4996'	5393'	397'	6-3/4	
16	7-7/8"	Smith DGT H	5393'	5722'	329'	8	
17	7-7/8"	Smith DGT J	5722'	6089'	376'	9	
18	7-7/8"	Smith DGT H	6089'	6378'	280'	6	
19	7-7/8"	Hughes CI C	6378'	6812'	434'	11-3/4	
20	7-7/8"	Hughes CI C	6812'	7243'	431'	9	
		Smith DGT HJ	7243'	7379'	136'	3-1/2	

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

PAGE #6

History of Oil or Gas Well

OPERATOR E. A. Bender, Operator FIELD Cheney Ranch
 Well No. "Silver Creek No. 57X-18", Sec. 18, T. 14S, R. 13E, M D. B. & M.

Date _____, 19____ Signed _____

P.O. Box 52,
Bakersfield, Calif. 93302 (805) 831-7461 Title _____
 (Address) (Telephone Number) (President, Secretary or Agent)

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Date

1973

7-22

Completion (Continued)

Bled tubing pressure to 1500 psi.

7-23

Welex using portable mastpole and Double Bowen Flow Tubes and Magnetic Sidekicker perforated four holes per foot from 7327 to 7335 through tubing.

7-24

Flowed salt water through tubing into 300 bbls water tank; well cleaned up. Shut well in. Preparing location for producing equipment.

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR E.A. BENDER, OPERATOR FIELD Cheney Ranch

Well No. Silver Creek #57X-18, Sec. 18, T. 14S, R. 13E, M.D. B. & M.

Date _____, 19____ Signed _____

P. O. Box 52,
Bakersfield, Ca. 93309 (805) 831-7461 Title _____
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Date
1973

Single Shot
Deviation Record

<u>Depth</u>	<u>Angle</u>
1590'	0° 15'
2774'	1° 45'
3832'	3° 15'
4952'	2° 30'
5455'	1° 00'
6142'	3° 00'
6828'	N.G.
7260'	3° 30'

Well No. Silver Creek 57X-18

Cheney Ranch, California

Elevation:

Section Bearing (None)

Decl. 16 0 East

Survey by: Eastman Oil Well Survey Co.

Date: May 1973

Job No. L5-1973 D11

Meas. Depth	Drift Angle	Drift Dir'n.	Vertical Depth	Vertical Sub-Sea	Total Sec'n.	Course Dev.	Total Coordinates
4043			4043.00	.00	0	.00	.000
4118	5 45	S1000E	4117.62	.00	0	7.51	7.40S
4180	8 45	S4000E	4178.90	.00	0	9.43	14.63S
4243	8 00	S7000E	4241.29	.00	0	8.77	17.62S
4308	8 00	N8500E	4305.66	.00	0	9.05	16.84S
4368	10 15	N8100E	4364.70	.00	0	10.68	15.17S
4459	11 30	N8200E	4453.87	.00	0	18.14	12.64S
4588	12 15	N8200E	4579.93	.00	0	27.37	8.83S
4715	12 30	N6000E	4703.92	.00	0	27.49	4.06S
4871	12 30	N8000E	4856.23	.00	0	33.76	1.81N
5026	12 30	N7200E	5007.55	.00	0	33.55	12.17N
5181	12 45	N7400E	5158.73	.00	0	34.21	21.60N
5337	13 15	N7400E	5310.58	.00	0	35.76	31.46N
5505	13 00	N7400E	5474.27	.00	0	37.79	41.87N
5659	12 45	N7400E	5624.47	.00	0	33.99	51.24N
5753	12 45	N7400E	5716.16	.00	0	20.75	56.96N
5878	12 30	N2600E	5838.19	.00	0	27.05	63.51N
6034	11 30	N8000E	5991.06	.00	0	31.10	68.91N
6192	10 30	N8200E	6146.42	.00	0	28.79	72.91N
6348	9 30	N8400E	6300.28	.00	0	25.75	75.60N
6472	9 30	S8900E	6422.58	.00	0	20.47	75.25N
6597	9 45	S8200E	6545.77	.00	0	21.17	72.30N
6724	9 15	S8100E	6671.12	.00	0	20.41	69.11N
6812	8 45	S8100E	6758.09	.00	0	13.39	67.01N
6943	9 00	S7400E	6887.48	.00	0	20.49	61.37N
7101	9 45	S6700E	7043.20	.00	0	26.76	50.91N
7329	9 45	S6700E	7267.91	.00	0	38.61	35.82N
7379	9 45	S6700E	7317.18	.00	0	8.47	32.51N
Closure		603.01	N 86 55E				
27 Stations							

Well Considered Vertical to 4043'
Stations at 7329' and 7379' are Projected.

18-14S-13E **

MUNGER'S HISTORY RECORD

SEC. 18-14S-13E **

OPERATOR E. A. BENDER, OPER.

LEASE "Silver Creek"

WELL NO. 57X-18

FIELD AREA Cheney Ranch

COUNTY Fresno

ELEV. 368¹KB

MAP W-33

SPUD. 4 AM 4/24/73

LOCATION From SE cor Sec., 660¹N 1980¹W

COMP. 5/30/73

RSM.

RECOMP.

ABAND.

T. D. 7500 , Rd. 7379

PLUG

DATE OF ISSUE: 6/9/73

A.P.I. 019-20736

CLASSIFICATION: Gas

CASING RECORD

1973 footage drilled 10,846¹

SIZE	DEPTH		MARKERS
9 ⁵ / ₈ "	1693	Cmtd.	T. Cheney 57-2328
5 ¹ / ₂ "	7359	Cmtd.	
2-7/8"	7285	Hung	
			INTERVAL
			4 holes at 7289 ¹

DATE	DEPTH		
12/22/72		Location.	CONTRACTOR Tiger Drilling Co., #6
12/23/72		Location, D.O.G.	
4/23/73		Rigged rotary.	GEOLOGIST
4/25/73	1693	Cemented 9 ⁵ / ₈ " at 1693 ¹ .	ENGINEER
4/26/73	2570	Drilling	
4/27/73	4307	Drilling	PROPOSED DEPTH
4/30/73	7260	Ran Welex I-ES.	
5/ 1/73		Drill stem tested.	
5/ 2/73	7500	Ran I-ES 7260-7500 ¹ .	1/2 mile N of Operator's "Cheney Ranch" #73X, completed 10/20/72, for 2570 MCF/D, 1/4" bean, 2263/2320 ¹ Int: 7253-63 ¹ - Moreno Sand.
5/ 3/73		Plugged back to redrill.	
5/ 4/73		Redrilling from 4033 ¹ with dyna-drill.	
5/ 7/73		Redrilling at 5629 ¹ .	
5/ 8/73		Redrilling at 6192 ¹ .	
5/ 9/73		Redrilling at 6812 ¹ .	
5/10/73	Rd. 7379	Redrilled to 7379 ¹ . Ran Sonic and I-ES.	
5/14/73		Standing cemented with 5 ¹ / ₂ " casing at 7359 ¹ . Released rig 6 PM 5/12/73.	
5/18/73		Moved in Pyramid Oil Co. Production Rig.	
5/21/73		Ran Cement Bond Log.	
5/25/73		Drilled out cement to bottom of casing.	
5/29/73		Flowed 3000 MCF/D thru 16/64" bean on WSO test of 4 holes at 7289 ¹ .	
5/31/73		Completed 5/30/73 flowing 500 MCF/D thru 1/4" choke, 2610 ¹ T.P., on 2 hr. test thru 4 holes at 7289 ¹ .	

BUREAU OF LAND MANAGEMENT
JUN 19 1973

Rob
6-19-73

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

Report on Operations

No. T 573-123

Mr. Merlin J. Finsch, Agent
E. A. BENDER, OPERATOR
P. O. Box 52
Bakersfield, CA 93302

Coalinga Calif.
May 29, 1973

DEAR SIR:

Operations at well No. "Silver Creek" 57X, API No. (019-20736), Sec. 18, T. 14S, R. 13E,
M.D., B & M. _____ Field, in Fresno County, were witnessed
on May 27, 1973. Mr. E. V. Keerlela, representative of the supervisor was
present from 1200 to 1500. There were also present O. Salman, Engineer

Present condition of well: 9-5/8" con. 1693'; 5 1/2" con. 7352', four holes 7289' W.S.O.
T.D. 7379', plugged with cement 7379'-7345'. Junk T.D. (1st hole) 7500'.

The operations were performed for the purpose of testing the 5 1/2" water shut-off by a forma-
tion test.

DECISION: THE 5 1/2" SHUT-OFF AT 7289' IS APPROVED.

EVK:ef
cc: Company

JOHN F. MATTHEWS, JR.
State Oil and Gas Supervisor

By C. H. Corwin Deputy
Rap

Halliburton

Water Shut-Off Test Memo

T 575 23

Company H. A. ...

Well No. ... Sec. ..., T. ..., R. ..., ... B&M
Field ..., County ... was tested for water
shut-off on May 27, 1955, Mr. ..., designated by the supervisor was
present from 12:00 to 1:00 as prescribed by law; there were also present

Casing record of well: ...
... KTD. (1st hole)

The operations were performed for the purpose of ...

The ..." shut-off at ...' is approved.

The operations as witnessed and reported are approved and indicate that no fluid has
access to the well from the annulus between ..." and ..." casings.

Hole size: ..." fr. ...' to ...', ..." to ...' & ..." to ...'

Casing				Cemented			Top of Fill		Squeezed	Final	Perfs.
Size	Wt.	Top	Bottom	Date	MO-Depth	Volume	Annulus	Casing	Away	Press.	
5 1/2"	10.5 lbs/ft	7200'	7200'	8-15-55	1000'	

Depth or interval tested ...

The hole fluid was bailed to ...' at ... on ... 19

The hole was open to ...' for test.

Packer(s) ...' & ...' Tail ...' Bean size ..." Cushion ...

IHP ... IFP ... FFP ... FHP ...

Blow ...

Open for test ... Hr. ... min. Fluid entry ...

Date ... 19 ... Time ... Engr. ..., Pump depth ...

Fluid level ..., Gauge/meter reading ...

Date ... 19 ... Time ... Engr. ..., Pump depth ...

Fluid level ..., Gauge/meter reading ...

Total fluid produced, Bbls. ... Net oil ... Water ...

Rate: ... B/D oil, ... B/D water, ... % water cut

RA/Spinner (Temperature) survey run at ... B/D & ... psi on ... 19 ...

fluid confined below ...' (Packer depth ...')

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

Report on Operations

No. T 573-100

Mr. Merlin J. Frasch, Agent
E. A. BENDER, OPERATOR
P. O. Box 52
Bakersfield, CA 93302

Coalinga Calif.
May 4, 1973

DEAR SIR:

Operations at well No. "Silver Creek" 57X, API No. (019-20736), Sec. 18, T. 14S, R. 13E.,
M.D., B & M. _____ Field, in Fresno County, were witnessed
on May 2, 1973. Mr. E. V. Kaarlela, representative of the supervisor was
present from 1300 to 1330. There were also present R. McGoey, Engineer
(E. A. Bender, Opr.)
Present condition of well: 9-5/8" casp. 1693'. T.D. 7500', plugged with cement
7500'-6930'.

The operations were performed for the purpose of witnessing the plugging operations in the
process of redrilling.

DECISION: THE LOCATION AND HARDNESS OF THE CEMENT PLUG AT 6930' IS APPROVED.

EVK:ef
cc: Company

JOHN F. MATTHEWS, JR.
State Oil and Gas Supervisor

By C. H. Corwin Deputy
115 Rep

Cementing/Plugging Memo

1593-100

Company _____
 Well No. _____ Sec. _____, T. _____, R. _____, _____ B&M
 Field _____, County _____ On May 2, 1973
 Mr. E. V. Kaurala, designated by the supervisor was present from 1300 to 1330
 as prescribed by law; there were also present McGee, Engineer (C.A. Borders, Supr.)
 Casing record of well: _____

The operations were performed for the purpose of witnessing the plugging operations in the process of rebarrelling.

- The plugging/cementing operations as reported and witnessed are approved.
- The location and hardness of the cement plug @ 6930 ' is approved.

Hole size: 13 3/8 " fr. surface ' to 1693 ', 7 3/8 ' to 7500 " & _____ " to _____ '.

Casing				Cemented		Top of Fill		Squeezed Away	Final Press.	Perfs.
Size	Wt.	Top	Bottom	Date	MO-Depth	Volume	Annulus Casing			

Casing/tubing recovered: _____ " shot/cut at _____ ' ; _____ ' pulled fr. _____ ' ;
 _____ " shot/cut at _____ ' ; _____ ' pulled fr. _____ ' .

Junk (in hole): _____

Hole fluid (bailed to) at _____ ' . Witnessed by _____

Mudding	Hole fluid (bailed to) at _____ ' . Witnessed by _____					
	Date	Bbls.	Displaced	Poured	Fill	Engr.

Cement Plugs		Placing MO & Depth	Placing Witnessed		Top Witnessed			
Date	Sx./cu.ft.		Date & Time	Engr.	Depth	Wt./Sample	Date & Time	Engr.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P 573-96

Mr. Marlin J. Frasch, Agent
E. A. HENDER, OPERATOR
P. O. Box 52
Bakersfield, CA 93302

Coalinga Calif.
May 4, 1973

DEAR SIR:

Your proposal to redrill Well No. "Silver Creek" 577,
Section 18, T. 14 S., R. 13 E., M.D.B. & M., Fresno County,
dated 5-3-73, received 5-4-73, has been examined in conjunction with records filed in this office.

(019-20736)

DECISION: THE PROPOSAL IS APPROVED PROVIDED THAT the well shall be redrilled in accordance with the provisions outlined in report No. P 572-327, dated December 22, 1972.

Blanket Bond
CHC:ef
cc: Company

JOHN F. MATTHEWS, JR., State Oil and Gas Supervisor

By C. H. Cowin, Deputy
115 P.P.

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Notice of Intention to Deepen, Redrill, Plug or Alter Casing in Well

This notice must be given before work begins; one copy only

Bakersfield, Calif. May 3, 1973

DIVISION OF OIL AND GAS

Coalinga, Calif.

In compliance with Section 3203, Chapter 93, Statutes of 1939, notice is hereby given that it is our intention to commence the work of ~~deepening~~ redrilling, ~~plugging and casing~~ at Well No. Silver Creek No. 57X-18
(Cross out unnecessary words)

, Sec. 18, T. 14 S., R. 13 E., M. D. B. & M.

Cheney Ranch Field, Fresno County.

The present condition of the well is as follows:

- Total depth. 7500'
Plugged: 6936'
- Complete casing record.
9-5/8" casing cemented at 1693'.
7-7/8" open hole from 1693' to 6936'.

COPIED
MAY 1973

Reference to file of data

Tap			
		✓	✓

3. Last produced. Never Produced
(Date) (Net Oil) (Gravity) (Cut)

The proposed work is as follows:

- Set a cement plug in 7-7/8" open hole with top of cement at approximately 4100', using 100 sacks of cement.
- Redrill from 4100' to 7300'±.

NOTE: Above confirms telephone conversation on 5-3-73 with Mr. Ralph McGoey, engineer for E. A. Bender, Operator.

E. A. BENDER, OPERATOR
(Name of Operator)

By M. J. Frasch, Agent

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION
(Proposed Well Operations)

Operator E.A. Bender, Ope Well No. Silver Creek 57X
Field Fresno Co. Sec. 18 T. 14S R. 13E B&M
~~personal~~

A telephone conversation was held, concerning above well, with Mr. Ralph McGee
Engineer for above operator MAY 3 1973, at 10³⁰ A.M.

Details of the conversation were as follows:

Total depth 7500 Plugs 7500-6930'

Casing record 9 7/8" Cas. 1693'

Oil or gas showings _____

Results of tests _____

Stratigraphic markers _____

Geologic age at bottom _____ Base of fresh water _____

Operator proposes the following work:

- 1) Cancel Abandonment
- 2) Place cement plug from 4300' - 4055' for a redrill
- 3) Drill to the gas tested in the original hole

Additional requirements outlined:

Test of W.S.O. to be witnessed by D.O.G. at _____ By operator at _____

Plugs to be located by D.O.G. at _____ By operator at _____

Notice to be filed immediately Yes () Not necessary *(for contractor's purposes)*

Other data This well will be in Bender's name only and Arhan Salamon
will be the new engineer

(Signed) R.A. Ruff

Title _____

MEMORANDUM OF TELEPHONE OR PERSONAL CONVERSATION
(Proposed Well Operations)

Operator E.A. Bunker Well No. "Silver Crown" 57X

Field _____ Sec. _____ T. _____ R. _____ B&M
~~personal~~

A telephone conversation was held, concerning above well, with Mr. Ralph McSwain
Engineer for above operator May 1 1973, at 11:45 A.M.

Details of the conversation were as follows:

Total depth 7525' Plugs _____

Casing record 1743' thru 1693'

Oil or gas showings Good show on mud log from 7205-7260 but log indicated no permeability

Results of tests A drill stem test was run on the above interval. Gas surfaced in 5 min. A 500' water cushion was used and there was a net rise of 350' of gas oil mud. I.P. 3213, I.P.P. 423, FFP 312, F.S.P. 2584'

Stratigraphic markers _____

Geologic age at bottom Cretaceous Base of fresh water above 1693

Operator proposes the following work:

1. Will relog interval
2. Place Plug from 7260 - 7105
3. Plug from 1743' - 1693'
4. Place 25' surface plug

Additional requirements outlined:

Test of W.S.O. to be witnessed by D.O.G. at _____ By operator at _____

Plugs to be located by D.O.G. at 1693 By operator at 7105

Notice to be filed immediately Yes () Not necessary

Other data _____

(Signed) R.A. Reed
Title Accountant

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

Report on Operations

No. T 573-94

Mr. Merlin J. Frasch, Agent
E. A. BENDER, OPERATOR
P. O. Box 52
Bakersfield, CA 93302

Coalinga Calif.
April 27, 1973

DEAR SIR:

Operations at well No. "Silver Creek" 577, API No. (019-20736), Sec. 18, T. 14S., R. 13E.,
H.D., B & M, _____ Field, in Fresno County, were witnessed
on April 26, 1973. Mr. E. V. Karriela, representative of the supervisor was
present from 0900 to 0930. There were also present B. Matthews, Driller (Tiger
Drilling Co.)

Present condition of well: 9-5/8" com. 1693'. T.D. 2000' (drilling)

The operations were performed for the purpose of inspecting the blowout-prevention
equipment and installation.

DECISION: THE BLOWOUT-PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

EVK:ef
cc: Company

JOHN F. MATTHEWS, JR.
State Oil and Gas Supervisor

By C. H. Corwin Deputy

BOPE Memo

T 573-94

Operator E. A. Bender, Opr.
 Well No. "Silver Creek" 57X (019-20736) Sec. 18, T. 14E, R. 13E, M.D. B&M
 Field _____, County Fresno. On April 26, 1973
 Mr. A. V. Kaariela, representative of the supervisor was present from 0900
 to 0930. There was also present B. Mathews, driller (Tiger Drilling Co.)
 Casing record of well: 9 5/8" com 1693, T.D. 2000' (drilling)

The operations were performed for the purpose of testing (inspecting) the blowout-prevention equipment and installation.

The blowout-prevention equipment and installation are (not) approved.

Hole size: 13 3/8" fr. surface ' to 1693 ', 7 1/2" to 2000 ' & _____ " to _____ "

X	Installed	Cemented				Tested		Date	Psi	Time
	Casing (BOPE Anchor)				MO-Depth	Volume	Annulus	Casing		(Min.)
	Size	Wt.	Top	Bottom	Date					
X	9 5/8	53.5	Surface	1693	4-24-73	Pump 1693	2490 cuft	130 cuft	1680	
								Returns		

* 390.5x Class G premixed with 200.5x class G (Sagel) followed by 125.5x Class G 3% gel

Blowout Preventers

Types Enumerated	Top to Bottom	Mfg.-Model	Overhaul Date	Flange Bolt	Clamp Size	Psi Rating	Date	Psi	Time
X	Annular	1 G.K. Hydvil 10"-900	9-72	✓		3000	4-24-73	1500	15 min
X	Pipe rams	2 Cameron 10"-900	"	✓		2000	"	"	"
X	Blind rams	3 Cameron 10"-900	"	✓		3000	"	"	"

Accessories

Type	Psi Rating	Size or Capacity
✓ Accumulator		80
* Nitrogen bottle		2
✓ Mud pump National	6-700	6"X14"
✓ Standpipe gauge	5000	N.A.
Check valve		
✓ Inside BOP	3000	4 1/2"
✓ Kelly cock	3000	N.A.
✓ Spool	3000	10"-900

X	Type	Psi Rating	Size or Capacity
✓	Choke line	3000	2"
✓	Fill-up line	Nose	2"
✓	Kill line	3000	2"
✓	Control lines	1500	1"
	Rotating head	N.A.	N.A.
	Banjo box & blow line	N.A.	N.A.
	Muffler on blowline	N.A.	N.A.
	Pressure relief valve		

* not connected yet

Drilling Fluid Program *

1.51

Type	Weight	Water Loss	Cake	Viscosity	Storage

* see back

BOPE Control Stations	
Remote: <u>Rig Floor</u>	5
Remote: <u>✓</u>	80
Manual: <u>Rockett</u>	

will have mud logger at 5500'	Alarm Monitoring Devices	
	Yes	No
Calibrated mud pit		✓
Mud pit level indicator		✓
Gas detector		✓
Continuous (mud densimeter or) (temperature recorder)		✓

pad

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P. 572-327

Mr. Merlin J. Frascch, Agent
E. A. DENIER, OPERATOR
P. O. Box 52
Bakersfield, CA 93302

Coalinga Calif.
December 22, 1972

DEAR SIR:

Your proposal to drill Well No. (019-20736) "Silver Creek" 57X,
 Section 18, T. 14 S, R. 13 E, K.D.B. & M., Field, Fresno County,
 dated 12-21-72, received 12-22-72, has been examined in conjunction with records filed in this office.

DECISION: THE PROPOSAL IS APPROVED PROVIDED THAT:

1. The 9" surface casing shall be cemented with sufficient cement to fill back of this casing from the shoe to the ground surface.
2. Mud fluid of sufficient weight and proper consistency to prevent blowouts shall be used in drilling, and the column of mud fluid shall be maintained to the surface at all times, particularly while pulling the drill pipe.
3. Adequate blowout-prevention equipment shall be installed, consisting in part of power-operated equipment capable of closing in the well with the pipe either in or out of the hole. Power-operated controls shall be situated both on the derrick floor and at a remote location. For this well, minimum equipment shall consist of an annular preventer and two ram-type preventers, one of which is a complete shutoff and the other is to close around the drill pipe.
4. This Division shall be notified to witness:
 - a. A pressure test of the blowout-prevention equipment on the 9" casing string prior to drilling below the shoe of the 9" casing.
 - b. A test of the water shut-off through four shot perforations immediately above the objective sand, prior to perforating the casing for production.

Note: Information on file in this office indicates that the base of the usable fresh water deposits should be encountered above a depth of 1700'.

Blanket Bond
 EAR:ef
 cc: Company

JOHN F. MATTHEWS, JR., State Oil and Gas Supervisor

By C. J. Corwin, Deputy

DIVISION OF OIL AND GAS
Notice of Intention to Drill New Well
This notice and surety bond must be filed before drilling begins

019 20736

Bakersfield Calif. December 21, 1972

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division III, Article 4, Public Resources Code, notice is hereby given that it is our intention to commence drilling well No. Silver Creek No. 57X-18, Sec. 18, T. 14 S., R. 13 E., M. D. B. & M., Cheney Ranch Gas Field, Fresno County.

Legal description of mineral-right lease, consisting of 160 acres, is as follows: Southeast quarter of Sec. 18, T. 14 S., R. 13 E., MDB&M

Do mineral and surface leases coincide? Yes No If answer is no, attach legal description of both surface and mineral leases, and map or plat to scale.

Location of Well: 660 feet North along section line and 1980 feet West at right angles to said line from the Southeast corner of section 18 T. 14 S., R. 13 E., MDB&M

DIVISION OF OIL AND GAS
RECEIVED
DEC 22 1972

Elevation of ground above sea level 357 feet datum. All depth measurements taken from top of Kelly Bushing which is 11 feet above ground.

PROPOSED CASING PROGRAM

SIZE OF CASING INCHES A.P.I.	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS
9"	45#	D - Smls.	0'	1700'	Shoe to surface
5 1/2"	15 1/2#	K-55	0'	7500'	7500'±

Intended zone(s) of completion: Moreno Sands 7250'± Estimated total depth 7500'

Blanket bond on file.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address P. O. Box 52
Bakersfield, Calif. 93302
Telephone Number (805) 831-7461

E. A. Bender, Operator
(Name of Operator)
By M. J. Frasch
M. J. Frasch, Agent
Type of Organization Individual
(Corporation, Partnership, Individual, etc.)

#W5-2
12/22/72
EVK
Reference to file of data

APPENDIX 4

EFFICACY OF MUD PLUGS

APPENDIX 4

MUD COLUMN CHARACTERISTICS AND CONDITIONS

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1.0 EFFICACY OF MUD PLUGS IN ABANDONED WELLS

1.1 SUMMARY

Common drilling mud is largely composed of clays and water, forming a colloidal base. Typically, bentonite (sodium montmorillonite) is added to the drilling mud as the clay and is used to obtain viscosity in the slurry and promoting the formation of wall cake (the low-permeability layer of clay lining the borehole). Bentonite is hydrophilic (it readily absorbs water), and its flat platy shape is the primary reason it is desired for use in common drilling fluids. The development of gel strength in a drilling mud is due to the tendency of the clay platelets to align in a configuration where positively charged edges are adjacent to negatively charged surfaces, resulting in a medium with thixotropic properties. Thixotropy is the characteristic whereby certain gels evolve to a semi-solid state when allowed to stand undisturbed but liquefy upon shock disturbance. The gel phase is desirable because it assists in suspending cuttings released by the drilling procedure, producing the required viscosity and mud cake properties in the circulating mud system.

The physical characteristics that make clay-based drilling mud useful during active drilling operations also make it an effective barrier to vertical fluid movement within abandoned boreholes. In thixotropic behavior, under static conditions the clay platelets aggregate (flocculate) in three ways: 1) face-to-face, 2) edge-to-edge, or 3) edge-to-face, because the platelets are electrically charged. This thixotropic or gelling property of a clay-based bentonite slurry is what gives drilling mud its gel strength. In clay-based mud systems, gel structures build with time (progressive gel) as the positive edge of one particle or plate moves toward the negative surface of another; that is, when the platelets are layered (Gray et al., 1980). Laboratory studies have shown that although the exact relationship between gel strength and time varies, depending on specific mud composition and additives, the gel strength always increases with time. Additionally, this orientation of the clay plates reduces the vertical permeability of the mud column significantly because tortuosity through the mud is increased.

Clay-based drilling fluids that contain bentonite or natural clays provide adequate long-term protection against vertical fluid movement into and within in abandoned wellbores. Field studies of mud conditions in decades old abandoned wellbores confirm expectations gained from laboratory testing data and can be used to predict the long-term behavior of relevant mud properties.

1.2 INTRODUCTION

Whenever effluent is injected into a subsurface geologic formation, the pressure within the injection interval will increase. This pressure increase will be greatest at the injection well(s) and will decrease with distance away from the injection site. Because of the driving force supplied by the increase in formation pressure within the injection intervals, artificial penetrations within the radius of the effluent plume have the potential to convey effluent out of the injection zone, and artificial penetrations within the Area of Review have the potential to convey formation brines into an Underground Source of Drinking Water (USDW). This is especially so in the specific case where a well is abandoned with brine in the open spaces of the wellbore and/or annulus. However, in rotary drilled wells this is exceedingly rare and only occurs where a formerly productive well is “walked away” from without abandonment.

In a rotary drilled well, the driving force due to injection is opposed by the flow resistance of the material (drilling mud and /or drilling mud and cement plugs) residing in the borehole or the borehole by casing annulus. In order to pose a potential threat to a USDW (*i.e.*, pressure buildup from injection sufficient to drive fluids into a USDW), the pressure increase in the injection interval must be greater than the pressure necessary to displace the material residing within the open spaces in the borehole. This pressure necessary to displace the material residing within the borehole is defined as the allowable buildup pressure.

A mud column exerts pressure. For a well to provide a pathway for fluid movement, the pressures acting on the mud column (pressure due to injection plus original formation pressure) must be greater than the mud column pressure (Davis, 1986). Exploration and production wells are commonly drilled at a mud weight that provides 200 psi or more overbalance to the formations encountered during the drilling activity (Pearce, 1989). In a static fluid column of drilling mud, such as exists upon abandonment of the well, the gel strength of the mud must also be considered. Gel strength refers to the shear stress required to initiate flow after static periods of time (*i.e.*, without mud circulation) and is a measure of the degree of gelation that occurs due to the attractive forces between particles in the mud over time. The gel strength adds to the flow resistance in the well and fluid movement cannot begin until the pressure in the injection interval has increased beyond this critical threshold value necessary to overcome the flow resistance of the borehole material (weight and gel strength).

As long as the pressure buildup in the injection interval is less than the threshold value, the artificial penetration cannot serve as a conduit for either effluent or formation brines (Davis, 1986; Collins

1986). Therefore, as long as the threshold value is not exceeded, the artificial penetration is safe, and corrective action to enter and plug the well is not necessary.

1.3 PROPERTIES OF CLAY-BASED DRILLING MUD

The physical characteristics which make drilling muds useful during drilling also make them effective barriers against formation fluid entry into a wellbore and mud-column displacement into a wellbore. This is particularly true of a commonly used base for mud, bentonite, which is predominantly sodium montmorillonite clay. Bentonite-based mud types are used the Cheney Ranch field wells. The platy electrically charged clay particles comprising bentonite strongly attract water, a polar molecule. This causes the clay to swell, thereby increasing the borehole fluid viscosity (Davis, 1986). Of the clays, montmorillonite has the greatest hydration potential and effects the greatest viscosity enhancement for a given amount of solids. This accounts for its long-standing popularity of bentonite as an additive.

A second important property, the gel strength of clay-based drilling muds comes from the tendency of the plate-like clay particles to align so that positively charged edges are adjacent to negatively charged flat surfaces. The gel is "a disheveled yet interconnected network of parallel clay particles separated by an average distance" (Jahnke, 1987). If the mud is agitated, then the gel breaks down. If, on the other hand, the mud sits at rest, then gel strength increases with time as the additional clay particles come into alignment. This is documented by studies conducted by both Garrison (1939) and Gray, et al. (1980). If the drilling fluid is at rest for a long time, high pump pressures are sometimes necessary to restore circulation in the borehole (see example from Cheney Ranch field below). This strong resistive force in a mud column would also need to be overcome during injection.

For many years, alternating cement and mud plugs have been advocated for properly abandoning well bores because they provide an effective barrier to vertical fluid flow. The "balanced method" is the most common method used for the placement of cement plugs during well abandonment procedures. Mud plugs have been shown to have a very low permeability and provide great resistance to fluid movement. In addition, mud plugs have been shown to plug an artificial penetration through time and under the various conditions encountered within a wellbore. A mud plug, with its inherent low permeability, in combination with the hydrostatic head of an overbalanced mud column, is sufficient to counterbalance increased formation pressure due to injection effects, thereby creating an effective barrier to fluid flow. These sealing and fluid barrier characteristics of mud plugs, combined with hydrostatic pressures and natural borehole closure processes, minimize the chance of encountering a truly open conduit in an artificial penetration that was drilled in unconsolidated sediments.

Drilling mud is largely composed of clays and water. Commonly, bentonite-type clays (sodium

montmorillonite) is added to the drilling mud to obtain viscosity in the slurry, in addition to promoting the formation of wall cake (the low-permeability layer of clay lining the borehole). Bentonite is hydrophilic (it readily absorbs water), and its flat platy shape is the primary reason it is desired for use in drilling mud fluids. Clay platelets aggregate (flocculate) in three ways:

- 1) face-to-face,
- 2) edge-to-edge, or
- 3) edge-to-face

Because the platelets are electrically charged. This thixotropic or gelling property of a bentonite slurry is what gives drilling mud its gel strength, as discussed below. Gel structures build with time as the positive edge of one particle or plate moves toward the negative surface of another; that is, when the platelets are layered (Gray et al., 1980). This orientation reduces the vertical permeability of the mud column significantly because tortuosity is increased.

The gel strength and wall cake of bentonite clay mud systems provide an effective barrier against both vertical fluid migration within the wellbore, and migration of fluids into overlying formations. The following subsections examine various aspects of mud plugs and their ability to effectively prevent migration of fluids.

The permeability of drilling mud in abandoned wells depends on the amount and size of the clay particles and other colloids available in the mud slurry, as well as the time the mud has been left in the hole. Although the permeability of mud in deep boreholes has not been measured directly, the permeability of other similar clay mixtures, such as those used in slurry wall construction and bentonite grout slurry mixtures used to plug shallow borings, has been measured and quantified. Alther (1982), while investigating the use of bentonite for clay caps and slurry wall containment, found that a mixture of bentonite and high-permeability soils reduced the coefficient of permeability to 10^{-9} cm/sec. Alther (1982) used a falling head permeameter to measure the permeability of a mixture of 8 percent bentonite and 92 percent Lake Michigan sand.

Polk and Gray (1984) investigated the adequacy of mud as a sealing agent in abandoned boreholes related to mineral exploration. Their focus was on the ability of a bentonite mud to form a filter cake with a low enough permeability to ensure that there would not be fluid flow between aquifers penetrated during drilling. Polk and Gray (1984) directly measured filter cake permeabilities using the cake formed in a standard American Petroleum Institute (API) filter press filtration test run for 30 minutes at a differential pressure of 100 psi. The cake that formed on the filter paper was then

tested with water to determine the cake's permeability. The cake had measured permeabilities ranging from 2×10^{-8} to 8×10^{-9} cm/sec, which are regarded as low enough permeability values to prevent fluid flow from one aquifer to another through an open borehole. The filter cake essentially keeps all the solid particles within the mud column. The formation of these low permeability filter cakes is one of the most desirable properties of clay-based mud systems. Experiments show the filter cake to have permeability below microdarcy values (Kelessidis, et al, 2007; Elkatatny et al., 2012). This mud filter cake acts as a membrane "skin" or barrier that effectively seal off formations and prevent fluid loss from the mud column to the formation or loss of fluid from the formation when the well was drilled.

Because the EPA defines "low permeability" for soil as 1×10^{-7} cm/sec, the minimum required permeability of the three feet of compacted clay beneath a landfill or surface impoundment, then it is reasonable to believe that the permeability of a column or mud plug (1×10^{-7} cm/sec or less) is more than sufficient to prevent movement of fluids within an "open" unplugged well bore.

1.3.1 Long-term Properties of Drilling Mud

The functions of the drilling mud result from its physical properties. The primary functions of drilling mud are to prevent the inflow of formation fluids and prevent the collapse of formation materials into the wellbore. These are primarily accomplished by altering the mud weight during drilling. Mud weight can be increased by increasing the salinity of the mud or adding insoluble solids, typically barite (BaSO_4). In general, mud weight is increased with depth so that the mud column will overbalance the encountered formation pressures by 200 to 400 psi (Pierce, 1989). The physical characteristics that make the mud useful during drilling also make it an effective barrier to vertical fluid movement over the long-term.

1.3.1.1 Static Mud Column Height

In general, the top of the mud column is found at, or very near, ground level for re-entered boreholes. Documentation offered from several field examples are:

- In the Nora Schulze wellbore, located in Nueces County, Texas, was reentered by K. E. Davis Associates during 1988. The top of the mud plug was encountered immediately below the cement plug at the top of the wellbore (top cement plug), with no fallback in the mud column.

- Subsurface, Inc. (1976) reentered and replugged the Brewster Bartle Drilling Company (British American Oil Production Company), University of Texas No. 1B well located in Galveston County, Texas, during 1976, at the request of Amoco and Monsanto. During the re-entry operation, drilling mud was found immediately below the surface cement plug with its properties relatively intact. This confirms that mud properties maintain their plugging capabilities and offer major resistance as fluid barriers.
- AIC (1988), in a study of well reentries originally plugged 20 to 30 years prior, found that in the Texas Gulf Coast and West Texas, most operators reported finding the top of the mud just below the surface plug.
- Mr. John Luttig, PE, stated in a letter that he has never encountered voids in a wellbore devoid of mud in any well reentry in his more than 30 years in the oil fields of East Texas (Luttig, 1990: Pers.Com.). This includes wells that had been plugged for more than 50 years following plugging. He also indicated that he confirmed this statement with his contemporaries.

It is not possible to force significant quantities of mud out of the borehole and out into a permeable formation because of the effect of nearly impermeable residual mud cake that forms along the formation wall.

1.3.1.2 Mud Column Properties

The long-term properties of mud can be determined from a theoretical standpoint. Mud weight should not vary significantly from that at abandonment because virtually all the weighting (barite) particles will remain in suspension due to mud gel strength, which quickly develops. Pearce (1989) found that gravitational settling of barite or other mud additives has been overestimated. Even though settling of the largest drill cuttings particles may occur, overall, this effect does not diminish mud density, or more importantly, affect the plugging and sealing characteristics of a column of mud in an abandoned borehole. The higher the gel strength of a mud column, the larger the particle that can remain in indefinite suspension. This is completely analogous to a solid mechanics problem where a sphere is suspended in an elastic solid. Only when the maximum shear stress on the surface of the particle exceeds the gel strength of the mud will the particle have the potential to settle out of the mud column. For mud-based barite weighting particles, with a density of 4.2 gm/cm³, the critical diameter (in centimeters) for settling is approximately equal to

the gel strength of the mud (lb./100 ft²) divided by 100. For a reasonable low-end gel strength of 20 lb./100 ft² (typically required at 30 minutes measurement time) all barite particles smaller than 0.2 cm will remain in indefinite suspension. In a typical weighted drilling mud, barite particles are generally an order of magnitude less than 0.2 cm in diameter (NL Baroid, 1988). The maximum diameter of the largest 3 percent of the barite particles in standard API weighted mud systems can be no greater than 0.00635 cm (Gray et al., 1980), or 31 times smaller than the theoretical settling size. A gel strength of only 6 lb./100 ft² is needed to suspend 97 percent of the barite in the mud column and the larger drilled solids in the well (Pearce, 1989). Even if these larger drilled solids settle out of the mud, this will not readily affect the weight of the mud as these larger drilled particles are routinely screened out of the mud at surface during active drilling and circulation of the mud system (Pearce, 1989).

Since the solids remain in the mud column, the only way to relieve formation stresses imposed on the static mud column is by compaction and the consequent movement of water from the mud out into the formation. However, this process is self-limiting, any water movement from the mud column will increase the average density of the mud due to the loss of low density water, increase the gel strength and the solids are brought closer together and decrease the effective permeability of the mud column (Pearce, 1989).

1.3.1.3 Mud Column Gel Strength

The relationship between gel strength and time varies with the mud type, depending on such variables as composition, pH, temperature, pressure, solids, and degree of flocculation (Figure 1). Srimi-Vasan (1957) investigated the affect of temperature (up to 220 °F) on water-based muds with drilling weights like the wells in the Cheney Ranch Field. Annis (1967) showed that the gelling process is depends on both time and temperature, with 18 parts per billion (ppb) bentonite solution at any temperature having a gel strength six times that of the initial gel strength of the mud. Vryzas et al. (2016) found that the gel-like structure of water/bentonite suspensions proved to be rheologically stable after an aging period of 30 and 60 days.

As shown in Davis and Pearce (1989), Chevron conducted laboratory experiments to determine the expected condition of mud left in wellbores. Chevron formulated muds like those used in Mississippi and “aged” the mud samples at temperature and pressure for a two-week period. The testing showed that the muds developed significant compressive strength and was described as a “plug”, with a gel strength too high to measure with standard equipment (Davis and Pearce, 1989).

Field evidence of the longevity of mud as a plugging material has been demonstrated during well reentries. The Nora Schulze No. 2, located in Nueces County, Texas, was reentered by Envirocorp in the late 1980's. The well was plugged with 10.6 to 11.0 lb./gal mud when abandoned in 1959 (Pearce, 1989). Mud samples were taken upon reentry to a depth of approximately 754 feet using tubing pushed into the mud column from a depth of 120 feet. Below a depth of 754 feet, the mud could only be displaced from the well by breaking circulation (Pearce, 1989). Results of measured mud characteristics are presented in Figure 2. The average mud weight of the recovered samples was 11.1 lb./gal, showing that the mud did not appreciably change over the intervening 29 years following abandonment. The gel strengths of the samples ranged between 217 lb./100 ft² to greater than 320 lb./100 ft². These values are over an order of magnitude greater than the 20 lb./100 ft² value required in California plugging rules and commonly used for modeling purposes (Pearce, 1989). In addition, shear strengths of the mud samples ranged from 170 lb./100 ft² to 7,000 lb./100 ft², increasing with depth (Pearce, 1989).

Additional information on mud characteristics from well reentries are:

- Subsurface, Inc. (1976) reentered and replugged the Brewster Bartle Drilling Company (British American Oil Production Company), University of Texas No. 1B well located in Galveston County, Texas, during 1976, at the request of Amoco and Monsanto. Cement plugs were placed from 11,000 to 11,200 feet, and from 130 to 180 feet, and near the surface (top cement plug) with mud-laden fluid filling the remainder of the wellbore (conforming to Texas Railroad Commission plugging and abandonment requirements of 1961). During the re-entry operation, drilling mud was found immediately below the surface cement plug with its properties relatively intact. The mud had to be circulated out using 12-lb/gal mud.
- AIC (1988), in a study of well reentries originally plugged 20 to 30 years prior, found that in the Texas Gulf Coast, most operators reported that the mud was generally hard, with the following comments reflecting the condition of the drilling mud and/or borehole fluids encountered in the Gulf Coast:
 - mud set up like cement;
 - mud set up firm after about five years; and
 - mud encountered is hard and firm

1.4 CONCLUSIONS

The long-term properties of clay-based drilling mud can be determined from a theoretical standpoint. Mud weight is not expected to vary significantly from that at abandonment (start of static conditions) because virtually all of the weighting barite particles (97%) will remain in indefinite suspension due to gel strength of the mud. Gel strength in clay-based muds generally increases with time due to the electrical attraction of the clay platelets in the mud to continually align.

Field investigations from well reentries have found that measured mud properties support the expectations associated with extrapolating laboratory studies over an extended period of time. In the reentry of the Nora Schulte wellbore, mud density remained essentially unaltered, gel strength exceeded 100 lbs./100 ft², and, even for the most highly gelled samples, the mud remained a fluid. All evidence gathered to date indicates clay, water-based drilling fluids provide adequate protection against vertical fluid migration over short and long time periods.

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FIGURES

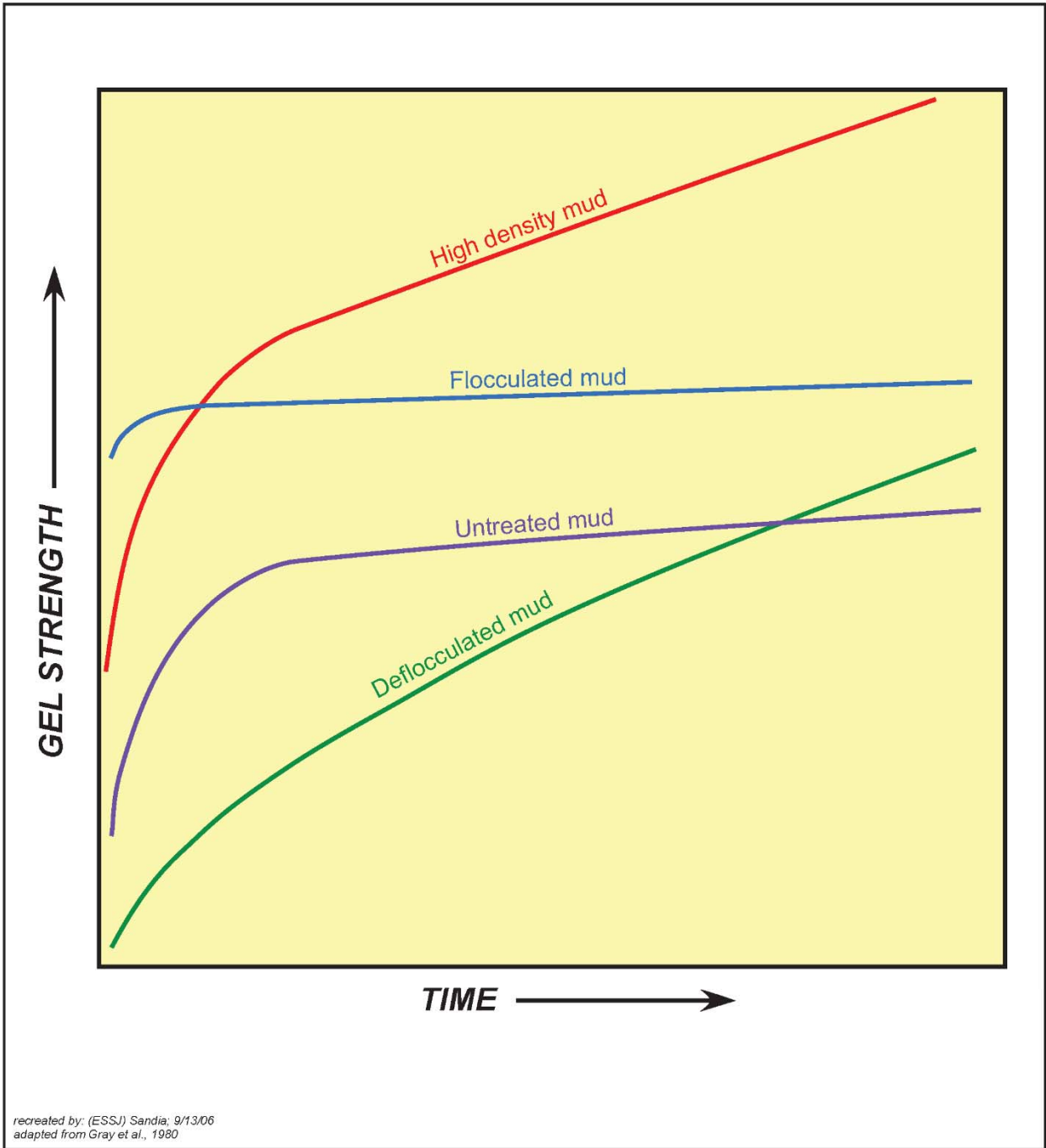


Figure 1 Gel Strength Increase Through Time (Adapted from: Gray et al., 1980)

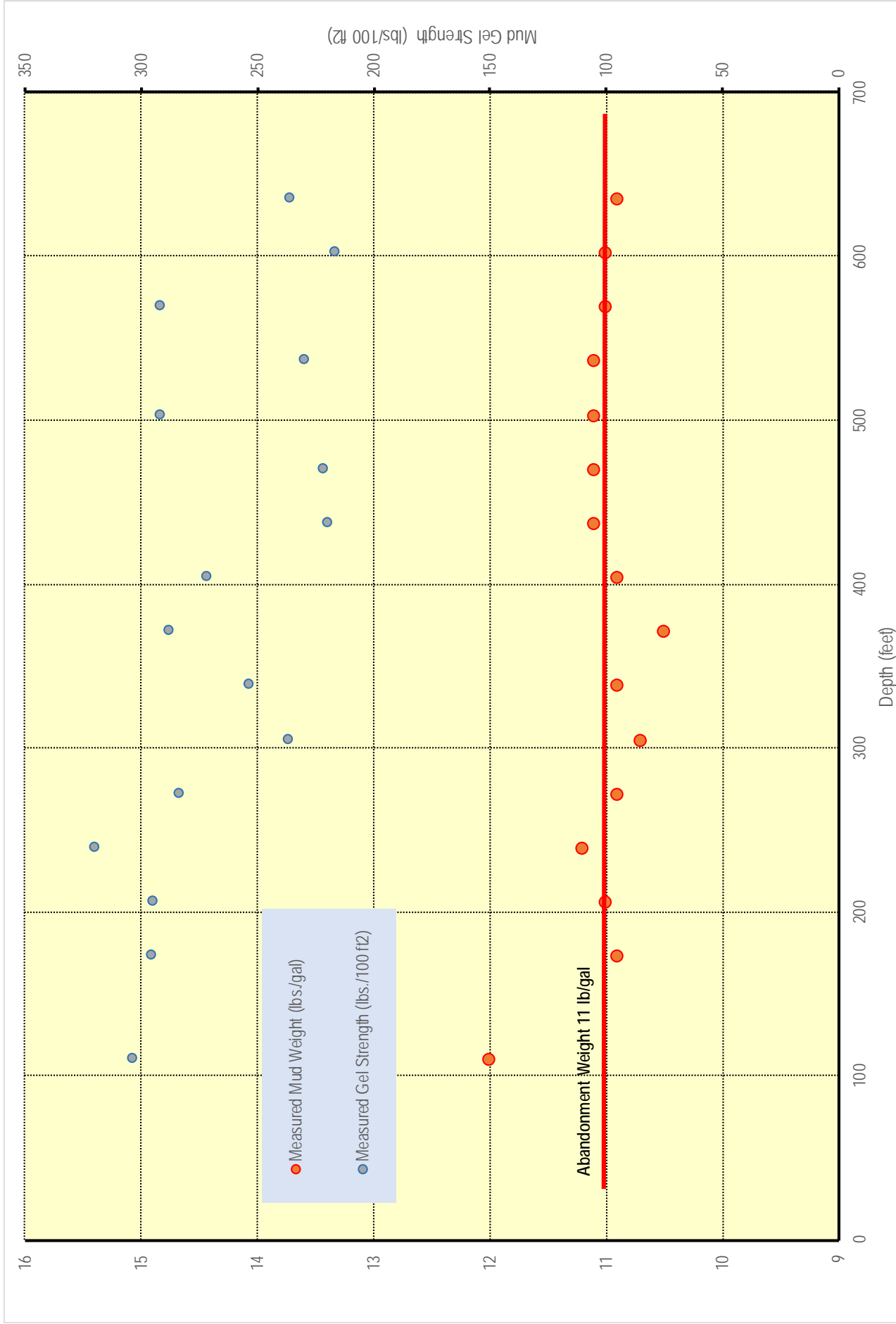


Figure 2 Measured Mud Properties in the Nora Schultze No. 1 well upon reentry in 1988

