DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

CHECK LIST-RECORDS RECEIVED AND WELL STATUS

Operator: **Southern California Gas Company** WELL DESIGNATION **"Frew" 7**

API No. **03700670** SE **29** T: **3N** R.: **16W** , **SB** B. and M.

County: **Los Angeles** FIELD: **Aliso Canyon**

Type of Notice: **Rework** **Date** **7/13/2016** **Report Number:** **P216-0131**

RECORDS RECEIVED (ATTACH PAGES IF REQUIRED)

	Date	OK	NEED	Remarks
Well Summary (OG100)				
History (OG103)				
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				
Press Test	7-26-16	NO	✓	Need raw sheet and Press data from SCG RIG on well.

NEW STATUS

DATE: _____

NOTICE OF RECORDS DUE

DATE: _____

DATE: _____

DATE: _____

DATE: _____

WELL STATUS INQUIRY

DATE: _____

DATE: _____

Well Stat

Change Required: _____

Change Done: _____

ABANDONMENTS/REABANDONMENTS/DRILLS/REDRILLS

CalWims Abandonment Form: _____ SURFACE INSPECTION NEEDED _____ COMPLETED _____
Date and Inspector

FINAL LETTER NEEDED _____ COMPLETED _____ Calwims DRILL/REDRILL Form _____
(Date)

ENGINEER'S CHECK LIST

T-REPORT(S) _____ OPERATOR'S NAME _____ WELL DESIGNATION _____ SIGNATURE _____

Calwims Location _____ Calwims ELEVATION: _____ CONFIDENTIAL RELEASE DATE: _____ PERMIT REQUIREMENTS MET _____

CLERICAL CHECK LIST

LOCATION CHANGE (OG165) _____ ELEVATION CHANGE (OG165) _____ RELEASE OF BOND (OG150) _____

REMARKS

RECORDS SCANNED: _____ **RECORDS APPROVED:** _____
(Date) (Date and Engineer)

Modified OGD2

AOR Database _____

JRAL RESOURCES AGENCY OF CALIFORN
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003 - 4458

No. P 216-0131

Old	New
010	010
FIELD CODE	
00	00
AREA CODE	
30	30
POOL CODE	

PERMIT TO CONDUCT WELL OPERATIONS

Gas Storage
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation
Plugback and Suspend for One Year

Ventura, California
July 18, 2016

Amy Kitson, Agent
Southern California Gas Company (S4700)
12801 Tampa Ave., SC9382
Northridge, CA 91326

Your proposal to **Rework** well **"Frew" 7**, A.P.I. No. **037-00670**, Section **29**, T. **03N**, R. **16W**, **SB** B. & M., **Aliso Canyon** field, **Any** area, **Sesnon-Frew** pool, **Los Angeles** County, dated **7/13/2016**, received **7/13/2016** has been examined in conjunction with records filed in this office. (Lat: **34.313186** Long: **-118.574768** Datum:**83**)

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
   a. Class **I** **Note: work to be completed without the removal of the injection assembly.**
2. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
3. A pressure test is conducted to demonstrate the mechanical integrity of the **7"** casing.
4. This well is to be taken out of service and isolated from the storage reservoir. The well shall be re-evaluated or abandoned within 1 year of the completion of the pressure testing pursuant to Order #1109 and its amendments.
5. In all other respects, the provisions of Division Order #1109 and its amendments shall remain in effect.
6. This office shall be contacted by phone prior to making any program changes and no changes are made without Division approval.
7. **THIS DIVISION SHALL BE NOTIFIED TO:**
   a. Witness a pressure test on the **7"** casing and tubing plug.

Continued on Next Page

Blanket Bond Dated: 7/6/1999
UIC Project No. 0100006
cc:

Engineer Clifford R. Knight
Office (805) 654-4761

CRK/crk

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By _____ for
Patricia A. Abel, *District Deputy*

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. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

NOTE:

1. The base of the freshwater zone is at **800'±**.
2. No operation shall be undertaken or continued that will contaminate or otherwise damage the environment.
3. This permit is being issued as part of Division Order No. 1109 dated March 4, 2016. Any well that fails any of the testing must be taken out of service and isolated from the storage reservoir pursuant to the Safety Review Testing Regime.
4. The required History of Oil or Gas Well (OG103) shall include a complete description of the required pressure testing. **An updated casing and tubing diagram shall be included with the well history.**
5. **A Well Summary Report (Form OG 100)** and **Well History (Form OG 103)** shall to be submitted to the Division within 60 days after the well is drilled, reworked, plugged and abandoned, or if the work is suspended. Any additional well work will require an additional notice to be submitted to this office prior to resuming well operations.

Enclosure: **Attachment 1 to DOGGR Order 1109. Safety Review Testing Regime for the Aliso Canyon Natural Gas Storage Facility**

ATTACHMENT 1
TO DOGGR ORDER 1109

SAFETY REVIEW TESTING REGIME
FOR THE ALISO CANYON NATURAL GAS STORAGE FACILITY

This document identifies the requirements of this comprehensive safety review that shall be completed by the Southern California Gas Company (Operator) and verified by the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (Division). The Operator shall use accepted industry practices and procedures.

The Division has consulted with independent technical experts from the Lawrence Berkeley, Lawrence Livermore, and Sandia National Laboratories ("National Laboratories") to develop the requirements of this facility safety review. The National Laboratories experts independently reviewed and concurred with the testing requirements for the safety review detailed below.

This comprehensive safety review requires that each of the active injection wells in the Aliso Canyon Storage facility either pass a thorough battery of tests in order to resume gas injection or be taken out of operation and isolated from the underground gas storage reservoir. Several steps, detailed below, are required in this safety review. Documentation of all testing required under this comprehensive safety review shall be provided electronically to the Division within 72 hours of completion of a test in digital (i.e. LAS) and printed (i.e. pdf) form. All pressure tests required under this comprehensive safety review shall be witnessed by Division staff. A well that is properly plugged and abandoned in accordance with Public Resources Code section 3208 is not subject to testing under this comprehensive safety review. A well that does not pass all tests must be repaired, retested, and pass all tests, or be plug and abandoned.

REQUIRED TESTS FOR EACH WELL IN THE FACILITY

Step 1: The Operator shall perform an initial casing assessment on the well consisting of temperature and noise logs.

a. Temperature Log:
A temperature survey shall be run from the surface to the packer to measure the temperature within the wellbore. A temperature survey that demonstrates no unexplained anomalous temperature changes in the well is one indication of casing integrity.

b. Noise Log:
An acoustic sensor survey capable of detecting the sound of fluid flow will be conducted the length of the well above the packer to the surface. The survey will include stops at least every 250 feet and at the midpoint of any anomaly detected by the temperature survey. The absence of anomalous sound above the packer is an indication of well integrity

Step 2: The results of the Temperature Logs and Noise Logs will be independently reviewed by Division engineers. Any unexplained abnormal findings in this set of tests shall be addressed by the Operator in one of the following ways:

a. Conduct further investigation and demonstrate to the Division's satisfaction that the abnormal finding is not an indicator of a lack mechanical integrity;
b. Remediate the well to the Division's satisfaction; or
c. With Division review and approval, remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

Necessary actions to remediate any abnormalities revealed by these tests will be reviewed by Division engineers. Once repairs or mitigations are completed, the Temperature Log and Noise Log must then be repeated on the well and reviewed by Division engineers to ensure that there are no additional abnormal test results and to confirm the issue was repaired.

Step 3: After these tests are completed on the well, and all required action has been completed, the operator shall either:

a. Conduct the additional tests and evaluations on the well, outlined in Steps 4a through 7a below, in order to gain approval for injecting gas through that well; or
b. Remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

REQUIRED TESTS IF A WELL IS INTENDED TO RESUME OPERATIONS

If Temperature and Noise Logs have been completed on a well and they indicate well integrity, and the Operator designates the well to return to injection operations, then the Operator shall perform the additional testing outlined in Steps 4a through 7a. The results of these tests will be independently reviewed by Division engineers and posted publicly. Each of the following tests requires that the production tubing be removed from the well.

Step 4a: The Operator shall conduct a **Casing Inspection log.**
The Operator shall conduct a Casing Inspection log of the well that measures the thickness of the production casing, from the surface to the bottom of the gas storage reservoir cap rock. If the inspection reveals a reduction in wall thickness, the current minimum strength of the casing will be calculated. If the current minimum strength of the casing has diminished to the point that it cannot withstand authorized operating pressures for the well plus a built-in additional safety factor of pressure, the well has failed this test. *A passing test for a casing inspection log would show no thinning of the casing that diminishes the casing's ability to contain at least 115% of the well's maximum allowable operating pressure as authorized in the current Project Approval Letter.*

Step 5a: The Operator shall conduct a **Cement Bond Log** for the well.
The Operator shall conduct a Cement Bond Log (CBL) that measures the bonding between cement and the production casing of the well, and also the bonding between the annular cement and the formation. Cement should be solidly bonded to both the well's production casing and the geologic formation to ensure a seal that prevents fluids from migrating up or down the outside of the well. *A passing test for a cement bond log shows definitive bond, as demonstrated by sonic waveform,*

between cement and casing and between cement and the gas storage formation and/or cap rock for at least 100 feet above the top of the gas storage reservoir.

Step 6a: The Operator shall conduct a **Multi-Arm Caliper Inspection** of the well. The operator shall conduct an inspection that measures any internal degradation or significant changes to the well's geometry from the surface to the top of the gas storage reservoir, using a minimum 32-arm caliper tool. If the inspection reveals a thinning or deformity of the casing, the current strength of the casing will be calculated. If the current strength of the casing has diminished, such that it cannot withstand authorized operating pressures plus a built-in safety factor of additional pressure, the well fails this inspection. *A passing test for a Multi-Arm Caliper Inspection would show no deformation or thinning of the casing that diminishes the casing from being able to properly contain at least 115% of each well's maximum operating pressure.*

Step 7a: The Operator will conduct a **Pressure Test** of the production casing and of the well once the production tubing has been reinstalled. The Operator may conduct the casing pressure test prior to reinstalling the production tubing. Using a digital recorder, the operator will conduct a liquid-filled positive pressure test within the production tubing of the well, and in the annular space between the production tubing and the casing, to determine the well's ability to withstand normal operating pressures. The production tubing will be isolated and then pressure tested. The annular space between tubing and casing will be pressure tested. This testing also evaluates the integrity of any packers, which seal the annular space between the tubing and casing. The pressure test will be one hour and begin at a pressure of 115% of the maximum operating pressure or the minimum yield strength of the casing and tubing, whichever is less. *A passing pressure test is a pressure loss not exceeding 10% for any 30 minute period during the hour long test.*

After conducting the above tests, the Operator will conduct any indicated remediation so that the well can pass these tests. All remediation will be subject to the review of Division engineers. The well would then be required to undergo the tests once again to demonstrate well integrity.

If the well passes the Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper inspection and the Pressure Test to the Division's satisfaction, then the Division may clear the well for use for gas injections and withdrawal, once the Division has authorized resumption of injection into the gas storage reservoir. As noted below, wells approved for operation will only be permitted to inject or withdraw gas through the production tubing.

REQUIRED ACTIONS IF THE WELL IS TO BE TAKEN OUT OF OPERATION AND ISOLATED FROM THE GAS STORAGE RESERVOIR:

If the operator elects to take a well out of service, then the following steps shall be taken to isolate the well from the gas storage reservoir:

Step 4b: The Operator shall confirm the presence of cement outside the well's external casing in the section of the well that prevents the movement of gas from the underground gas storage reservoir to shallower geologic zones above the gas storage reservoir. Existing cement bond logs and well construction

records may be used to make this confirmation. This confirmation requires concurrence from Division engineers.

Step 5b: The Operator shall install a mechanical seal or "packer" within the well's production casing and install a mechanical plug within the well's production tubing, if applicable. These seals shall be set in place near the bottom of the well, within the portion of the well surrounded by cement. This kind of seal is an industry standard practice for isolating a well from reservoir gases or fluids and will further protect the casing from internal gas pressure.

Step 6b: The Operator shall fill the well with fluid to the well's surface in order to create appropriate downward hydrostatic pressure in the well that further contributes to the integrity of the well seal.

These measures will isolate a well from the underground gas reservoir, as confirmed by National Laboratory experts. Each of the above actions is subject to review and approval by Division Engineers.

Step 7b: Once the Operator has completed steps 4b, 5b, and 6b, and the seal is in place at the bottom of the well and the well is filled with fluid above the seal, the operator shall:

a. Conduct daily gas monitoring at the surface of the non-operational well, including monitoring the area around the well perimeter and in the annular space between the plugged casing string and the outmost casing;
b. Conduct noise log, temperature log and positive pressure test every six months;
c. Conduct weekly monitoring of fluid levels in the well or, install and operate real-time pressure monitors that provide immediate notification to the operator when pressures deviate from normal in the well's interior tubing and its annular space.

The above monitoring shall be reported to Division engineers and maintained as a part of the well file. Division engineers will review all submitted information for evaluation on a regular basis to ensure that the well taken out of service has maintained safety, and the operator shall take all necessary steps maintain the safety of the well.

Any well taken out of operation cannot be approved to resume operations and gas injection until the successful completion of the battery of tests outlined above in Steps 4a through 7a (Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper Extension and the Pressure Test) is completed. Those tests must be successfully completed within one year of completing step 6b. If a well cannot successfully complete all necessary steps required in this safety review after one year of completing step 6b, then the well shall be properly plugged and abandoned in accordance with Public Resources Code section 3208.

REQUIREMENTS FOR WELLS RESUMING OPERATIONS IN ALISO CANYON

The Division's authorization to resume injection in the Aliso Canyon Storage Facility will be contingent on the successful completion of this comprehensive safety review. The State Oil and Gas Supervisor must confirm in writing that all wells in the facility have either completed and passed the full battery of tests required in the safety review, been taken out of service and isolated from the underground gas storage reservoir, or been properly plugged and abandoned in accordance with Public Resources Code Section 3208.

NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

FOR DIVISION USE ONLY			
	Forms		
Bond	~~OGD114~~	OGD121	
	CALV WIMS	115V	

P216-0131

NOTICE OF INTENTION TO REWORK / REDRILL WELL

Detailed instructions can be found at: www.conservation.ca.gov/dog/

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework ☒ / redrill ☐ (Check one) well Frew 7, API No. 037-00670,

Sec. 29, T. 3N, R. 16W, S.B. B.&M., Aliso Canyon Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)

See attached wellbore schematic and completed work summary.

The total depth is: 8825 feet. The effective depth is: 8746 feet.

Present completion zone(s): Sesnon (Name). Anticipated completion zone(s): Same (Name).

Present zone pressure: storage psi. Anticipated/existing new zone pressure: storage psi.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes☐ No☒

For redrilling or deepening only, is a California Environmental Quality Act (CEQA) document required by a local agency? Yes☐ No☒ If yes, see next page.

The proposed work is as follows: (A complete program is preferred and may be attached.)

The SCGC plans to take this well out of operation and isolate from the gas storage reservoir as per the First Amended Safety Review Testing Regime: Steps 4b-7b

7b - MIRU pump, with casing valve closed, pressure-up on tubing to 500 psi. for 1 hour (will test csg., packer and tubing plug all at same time). Note: squeezed holes above packer at 8269'-8270' and 8300'-8301'

If well is to be redrilled or deepened, show proposed coordinates (from surface location) and true vertical depth at total depth: _____ feet _____ (Direction) and _____ feet _____ (Direction) Estimated true vertical depth: _____

Will the Field and/or Area change? Yes☐ No☒ If yes, specify New Field: _____ New Area: _____

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator			
Southern California Gas Company			
Address: P. O. Box 2300		City/State: Chatsworth	Zip Code: 91313-2300
Name of Person Filing Notice: Mike Giuliani	Telephone Number: (805) 290-2074	Signature	Date: 7/13/16
Individual to contact for technical questions: Mike Giuliani	Telephone Number: (805) 290-2074	E-Mail Address: mike.giuiliani@interactprojects.com	

This notice and an indemnity or cash bond must be filed, and approval given, before the workover begins. (See the reverse side for bonding information.) If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

Rec'd 07-13-16 DOGGR Ventura.

INFORMATION FOR COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA)

If an environmental document has been prepared by the lead agency, submit a copy of the ***Notice of Determination*** or ***Notice of Exemption*** with this notice. Please note that a CEQA determination by a local jurisdiction, if required, must be complete, or the Division may not issue a permit.

CRITICAL WELL DEFINITION

As defined in the California Code of Regulations, Title 14, Section 1720 (a), "Critical well" means a well within:

(1) 300 feet of the following:
  (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
  (B) Any airport runway.
(2) 100 feet of the following:
  (A) Any dedicated public street, highway or the nearest rail of an operating railway that is in general use;
  (B) Any navigable body of water or watercourse perennially covered by water;
  (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground or any other area of periodic high-density population; or
  (D) Any officially recognized wildlife preserve.

WELL OPERATIONS REQUIRING BONDING

1. Drilling, redrilling, or deepening any well.
2. Milling out or removing a casing or liner.
3. Running and cementing casing or tubing.
4. Running and cementing liners and inner liners.
5. Perforating casing in a previously unperforated interval for production, injection, testing, observation, or cementing purposes.
6. Drilling out any type of permanent plug.
7. Reentering an abandoned well having no bond.

This form may be printed from the DOGGR website at www.conservation.ca.gov/dog/

Well
Frew 7

API #: 04-037-00670-00
Sec 29, T3N, R16W

Operator: So. California Gas Co.

Lease: Frew
Field: Aliso Canyon
Status: Active Gas Storage
BFW:
USDW:

Ground Elevation: 2409.7' asl
Datum to Ground: 9.0' DF

Spud Date: 11/27/1954
Completion Date: 2/14/1955

Junk: None

11-3/4" TOC Surface

16" Hole

Surface Casing
11-3/4", 47#, J-55
0' - 1977'

CMT'D w/ 1300 CF 1:1 Perlite +
125 SKS Neat , Good CMT
Returns to Surface

1977'

Tubing
0' - 8357' 2-7/8"
8357' - 8659' 2-3/8"

10-5/8" Hole (1977' - 8288')

7" ETOC 7707'

9-7/8" Hole (8288' - 8750')

8236' Camco KBMG GLM
8269' (4) Holes WSO
8270' (4) Holes (85 CF CMT SQZ'D Away 6/26/1975)

8300' (4) Holes (137 SKS CMT, SQZ'D, 6/20/1975)
8301' (4) Holes (97 CF CMT SQZ'D Away 6/24/1975)
8306' Camco KP-5 Safety Mandrel

8352' Baker Model D PCKR
8357' 2-7/8" x 2-3/8" X-Over

Production Casing
7"
0' - 971' 23#, N-80
971' - 5004' 23#, J-55
5004' - 6545' 26#, J-55
6545' - 7297' 23#, N-80
7297' - 8750' 26#, N-80

CMT'D w/ 300 SKS

8383'

8399' Baker Model L Sliding Sleeve

8452' (4) Holes (35 CF CMT SQZ'D Away, 6/16/1975)

8465' Baker Model D PCKR

8535' Baker Model L Sliding Sleeve

8645' Baker Model D PCKR

8654' Baker Model R No-Go Nipple
8659' Tail
8665' (4) Holes WSO (8 SKS CMT SQZ'D Away)

7" Perfs:
Four (4) HPF 8383' - 8442' &
8475' - 8618' (7/7/1975)
Two (2) bullet & (2) jet, 1/2" HPF
8670' - 8702' & 8730' - 8744'
(2/10/1955)

PBTD @ 8746'

8744'

8745' (6) 1/2" Holes (plug at 8750' determined effective)

8750'

7-5/8" Hole

CMT Plug @ 8750' - 8825'
(40 SKS, CO f/ 8723' - 8750')

TD 8825'
TVD (8823')
Directionally Drilled: No

Top of Zone Markers	md (tvd)
PEupth	1660' (1660')
FREWupth	2650' (2650')
CRupth	2810' (2810')
K1upth	2930' (2930')
MP	7813' (7811')
S1	8278' (8276')
S4	8358' (8356')
S8	8454' (8452')
S14	8583' (8581')
FREW	8730' (8728')

Prepared by: MAM (2/9/2016)
Updated by: LD (7/13/2016)

InterAct

Rec'd 07-13-16 DOGGR Ventura.

Completed Work Summary - Frew 7		
Step	Work Completed	Date
4b	ETOC at 7707' - History shows no CBL ran in well	
5b	Set packer at 8352'	7/7/1975
5b	Plug set in sliding sleeve at 8399'	1/29/2016
6b	Circulated well full of 3% KCL through SSSV at 8306'	2/6/2016

Casing Pressure Test Safety Check (1000 psi)

Well	Packer Depth MD/TVD	Casing Size/Grade/Weight	Depth MD	Burst PSI	85% of Burst PSI	Pressure at Depth w/1000 psi Surface Pressure	Press < 85% of Burst
Frew 7	8352'/8352'	7", 23#, N-80	971	6340	5389	1429	Yes
		7", 23#, J-55	5004	4360	3706	3212	Yes
		7", 26#, J-55	6545	4980	4233	3893	Yes
		7", 23#, N-80	7297	6340	5389	4225	Yes
		7", 26#, N-80	8352	7240	6154	4692	Yes
Mission Adrian 3	7570'/7570'	7", 26#, N-80	33	7240	6154	1015	Yes
		7", 23#, N-80	1384	6340	5389	1612	Yes
		7", 23#, J-55	4995	4360	3706	3208	Yes
		7", 23#, N-80	7419	6340	5389	4279	Yes
		7", 26#, N-80	7570	7240	6154	4346	Yes
Porter 36	7269'/7269'	7", 23#, J-55	3724	4360	3706	2646	Yes
		7", 23#, N-80	5406	6340	5389	3389	Yes
		7", 26#, N-80	7037	7240	6154	4110	Yes
		7", 29#, N-80	7269	8160	6936	4213	Yes
Fernando Fee 35D	7087'/6849'	8-5/8", 36#, K-55	5756	4460	3791	3544	Yes
		8-5/8", 36#, N-80	7087	6490	5517	4132	Yes

D ARTMENT OF CONSERVATI
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003-4458
Phone:(805) 654-4761 Fax:(805) 654-4765

Ventura, California
February 19, 2016

Amy Kitson
Southern California Gas Company (S4700)
12801 Tampa Ave., SC9382
Northridge, CA 91326

This Division has received your Notice of Intention to **Rework** dated **2/8/2016,** for **"Frew" 7**, API. **037-00670**, **Aliso Canyon** field, Sec. **29**, T. **03N**, R. **16W**, **SB** B&M, **Los Angeles** County.

THIS NOTICE IS BEING HELD IN ABEYANCE PENDING THE REVIEW AND APPROVAL OF CONTINUATION OF YOUR GAS STORAGE PROJECT #0100006.

NOTE: This notice is being held in abeyance pending the Division review of gas storage integrity testing.

If you have any questions, please call Bruce Hesson at (805) 654 - 4761.

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By _____
Bruce Hesson
Senior Oil and Gas Engineer

BH:kg

OG113

DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

CHECK LIST-RECORDS RECEIVED AND WELL STATUS

Operator: **Southern California Gas Company** WELL DESIGNATION **"Frew" 7**

API No. **03700670** SE **29** T: **3N** R.: **16W** , **SB** B. and M.

County: **Los Angeles** FIELD: **Aliso Canyon**

Type of Notice: **Rework** **Date** **2/8/2016** **Report Number:** **P216-0017**

RECORDS RECEIVED (ATTACH PAGES IF REQUIRED)

	Date	OK	NEED	Remarks
Well Summary (OG100)				
History (OG103)				
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				

NEW STATUS

DATE: _____

NOTICE OF RECORDS DUE

DATE: _____

DATE: _____

DATE: _____

DATE: _____

WELL STATUS INQUIRY

DATE: _____

DATE: _____

Well Stat

Change Required: _____

Change Done: _____

ABANDONMENTS/REABANDONMENTS/DRILLS/REDRILLS

CalWims Abandonment Form: _____ SURFACE INSPECTION NEEDED _____ COMPLETED _____
Date and Inspector

FINAL LETTER NEEDED _____ COMPLETED _____ Calwims DRILL/REDRILL Form _____
(Date)

ENGINEER'S CHECK LIST

T-REPORT(S) _____ OPERATOR'S NAME _____ WELL DESIGNATION _____ SIGNATURE _____

Calwims Location _____ Calwims ELEVATION: _____ CONFIDENTIAL RELEASE DATE: _____ PERMIT REQUIREMENTS MET _____

CLERICAL CHECK LIST

LOCATION CHANGE (OG165) _____ ELEVATION CHANGE (OG165) _____ RELEASE OF BOND (OG150) _____

REMARKS

Held in Abeyance 2-19-16

RECORDS SCANNED: _____
(Date)

RECORDS APPROVED: _____
(Date and Engineer)

Modified OGD2

AOR Datbase _____

...URAL RESOURCES AGENCY OF CALIFORN...
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003 - 4458

No. P 216-0017

Old	New
010	010
FIELD CODE	
00	00
AREA CODE	
30	30
POOL CODE	

PERMIT TO CONDUCT WELL OPERATIONS

Gas Storage
Comprehensive Safety Review
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation

Ventura, California
March 18, 2016

Amy Kitson, Agent
Southern California Gas Company (S4700)
12801 Tampa Ave., SC9382
Northridge, CA 91326

Your proposal to **Rework** well **"Frew" 7**, A.P.I. No. **037-00670**, Section **29**, T. **03N**, R. **16W**, **SB** B. & M., **Aliso Canyon** field, **Any** area, **Sesnon-Frew** pool, **Los Angeles** County, dated **2/8/2016**, received **2/11/2016** has been examined in conjunction with records filed in this office. (Lat: **34.313186** Long: **-118.574768** Datum:**83**)

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements:
   a. Class **III 5M** on the **7"** casing.
2. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
3. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
4. A Temperature and Noise log are run on the well from the packer to surface.
5. **A Casing Wall Thickness Test, Cement Bond Log/USIT, and a Multi-Arm Caliper** shall be performed to demonstrate that the **7"**casing has integrity.
6. Prior to commencing injection, a pressure test is conducted to demonstrate the mechanical integrity of the **7"** casing.
7. Injection shall be through tubing and packer only. Injection or withdrawal through the casing is not permitted.
8. This office shall be contacted by phone prior to making any program changes and no changes are made without Division approval.
9. **THIS DIVISION SHALL BE NOTIFIED TO:**
   a. Inspect the installed blowout prevention equipment prior to commencing **downhole** operations.
   b. Witness a pressure test of the tubing and **7"** casing prior to commencing injection.

Continued of Next Page

Blanket Bond Dated: 7/6/1999
UIC Project No. 0100006

Engineer Kris Gustafson
Office (805) 654-4761

KG/kg

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By for Pat Abel
Patricia A. Abel, *District Deputy*

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. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

NOTE:

1. This permit was held in abeyance pending the approval of the Safety Review Testing Regime process.
2. The base of the freshwater zone is at or above **800'±**.
3. No operation shall be undertaken or continued that will contaminate or otherwise damage the environment.
4. This permit is being issued as part of Division Order No. 1109 dated March 4, 2016. Any well that fails any of the testing must be taken out of service and isolated from the storage reservoir pursuant to the Safety Review Testing Regime.
5. The required History of Oil or Gas Well (OG103) shall include a complete description of the required pressure testing. **An updated casing and tubing diagram shall be included with the well history.**
6. **A Well Summary Report (Form OG 100)** and **Well History (Form OG 103)** shall to be submitted to the Division within 60 days after the well is drilled, reworked, plugged and abandoned, or if the work is suspended. Any additional well work will require an additional notice to be submitted to this office prior to resuming well operations.

Enclosure: **Attachment 1 to DOGGR Order 1109. Safety Review Testing Regime for the Aliso Canyon Natural Gas Storage Facility**

ATTACHMENT 1
TO DOGGR ORDER 1109

SAFETY REVIEW TESTING REGIME
FOR THE ALISO CANYON NATURAL GAS STORAGE FACILITY

This document identifies the requirements of this comprehensive safety review that shall be completed by the Southern California Gas Company (Operator) and verified by the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (Division). The Operator shall use accepted industry practices and procedures.

The Division has consulted with independent technical experts from the Lawrence Berkeley, Lawrence Livermore, and Sandia National Laboratories ("National Laboratories") to develop the requirements of this facility safety review. The National Laboratories experts independently reviewed and concurred with the testing requirements for the safety review detailed below.

This comprehensive safety review requires that each of the active injection wells in the Aliso Canyon Storage facility either pass a thorough battery of tests in order to resume gas injection or be taken out of operation and isolated from the underground gas storage reservoir. Several steps, detailed below, are required in this safety review. Documentation of all testing required under this comprehensive safety review shall be provided electronically to the Division within 72 hours of completion of a test in digital (i.e. LAS) and printed (i.e. pdf) form. All pressure tests required under this comprehensive safety review shall be witnessed by Division staff. A well that is properly plugged and abandoned in accordance with Public Resources Code section 3208 is not subject to testing under this comprehensive safety review. A well that does not pass all tests must be repaired, retested, and pass all tests, or be plug and abandoned.

REQUIRED TESTS FOR EACH WELL IN THE FACILITY

Step 1: The Operator shall perform an initial casing assessment on the well consisting of temperature and noise logs.

a. Temperature Log:
   A temperature survey shall be run from the surface to the packer to measure the temperature within the wellbore. A temperature survey that demonstrates no unexplained anomalous temperature changes in the well is one indication of casing integrity.

b. Noise Log:
   An acoustic sensor survey capable of detecting the sound of fluid flow will be conducted the length of the well above the packer to the surface. The survey will include stops at least every 250 feet and at the midpoint of any anomaly detected by the temperature survey. The absence of anomalous sound above the packer is an indication of well integrity

Step 2: The results of the Temperature Logs and Noise Logs will be independently reviewed by Division engineers. Any unexplained abnormal findings in this set of tests shall be addressed by the Operator in one of the following ways:

a. Conduct further investigation and demonstrate to the Division's satisfaction that the abnormal finding is not an indicator of a lack mechanical integrity;
b. Remediate the well to the Division's satisfaction; or
c. With Division review and approval, remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

Necessary actions to remediate any abnormalities revealed by these tests will be reviewed by Division engineers. Once repairs or mitigations are completed, the Temperature Log and Noise Log must then be repeated on the well and reviewed by Division engineers to ensure that there are no additional abnormal test results and to confirm the issue was repaired.

Step 3: After these tests are completed on the well, and all required action has been completed, the operator shall either:

a. Conduct the additional tests and evaluations on the well, outlined in Steps 4a through 7a below, in order to gain approval for injecting gas through that well; or
b. Remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

REQUIRED TESTS IF A WELL IS INTENDED TO RESUME OPERATIONS

If Temperature and Noise Logs have been completed on a well and they indicate well integrity, and the Operator designates the well to return to injection operations, then the Operator shall perform the additional testing outlined in Steps 4a through 7a. The results of these tests will be independently reviewed by Division engineers and posted publicly. Each of the following tests requires that the production tubing be removed from the well.

Step 4a: The Operator shall conduct a **Casing Inspection log.**
The Operator shall conduct a Casing Inspection log of the well that measures the thickness of the production casing, from the surface to the bottom of the gas storage reservoir cap rock. If the inspection reveals a reduction in wall thickness, the current minimum strength of the casing will be calculated. If the current minimum strength of the casing has diminished to the point that it cannot withstand authorized operating pressures for the well plus a built-in additional safety factor of pressure, the well has failed this test. *A passing test for a casing inspection log would show no thinning of the casing that diminishes the casing's ability to contain at least 115% of the well's maximum allowable operating pressure as authorized in the current Project Approval Letter.*

Step 5a: The Operator shall conduct a **Cement Bond Log** for the well.
The Operator shall conduct a Cement Bond Log (CBL) that measures the bonding between cement and the production casing of the well, and also the bonding between the annular cement and the formation. Cement should be solidly bonded to both the well's production casing and the geologic formation to ensure a seal that prevents fluids from migrating up or down the outside of the well. *A passing test for a cement bond log shows definitive bond, as demonstrated by sonic waveform,*

between cement and casing and between cement and the gas storage formation and/or cap rock for at least 100 feet above the top of the gas storage reservoir.

Step 6a: The Operator shall conduct a **Multi-Arm Caliper Inspection** of the well.
The operator shall conduct an inspection that measures any internal degradation or significant changes to the well's geometry from the surface to the top of the gas storage reservoir, using a minimum 32-arm caliper tool. If the inspection reveals a thinning or deformity of the casing, the current strength of the casing will be calculated. If the current strength of the casing has diminished, such that it cannot withstand authorized operating pressures plus a built-in safety factor of additional pressure, the well fails this inspection. *A passing test for a Multi-Arm Caliper Inspection would show no deformation or thinning of the casing that diminishes the casing from being able to properly contain at least 115% of each well's maximum operating pressure.*

Step 7a: The Operator will conduct a **Pressure Test** of the production casing and of the well once the production tubing has been reinstalled. The Operator may conduct the casing pressure test prior to reinstalling the production tubing. Using a digital recorder, the operator will conduct a liquid-filled positive pressure test within the production tubing of the well, and in the annular space between the production tubing and the casing, to determine the well's ability to withstand normal operating pressures. The production tubing will be isolated and then pressure tested. The annular space between tubing and casing will be pressure tested. This testing also evaluates the integrity of any packers, which seal the annular space between the tubing and casing. The pressure test will be one hour and begin at a pressure of 115% of the maximum operating pressure or the minimum yield strength of the casing and tubing, whichever is less. *A passing pressure test is a pressure loss not exceeding 10% for any 30 minute period during the hour long test.*

After conducting the above tests, the Operator will conduct any indicated remediation so that the well can pass these tests. All remediation will be subject to the review of Division engineers. The well would then be required to undergo the tests once again to demonstrate well integrity.

If the well passes the Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper inspection and the Pressure Test to the Division's satisfaction, then the Division may clear the well for use for gas injections and withdrawal, once the Division has authorized resumption of injection into the gas storage reservoir. As noted below, wells approved for operation will only be permitted to inject or withdraw gas through the production tubing.

REQUIRED ACTIONS IF THE WELL IS TO BE TAKEN OUT OF OPERATION AND ISOLATED FROM THE GAS STORAGE RESERVOIR:

If the operator elects to take a well out of service, then the following steps shall be taken to isolate the well from the gas storage reservoir:

Step 4b: The Operator shall confirm the presence of cement outside the well's external casing in the section of the well that prevents the movement of gas from the underground gas storage reservoir to shallower geologic zones above the gas storage reservoir. Existing cement bond logs and well construction

records may be used to make this confirmation. This confirmation requires concurrence from Division engineers.

Step 5b: The Operator shall install a mechanical seal or "packer" within the well's production casing and install a mechanical plug within the well's production tubing, if applicable. These seals shall be set in place near the bottom of the well, within the portion of the well surrounded by cement. This kind of seal is an industry standard practice for isolating a well from reservoir gases or fluids and will further protect the casing from internal gas pressure.

Step 6b: The Operator shall fill the well with fluid to the well's surface in order to create appropriate downward hydrostatic pressure in the well that further contributes to the integrity of the well seal.

These measures will isolate a well from the underground gas reservoir, as confirmed by National Laboratory experts. Each of the above actions is subject to review and approval by Division Engineers.

Step 7b: Once the Operator has completed steps 4b, 5b, and 6b, and the seal is in place at the bottom of the well and the well is filled with fluid above the seal, the operator shall:

a. Conduct daily gas monitoring at the surface of the non-operational well, including monitoring the area around the well perimeter and in the annular space between the plugged casing string and the outmost casing;
b. Conduct noise log, temperature log and positive pressure test every six months;
c. Conduct weekly monitoring of fluid levels in the well or, install and operate real-time pressure monitors that provide immediate notification to the operator when pressures deviate from normal in the well's interior tubing and its annular space.

The above monitoring shall be reported to Division engineers and maintained as a part of the well file. Division engineers will review all submitted information for evaluation on a regular basis to ensure that the well taken out of service has maintained safety, and the operator shall take all necessary steps maintain the safety of the well.

Any well taken out of operation cannot be approved to resume operations and gas injection until the successful completion of the battery of tests outlined above in Steps 4a through 7a (Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper Extension and the Pressure Test) is completed. Those tests must be successfully completed within one year of completing step 6b. If a well cannot successfully complete all necessary steps required in this safety review after one year of completing step 6b, then the well shall be properly plugged and abandoned in accordance with Public Resources Code section 3208.

REQUIREMENTS FOR WELLS RESUMING OPERATIONS IN ALISO CANYON

The Division's authorization to resume injection in the Aliso Canyon Storage Facility will be contingent on the successful completion of this comprehensive safety review. The State Oil and Gas Supervisor must confirm in writing that all wells in the facility have either completed and passed the full battery of tests required in the safety review, been taken out of service and isolated from the underground gas storage reservoir, or been properly plugged and abandoned in accordance with Public Resources Code Section 3208.

Rec'd 02-11-16 DOGGR D2 Ventura

NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

FOR DIVISION USE ONLY		
	Forms	
Bond	~~OGD114~~ ✓	OGD121 ✓
	CAL WIMS ✓	115 ✓

P216-0017

NOTICE OF INTENTION TO REWORK / REDRILL WELL

Detailed instructions can be found at: www.conservation.ca.gov/dog/

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework ☒ / redrill ☐ well (Check one) Frew 7, API No. 037-00670,

Sec. 29, T. 3N, R. 16W, S.B. B.&M., Aliso Canyon Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)
See attached wellbore schematic

The total depth is: 8825 feet. The effective depth is: 8746 feet.

Present completion zone(s): Sesnon (Name). Anticipated completion zone(s): Same (Name).

Present zone pressure: storage psi. Anticipated/existing new zone pressure: storage psi.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes☐ No☒

For redrilling or deepening only, is a California Environmental Quality Act (CEQA) document required by a local agency? Yes☐ No☒ If yes, see next page.

The proposed work is as follows: (A complete program is preferred and may be attached.)

See attached program

If well is to be redrilled or deepened, show proposed coordinates (from surface location) and true vertical depth at total depth: _____ feet _____ (Direction) and _____ feet _____ (Direction) Estimated true vertical depth: _____

Will the Field and/or Area change? Yes☐ No☒ If yes, specify New Field: _____ New Area: _____

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator: Southern California Gas Company			
Address: 12801 Tampa Ave, SC 9382		City/State: Northridge	Zip Code: 91326-1045
Name of Person Filing Notice: Jovy Kroh	Telephone Number: (818)590-0298	Signature: Jovy Kroh	Date: 02/08/2016
Individual to contact for technical questions: Jovy Kroh	Telephone Number: (818)590-0298	E-Mail Address: jkroh@semprautilities.com	

This notice and an indemnity or cash bond must be filed, and approval given, before the workover begins. (See the reverse side for bonding information.) If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

WORKOVER PROJECT

Frew 7 – Well Inspection

DATE: February 8, 2016

OPERATOR: SOUTHERN CALIFORNIA GAS COMPANY

FIELD: ALISO CANYON

WELL: Frew 7

API NUMBER: 037-00670

ELEVATION: All depths based on original KB, 9' above GL
GL = 2410' above mean sea level

SURFACE LOCATION: SEC 29, T3N, R16W, S.B. B&M

OBJECTIVE

The intent of this program is to inspect the well integrity and remediate identified conditions as part of the Storage Integrity Management Program (SIMP). This project will include pulling 2-7/8" completion string, running USIT and Gyro surveys, pressure testing casing and well laterals, installing a new completion string, converting well to tubing flow, and installing pressure monitors. Baseline assessment data will be gathered on vertical casing pipe and other well components.

WELL RECORD

Current Status:	Shut-in with FWG tubing plug in sliding sleeve at 8399'
TD:	8825'md
Special Conditions:	Last well work: 01/27-01/30/2016: Set tubing plug Last workover: See wellbore schematic
Casing Record:	11-3/4" 47# J-55 Range 3 STC casing cemented at 1977' with 1300 cuft 1:1 perlite and Colton type "O" cement (90#/cuft), followed by 90 sx neat cement 7" 23 & 26# J-55 & N-80 T&C casing cemented at 8750' with 300 sx Colton type "D" cement (117#/cuft) Perfs: 02/06/55: (6) ½" holes at 8745' 02/7/55: WSO (4) ½" holes at 8665', squeezed 02/08/55 02/10/55: (2) ½" hpf from 8670-8702' and 8730-8744' 06/13/75: WSO (4) holes at 8452', squeezed 06/16/75 06/18/75: WSO (4) holes at 8300', squeezed 06/19/75 06/21/75: WSO (4) holes at 8301', squeezed 06/24/75 06/25/75: WSO (4) holes at 8270', squeezed 06/26/75 06/27/75: WSO (4) holes at 8269', not squeezed 07/05/75: Jet-perfed 4 hpf from 8618-8475' and 8442-8403' 07/07/75: Jet-perfed 4 hpf from 8403-8383'
Tubing Record:	See attached tubing detail; last tubing change 07/09/75 Note: Production packer at 8645' is Baker Model "D" run 07/07/75

4. +++Install a Class III 5M BOPE per Gas Company Standard 224.05 and in accordance with the DOGGR permit. All connections and valves must be flanged and at least 5000 psig rated.
   a.) Pressure test the Class III 5M annular preventer to 3500 psig for 20 minutes. Test blind rams and the 2-7/8" pipe rams to 5000 psig for 20 minutes. Test all lines and connections to 5000 psig.
   b.) Perform a 300 psig low pressure test on the annular preventer, blind rams and pipe rams for 20 minutes. Test all lines and connections to 300 psig.
   c.) All tests are to be charted and witnessed by a DOGGR representative.

5. Pick up a 2-7/8", 6.5#, N-80 joint of tubing with safety valve, unland the 2-7/8" 6.5#, J-55 tubing string.

6. Attempt to release the (3) Baker Model "D" production packers as per vendor recommendation and POOH with the completion tubing including the Camco SSSV mandrel. POOH and lay down completion jewelry.
   - See tubing detail for packer depths.

7. Pick up and stand back approximately 8000' 2-7/8" TKC/CTR 6.5 ppf# tubing workstring.

8. Pick up 7" 23-26# all-weight casing scraper on tubing and scrape casing to cleanout depth at 8746' or as deep as possible. Circulate well clean. POOH.

9. Make up and run a 7" retrievable bridge plug on workstring. Set at approximately 8260', pressure test, and sand off.
   - *Note: Ensure plug is set above WSO holes at 8269'.*

10. Rig up wireline unit and run gyro survey from bridge plug to surface.

11. Run 60-arm real-time caliper log from bridge plug to surface. Rig down wireline.

12. Rig up wireline unit with lubricator and log USIT-UCI:
    - 1st run: Log USIT/Neutron/CBL/GR in 1.5" high resolution mode in the 7" production casing from the top of the bridge plug to surface.
    - 2nd run: Log UCI in areas of interest. Rig down wireline.

13. Run Pressure Integrity Test on 7" casing from bridge plug to surface to a minimum of 3400 psi as per schedule.
    - Engineering team to analyze logs and pressure test results and recommend any additional evaluation or remediation.

14. Nipple down the 11" Class III 5M BOPE, crossover spool, and primary pack-off. Send in wellhead and tree components to Cameron for inspection.
    - Replace the pack-off seals and reinstall a tubing head, refurbished as necessary. Install new wellhead and tree valves.
    - Pressure test all the wellhead seals to 80% of top joint casing collapse rate.
      - On Frew 7, top joint is 7" 23# N-80:
        - API Collapse rating = 3830 psi; 80% of collapse rating = 3064 psi
    - Reinstall the 11" Class III 5M BOPE on the tubing head and function test.

Southern California Gas Company

Frew 7 SIMP Project

Pressure Test Procedure

02-10-16

7" Production Casing Data:

Depth (ft)	Weight (lb/ft)	Grade	API Burst Rating (psi)	85% of Burst (psi)
0 – 971'	23#	N-80	6340	5389
971 – 5004'	23#	J-55	4360	3706
5004 – 6545'	26#	J-55	4980	4233
6545 – 7297'	23#	N-80	6340	5389
7297 – 8750'	26#	N-80	7240	6154

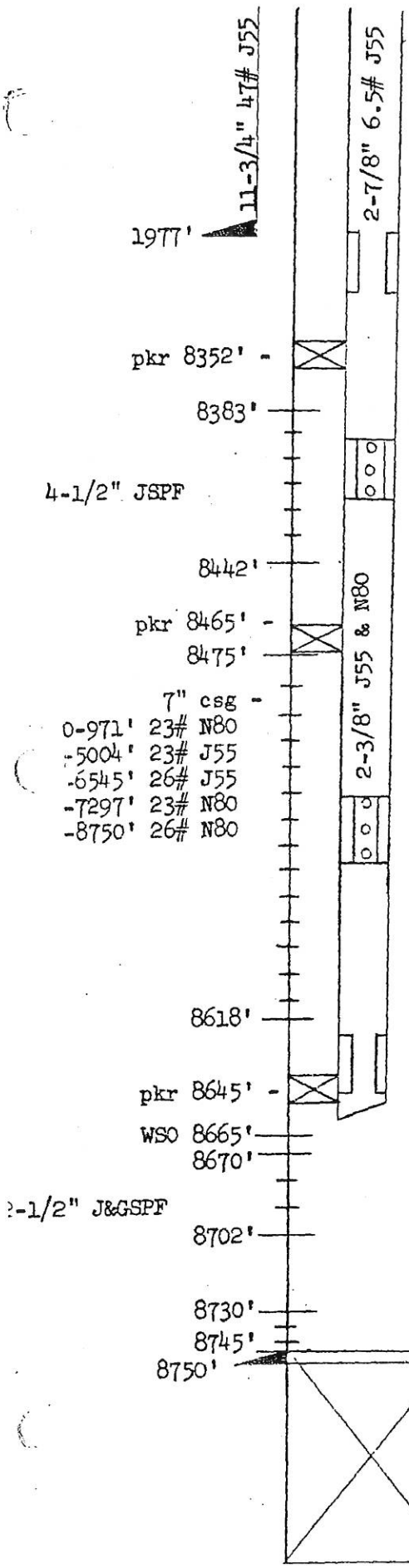
Objective: To test all sections of 7" production casing to a minimum of 3400 psi plus a full column of gas weight.

- Perform all casing tests for 30 min and record on chart.
- Contact engineer if bleed-off approaches 10% of initial test pressure in 30 min.

1. Rig up equipment to pressure test with rig pumps and chart recorder, using 8.5 ppg viscosified brine.
    - Confirm fluid in the well is 8.5 ppg viscosified brine.
    - Confirm bridge plug is set and tested at ~ 8260'md.
2. Pick up and RIH with 7" test packer on tubing. Set packer at 950'md.
    - 1st test: Test *above* packer to 3400 psi.
3. Release packer. Move down the well and set packer at 1200'md.
    - 2nd test: Test *above* packer to 3100 psi.
4. Release packer. Move down the well and set packer at 1500'md.
    - 3rd test: Test *above* packer to 2900 psi.
5. Release packer. Move down the well and set packer at 3000'md.
    - 4th test: Test *above* packer to 2700 psi.
6. Release packer. Move down the well and set packer at 3500'md.
    - 5th test: Test *above* packer to 2400 psi.
7. Release packer. Move down the well and set packer at 5500'md.
    - 6th test: Test *above* packer to 2000 psi.
8. Release packer. Move down the well and set packer at 7000'md.
    - 7th test: Test *above* packer to 1300 psi.
9. Release packer.
    - 8th test: With packer unseated, test well to 800 psi, testing down to bridge plug at ~ 8260'md.
10. POOH and lay down test packer.
11. Proceed with Step 14 on Frew 7 Workover Project: test production tree and wellhead seals.

Elevation: 2410' G.L.
KB: 9' MV: 10'

Frew 7 API # 037-00670



Surface choke: _____

Tubing flow string

--(7819')(-5400')
--8236' KBMG

--8306' Camco KP-5, 2-1/2" SSSV (8306') 2.313" ID Removed

--S4 ~~8310'~~ 8356'

--8357' X-Over

--8399' Baker "L" sliding sleeve (8399') open. 1.87" ID

--S8 8452'

--8535' Baker "L" sliding sleeve (8535') 1.87" ID

--8654' Baker "R" No-Go 1.76" ID (8654')

--8659'

--Frew 8670'

--8746'

11/27/54 - Well spud
2/14/55 - Well completed
6/5/75 - 7/9/75 Cleaned out to 8746', pressure tested 7" csg., squeezed holes at 8452', 8301', 8300', 8270' before obtaining WSO at 8269', jet perf'd 8383'-8442' & 8475'-8618' for conversion to gas storage, ran production string.

Zone	MD
M-P	7813'
S-1	8278'
S-2	8313'
S-4	8356'
S-8	8452'
Frew	8670'

(Well is assumed to be near vertical, i.e. TVD ≈ MD)

7/92 P/U 8616'
9/91 P/U 8630'
9/90 P/U 8635'

Next workover
New SSSV?
Clean out fill?
Tbg. Plug?
Remove Isolation Pkr.?

WELL VOLUME

	Cu.Ft.	Bbl.
Tubing	278	50
Csg/Lnr.	19	3
Annulus	1454	259

6/20/85

July 8, 1965

TUBING STRING Frew #7

No. JOINTS	ITEM	LENGTH	DEPTH
	Below K.B.	12.00	12.00
	2 7/8" EUE 8rd Doughnut and N-80 Pup Joint	4.80	16.80
	2 7/8" EUE 8rd J-55 Pup Joint	10.00	26.80
263	2 7/8" EUE 8rd J-55 Tubing	8236.73	8236.73
	2 7/8" EUE 8rd CAMCO KBMG Mandrel (empty) 1220#	11.38	8274.91
1	2 7/8" EUE 8rd J-55 Tubing	31.45	8306.36
	2 7/8" EUE 8rd CAMCO KP-5 Safety Mandrel (empty) 2.313 ID	14.46	8320.82
1	2 7/8" EUE 8rd J-55 Tubing	31.45	8352.27
	2 7/8" EUE 8rd Baker Model "D" Latch and 2 Seal-Units - latched into Model "D" packer @ 8350' w/8000# weight on same XP	4.57	8356.84
	2 3/8" EUE 8rd N-80 Pup Joint	2.00	8358.84
	2 3/8" EUE 8rd N-80 Pup Joint	4.00	8362.84
	2 3/8" EUE 8rd N-80 Pup Joint	6.00	8368.84
1	2 3/8" EUE 8rd J-55 Tubing	31.20	8399.04
	2 3/8" EUE 8rd Baker Model "L" Sliding Sleeve w/1.87 I.D.(open) S	2.61	8402.65
2	2 3/8" EUE 8rd J-55 Tubing	62.47	8465.12
	2 1/2" X 2 3/8" Baker Seals 7 units in Model "D" packer @ 8465' P	7.78	8472.90
2	2 3/8" EUE 8rd J-55 Tubing	62.52	8535.42
	2 3/8" EUE 8rd Baker Model "L" Sliding Sleeve w/1.87 I.D. (open) S	2.61	8538.03
3	2 3/8" EUE 8rd J-55 Tubing	91.96	8629.99
	2 3/8" EUE 8rd N-80 Pup Joint	8.00	8637.99
	2 3/8" EUE 8rd N-80 Pup Joint	8.00	8645.99
	2 1/2" X 2 3/8" Baker Seals 7 units in Model "D" packer @ 8645" P	7.70	8653.69
	2 3/8" EUE 8rd Baker Model "R" NO-GO Nipple I.D. 1.81	.75	8654.44
	2 3/8" EUE 8rd Baker Production Tubing	8.02	8659.46

K B M G Mandrel - empty 8274'

KP-5 Safety Mandrel - empty 8320'

Latch into Model "D" packer at 8350' and to unlatch from Model "D" packer, take 3000# or 4000# overpull and rotate to right.

Baker Sliding Sleeve - open 8402'

Baker Sliding Sleeve - open 8538'

WELLHEAD DESCRIPTION

Well No. Frew-7

Field Aliso

Date Prepared 4-8-81

Wellhead Mfgr Shaffer

1. Casing Head Shaffer Size 13-5/8"x13-3/8" 5000 psi Type KD

   Slips & Pack-off 13-5/8" x 7"

   A. Surface Csg. Size 11-3/4" Wt 47# Grade J-55

   B. Casing Head Valve Marpac Size 2" 3000 psi Fig.No. CSB-790-JN

2. Seal Flange Shaffer Size 13-5/8" x 10" 5000 psi

   A. Type Seal Lock screw Ring BX-160 & R-54

3. Tubing Head Shaffer Size 10" x 8" 5000 psi Type 63-L-1

   Ring R-54 & Ring R-50

   Outlets 2-3" Sec.Seal Lock screw

   Valve Removal Thrd 2-1/2" 8-V LP

   A. Tubing Hanger Shaffer Size 8" x 2-7/8" Type AJO

   B.P.V. Size 2-7/8" Thrd 4 LH

   B. Tubing Head Valves 2-McEvoy Size 3" 5000 psi Fig.No. 129

   C. Automatic Csg. Valve WKM Size 3" 5000 psi Fig.No. 114522

4. Adapter Seal Flange Shaffer Size 8" x 2-1/2" Type AJO

   A. Ring Size R-50 & R-27

5. Master Valve McEvoy Size 2-1/2" 5000 psi Fig.No. 129

6. Xmas Tree Cross Shaffer Size 2-1/16"x2-1/16" 2-9/16"x2-9/16"x Bore Thru 2-9/16" Across 2-1/16"

7. Tubing Wing Valves Rockwell Size 2" 5000 psi Fig.No. 21055

   A. Automatic Tbg. Valve WKM Size 2" 5000 psi Fig. No.

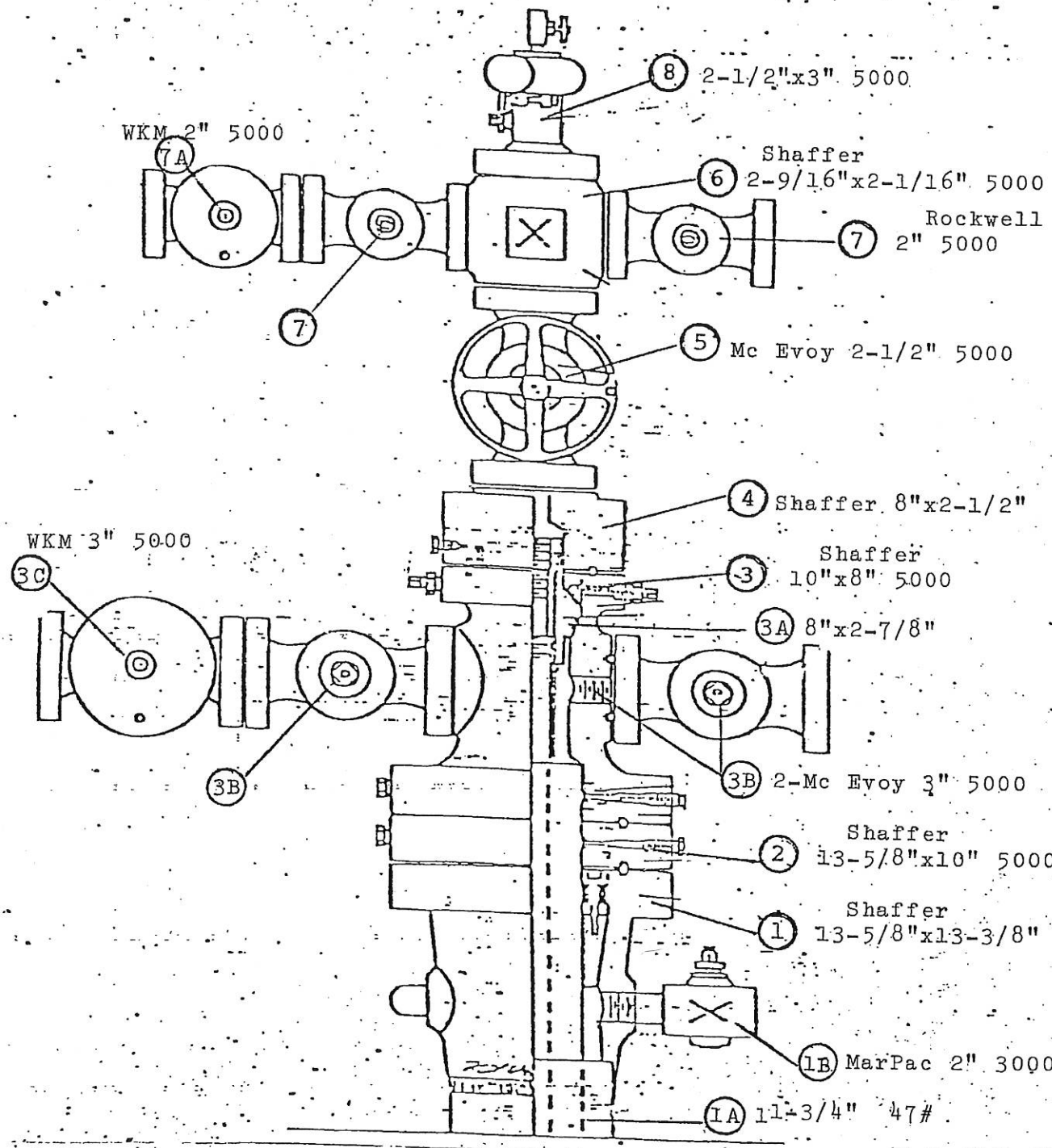
8. Unibolt Size 2-1/2" x 3" 5000 Inside Thrds NA

9. Wt. Landed in Csg. Head 190,000 Wt. 23# Grade N-80

10. Wt. Landed on Doughnut 34,000 Wt. 6.5# 2-7/8" Grade J-55

11. Tubing Head to Ground Level 2.72

TYPE IV

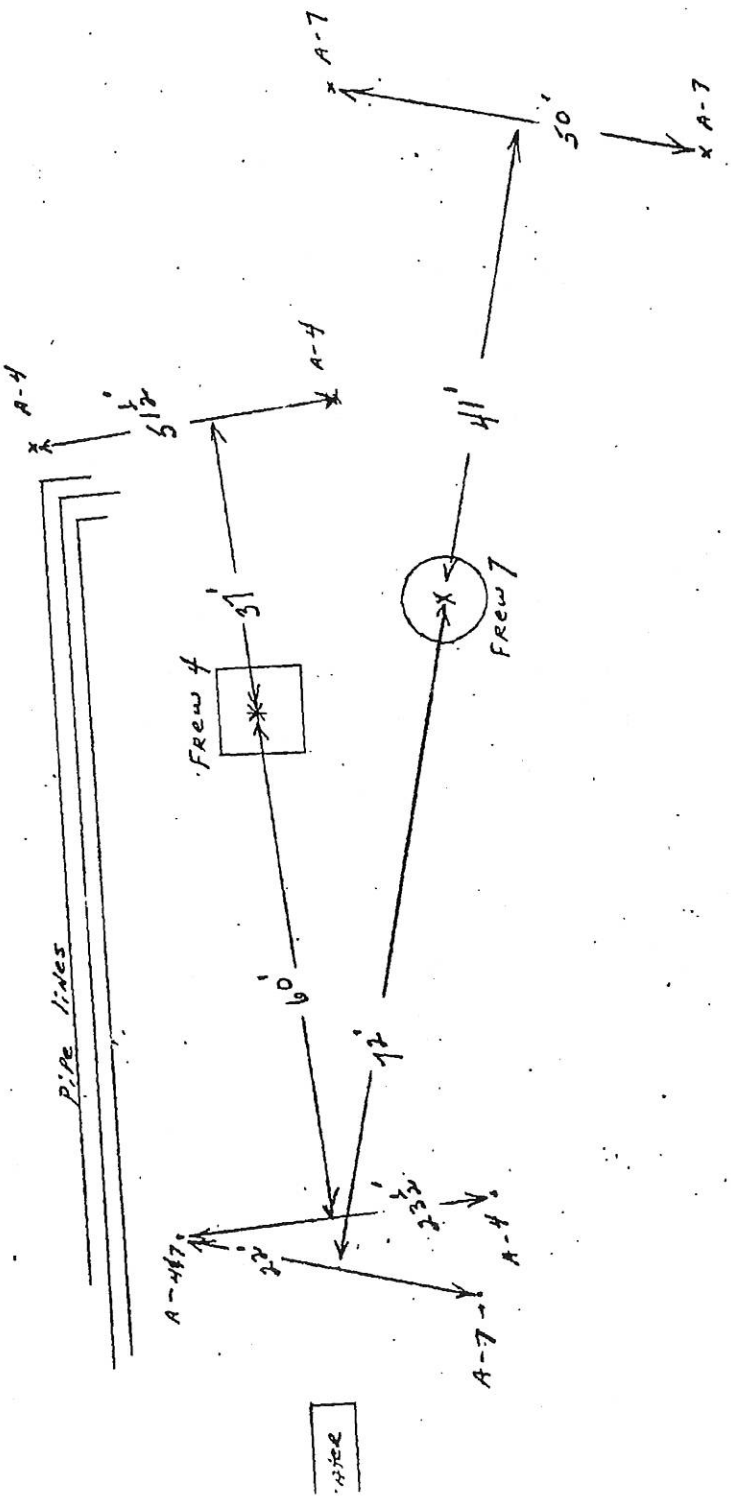


Well Name: Frew #7

Mfgr.: Shaffer

Date Prepared: 11-29-82

Anchores
Frew #7



FREW 7

STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

Ventura, California

November 12, 1991

R. D. Phillips, Agent
SOUTHERN CALIFORNIA GAS COMPANY
P.O. Drawer 3249 Mail Location 22GO
Los Angeles, CA 90051-1249

Your request, dated July 24, 1991, proposing to change the designation of well(s) in Sec. 29, T. 3N, R 16W, S.B. B. & M., Aliso Canyon field, Los Angeles County, District No. 2, has been received.

The proposed change in designation, in accordance with Section 3203, Public Resources Code, is authorized as follows:

FROM	TO
"SFZU" F-2 (037-00665)	"Frew" 2 (037-00665)
"SFZU" F-3 (037-00666)	"Frew" 3 (037-00666)
"SFZU" F-4 (037-00667)	"Frew" 4 (037-00667)
"SFZU" F-5 (037-00668)	"Frew" 5 (037-00668)
"SFZU" F-6 (037-00669)	"Frew" 6 (037-00669)
"SFZU" F-7 (037-00670)	"Frew" 7 (037-00670)
"SFZU" F-8 (037-00671)	"Frew" 8 (037-00671)
"SFZU" F-9 (037-00672)	"Frew" 9 (037-00672)
"SFZU" SS-4 (037-00757)	"Standard Sesnon" 4 (037-00757)
"SFZU" SS-12 (037-00764)	"Standard Sesnon" 12 (037-00764)
"SFZU" SS-4-0 (037-22063)	"Standard Sesnon" 4-0 (037-22063)
"SFZU" SS-10 (037-00040)	"Standard Sesnon" 10 (037-00040)

M. G. MEFFERD, State Oil and Gas Supervisor

By Patrick J. Kinnear
Deputy Supervisor
PATRICK J. KINNEAR

OGD157 (10/85/DWRR/1M)

OUTHERN CALIFORNIA GAS
REW #7
LISU CANYON
OS ANGELES COUNTY CALIFORNIA
YROSCOPIC MULTISHOT

037-00670

29-3N-16W

Rcd 12/12/79

PAGE 1
DATE OF SURVEY DECEMBER 5, 1979
VERTICAL SECTION DIRECTION CLOSURE
SU1.75-12559

SPERRY-SUN, INC.
RECORD OF SURVEY

MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE INCLINATION DEG MIN	COURSE DIRECTION DEG	DOG-LEG SEV DEG/100	TOTAL RECTANGULAR COORDINATES NORTH/SOUTH	EAST/WEST	VERTICAL SECTION
0	0.	0.	ORIGIN AT SURFACE			0. N	0. E	0.
100	100.00	100.00	0 20	S 51 W	0.33	0.18 S	0.23 W	0.28
200	200.00	200.00	0 25	S 5 W	0.30	0.73 S	0.48 W	0.87
300	299.99	299.99	0 40	S 47 W	0.45	1.49 S	0.94 W	1.76
400	399.98	399.98	0 50	S 49 W	0.17	2.36 S	1.92 W	3.03
500	499.97	499.97	1 0	S 48 W	0.17	3.42 S	3.11 W	4.57
600	599.96	599.96	1 5	S 47 W	0.09	4.65 S	4.45 W	6.33
700	699.94	699.94	1 5	S 59 W	0.23	5.78 S	5.95 W	8.10
800	799.91	799.91	1 20	S 59 W	0.25	6.87 S	7.76 W	10.00
900	899.89	899.89	1 10	S 61 W	0.17	7.96 S	9.65 W	11.96
1000	999.87	999.87	1 15	S 63 W	0.09	8.95 S	11.51 W	13.81
1100	1099.84	1099.84	1 30	S 65 W	0.25	10.00 S	13.67 W	15.87
1200	1199.81	1199.81	1 30	S 64 W	0.02	11.13 S	16.03 W	18.11
1300	1299.77	1299.77	1 30	S 63 W	0.02	12.29 S	18.37 W	20.37
1400	1399.74	1399.74	1 25	S 66 W	0.11	13.39 S	20.67 W	22.55
1500	1499.71	1499.71	1 10	S 60 W	0.28	14.40 S	22.68 W	24.50
1600	1599.69	1599.69	1 5	S 62 W	0.09	15.35 S	24.40 W	26.24
1700	1699.68	1699.68	1 0	S 62 W	0.08	16.21 S	26.00 W	27.84
1800	1799.66	1799.66	0 55	S 58 W	0.11	17.04 S	27.45 W	29.33
1900	1899.65	1899.65	1 0	S 59 W	0.09	17.92 S	28.88 W	30.84
2000	1999.64	1999.64	0 55	S 58 W	0.09	18.79 S	30.30 W	32.36
2100	2099.62	2099.62	0 50	S 57 W	0.08	19.61 S	31.59 W	33.75
2200	2199.61	2199.61	0 55	S 58 W	0.08	20.43 S	32.88 W	35.14
2300	2299.60	2299.60	1 0	S 59 W	0.09	21.30 S	34.31 W	36.66
2400	2399.58	2399.58	1 0	S 75 W	0.28	21.98 S	35.90 W	38.09
2500	2499.57	2499.57	1 5	S 79 W	0.11	22.38 S	37.67 W	39.41
2600	2599.54	2599.54	1 25	S 78 W	0.33	22.82 S	39.81 W	40.95
2700	2699.51	2699.51	1 35	S 72 W	0.23	23.50 S	42.33 W	42.91
2800	2799.46	2799.46	2 0	S 64 W	0.48	24.70 S	45.21 W	45.49
2900	2899.40	2899.40	1 55	S 65 W	0.09	26.17 S	48.30 W	48.41

OUTHERN CALIFORNIA GAS
REW #7
LISO CANYON
OS ANGELES COUNTY CALIFORNIA
YROSCOPIC MULTISHOT

DATE OF SURVEY DECEMBER 5, 1979
VERTICAL SECTION-DIRECTION-CLOSURE

SU1.75-12559

SPERRY-SUN, INC.
RECORD OF SURVEY

EASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE INCLINATION DEG MIN	COURSE DIRECTION DEG	DOG-LEG SEV DEG/100	TOTAL RECTANGULAR COORDINATES NORTH/SOUTH	EAST/WEST	VERTICAL SECTION
3000	2999.34	2999.34	1 55	S 63 W	0.07	27.63 S	51.30 W	51.29
3100	3099.29	3099.29	1 45	S 61 W	0.18	29.13 S	54.13 W	54.09
3200	3199.26	3199.26	1 25	S 55 W	0.37	30.58 S	56.47 W	56.60
3300	3299.23	3299.23	1 10	S 45 W	0.34	32.01 S	58.21 W	58.74
3400	3399.21	3399.21	1 10	S 39 W	0.12	33.52 S	59.57 W	60.75
3500	3499.19	3499.19	1 10	S 29 W	0.20	35.20 S	60.70 W	62.78
3600	3599.17	3599.17	1 20	S 11 W	0.42	37.24 S	61.42 W	64.87
3700	3699.13	3699.13	1 40	S 5 W	0.37	39.83 S	61.77 W	67.23
3800	3799.09	3799.09	1 35	S 7 W	0.10	42.65 S	62.06 W	69.75
3900	3899.05	3899.05	1 30	S 1 E	0.23	45.33 S	62.21 W	72.06
4000	3999.02	3999.02	1 25	S 7 E	0.17	47.86 S	62.03 W	74.09
4100	4098.99	4098.99	1 25	S 8 E	0.02	50.31 S	61.71 W	75.96
4200	4198.96	4198.96	1 15	S 3 E	0.20	52.63 S	61.48 W	77.76
4300	4298.94	4298.94	1 15	S 1 E	0.04	54.81 S	61.41 W	79.54
4400	4398.92	4398.92	1 15	S 5 E	0.09	56.98 S	61.29 W	81.30
4500	4498.89	4498.89	1 35	S 13 W	0.55	59.42 S	61.51 W	83.45
4600	4598.84	4598.84	1 50	S 24 W	0.41	62.22 S	62.47 W	86.32
4700	4698.79	4698.79	1 50	S 22 W	0.06	65.17 S	63.72 W	89.47
4800	4798.74	4798.74	1 40	S 17 W	0.23	68.04 S	64.74 W	92.43
4900	4898.70	4898.70	1 40	S 16 E	0.95	70.83 S	64.77 W	94.77
5000	4998.66	4998.66	1 50	S 25 E	0.32	73.68 S	63.69 W	96.56
5100	5098.59	5098.59	2 20	S 33 E	0.58	76.84 S	61.91 W	98.22
5200	5198.51	5198.51	2 15	S 35 E	0.12	80.15 S	59.67 W	99.76
5300	5298.43	5298.43	2 20	S 33 E	0.12	83.47 S	57.44 W	101.30
5400	5398.35	5398.35	2 20	S 35 E	0.08	86.84 S	55.16 W	102.87
5500	5498.28	5498.28	2 0	S 36 E	0.34	89.92 S	52.97 W	104.23
5600	5598.21	5598.21	2 5	S 33 E	0.14	92.86 S	50.95 W	105.58
5700	5698.14	5698.14	2 10	S 38 E	0.20	95.87 S	48.80 W	106.91
5800	5798.08	5798.08	1 50	S 38 E	0.33	98.62 S	46.65 W	108.02
5900	5898.04	5898.04	1 40	S 36 E	0.18	101.06 S	44.81 W	109.05

UTHERN CALIFORNIA GAS
EW #1
ISO CANYON
S ANGELES COUNTY CALIFORNIA
ROSCOPIC MULTISHOT

DATE OF SURVEY DECEMBER 5, 1979
VERTICAL SECTION DIRECTION CLOSURE

SU1.75-12559

SPERRY-SUN, INC.
RECORD OF SURVEY

MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE INCLINATION DEG MIN	COURSE DIRECTION DEG	DOG-LEG SEV DEG/100	TOTAL RECTANGULAR COORDINATES NORTH/SOUTH	EAST/WEST	VERTICAL SECTION
6000	5998.00	5998.00	1 35	S 20 E	0.46	103.53 S	43.48 W	110.39
6100	6097.96	6097.96	1 30	S 38 E	0.49	105.86 S	42.20 W	111.63
6200	6197.94	6197.94	0 55	S 36 E	0.58	107.54 S	40.93 W	112.33
6300	6297.93	6297.93	0 50	S 38 E	0.09	108.76 S	40.01 W	112.84
6400	6397.92	6397.92	0 45	S 16 E	0.31	109.96 S	39.38 W	113.50
6500	6497.91	6497.91	0 40	S 9 E	0.12	111.17 S	39.11 W	114.36
6600	6597.91	6597.91	0 25	S 5 E	0.25	112.10 S	38.99 W	115.07
6700	6697.90	6697.90	0 40	S 79 W	0.75	112.58 S	39.53 W	115.77
6800	6797.89	6797.89	1 5	S 55 W	0.55	113.23 S	40.87 W	117.05
6900	6897.86	6897.86	1 45	S 47 W	0.69	114.81 S	42.76 W	119.41
7000	6997.82	6997.82	1 35	S 60 W	0.41	116.55 S	45.08 W	122.13
7100	7097.78	7097.78	1 50	N 84 W	1.08	117.07 S	47.86 W	124.10
7200	7197.74	7197.74	1 25	S 75 W	0.72	117.22 S	50.65 W	125.76
7300	7297.70	7297.70	1 50	N 56 W	1.40	116.65 S	53.17 W	126.67
7400	7397.64	7397.64	2 10	N 81 W	0.92	115.46 S	56.36 W	127.43
7500	7497.59	7497.59	1 35	N 46 W	1.26	114.20 S	59.22 W	127.95
7600	7597.56	7597.56	1 25	N 61 W	0.42	112.64 S	61.30 W	127.79
7700	7697.54	7697.54	1 5	S 62 W	1.23	112.49 S	63.21 W	128.72
7800	7797.52	7797.52	0 55	S 12 W	0.86	113.71 S	64.21 W	130.29
7900	7897.49	7897.49	1 50	S 35 W	1.05	115.81 S	65.30 W	132.63
8000	7997.41	7997.41	2 55	S 71 W	1.79	117.95 S	68.62 W	136.25
8100	8097.31	8097.31	2 20	S 70 W	0.59	119.47 S	72.94 W	139.90
8200	8197.22	8197.22	2 30	S 67 W	0.21	121.02 S	76.86 W	143.34
8300	8297.15	8297.15	1 45	S 81 W	0.91	122.11 S	80.38 W	146.19

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 146.19 FEET AT SOUTH 33 DEG. 21 MIN. WEST (TRUE)

FORM 103 SUBMIT IN DUPLICATE △ OSP

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

DIVISION OF OIL AND GAS
RECEIVED
JUL 30 1975
SANTA PAULA, CALIFORNIA

History of Oil or Gas Well

OPERATOR SOUTHERN CALIFORNIA GAS COMPANY FIELD ALISO CANYON

Well No. 7-Frew, Sec. 29, T. 3N., R. 16W., S.B. B. & M.

Date July 8, 1975 Signed P. S. Magruder, Jr.
P. S. Magruder, Jr.

P.O. Box 3249, Terminal Annex,
Los Angeles, California 90051 Title Agent
(Address) (Telephone Number) (President, Secretary or Agent)

(213) 689-3561

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	
6-5-75	Moved in California Production Service rig, pump, and shaker tank. Rigging up.
6-6-75	Checked tubing and casing pressure. Very light. Using rig pump, displaced fluid in hole with 320 barrels - 70#/cu.ft. polymer workover fluid. Circulated 2 1/2 hours. Returns slightly gas cut. Using Archer-Reed Wire Line Service, set tubing plugs. Removed Christmas tree and installed B.O.P.E. Tested same with clear water as follows: Blind rams 2350 psi, pipe rams 2750 psi, Hydril 2600 psi. Each test 20 minutes - OK. Division of Oil and Gas declined to witness.
6-7-75	Tested B.O.P.E. with nitrogen as follows: Blind rams 2600 psi, pipe rams 2600 psi, Hydril 2500 psi. Division of Oil and Gas declined to witness. Each test 20 minutes - OK. Removed tubing plugs, pulled and measured tubing. Made up 6 1/8" bit and 7" 26# positive casing scraper. Ran in hole on 2 7/8" tubing. Found fill at 8740'. Cleaned out to 8746' (top of cement plug). Circulated hole clean, pulled 114 doubles.
6-8-75	Rig idle.
6-9-75	Finished pulling out of hole with bit and scraper. Using Dresser Atlas, ran Neutron Lifetime Log and recorded from 8741' to 6850'. Ran cement bond log and recorded from 8741' to 7700'. Ran in hole with Baker Model "B" loc-set bridge plug on 2 7/8" tubing. Set same at 8650'. Tested bridge plug and casing under 1500 psi - 15 minutes OK. Started out of hole.
6-10-75	Finished pulling out of hole with bridge plug setting tool. Removed tubing head and packing. Using casing jacks, unlanded 7" casing with 200,000# pull. Cut off 3000 psi casing head. Dug cellar floor down 24".
6-11-75	Installed new Shafco 5000 psi casing head by butt welding to 11 3/4" surface pipe 4" below head. X-rayed weld. OK. Relanded 7" casing in slips with 200,000# weight. Installed packing and new Shafco 5000 psi tubing head. Tested in two places under 3500 psi. Each test 20 minutes - OK. Reinstalled B.O.P.E.

6-12-75 Tested B.O.P.E. with clear water as follows: Pipe rams 2750 psi, blind rams 2500 psi, Hydril 2450 psi. Tested same with nitrogen as follows: Blind rams 2400 psi, pipe rams 2500 psi, Hydril 2500 psi. Each test 20 minutes. O.K. All tests witnessed and approved by Division of Oil and Gas. Using Baker full bore retainer and Byron Jackson pump truck, tested 7" casing as follows: 0' to 950' - 3400 psi, 0' - 2500' 2800 psi, 0' - 4000' - 2600 psi, 0' - 6000' - 2400 psi. Each test 20 minutes O.K.

6-13-75 Pumped down tubing and tested casing from 6000' to 8650' under 2200 psi - 20 minutes, O.K. Reset full bore at 8368' and tested tubing under 2200 psi - 20 minutes, O.K. Using McCullough Services and reference collars, shot four holes at 8452' for water shut off test. Ran Halliburton tester in hole, set packer at 8402', tail at 8416'. Opened tester at 5:33 P.M. Light blow after 10 minutes. Remained constant throughout test (90 minutes). Closed tool at 7:03 P.M. Started out of hole. Fluid rise 2900'.

6-14-75 Sheared pin in reversing sub. Back scuttled 30 minutes. Pulled out of hole with tester. Charts read as follows: TOP Initial Hydrostatic 4044 psi, Initial flow -0- Final flow 1450 psi. Final Hydrostatic 4044 psi. BOTTOM Initial Hydrostatic 4087 psi, Initial flow -0-, Final flow 1456 psi, Final Hydrostatic 4087 psi. Set full-bore at 8589' and using Byron Jackson pump truck, spotted four sacks of sand on top of bridge plug. Tagged fill at 8629'. Set full-bore at 8249' and attempted to obtain breakdown through shot holes at 8452'. Applied 3800 psi down tubing with 1500 psi back up down annulus. Rate 1.5 cu. ft. 2 minutes.

6-15-75 Rig idle.

6-16-75 Back scuttled two hours. Using Byron Jackson pump truck, obtained breakdown through shot holes at 8452' under 2600 psi, 16 cu. ft. per minute rate. Reset full bore at 8244' and mixed 137 cu. ft. - 118 # per cu. ft. class G cement (120 sacks). Started pumping at 12:25 P.M. Cement in place at 1:05 P.M. Back scuttled 58 cu. ft. excess cement out of tubing. Estimate 35 cu. ft. behind pipe, 44 cu. ft. rat hole. Final pressure 4500 psi. Pulled out of hole with full-bore. Made up 6 1/8" bit and 7" positive casing scraper on 2 7/8" tubing. Ran 127 doubles in hole. Dropped half of one tubing slip down hole.

6-17-75 Finished pulling out of hole, retrieved fish. Laid down 14 joints of bent tubing. Replaced same and ran back in hole with bit and scraper. Tagged top of cement at 8243'. Rigged up power swivel and drilled out to 8404'. Circulated hole clean.

6-18-75 Pulled out of hole with bit and scraper. Using McCullough Services and reference collars, shot four holes at 8300' for water shut out test. Tagged top of cement at 8408' (wire line measurement). Ran in hole with Halliburton tester on 2 7/8" tubing. Set packer at 8279'; tail at 8295'. Opened tester at 11:14 A.M. Light blow throughout test (90 minutes). Closed tool at 12:44 P.M. Pulled tester loose and two joints of tubing collapsed. Test inconclusive. Made up new tester and started in hole. Filled 1000' tubing with mud cushion.

6-19-75 Finished running in hole with tester. Set packer at 8281'; tail at 8290'. Opened tester at 10:12 A.M.; closed tester at 11:42 A.M. Light blow throughout test (90 minutes). 2900' net fluid rise. Pulled 18 doubles wet, sheared pin in reversing sub and back scuttled tubing clean. Chart readings as follows: TOP Initial hydrostatic 3945 psi, initial flow 463 psi, final flow 1834 psi, final hydrostatic 3945 psi. BOTTOM Initial hydrostatic 4020 psi, initial flow 443 psi, final flow 1861 psi, final hydrostatic 4020 psi. Ran in hole with full-bore on 2 7/8" tubing. Set same at 8183'. Using Halliburton pump truck, obtained breakdown through holes at 8300' under 3300 psi, 14 cu. ft. per minute rate. Mixed 50 sacks, class G cement, 58 cu. ft. 118# per cu. ft. slurry. Pumped away under 3500 psi. No build up. Cleared holes with 36 cu. ft. water and 10 cu. ft. mud. Closed well in under 1200 psi.

6-20-75 Using Halliburton pump truck, obtained break down under 2900 psi - 10 cu. ft per minute rate. Mixed 87 sacks class G cement 100 cu. ft. - 118# per cu. ft. slurry. Started pumping at 7:30 A.M.; pumped 30 cu. ft. fresh water ahead and 10 cu. ft. behind. Applied 1500 psi down annulus for back up. Built up to 3300 psi -- bled down to 1500 psi. Set 15 minutes pumped 3 cu. ft. Pressure to 3600 psi. Held 60 minutes. Final pressure 3500 psi. Bled back 1 cu. ft. Cement in place at 8:06 A.M. Released full-bore and pulled out of hole. Found 5 joints - 2 7/8" tubing full of cement. Left one top slip from full-bore in hole. Ran in hole with 6" O.D. magnet on sand line and recovered same. Made up 6 1/8" bit and 7" casing scraper on 2 7/8" tubing; started in hole with same.

6-21-75 Continued going in hole with bit and scraper. Found top of cement at 8183'. Drilled out to 8400'. Circulated 1 1/2 hours. Pulled out of hole. Using rig pump, tested for leaks at 8300' applied 1300 psi - 15 minutes. O.K. Using McCullough Services, shot four holes at 8301' for water shut out test. Ran 20 doubles in hole.

6-22-75 Rig idle.

6-23-75 Pulled 20 doubles. Made up Halliburton formation tester and ran same in hole on 2 7/8" tubing. Set packer at 8288'; tail at 8304'. Opened tool at 11:20 A.M. Closed tool at 12:50 P.M. Used 1000' (68# per cu. ft.). Mud cushion. No gas to surface. Medium blow throughout test. Net fluid rise 2500'. Back scuttled formation water and mud out of tubing.

6-23-75 (continued)

CHART READINGS: TOP

Initial hydrostatic --- not recorded
Initial flow ---------- 477 psi
Final flow ---------- 1748 psi
Final hydrostatic ----- not recorded.

Ran in hole with Model "C" full-bore on 2 7/8" tubing and set same at 8187'.

6-24-75 Reset full-bore at 8151'. Using Halliburton pump truck, obtained breakdown at 3800 psi, 11 cu. ft. per minute rate. Squeezed through shot holes at 8301'. Mixed 100 sacks, class G cement 115 cu. ft., 118# cu. ft. slurry. Started mixing at 8:20 A.M., 20 cu. ft. fresh water ahead, 10 cu. ft. fresh water behind. Cement in place at 8:45 A.M. Final pressure 4100 psi at 9:10 A.M. Calculated 97 cu. ft. through holes, 18 cu. ft. in casing. Back scuttled -- no cement returns. Pulled out of hole with full bore. Ran back in with 6 1/8" bit and 7" casing scraper. Tagged top of cement at 8211'. Drilled out to 8400'. Circulated hole clean.

6-25-75 Finished pulling out of hole. Using McCullough Services, shot four holes at 8270 for water shut out test. Made up Halliburton tester and ran same in hole. Set packer at 8255', tail at 8271'. Opened tool at 12:45 P.M. Closed tool at 2:15 P.M. Used 1000' mud cashion. Medium blow throughout test. Slightly gassy. 2650' net fluid rise.

CHART READING:	TOP	MIDDLE	BOTTOM
Initial hydrostatic	---	3880 psi	3952 psi
Initial flow	447 psi	496 psi	511 psi
Final flow	1906 psi	1811 psi	1861 psi
Final hydrostatic	---	3880 psi	3952 psi

Started in hole with Baker Model "C" full-bore.

6-26-75 Set full-bore at 8055'. Using Halliburton pump truck, obtained breakdown at 3700 psi - 12 cu. ft. per minute rate. Squeezed holes at 8270' with 100 sacks class G cement. 115 cu. ft. - 118# cu. ft. Started mixing at 8:40 A.M. 25 cu. ft. fresh water ahead and 10 cu. ft. fresh water behind. Cement in place at 9:00 A.M. Final pressure 4600 psi at 12 noon. Estimate 85 cu. ft. outside casing, 30 cu. ft. in casing. Set three hours. Pulled out of hole with full-bore. Started in hole with 6 1/8" bit and 7" casing craper.

6-27-75 Continued going in hole with bit and scraper. Tagged top of cement at 8156'. Drilled out to 8342'. Circulated 2 1/2 hours and pulled out of hole. Using McCullough Services, shot four holes at 8269' for water shut off test.

6-28-75 Made up Halliburton straddle formation tester and ran in hole on 2 7/8" tubing. Set top packer at 8235', bottom packer at 8284' (holes at 8269'). Opened tool at 10:35 A.M., light blow after five minutes. Fluid level in annulus dropped slightly. At 11:05 A.M. med-strong blow. Fluid level dropped rapidly. Pulled testor out of hole, lost two packing elements from top packer. Ran 20 doubles in hole.

CHART READINGS:	TOP	MIDDLE	BOTTOM
Initial hydrostatic ---	3897 psi	3902 psi	3805 psi
Initial flow ----------	546 psi	579 psi	3663 psi
Final flow ----------	612 psi	646 psi	3663 psi
Final hydrostatic -----	3897 psi	3902 psi	3805 psi

6-29-75 Rig Idle.

6-30-75 Pulled 20 doubles out of hole. Made up Halliburton straddle tool tester on 2 7/8" tubing with 1000' mud cushion. Set top packer at 8257'; bottom packer at 8284'. Opened tool at 11:45 A.M.; closed tool at 1:14 P.M. No blow during test. Fluid rise nil (1 ft.). Pulled out of hole with testing tools. Water shut off approved by Division of Oil and Gas. Ran in hole with 6 1/8" bit and 7" casing scraper on 2 7/8" tubing. Tagged top of cement at 8400'. Circulated two hours. Pulled up two doubles.

CHART READINGS:	TOP	MIDDLE	*BOTTOM
Initial hydrostatic ---	3978 psi	3986 psi	3963 psi
Initial flow ----------	530 psi	545 psi	3710 psi
Final flow ----------	530 psi	545 psi	3694 psi
Final hydrostatic -----	3978 psi	3986 psi	3963 psi

* Blank below bottom packer.

7-1-75 Drilled out cement from 8400' - 8460'. Tagged top of sand at 8626'. Circulated and conditioned mud. Pulled out of hole with bit and scraper. Ran back in with bridge plug retrieving tool. Cleaned out to 8636'. Circulated bottoms up.

7-2-75 Cleaned out to 8645'. Unable to reach bridge plug. Pulled out of hole, put on new retrieving tool and ran back in. Using power swivel, attempted to make hole with no success.

7-3-75 Pulled out of hole with bridge plug retrieving tool. Made up 5 3/4" O.D. midway washover shoe. Ran same in hole and cleaned out to top of bridge plug (8649'). Pulled out of hole with washover shoe, made up retrieving tool. Ran 93 doubles in hole.

7-4-75 Rig idle.

7-5-75 Finished running in to 8649'. Released bridge plug, back scuttled hole clean. Pulled out of hole with dridge plug. Using McCullough Services 4" Omega jet guns, jet perforated four holes per foot from 8618' to 8475' and four holes per foot from 8442' to 8403'. Ran 30 doubles in hole.

7-6-75 Rig idle.

7-7-75 Pulled tubing out of hole. Using McCullough 4" Omega jet gun, jet perforated four holes per foot from 8403' to 8383'. Ran in hole with 6 1/8" bit and 7" casing scraper. Tagged bottom at 8744'. Circulated hole clean and pulled out with bit and scraper. Using McCullough Services, made feeler run to 8670'. Set Model "D" packer (Baker) at 8645' - 8465' - 8350'. Ran 30 doubles in hole.

7-8-75 Pulled 30 doubles out of hole. Ran production string (tubing detail attached). Latched in Model "D" packer at 8350' with 8000# weight on packer. All tubing and donut hydrotested to 4000 psi. Removed B.O.P.E. and installed Christmas tree.

7-9-75 Tested Christmas tree under 3500 psi. Two tests 20 minutes each; O.K. Displaced workover fluid in well with 335 barrels of lease salt water. Closed well in. Rigged down to move. Released rig at 2:00 P.M.

FORM 109

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Report on Operations

No. T 275-241

Mr. P.S. Magruder, Agent
So. Calif. Gas Co.
P.O. Box 54790, Terminal Annex
Los Angeles, Calif. 90054

Santa Paula Calif.
August 6, 1975

DEAR SIR:

Operations at well No. "SFZU" F-7, API No. 037-00670, Sec. 29, T. 3N, R. 16W, S.B., B & M. Aliso Canyon Field, in Los Angeles County, were witnessed on June 30, 1975. Mr. P. R. Wygle, representative of the supervisor was present from 1700 to 1900. There were also present T. Ashe, foreman

Present condition of well: additions to casing record since proposal dated 6/2/75: 7" casing c.p. 8452', 8300', 8301', & 8270', perf. 8269' WSO.

The operations were performed for the purpose of testing the 7" shut-off by means of a formation tester.

DECISION:

THE 7" SHUT-OFF AT 8269' IS APPROVED.

b

THOMAS E. GAY, JR., ACTING CHIEF
JOHN F. MATTHEWS, JR.
State Oil and Gas Supervisor

By L.O. Pitzer Deputy

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: LA 055641 A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER Gas Storage

7. UNIT AGREEMENT NAME: Sesnon-Frew Zone

2. NAME OF OPERATOR: SOUTHERN CALIFORNIA GAS COMPANY

8. FARM OR LEASE NAME: FREW

3. ADDRESS OF OPERATOR: P. O. Box 3249, Terminal Annex, Los Angeles, Calif. 90051

9. WELL NO.: 7

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface

Aliso Canyon Field, Los Angeles County, California
Sec.29 3N 16W S.B. B & M

10. FIELD AND POOL, OR WILDCAT: Aliso Canyon SFZU

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec.29, T3N, R16W

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 2418.7' D.F.

12. COUNTY OR PARISH: Los Angeles

13. STATE: Californi

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	X	PULL OR ALTER CASING		WATER SHUT-OFF		REPAIRING WELL	
FRACTURE TREAT		MULTIPLE COMPLETE		FRACTURE TREATMENT		ALTERING CASING	
SHOOT OR ACIDIZE	X	ABANDON*		SHOOTING OR ACIDIZING		ABANDONMENT*	
REPAIR WELL		CHANGE PLANS		(Other)			
(Other)							

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

DIVISION OF OIL AND GAS
RECEIVED
JUN 30 1975
SANTA PAULA, CALIFORNIA

The present condition of the well is as follows:

1.) Total depth 8825', plugged with cement 8825'-8746'

2.) Complete Casing Record:

11 3/4" 47# J-55 cemented 1977'.
7" 23#, 26#, J-55 and N-80 cemented 8750'.
WSO at 8665'. Shot two jet and two bullet holes per foot 8744'-8730' and 8702'-8670'.

PROPOSED WORK:

1. Run cement bond and neutron lifetime logs.
2. Pressure test 7" casing. Test WSO at 8300'.
3. Perforate Sesnon Zone 8610'-8475', 8440'-8355'.
4. Complete.

18. I hereby certify that the foregoing is true and correct

SIGNED John Melton JOHN MELTON TITLE Reservoir Engineer DATE June 23, 1975

(This space for Federal or State office use)

APPROVED BY D. F. Russell TITLE District Engineer DATE June 25, 1975

CONDITIONS OF APPROVAL, IF ANY: D. F. Russell

cc: DOG, Long Beach

SEE ATTACHED CONDITIONS AND REQUIREMENTS

*See Instructions on Reverse Side

GEOLOGICAL SURVEY
RECEIVED
JUN 25 1975

FORM 109

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Report on Operations

No. T 275-206

Mr. P. S. Magruder, Jr., Agent
Pacific Lighting Service Co.
P.O. Box 54790, Terminal Annex
Los Angeles, California 90054

Santa Paula, Calif.
June 19, 1975

DEAR SIR:

Operations at well No. "SPZU" F-7, API No. 037-00670, Sec. 29, T. 3N, R. 16W, S.B., B & M. Aliso Canyon Field, in Los Angeles County, were witnessed on June 12, 1975. Mr. A. Lorahbough, representative of the supervisor was present from 0700 to 1030. There were also present T. Ash, foreman

Present condition of well: No changes since history filed June 28, 1955.

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

DECISION:

THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

bj
cc: Operator

Thomas E. Gay, Jr., Acting Chief
JOHN F. MATTHEWS, JR.
State Oil and Gas Supervisor

By [signature] Deputy

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P 275-203

Mr. P. S. Magruder, Jr., Agent
Pacific Lighting Service Co.
P.O. Box 54790, Terminal Annex
Los Angeles, California 90054

Santa Paula, Calif.
June 12, 1975

DEAR SIR:

Your proposal to alter casing Well No. "SFZU" F-7 (037-00670),
Section 29, T. 3N, R. 16W, S.B.B. & M., Aliso Canyon Field, Los Angeles County,
dated 6/2/75, received 6/9/75, has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. The drilling fluid used shall be of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts. NO CONTAMINANTS OR TOXIC MATERIAL SHALL BE USED IN ANY DRILLING FLUID THAT IS TO BE PLACED IN AN UNLINED SUMP.
2. Blowout prevention equipment, at least of the Division of Oil and Gas Class III rating, shall be installed and maintained in operating condition at all times.
3. THIS DIVISION SHALL BE NOTIFIED TO WITNESS:
   a. A pressure test of the blowout prevention equipment immediately prior to perforating the casing.
   b. The test of the 7" water shut-off above the Sesnon zone.

NOTE: A COPY OF THIS APPROVAL SHALL BE POSTED AT THE WELL SITE PRIOR TO COMMENCING OPERATIONS.

6/12/75
Tom Ash/DEP
will take WSO @ S_8 point = 5452 Div. will witness
then
will take WSO @ S_4 point = 8300 Div will witness

Blanket Bond
ALL:b
cc: Operator

Thomas E. Gay, Jr., Actin gChief
JOHN F. MATTHEWS, JR., State Oil and Gas Supervisor

By [signature], Deputy

25476-705 7-74 50M ①D OSP

FORM 107

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

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

Los Angeles Calif. June 2 19 75

DIVISION OF OIL AND GAS

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 or altering casing at Well No. SFZU Frew #7
(Cross out unnecessary words)

, Sec. 29, T. 3N, R. 16W, S.B. B. & M.

Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

DIVISION OF OIL AND GAS
RECEIVED
JUN 9 1975
SANTA PAULA, CALIFORNIA

1. Total depth.
8825'

2. Complete casing record, including plugs:

11 3/4" Cemented 1977'
7" Cemented 8750'
Cement Plug 8746'
Jet perforated 2 holes per foot and
gun perforated 2 holes per foot
8670'-8702' and 8730'-8744'
WSO 8665'
Four holes 8745'

3. Last produced. December 1963 (Date) 7 (284) (Oil, B/D) 60 (2375) (Water, B/D) 16 (483) (Gas Mcf/D)

The proposed work is as follows:

1. Demonstrate W.S.O. above Sesnon Zone.

2. Perforate Sesnon Zones as required, to convert to gas storage.

MAP	MAP BOOK	CARDS	BOND	FORMS	
			bb	✓	✓

P. O. Box 54790, Terminal Annex
Los Angeles, California 91054
(Address)

(213) 689-3561
(Telephone No.)

PACIFIC LIGHTING SERVICE CO.,
(Name of Operator)

By P. S. Magruder, Jr.

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

FORM 156

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

REPORT OF PROPERTY AND WELL TRANSFER

Field or County: Aliso Canyon — District: 1

Former Owner: Standard Oil Co. of Calif. — Date: Sept. 24, 1968

Description of Property: Sec. 29, T. 3 N., R. 16 W., S. B. B. & M.

List of Wells:
"Frew 1" 2 (037-00665)*
" 3 (037-00666)
" 4 (037-00667)
" 5 (037-00668)
" 6 (037-00669)
" 7 (037-00670)
" 8 (037-00671)
" 9 (037-00672)

Date of Transfer: August 1, 1968
New Owner: GETTY OIL COMPANY, OPERATOR
Address: 3450 Wilshire Boulevard, Room 720
Los Angeles, California 90005
Telephone No. 381-7151

Type of Organization: Corporation
Reported by: C. G. Nelson for Getty Oil Co. (letter of 8-7-68)*
Confirmed by: R. E. France for Standard Oil Co. of Calif. (letter of 9-18-68)
New Operator New Status PA , Old Operator New Status PA
Request Designation of Agent No

Remarks:

ag
cc: F. E. Kasline
Production Dept.
Conservation Committee

Wm. C. Bailey
Deputy Supervisor

	INITIALS	DATE
Form 121		
New Well Cards		
Well Records		
Electric Logs		
Production Reports		
Map and Book		
Form 148		
Notice to be cancelled		
Bond status		

LEGEND
PA—Producing Active
NPA—Non Potential Active
PI—Potential Inactive
NPI—Non Potential Inactive
Ab—Abandoned or No More Wells

FORM 157

STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

830 North La Brea Avenue
Inglewood, California

September 24, 1968

Mr. Mr. C. G. Nelson, Agent
Getty Oil Co., Operator
P. O. Box 811
~~Agent for~~ Ventura, California 93001

DEAR SIR:

Your ~~request~~ dated letter dated August 26, 1968, relative to change in designation of well(s) in Sec. 29, T. 3 N., R. 16 W., S.B.B. & M., Aliso Canyon field, Los Angeles County, District No. 1, has been received;

and in accordance with Section 3203, Public Resources Code, reading in part as follows:

> "* * * The number or designation by which any well heretofore drilled has been known, and the number or designation specified for any well in a notice filed as required by Section 3203, shall not be changed without first obtaining a written consent of the Supervisor."

the proposed change in designation is hereby authorized as follows: (formerly owned by Standard Oil Co. of Calif.)

Old Designation	New Designation
"Frew 1" 2	"SFZU" F-2 (037-00665)
" 3	" F-3 (037-00666)
" 4	" F-4 (037-00667)
" 5	" F-5 (037-00668)
" 6	" F-6 (037-00669)
" 7	" F-7 (037-00670)
" 8	" F-8 (037-00671)
" 9	" F-9 (037-00672)

ag
cc: F. E. Kasline
Production Dept.
Conservation Committee

F. E. KASLINE
~~E. R. MURRAY-AARON~~
State Oil and Gas Supervisor

By Wm. C. Bailey
Deputy Supervisor

△ SPO

DOC-2 ✓
CWG
HCB
RWN
MC -File

54

COMPLETION REPORT - NEW WELL PRO-318-D

STANDARD OIL COMPANY OF CALIFORNIA

FIELD: Aliso Canyon

PROPERTY: "Frew 1"

WELL NO: 7 Sec. 29, T. 3-N., R. 16-W., S.B. B.& M.

LOCATION: 1345.14' southerly along property line and 415.0' westerly at right angles to said line from the Station S. F. #19 of Ex Mission San Fernando Rancho.

ELEVATION: 2418.7' D.F. U.S.G.S. D.F. above concrete mat 9.0'

DATE: March 11, 1955 By W. C. JOHNSON
Manager, Prod. Dept., So. Dist.

DRILLED BY: Rocky Mountain Drilling Company, contractor, using portable equipment.

COMMENCED DRILLING: November 27, 1954 COMPLETED DRILLING: February 13, 1955

DATE OF INITIAL PRODUCTION: February 14, 1955

PRODUCTION:

Daily average 1st	30 days			
Oil	156 Bbl.	Gravity	20.4° API	PUMPING
Water	10 Bbl.	T. P.	100#	x FLOWING
Gas	95 Mcf.	C. P.	1000#	
		Orifice	-	

SUMMARY

TOTAL DEPTH: 8825'. PLUG: 8746-8825', cement.

CASING:

20"	cemented 44'	Not tested.
11-3/4"	cemented 1977'	with 1300 cu.ft. perlite and 125 sacks neat cement. Not tested. 16" hole.
7"	cemented 8750'	with 300 sacks. W.S.O. on holes at 8665' (squeezed with cement). Jet and gun holes at 8745'. Perforated 8670-8702' and 8730-8744'. Plugged with cement to 8746'. Hole Size: 10-5/8" 1977-8288'; 9-7/8" to 8750'; 7-5/8" to 8825'.

(Summary continued next page.)

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Frew 1-#7
Aliso Canyon

Standard Oil Company of California

S U M M A R Y (Continued)

PERFORATIONS: 7" jet perforated with four 1/2" holes at *8665' (W.S.O.) and at 8745' (to test effectiveness of plug at 8750'), McCullough jetgun. *Squeezed with cement.
7" gun reperforated with six 1/2" gun holes at 8745' (to test effectiveness of plug at 8750'), McCullough gun.
7" perforated with two 1/2" gun holes and two 1/2" jet holes/foot from 8670-8702' and 8730-8744', McCullough perforator.

JUNK: None

	Type	Intervals Recorded
LOG RUNS:	Schlumberger	73-2500'.
	Schlumberger	2500-8750'.
	Schlumberger section gauge	8200-8478'.
	Schlumberger log and dipmeter	8750-8825'.
	McCullough neutron log	7700-8746'.

DIVISION OF OIL AND GAS
RECEIVED
JUN 28 1955
LOS ANGELES, CALIFORNIA

54

Frew 1-#7
Aliso Canyon

Standard Oil Company of California

Well drilled to the Frew zone by Rocky Mountain Drilling Company, contractor, using a portable mast and Emsco J-750 equipment, with the derrick floor 9.0' above the concrete mat.

November 10, 1954 Gallighen Drilling Service, contractor, moved in and drilled a 30" hole to 44'.

- -

November 10, 1954 cemented 20" conductor pipe at 44' with 3-1/2 cubic yards of ready mixed concrete.

Casing Detail: All 1 joint, or 44', is 20", 79#, grade B, range 3, plain end, new National seamless blank casing. Fitted on bottom at 44' with a 1/2" x 4" steel band welded on for a shoe.

- -

November 27, 1954 spudded in at 2:00 p.m. and drilled 10-5/8" hole from 44' to 135'.

November 28-30, 1954 drilled 10-5/8" hole from 135' to 1019' and twisted off drill pipe, leaving 185' of fish in hole from 834' to 1019', consisting of 7-1/2" drill collars and 10-5/8" bit. Fished for and recovered all of fish.

December 1, 1954 drilled 10-5/8" hole from 1019' to 1142' and drill pipe parted, leaving 244' of fish in hole from 898' to 1142', consisting of 4-1/2" drill pipe, 7-1/2" drill collars and 10-5/8" bit. Fished for and recovered all of fish.

December 2-5, 1954 drilled 10-5/8" hole from 1142' to 2500'.

December 6, 1954 ran Schlumberger electric log and recorded from 73' to 2500'.

Opened 10-5/8" hole to 16" from 44' to 1977'.

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Frew 1-#7
Aliso Canyon

Standard Oil Company of California

From To Feet Formation Cored

December 9, 1954 cemented 11-3/4" casing at 1977' with 1300 cubic feet of 1:1 ratio perlite and Colton type "C" cement, mixed to an average 90#/cu.ft. slurry, followed by 125 sacks of neat cement. Used two top plugs. Preceded cement with 50 cubic feet of water. Displaced cement with 1255 cubic feet of drilling fluid. Plugs did not bump under 550# final pressure. Casing free and good circulation throughout with cement returns to the surface. Sixty minutes mixing and pumping cement to place. Finished job at 5:20 p.m. Used Byron Jackson power equipment and bulk cement.

Casing Detail: All 48 joints, or 1977', are 11-3/4", 47#, J-55, range 3, short 8-round thread, new National and Jones & Laughlin seamless blank casing. Fitted from 1975' to 1977' with a 2' x 11-3/4" Larkin cement float shoe; from 1894' to 1896' with a 2' x 11-3/4" Larkin cement float collar and at 1972' and 1952' with B & W scratchalizers.

Cut and recovered 14' of 20" conductor pipe, all of which was below the derrick floor.

Cut and recovered 23' of 11-3/4" casing, 14' of which was below the derrick floor.

December 10, 1954 installed Class III B.O.P. and tested under 1000# pressure - held O.K.

December 10-11, 1954 drilled out cement from 1865' to 1977' including shoe of 11-3/4" casing at 1977' and cleaned out to 2500' with a 10-5/8" bit.

December 11-24, 1954 drilled 10-5/8" hole from 2500' to 5307' and drill collars parted, leaving 134' of fish in hole from 5173' to 5307', consisting of 7-1/2" drill collars and 10-5/8" bit. Fished for and recovered all of fish.

December 24, 1954-January 13, 1955 drilled 10-5/8" hole from 5307' to 7855'.

January 13-14, 1955 conventionally cored 9-7/8" hole:

From	To	Feet	Formation Cored
7855	7869	14	Recovered 11'
7855	7866	11	11' firm, hard, massive, dark grayish brown to black shale. Calcareous, forams abundant, slickensided. Very thin streak of tan, cherty shale showing slickensides at 7857'
7866	7869	3	3' no recovery
7869	7884	15	Recovered 15'
7869	7884	15	15' same as above except light brown color in part. Slightly fractured. 38-40° dips. Rotten odor

---

Opened 9-7/8" hole to 10-5/8" from 7855' to 7884'.

January 14-26, 1955 drilled 10-5/8" hole from 7884' to 8288'; reduced 10-5/8" hole to 9-7/8" at 8288' and drilled to 8618'; reduced 9-7/8" hole to 7-5/8" at 8618' and drilled to 8750'.

January 26, 1955 ran Schlumberger electric log and recorded from 2500' to 8750'.

January 26, 1955 took Schlumberger sidewall samples as follows:

2600' - recovered 1" - friable, brown, slightly OIL STAINED, sandy siltstone. Slight odor, straw cut.

2614' - recovered 1" - gray conglomeratic sand. No cut or odor.

2680' - recovered 1" - easily friable, fine grained, greenish gray sand. No cut or odor.

2698' - recovered 1" - easily friable, green, fine to pebbly sand with mottled streaks of fine, gray sand. No odor or cut.

2770' - recovered 1" - massive, green, sandy siltstone with minor streaks of limy material.

2792' - recovered 1" - easily friable, fine grained, greenish, gray sand. No cut or odor.

2825' - recovered 1/4" - hard, brown, limy sandstone shell. Good petroleum odor. Light amber cut.

7816' - recovered 1" - easily friable, fine grained, brown OIL SAND. Excellent odor, light brown cut.

8625' - recovered 1/8" - easily friable, fine grained, unevenly saturated, light brown OIL SAND with mottled green, fine grained sand (glauconitic). Several veinlets of limy material. Fair odor, brown cut.

8652' - no recovery

8673' - recovered 1/4" - fragments of green, limy shale.

8679' - recovered 1/4" - friable, fine grained, brown OIL SAND. Good odor, dark brown cut.

(Core descriptions continued next page.)

Schlumberger sidewall samples continued:

8694' - recovered 1/2" - easily friable, fine to coarse grained, unevenly saturated, light brown OIL SAND with mottled green sand (glauconitic?). Fair odor, light brown cut.

8738' - no recovery

8745' - recovered 1/2" - easily friable, fine to medium grained, light brown OIL SAND. Good odor, brown cut.

January 26, 1955 ran Schlumberger section gauge and recorded from 8200' to 8478'.

Circulated to 8750' and conditioned drilling fluid for formation test.

Johnston Formation Test of Interval 8679' to 8750': January 27, 1955 ran tester and set packers at 8670' and 8679' with tail to 8750'. Opened tool at 10:15 a.m. Open sixty minutes. Used 1200' water cushion. Estimated gas to surface in ten minutes at 30 MCF/D decreasing gradually to 20 MCF/D in next ten minutes. Blow increased to 80 MCF/D at 10:35 a.m. and maintained steady 80 MCF/D for ten minutes then rate decreased gradually from 80 MCF/D to 15 MCF/D in next thirty minutes or for remainder of test. Recovered 6950' gross rise or 5750' net rise in 4-1/2" drill pipe. Unloaded water cushion and gassy OIL. Backscuttled out remainder of rise - all gassy OIL. Samples averaged 3% cut (1% sand and mud and 2% emulsion). Oil tested 18.5° API. Recovered 277' rise below backscuttling valve: Top 91' OIL, bottom 186' OILY, watery mud testing 68 G/G.

Tool Assembly: Hydraulic tool, 3/4" bean, backscuttle tool 277' above tool, dual 6-3/4" and 7" packers, Shaffer combination jars and safety joint, lefthand joint below packers and 71' of 4-1/2" drill collar tail (top 2' blank, next 62' perforated, bottom 7' blank including two pressure recorders).

January 27-30, 1955 drilled 7-5/8" hole from 8750' to 8825'.

January 30, 1955 ran Schlumberger electric log and recorded from 8750' to 8825'. Ran dipmeter.

54

6.

From 1-#7
Aliso Canyon

Standard Oil Company of California

Johnston Formation Test of Interval 8745' to 8825': January 31, 1955 ran tester and set packers at 8737' and 8745' with tail to 8825'. Opened tool at 11:30 a.m. Open sixty minutes. Used 1200' water cushion. No gas to surface. A steadily increasing blow for first seven minutes to a maximum of 13 M/D; next three minutes 13 M/D blow; next ten minutes decreasing to 6 M/D; next ten minutes increasing to 8 M/D; next five minutes steady 8 M/D blow; remaining twenty-five minutes of test decreased to a minimum of 2 M/D. Recovered 8300' gross rise or 7100' net rise in 4-1/2" drill pipe and 187' of 5-5/8" drill collars: Top 1200' water cushion, next 210' watery gassy mud, bottom 6890' all gassy, saltwater with a scum of OIL. Samples 6600', 5500', 4500', 4000', 3300', 2500', 2000', 1500', 1150' and 450' above tool and at tool, tested 900, 920, 928, 935, 951, 958, 965, 965, 985, 1000 and 1000 G/G, respectively.

Tool Assembly: Backscuttling tool, Shaffer combination jars and safety joint, Johnston hydraulic tool, 3/4" bean, two 7" sidewall packers, 80' of 4-1/4" drill collar tail (top 6' blank, next 69' perforated, bottom 5' blank including two pressure recorders).

To Plug Hole with Cement: February 1, 1955 equalized 40 sacks of type "B" Victor cement through 4-1/2" drill pipe (including 236' of 2-1/2" tubing equipped with scratchers) hanging at 8823'. Preceded cement with 25 cubic feet of water and followed with 5 cubic feet of water and 683 cubic feet of drilling fluid. Finished job at 10:25 a.m. Used Oil Well Cementing Company power equipment and bulk cement.

February 1, 1955 drilled out cement from 8723' to 8750'.

Opened 7-5/8" hole to 9-7/8" from 8618' to 8750'.

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7.

Frew 1-#7
Aliso Canyon

Standard Oil Company of California

February 3-4, 1955 cemented 7" casing at 8750' with 300 sacks of Colton type "D" cement, mixed to an average 117#/cu.ft. slurry. Used one top and one bottom plug. Preceded cement with 50 cubic feet of water. Displaced cement under 1750# final pressure when plugs bumped. Moved casing from 8750' to 8740' while pumping cement around the shoe. Casing free and good circulation throughout. Eleven minutes mixing and twenty-seven minutes pumping cement to place. Finished job at 1:35 a.m. Used Oil Well Cementing Company power equipment and bulk cement.

Casing Detail:

Bottom	34 joints, or 1453',	are 7", 26#, N-80, range 3, long 8-round thread, new Jones & Laughlin seamless blank casing. Fitted from 8748' to 8750' with a 2' x 7" Baker differential cement float shoe; from 8617' to 8619' with a 2' x 7" Baker differential float collar; at 8748', 8730', 8680' and 8650' with Stepp centralizers; at 8745', 8675' and 8660' with B & W scratchalizers and at 8745', 8675' and 8660' with a total of 15 B & W scratchers in clusters of 5.
Next	18 joints, or 752',	are 7", 23#, N-80, range 3, long 8-round thread, secondhand, unknown make, seamless blank casing.
Next	36 joints, or 1541',	are 7", 26#, J-55, range 3, short 8-round thread, new Jones & Laughlin and unknown make, seamless blank casing.
Next	96 joints, or 4083',	are 7", 23#, J-55, range 3, short 8-round thread, new Youngstown seamless blank casing.
Top	24 joints, or 971',	are 7", 23#, N-80, range 1 and 3, long 8-round thread, secondhand, unknown make seamless blank casing.
Total	208 joints, or 8750'	

Cut and recovered 22' of 7" casing, 13' of which was below the derrick floor.

February 4-5, 1955 re-installed Class III B.O.P. and tested under 1500# pressure - held O.K.

February 5, 1955 drilled out cement from 8613' to 8746'.

February 6, 1955 ran McCullough neutron log and collar locator and recorded from 7700' to 8746'.

February 6, 1955 ran McCullough jet perforator and shot four 1/2" jet holes in 7" casing at 8745'.

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Frew 1-#7
Aliso Canyon

8.

Standard Oil Company of California

Test to Determine Effectiveness of Plug at 8750': February 6, 1955 ran Halliburton tester and set packer at 8681' with tail to 8702'. Used 1000' mud cushion. Opened tool at 2:00 p.m. Open sixty minutes. Light blow of air for one minute then dead for remainder of test. Recovered 1020' gross rise or 20' net rise in 3-1/2" drill pipe: Top 1000' mud cushion, bottom 20' mud. Samples at tool and ditch tested 21 G/G. Test inconclusive.

Tool Assembly: Hydrospring tester, 1/2" bean, combination Shaffer jars and safety joint, 5-3/4" type "C" Halliburton packer, 21' of 2-7/8" drill pipe tail (top 7' blank, next 4' perforated, bottom 10' blank including two pressure recorders and one Amerada bomb).

February 6, 1955 ran McCullough gun perforator and shot six 1/2" gun holes in 7" casing at 8745'.

Re-test to Determine Effectiveness of Plug at 8750': February 7, 1955 ran Halliburton tester and set packer at 8681' with tail to 8702'. Opened tool at 2:50 a.m. Open sixty minutes. Used 1000' mud cushion. Light blow of air for one minute then dead for remainder of test. Recovered 1360' gross rise or 360' net rise in 3-1/2" drill pipe: Top 1000' mud cushion, bottom 360' gassy, OILY mud (estimated 5% OIL). Samples 90' above tool, at tool and ditch tested 21 G/G, respectively. Test indicates plug at 8750' effective.

Tool Assembly: Hydrospring tester, 1/2" bean, combination Shaffer jars and safety joint, 5-3/4" type "C" packer, 21' of 2-7/8" drill pipe tail (top 7' blank, next 4' perforated, bottom 10' blank including two pressure recorders and one Amerada bomb).

February 7, 1955 ran McCullough jet perforator and shot four 1/2" jet holes in 7" casing at 8665'.

February 7-8, 1955 Halliburton Water Shut-Off Test on Jet Holes in 7" Casing at 8665': Ran tester and set packers at 8650' and 8672' with tail to 8683'. Used 1000' mud cushion. Opened tool at 2:27 p.m. Open two hours. Light blow for first five minutes decreasing to faint blow in next forty-five minutes then increasing to medium strong blow in next sixty minutes, thereafter decreasing to medium light blow in remaining ten minutes. Gas to surface in one hour and fifteen minutes. Recovered 2640' gross rise or 1640' net rise in 3-1/2" drill pipe: Top 1000' gas-cut mud cushion which unloaded in stages and graded into 1605' of clean, gassy OIL which also unloaded in stages, bottom 35' was OILY (5%) water testing 109 G/G. Test witnessed and water shut-off approved by Inspector G. Y. Lee of the Division of Oil and Gas.

Tool Assembly: Hydrospring tester, Shaffer jars and safety joint, Halliburton packer, 8' perforated liner, pressure recorders and Olympic packer.

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9.

Frew 1-#7
Aliso Canyon

Standard Oil Company of California

To Squeeze Jet Holes in 7" Casing at 8665' with Cement: February 8, 1955 set magnesium bridge plug at 8725'. Set squeeze tool at 8630'; applied pressure and formation broke down and took fluid at 5 cu.ft./minute under 3800#. Pumped in 50 sacks of Victor type "D" cement and squeezed an estimated 8 sacks through holes at 8665' under 4800# final pressure. Backscuttled excess cement out of hole. Finished job at 4:25 p.m. Used Halliburton Cementing Company power equipment and bulk cement.

February 9, 1955 drilled out cement from 8530' to 8725' including bridge plug at 8725' and cleaned out to 8746'.

February 10, 1955 ran McCullough perforator and perforated 7" casing with two 1/2" gun holes and two 1/2" jet holes/foot from 8670' to 8702' and 8730' to 8744'.

Scraped 7" casing from 8670' to 8744'.

February 11, 1955 hung 2-1/2" tubing at 8708' with a swab shoe at 8708' and gas lift valves at 2415', 4072', 5507', 6696', 7699' and 8266'.

Tubing Detail: All 277 joints, or 8708', are 2-1/2", 6.5#, J-55, range 2, short 8-round thread, new Pittsburgh and Youngstown seamless blank tubing. Fitted from 8707' to 8708' with a 1' x 2-1/2" x 1-3/4" swab shoe; and at 2415', 4072', 5507', 6696', 7699' and 8266' with gas lift valves.

Installed Xmas tree.

Displaced drilling fluid with oil.

Injected gas and well commenced to flow at 5:00 p.m., February 12, 1955.

Crew released at 6:00 a.m., February 13, 1955.

Well completed in the Frew zone.

Frew 1-#7
Aliso Canyon

Standard Oil Company of California

PRODUCTION TREND

1955 Date	Hrs. G/L	Hrs. Flwg.	B/D Oil	B/D Wtr.	% Cut	°API Grav.	MCF/D Gas	# C.P.	# T.P.	Remarks
2-12	3		* 4	0	5.0			1075	150	22/64" bean.
2-13	24		*194	11	5.5			1000	75	
2-14		24	* 79							
			171	14	5.3			1000	185	
2-15		24	242	11	4.5	19.6	121	1050	250	
2-16		24	370	11	0.5	19.7	230	1000	250	
2-17		24	319	11	3.3	19.6	184	105	100	
2-18		24	242	7	2.7	20.0	138	1050	100	
2-19		24	210	5	2.3	19.9	94	1050	200	
2-20		24	232	6	2.4	19.7	95	1050	250	
2-21		7	64	2	3.6	20.7	30	1475	1400	Shut-in for static test.
2-22/24										Shut-in for static test.
2-25		16	188	7	3.6	20.7	95	900	150	
2-26		24	206	1	0.4	20.4	100	1000	100	
2-27		24	165	1	0.4	20.6	102	1000	100	

*Recoverable oil.

Well averaged 156 B/D oil, 10 B/D water, 95 MCF/D gas, for the first thirty days' new production.

DRILLING FLUID HISTORY

1954-1955 Date	Interval	Type of Fluid	Weight	Viscosity	Filter Loss
11/27-1/2	44-6500'	Gel-natural*	70-78 pcf.	40-60 sec.	7-10 cc.
1/2-2/12	6500-8825'	Soap emulsion	74-77 pcf.	45-65 sec.	3.5-5 cc.

*with fiber 44-2500'.

Contractor: Rocky Mountain Drilling Company

Drillers:

R. W. Mitchell	J. B. Cantrell
T. I. Birt	G. G. Ives
D. G. Harless	O. L. Winton
R. L. Burdick	H. L. Pullen

N. TWERELL

NT
March 11, 1955

FORM 109-A

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Report on Test of Water Shut-off

(FORMATION TESTER)

No. T 155-344

Mr. W C Johnson
Box 2437 Terminal Annex
Los Angeles 54 California
Agent for STANDARD OIL COMPANY OF CALIFORNIA

Los Angeles 15 Calif.
February 15 1955

SEC. 3606 WELL

DEAR SIR:

Your well No. "Frew 1" 7, Sec. 29, T. 3 N., R. 16 W., S B B & M.
Aliso Canyon Field, in Los Angeles County, was tested for water shut-off on February 7, 19 55. Mr. G. Y. Lee, Engineer, designated by the supervisor was present from 6:30 PM to 9:15 PM as prescribed by law; there were also present V. F. Larson, Engineer; and Mr. R. Salsbury, Drilling Foreman

Shut-off data: 7 in. 26 lb. casing was cemented at 8750 ft. on February 4, 19 55 in 9-7/8 in. hole with 300 ~~xxx~~ sacks of cement calculated to fill behind casing to 7482 ft. below surface.

Casing record of well: 11-3/4" cem. 1977'; 7" cem. 8750', six 1/2" holes 8745', four 1/2" test holes 8665', W.S.O. and plugged with cement 8825'-8750'.

Present depth 8825 ft. cmt. bridge 8750 ft. to 8746 ft. Cleaned out cmt. 8613 ft. to 8746 ft. for test. A pressure of 1500 lb. was applied to the inside of casing for 15 min. without loss after cleaning out to 8746 ft. A Halliburton tester was run into the hole on 3-1/2 in. drill pipe ~~tubing~~, with 1000 ft. of ~~xxxx~~ mud cushion, and packer ~~s~~ set at 8650 & 8672 ft. with tailpiece to 8683 ft. Tester valve, with 1/2 in. bean, was opened at 2:27 P.M. and remained open for 2 hr. and - min. During this interval there was a light blow for 5 minutes; faint blow for 45 minutes; medium blow for 1 hour, decreasing from medium to light blow for 10 minutes.
Mr. Salsbury reported:

1. A 10-5/8" rotary hole was drilled from 1977' to 8288', and a 9-7/8" rotary hole was drilled from 8288' to 8825'.
2. On February 2, 1955, 40 sacks of cement was pumped into the hole through 4-1/2" drill pipe hanging at 8825', filling to 8750'.
3. The 7" casing was shot-perforated with four 1/2" holes at 8665'.

THE ENGINEER NOTED:

1. When the drill pipe was removed, a net recovery of 1640' in all, composed of 30' of light drilling fluid and 1610' of oil, was found in the drill pipe above the tester, equivalent to 0.2 bbl. of drilling fluid and 12 bbls. of oil.
2. The recording pressure bomb chart showed that the tester valve was open 2 hours.

THE 7" SHUT-OFF AT 8665' IS APPROVED.

GYL:mn

cc Mr R W Norton
Mr C W Gibbs

Orig Mr W C Johnson Agent
Standard Oil Company of California
P O Box 397
La Habra California

E. H. MUSSER
R. D. BUSH, State Oil and Gas Supervisor

By [signature], Deputy

P/L

FORM 109-D

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

Special Report on Operations Witnessed

No. T 155-74

Mr. W C Johnson
Box 2437 Terminal Annex
Los Angeles 54
Agent for STANDARD OIL CO OF CALIFORNIA

Los Angeles 15 Calif.
January 12 1955

DEAR SIR:

Operations at your well No. "Frew 1" 7 Sec. 29, T. 3 N, R. 16 W, S B B. & M., Aliso Canyon Field, in Los Angeles County, were witnessed on December 20, 19 54. Mr. M. Dosch, Engineer, representative of the supervisor was present from 11:00 a.m. to 12:00 m. There were also present B. Salsbury, Drilling Foreman; R. L. Burdick, Driller.

Present condition of well: 11-3/4" cem. 1977'. T.D. 4600'.

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

Mr. Salsbury reported:

1. A 16" rotary hole was drilled from the surface to 1977'.
2. On December 16, 1954, 11-3/4", 47 lb. casing was cemented at 1689'.
3. Cement returned to the surface.
4. A 10-5/8" rotary hole was drilled from 1977' to 4600'.

THE ENGINEER NOTED THAT THE WELL WAS EQUIPPED WITH THE FOLLOWING BLOWOUT PREVENTION EQUIPMENT:

1. A Shaffer double cellar control gate for closing in the well with the drill pipe out of the hole, and for closing around the 4½" drill pipe.
2. A G.K. Hydril blowout preventer for closing around the 4½" drill pipe.
3. The controls for the above equipment were located outside the derrick.
4. A 2" mud fill-up line with a 2" high pressure stopcock into the 11-3/4" casing below the above equipment.
5. A high pressure stopcock on the kelly.

THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

MD:OH

cc K B McNamara
C W Gibbs

Orig Mr W C Johnson Agent
Standard Oil Co of California
P O Box 397
LA HABRA California

E. H. MUSSER
State Oil and Gas Supervisor

By D. M. Mallory Deputy

5440 3-54 17,850 ② SPO

FORM 111 (1-49) D

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS

No. P 154-1458

Mr. W C Johnson
Box 2437 Terminal Anncex
LOS ANGELES 54
Agent for STANDARD OIL CO OF CALIFORNIA

Los Angeles 15 California
November 29 19 54

SEC. 3606 WELL

DEAR SIR:

Your proposal to drill Well No. "Frew 1" 7,

Section 29, T. 3 N, R. 16 W, S B B. & M., Aliso Canyon Field, Los Angeles County,

dated Nov. 22 19 54, received Nov. 23 19 54, 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

"Location of Well: 1345.14 feet Southerly along property line and 415 feet Westerly at right angles to said line from the Station S.F. #19 of Ex Mission San Fernando Rancho (Final or (approx. 4000' S., 850' W. fr. NE cor. of Sec. 29)

Elevation of derrick floor above sea level 2418.7 feet U.S.G.S. datum. (FINAL)

All depth measurements taken from top of Derrick Floor which is 9.0 feet above concrete mat."

PROPOSAL

"PROPOSED CASING PROGRAM

Size of Casing Inches A.P.I.	Weight	Grade and Type	Top	Bottom	Cementing Depths
20"	Conductor pipe		0'	40'	40'
11-3/4"	47#	J-55	0'	1500'±	1500'±
7"	23# & 26#	J-55 & N-80	0	8700'±	8700'±
5"	18#	J-55	8650'±	8825'±	Landed liner

Intended zone or zones of completion: Frew zone

Well to be drilled under provisions of Section 3606, Chapter 3, Public Resources Code, State of California, because no other rig site in immediate area is feasible due to rugged topography. (Re: conversation Colahan - Kasline 10-18-54)

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

DECISION

THE PROPOSAL IS APPROVED PROVIDED THAT

1. The provisions of Sec. 3606 relating to derricks and subsurface spacing shall be followed.
2. A directional survey shall be made and filed with this division.
3. Mud fluid consistent with good drilling practice shall be used and the column of mud fluid maintained at all times to the surface, particularly while pulling the drill pipe
4. Adequate blowout prevention equipment shall be installed and maintained in operating condition at all times.
5. THIS DIVISION SHALL BE NOTIFIED AS FOLLOWS:
   (a) To inspect the installed blowout prevention equipment before drilling below 3000'.
   (b) To witness a test of the effectiveness of the 7" shut-off.

FEK:OH cc C W Gibbs
R W Norton
Orig W C Johnson Agent La Habra

E. H. MUSSER
State Oil and Gas Supervisor

By R. W. Wellmore Deputy

FORM 105

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

037 - 00670

Notice of Intention to Drill New Well

This notice and surety bond must be filed before drilling begins

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Oxnard, Calif. November 22, 1954

MAP	MAP BOOK	CARDS	BOND	FORMS 114	FORMS 121
18 AW&P	W XP		Blanket		

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 the work of drilling well No. "Frew 1-#7", Sec. 29, T. 3N, S&P R. 16W, S. B. B. & M., Aliso Canyon Field, Los Angeles County.

Legal description of lease

(Attach map or plat to scale)

Location of Well: 1345.14 feet Southerly (Direction) along ~~section~~ property line and 415 feet Westerly (Direction) at right angles to said line from the Station S. F. #19 of ~~xxxxxxxxxxxx~~ Ex Mission San Fernando Rancho (FINAL) or (Approx 4000'S, 850'W fr NE cor of sec 4

Elevation of ~~xxxxx~~ derrick floor above sea level 2418.7 feet U. S. G. S. datum. (FINAL)

All depth measurements taken from top of Derrick Floor which is 9.0 feet above ~~ground~~ concrete mat.
(Derrick Floor, Rotary Table or Kelly Bushing)

PROPOSED CASING PROGRAM

SIZE OF CASING INCHES A.P.I.	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS
20"	Conductor pipe		0'	40'	40'
11-3/4"	47#	J-55	0'	1500'±	1500'±
7"	23#&26#	J-55 & N-80	0	8700'±	8700'±
5"	18#	J-55	8650'±	8825'±	Landed liner

Intended zone or zones of completion: Frew zone

Well to be drilled under provisions of Section 3606, Chapter 3, Public Resources Code, State of California, because no other rig site in immediate area is feasible due to rugged topog raphy. (Re: conversation Colahan - Kasline 10-18-54)

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

Address Box 1211, Ventura, California

Telephone Number Hunter 3-0181

Standard Oil Company of California
(Name of Operator)

By W. C. Johnson
W. C. Johnson, Mgr. Prod. Dept. So. Dist.

SEND ONE COPY OF NOTICE TO DIVISION OFFICE IN DISTRICT WHERE WELL IS LOCATED