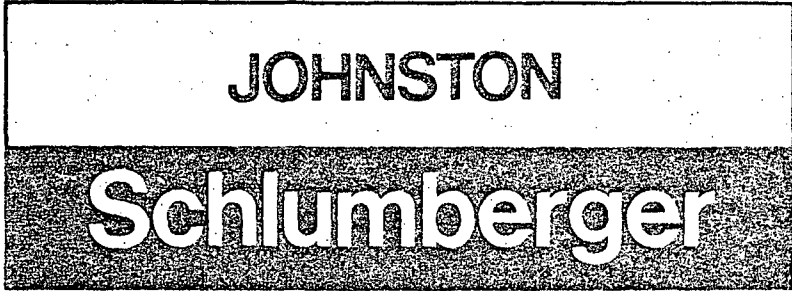


GLO2106

OPR - Mar 79
NY/SE/KRC-11'



technical report

COMPANY CHEVRON OIL COMPANY WELL KOSMOS #1-8 TEST NO. 2 COUNTY WASHOE STATE NEVADA

FIELD REPORT NO. : 06763 C

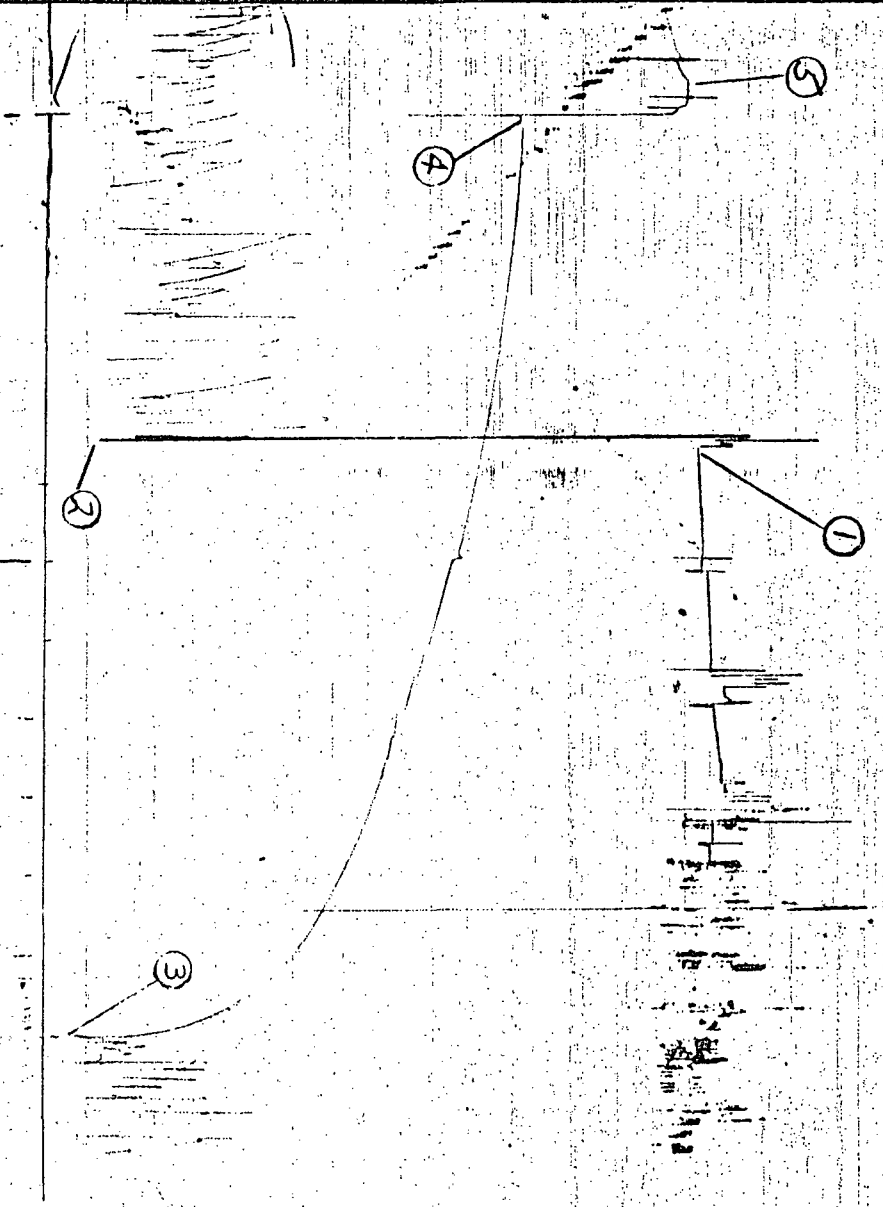
INSTRUMENT NO. : T-81

CAPACITY : 3000#

NO. OF REPORTS : 5+

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE

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INSTRUMENT NO.: T-81 CAPACITY(P.S.I.): 3000 DEPTH: 3856 FT.

PORT OPENING: INSIDE BOTTOM HOLE TEMP.: 204 PAGE 1 OF 2

DESCRIPTION	LABELLED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	1835.7		
FINAL FLOW(1)	2	134.2	73	74
FINAL FLOW(2)	3	53.9	120	119
FINAL SHUT-IN	4	1356.3		
FINAL HYDROSTATIC MUD	5	1822.2		

CHARTS INDICATE TOOL PLUGGING DURING THE FLOW PERIOD.

INCREMENTAL READINGS

LABEL POINT DELTA TIME PRESSURE (P.S.I.) T + DT/DT LOG PW - PF (P.S.I.) COMMENTS

1	0	1835.7	149.000	2.173	195.0	HYDROSTATIC MUD
2	74	134.2	75.000	1.875	243.6	FINAL FLOW(1)
3	0	53.9	50.333	1.702	285.5	FINAL FLOW(2)
3	74	53.9	38.000	1.580	327.3	STARTED SHUT-IN
0	0	53.9	30.600	1.486	363.5	
0.5	0	248.9	25.667	1.409	394.0	
1.0	0	297.5	22.143	1.345	423.4	
1.5	0	339.4	19.500	1.290	450.0	
2.0	0	381.2	17.444	1.242	474.9	
2.5	0	417.4	15.800	1.199	498.6	
3.0	0	447.9	13.333	1.125	539.3	
3.5	0	477.3	11.571	1.063	580.6	
4.0	0	503.9	10.250	1.011	613.9	
4.5	0	528.7	9.222	0.965	644.4	
5.0	0	552.5	8.400	0.924	673.3	
6	0	593.2	7.727	0.888	697.6	
7	0	634.5	7.167	0.855	720.2	
8	0	667.8	6.692	0.826	743.4	
9	0	698.3	6.286	0.798	762.6	
10	0	727.2	5.933	0.773	781.2	
11	0	751.5	4.700	0.672	861.0	
12	0	774.1	3.960	0.598	921.4	
13	0	797.3	3.467	0.540	969.5	
14	0	816.5	3.114	0.493	1004.5	
15	0	835.1	2.850	0.455	1035.1	
20	0	914.8	2.644	0.422	1069.5	
25	0	975.3	2.480	0.394	1087.1	
30	0	1023.4	2.345	0.370	1109.1	
35	0	1058.4	2.233	0.349	1126.1	
40	0	1089.0	2.138	0.330	1152.1	
45	0	1123.4	2.057	0.313	1166.2	
50	0	1141.0	1.987	0.298	1182.6	
55	0	1163.0				
60	0	1180.0				
65	0	1206.0				
70	0	1220.1				
75	0	1236.5				

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	80	1251.2	1.925	0.284	1197.3	
	85	1265.9	1.871	0.272	1212.0	
	90	1281.2	1.822	0.261	1227.3	
	95	1294.2	1.779	0.250	1240.3	
	100	1307.7	1.740	0.241	1253.8	
	105	1320.7	1.705	0.232	1266.8	
	110	1333.2	1.673	0.223	1279.3	
	115	1349.6	1.643	0.216	1295.7	
4	119	1356.3	1.622	0.210	1302.5	FINAL SHUT-IN
5		1822.2				HYDROSTATIC MUD

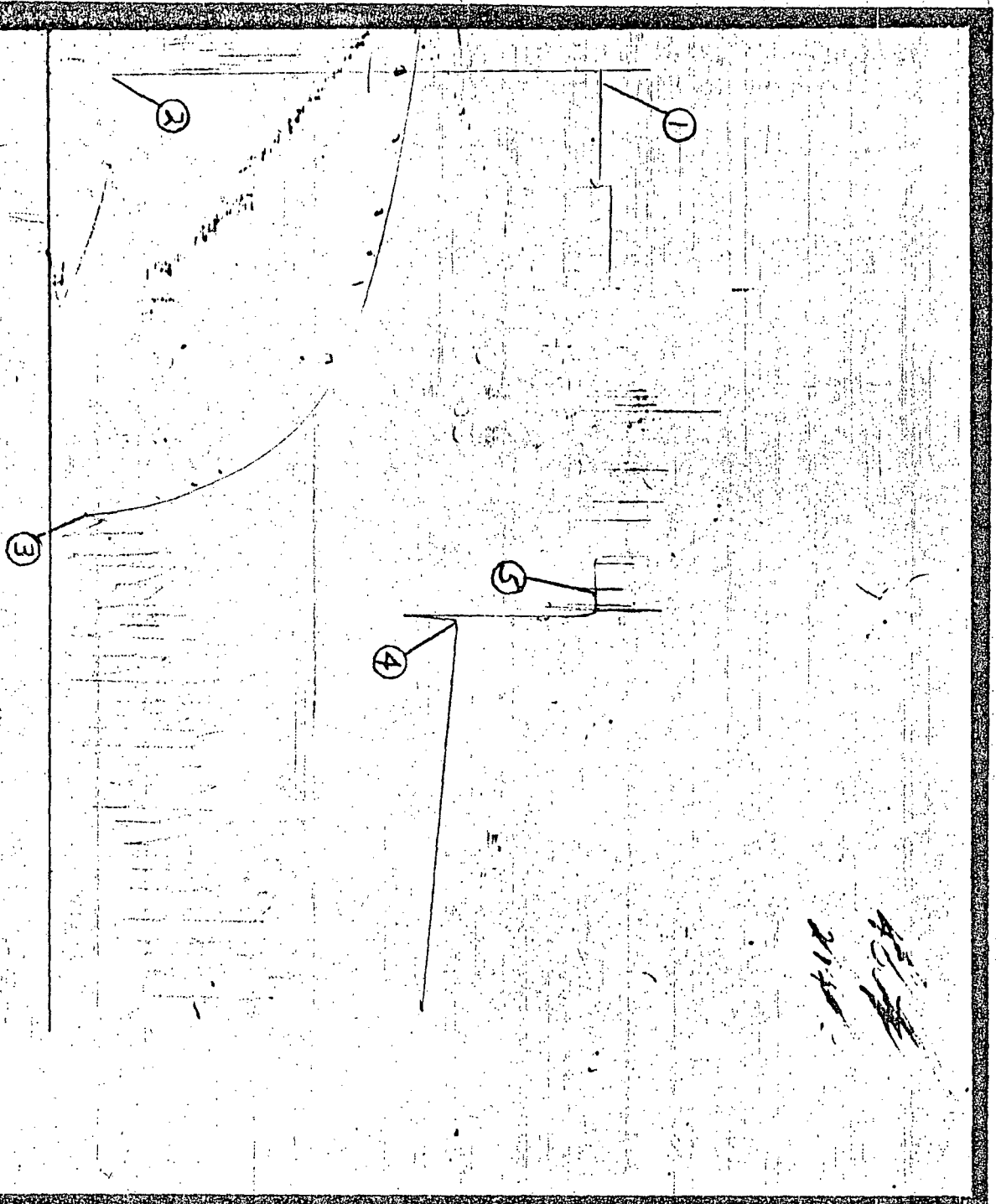
FIELD REPORT NO.: 06763 C

INSTRUMENT NO.: T-732

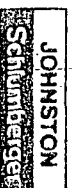
CAPACITY: 3000 #

NO. OF REPORTS: 5+

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA



INSTRUMENT NO.: T-732 CAPACITY(P.S.I.): 3000 DEPTH: 4001 FT.
 PORT OPENING: OUTSIDE BOTTOM HOLE TEMP.: 214 PAGE 1 OF 2

DESCRIPTION	LABELLED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	1919.2		
FINAL FLOW(1)	2	210.9	73	74
FINAL FLOW(2)	3	107.2	120	119
FINAL SHUT-IN	4	1401.5		
FINAL HYDROSTATIC MUD	5	1881.0		

CHARTS INDICATE TOOL PLUGGING DURING THE FLOW PERIOD.

INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1		1919.2				
2	0	210.9	149.000	2.173	76.4	HYDROSTATIC MUD
3	74	107.2	75.000	1.875	102.5	FINAL FLOW(1)
3	0	107.2	50.333	1.702	224.7	FINAL FLOW(2)
			38.000	1.580	262.9	STARTED SHUT-IN
	1.5	331.9	15.800	1.199	460.4	
	2.0	370.1	13.333	1.125	512.5	
	2.5	418.2	11.571	1.063	549.6	
	3.0	451.2	10.250	1.011	588.9	
	3.5	480.1	9.222	0.965	622.5	
	4.0	505.0	8.400	0.924	658.4	
	4.5	539.8	7.727	0.888	676.4	
	5.0	567.6	7.167	0.855	699.0	
	6	619.7	6.692	0.826	724.5	
	7	656.8	6.286	0.798	746.5	
	8	696.1	5.933	0.773	767.3	
	9	729.7	4.700	0.672	844.3	
	10	765.6	3.960	0.598	894.1	
	11	783.6	3.467	0.540	965.4	
	12	806.2	3.114	0.493	1001.3	
	13	831.7	2.850	0.455	1027.3	
	14	853.7	2.644	0.422	1074.8	
	15	874.5	2.480	0.394	1101.4	
	20	951.5	2.345	0.370	1127.5	
	25	1001.3	2.233	0.349	1149.5	
	30	1072.6	2.138	0.330	1169.8	
	35	1108.5	2.057	0.313	1183.7	
	40	1134.5	1.987	0.298	1195.3	
	45	1182.0				
	50	1208.6				
	55	1234.7				
	60	1256.7				
	65	1277.0				
	70	1290.9				
	75	1302.5				

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	80	1318.1	1.925	0.284	1210.9	
	85	1329.7	1.871	0.272	1222.5	
	90	1342.4	1.822	0.261	1235.2	
	95	1354.6	1.779	0.250	1247.4	
	100	1366.2	1.740	0.241	1259.0	
	105	1376.6	1.705	0.232	1269.4	
	110	1386.4	1.673	0.223	1279.2	
	115	1394.5	1.643	0.216	1287.3	
	119	1401.5	1.622	0.210	1294.3	
4						FINAL SHUT-IN
5		1881.0				HYDROSTATIC MUD

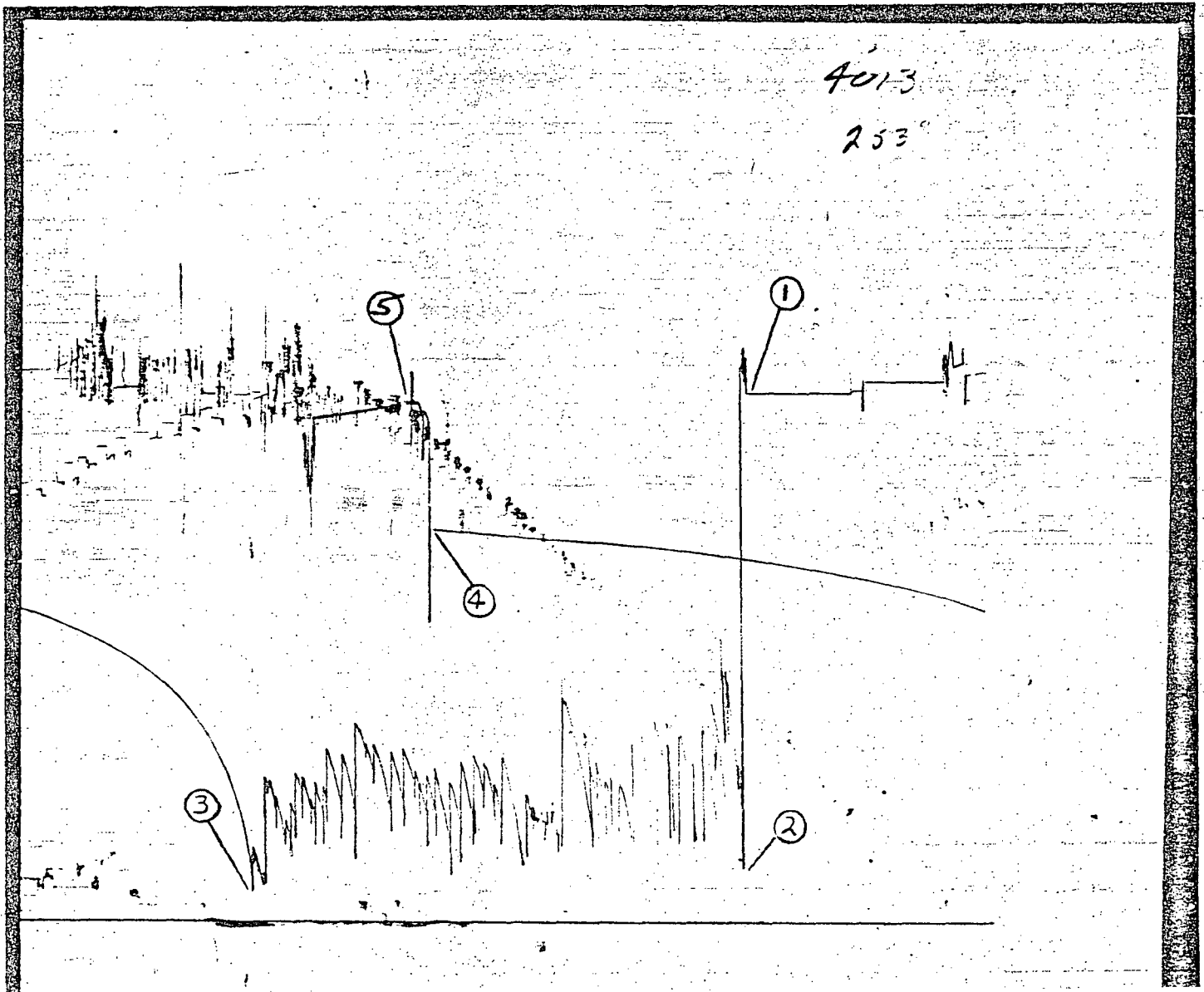
FIELD REPORT NO.: 06763 c

INSTRUMENT NO.: T-141

CAPACITY: 3000#

NO. OF REPORTS: 5+

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA



INSTRUMENT NO.: T-141 CAPACITY(P.S.I.): 3000 DEPTH: 4007 FT.
 PORT OPENING: OUTSIDE BOTTOM HOLE TEMP.: 252 PAGE 1 OF 2

DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	1880.7		
FINAL FLOW(1)	2	189.8	73	74
FINAL FLOW(2)	3	103.3		
FINAL SHUT-IN	4	1391.3	120	119
FINAL HYDROSTATIC MUD	5	1848.0		

CHARTS INDICATE TOOL PLUGGING DURING THE FLOW PERIOD.

INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1	0	1880.7	149.000	2.173	141.4	HYDROSTATIC MUD
2	0	189.8	75.000	1.875	193.9	FINAL FLOW(1)
3	74	103.3	50.333	1.702	240.6	FINAL FLOW(2)
3	0	103.3	38.000	1.580	288.0	STARTED SHUT-IN
	0.5	244.7	19.500	1.290	424.1	
	1.0	297.2	17.444	1.242	452.7	
	1.5	344.0	15.800	1.199	479.0	
	2.0	391.3	13.333	1.125	524.5	
	2.5	430.4	11.571	1.063	563.1	
	3.0	466.6	10.250	1.011	599.3	
	3.5	498.8	9.222	0.965	629.7	
	4.0	527.4	8.400	0.924	658.3	
	4.5	556.0	7.727	0.888	684.6	
	5.0	582.3	7.167	0.855	707.9	
	6	627.9	6.692	0.826	729.5	
	7	666.4	6.286	0.798	750.6	
	8	702.6	5.933	0.773	768.7	
	9	733.0	4.700	0.672	849.3	
	10	761.6	3.960	0.598	911.2	
	11	787.9	3.467	0.540	960.8	
	12	811.3	3.114	0.493	1002.3	
	13	832.9	2.850	0.455	1036.8	
	14	853.9	2.644	0.422	1066.0	
	15	872.0	2.480	0.394	1091.1	
	20	952.6	2.345	0.370	1114.5	
	25	1014.5	2.233	0.349	1135.5	
	30	1064.2	2.138	0.330	1154.2	
	35	1105.6	2.057	0.313	1171.1	
	40	1140.1	1.987	0.298	1188.1	
	45	1169.3				
	50	1194.4				
	55	1217.8				
	60	1238.8				
	65	1257.5				
	70	1274.4				
	75	1291.4				

Instrument No. T-141

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	80	1305.4	1.925	0.284	1202.1	
	85	1318.8	1.871	0.272	1215.5	
	90	1331.1	1.822	0.261	1227.8	
	95	1342.8	1.779	0.250	1239.5	
	100	1354.5	1.740	0.241	1251.1	
	105	1363.8	1.705	0.232	1260.5	
	110	1373.7	1.673	0.223	1270.4	
	115	1382.5	1.643	0.216	1279.2	
	119	1391.3	1.622	0.210	1287.9	
4						FINAL SHUT-IN
5		1848.0				HYDROSTATIC MUD

Side wall Samples Kosmas 8-1

- 600' sandy clay - red brown holds shape
- 696' soft wet sandy clay
- 767' coarse sand w/ red-brown clay matrix
- 900' fine - coarse sand w/ red-brown clay matrix
- 1024' v. fine sands & sandy clay
- 1090' pebb. - coarse sand w/ red-brown clay matrix
- 1109' pebb. - lithic fragments in coarse sandy matrix
- * 1190' coarse sand with small lithic fragments - good hydrothermal alteration? ^{calciferous?} hydrothermal crystals
- 1289' very fine - fine sand in red-brown clay matrix
- 1430' med - coarse sand, some pebb, w/ dark brown clay matrix
- 1628' fine sand - friable
- 1704' coarse sand w/ lithic frag, red-brown clay matrix
- 1845' very fine sand w/ red-brown clay matrix
- * 1927' poorly-sorted pebble conglom, lithic frags, clay matrix (alteration)
- 2000' very fine - fine sand w/ red-brown clay matrix
- 2110' coarse sand & lithic frag w/ red-brown clay hydrothermal alt.
- * 2150' very fine sand, somewhat friable, w/ red-brown clay hydrothermal alt.
- 2274' red brown clay w/ v. fine sand in red-brown clay matrix
- 2720' very fine sandy clay
- * 2942' v. fine sand, semi friable, w/ gray clay matrix, some alt. feldspar
- 3010' v. fine - fine sand, semi friable w/ gray clay matrix
- * 3064' fine-med sand friable, chlorite & other alt. min. present
- * 3090' fine-med sand friable, various alt. min. pyrr. chlorite

* 3940 light blue-grey, fine sandstone altered matrix few gtz remnants gyp? -??
occ black fragments volc glass, obsidian?? T/S

* 3121' fine-med sand friable; pyrite, chlorite

* 3200' fine sand semi friable w/ gray clay matrix; chlorite & other alt minerals

3310' med sand friable, hydrothermal alter.

* 3322' fine-med sand friable, alter. rings present minor chlorite

3380' fine sand w/ gray clay matrix

3420' fine-fine sand w/ gray clay matrix

3590' gray clay stone frag & fine sand in stringy red-grey clay

3730' bright red(-maroon) clay matrix surrounding isolated gtz (gyp?) grains some black(mag?) grains: very soft

* 3850' soft, friable v. fine sand partly consolidated gtz rich, rare mag?, would be good to thin section but very broken up. lt grey

* 3862' lt grey sandstone with clay matrix, partially consol. some black (Fe or calc?) matrix many clays may have to T/S this rather than

3872' similar to above but more green color showing through alteration was at one time a med-course sand v. extensive alteration only remnant gtz.

3877' blue-grey clay probably hydrothermal but v. little evidence of primary sandstone structure, no bedding or banding low mottled appearance X-ray

* 3910' very dk rabbit-brown; nearly black - carbonaceous or hematitic "friable shale"

* 3957' lt bluish-grey clay, occ sand frags, possibly hydrothermal may be lacustrine no bedding or banding X-ray

* 3970' dk grey-green clay probably hydrothermal - probably was top of mafic flow or intrusive chlorite - hematite pyrite (v. fine) common thin section

3990' hydrothermally altered basalt (basaltic andesite?) feldspars are warty, shot pyroxenes completely altered thin section

Temperature Run

	#9	#10	#11	#12					
Time tool reached bottom	11 52	12 45	13 36	14 27					
Time tool pulled off bottom	12 15	13 07	13 55	14 48					
Time tool on bottom	23	22	19	21					
Temperature readings (°F)									
Thermometer #738-167	2 06	2 12	2 07	2 05					
Thermometer #738-166	2 09	2 14	2 08	2 07					
Thermometer #738-113	2 11	2 17	2 11	2 07					
Depth of thermometers	32 20'	32 20'	32 20'	32 20'					
Time since last circulation (5:10) in minutes	4 25	4 77	5 25	5 78					
Run #11 and #12: Temperatures too low (shake-down?)									

11/28/75
 RWB/RJA
 Kosmos 1-8

Temperature Run

	#1	#2	#3	#4	#5	#6	#7	#8
Time tool reached bottom	5 27	6 18	6 59	7 39	8 34	9 19	10 03	11 00
Time tool pulled off bottom	5 48	6 38	7 19	7 59	8 56	9 42	10 25	11 23
Time tool on bottom	21	20	20	20	22	23	22	23
Temperature readings (°F)								
Thermometer #738-167	1 40	1 60	1 72	1 68 (757)	1 88	1 93	1 96	2 15
Thermometer #738-160	1 40	1 61	1 73	1 69	1 84	1 88	1 90	2 17
Thermometer #738-173	1 41	1 62	1 74	1 69	1 86	1 88	1 91	2 18
Depth of thermometers	32 20'	32 20'	32 20'	32 20'	32 20'	32 20'	32 20'	32 20'
Time since last circulation (5:10) in minutes	38	88	1 29	1 69	2 26	2 72	3 15	3 73
Run #4: thermometer shake-down?								
Run #8: mercury separated below capillary (too high)								

AV - San Emidio
Kosmos #1-8

A.P.I. No.

Well logs

CHEVRON RESOURCES CO.
WELL SUMMARY REPORT - GEOTHERMAL

Operator Chevron Resources Co.		Well name and number Kosmos 1-8				
Field San Emidio, Nevada		County Washoe, Nevada	Sec. 8	T. 29N	R. 23E	B.&M. MD

Location (property or section corner, or street center lines) 3098.16 S, 5358.95 W of Mineral Monument #136 (Final) This is approx. 635'N, 753'E of SE Cor Sec 8 (Projected)		Elevation of ground XXXX above sea level) 4040'
--	--	---

Commenced drilling (date) Nov. 13, 1975	Total depth (XXXX) 4013	Plugged depth (XXXX) -	Depth measurements taken from top of: <input type="checkbox"/> Derrick floor <input type="checkbox"/> Rotary table <input checked="" type="checkbox"/> Kelly bushing
Completed drilling (date) Nov. 30, 1975	Geologic formation and age at total depth -		Which is 10' XXXX above ground.
Commenced producing (date) -	Geologic marker(s) -		Depth (meters) -

Junk
None

DATE	STATIC TEST (Shut-in well head)		PRODUCTION TEST DATA										
	Temp °C	Press. bars	Total mass flow data					Separator data					
			kg/hr	Temp °C	Press. bars	Enthalpy	Orifice	Water kg/hr	Steam kg/hr	Press. bars	Temp °C		
None													

CASING RECORD (present hole)									
Size of casing (A.P.I.)	Top of casing (x)	Depth of shoe (x)	Weight of casing (kg)	New or second hand	Seamless or lapweld	Grade of casing	Size of hole drilled (xx)	Volume of cement (xx)	Depth of cementing if through perforations (m)
10³/₄"	Surf	80'	32.75#	N	Smls	K-55	16"	100 cu.ft.	-
7"	Surf	564'	23#	N	Smls	K-55	9 7/8" 6 1/4"	195 cu.ft.	-

PERFORATED CASING (size, top, bottom, perforated intervals, size and spacing of perforation and method)
None

Was analysis of effluent made? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Electric log depths 564, 4013	Temperature depths 3940
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In compliance with Section 3735, Chapter 4, Division 3 of the Public Resources Code, the information given herewith is a complete and correct record of the present condition of the well and all work done thereon, so far as can be determined from all available records.

Name B. D. Garrett	Title Operations Supervisor	
Address 225 Bush Street	City San Francisco	Zip Code 94104
Telephone Number 894-3192	Signature <i>B.D. Garrett</i> 4/10/77	Date March 30, 1977

File this report in duplicate with the appropriate geothermal district office.

CHEVRON RESOURCES CO.
WELL HISTORY - GEOTHERMAL

Operator Chevron Resources Co.		Well name and number Kosmos 1-8				
Field San Emidio, Nevada		County Washoe, Nevada	Sec. 8	T. 29N	R. 23E	B.&M. MD
<p><i>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 redrilling, permanently altering casing, plugging, or abandonment, with the dates thereof. Be sure to include such items as hole size (in cm), formation test details, volumes of cement used (in m³), top and bottom of plugs (in m), perforation details, sidetracked junk, bailing tests, shooting and initial production data (in kg/hr), and zone temperature (in °C).</i></p>						
DATE	HISTORY					
	Cemented 80' 10 ^{3/4} " 32.75# K-55 socket weld conductor at 80'					
11/13/75	Moved in Atlantic Drilling Co. Rig #14 and installed 10" Hydril GK BOP.					
11/14/75	Spud at 3am & drilled 9 7/8" hole to 574'. Ran Schlumberger DIL and Sonic Caliper.					
11/15/75	Ran 7" casing to 574'. Using Halliburton, cemented w/195 cu.ft. of slurry including Class G cement, 33% silica flour. Preceded cement w/30 cu.ft. water and displaced with 108 cu.ft. water. Bumped plug at 1000 psi. Good circulation throughout. No cement returns. Cemented 7" x 10 ^{3/4} " annulus with 45 cu.ft. slurry, as above, through 1" pipe hung at 60'.					
	<u>Casing Detail</u>					
	14 joints or 568.22' 7" 23# K-55 LIG unknown brand. Includes Baker float shoe at 564' and float collar at 522'. Two B-M KK6 centralizers on bottom joint, and at 522, 440, 319, 198, and 76. 4.22' above D.F.					
<p>In compliance with Section 3735, Chapter 4, Division 3 of the Public Resources Code, the information given herewith is a complete and correct record of the well and all work done thereon, so far as can be determined from all available records.</p>						
Name B. D. Garrett		Title Operations Supervisor				
Address 225 Bush St.		City San Francisco			Zip Code 94104	
Telephone Number 894-3192		Signature			Date March 30, 1977	

File this report in duplicate with the appropriate geothermal district office.

- 11/16/75 Install 6" 2000# API tubing head. Installed Class III BOP.
- 11/17/75 Tested BOP to 2000#. Drilled out plug and float collar at 522 and shoe at 564. Drilled 6 $\frac{1}{4}$ " hole to 950. Had minor mud loss at 750'; 145 bbl. loss at 850', and 80 bbl. loss at 1057'. Drilling through small cavities.
- 11/18/75 Drilled 6 $\frac{1}{4}$ " hole to 1539. Lost partial returns while drilling 1058-1087 (lost 137 bbl mud).
- 11/19/75 Drilled 6 $\frac{1}{4}$ " hole to 1822. No fluid loss.
- 11/20/75 Drilled 6 $\frac{1}{4}$ " hole to 2501.
- 11/21/75 Drilled 6 $\frac{1}{4}$ " hole to 3243.
- 11/22/75 Drilled 6 $\frac{1}{4}$ " hole to 3243. Ran 10 $\frac{1}{2}$ hr. temperature buildup survey. P.O.H. RIH w/new bit. Found 13' fill. Raised mud viscosity.
- 11/23/75 Drilled 6 $\frac{1}{4}$ " hole to 3885.
- 11/24/75 Drilled 6 $\frac{1}{4}$ " hole to 4013. Ran Schlumberger DIL, tool stopped at 3902. Logged 3902-564. RIH and cleaned out bridge at 3902 and reamed to 4013. Raised mud viscosity to 50 sec. Made 10 stand wiper run found bridge at 3902. Raised viscosity to 60 sec and made 5 stand wiper run. Found no bridge.
- 11/25/75 Ran Schlumberger DIL, CNL-FCD-Gamma, Dipmeter from 4013 to 564. Took 32 side wall samples at selected intervals. RIH and conditioned for D.S.T.
- 11/26/75 Ran Johnston MFE tester with packers at 3892' and 3898'. Opened tool for 1 hour light puff blow and dead. Shut in for 1 $\frac{1}{2}$ " buildup. Recovered 10' rise but discovered that float valve had not been removed from drill pipe. RIH and conditioned hole.
- 11/27/75 Ran Geonomics resistivity survey. RIH and conditioned for retest.
- 11/28/75 Ran Johnston MFE tester and set packers at 3877 and 3883. Opened tool for 73 min. Had medium-light blow diminishing to dead in 42 min. Shut tool in for 2 hr. buildup. Recovered 70' rise of drilling fluid. Charts showed partial plugging.
- 11/29/75 RIH to 3200' and conditioned hole. Ran Geonomics resistivity survey. R.I.H. to 4013 and conditioned hole. Laid down drill pipe.
- 11/30/75 Ran 2 7/8" EUE tubing and hung at 3942. Rigged down and released rig.

TUBING DETAIL

129 joints (3931.96') 2 7/8" EUE 8R N-80 tubing with slotted guide nipple and Baker float collar on bottom.

Tubing	3931.96
KB	<u>10.04</u>
	3942.00

KOSMOS 1-8
DRIFT SHOTS

<u>DEPTH</u>	<u>DRIFT</u>
90'	0°-30'
195'	0°-30'
395'	1°-15'
564'	1°-15'
863'	0°-15'
1174'	0°-00'
1330'	0°-15'
1855'	0°-30'
2257'	1°-00'
2501'	0°-30'
3000'	0°-45'
3733'	6°-00'
3827'	6°-30'
3920'	6°-30'
4010'	7°-30'