

601094

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
3:45 PM	257-288	very fine-grained siltstone- light grey to white- clay estimate - 50% pyrite cubes - green zeolite? trace	50%	98°		105°
4:15 PM	288-318	white to light grey silty clay- (most of sample washes away)	100	94°		105°
4:45 PM	318-348	very fine-grained siltstone & silty clay- common pyrite (2-3%) weak cement-Mainly compaction	~50% 50	103°		118°
5:15 PM	348-378	white, poorly cemented silt silty clay & unconsolidated clay pyrite common-cubes in clay	30 70	104°		115°
5:30 PM	378-408	silty clay white to lt. grey mainly quartz & feldspar? very minor dk minerals- some bitite? common pyrite	100	102°		115° (estimated)
?	408-437	Lt. grey silty clay as above very sticky-silt fraction <10% - trace pyrite	100	102°		110° (estimated)
8:55 PM	437-467	silty clay well cemented (silica) - siltstone secondary silica trace pyrite clay sometimes has green tinge - zeolite?  (Look at this in office - section &/or X ray?)	50 40 10	122°		126°
9:20 PM	467-497	silica cemented fine to very fine siltstone lt. grey clay massive secondary silica - some red like jasper? trace pyrite common green zeolite (?) in clays & silts	70 25 5	126°		131°

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(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
9:50 PM	497-505	white, grey, green & rarely-reddish - well cemented siltstone	80	120°	Bottoms up sample	131°
		massive quartz, pyrite, occ. brown banded (opal or jasper) & zeolites?	20		(Look at this sample)	
2/3/78	505-583	sand, fine, medium and coarse contains qtz detritus, pyrite, volcanics and siltstone	50	103°		103°
		siltstone - dark grey, well cemented	25			
		siltstone - white, grey, blue-green, medium cemented. No reaction with HCL.	25			
	583-610	No sample		105°		105°
2/4/78	610-643	Basalt, dark, hard, pyrite	40	110°		not measured
		Siltstone, bluish, very well cemented	30			
		Sand a/a HCL -	30			
		White quartz	TC			
	647-674	Sand a/a	40	120°		"
		Basalt a/a	30			
		Siltstone, bluish a/a	25			
		Quartz, white	5			
	674-704	Siltstone, bluish, medium to very well cemented	35	120°		"
		Sand - fine to coarse, some granule gravel contains quartz detritus				
		siltstone fragments and some volcanics. Subangular, poorly sorted.	35			
		Basalt, dark, dense, hard	25			
		Silica, white,	5			
	705-737	Basalt a/a	60	113°		123°
		Sand and granule gravel a/a	30			
		Siltstone, white, poorly cemented	5			
		Silica, white	5			

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TIME	DEPTH (ft)	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/4/78	737-768	Clay, soft, gummy, sandy	100	117°		not measured
	768-802	Clayey sand and gravel, grey	100	112°		112°
	802-832	Sand, fine to coarse, granule gravel	60	114°		112°?
		Clay, bluish	30			
		Basalt and quartz	5% 5			
	832-863	Clay, sandy, bluish	100	114°		120°
	863-834	Clay, sandy, grey	100	114°		118°
	834-924	a/a	100	118°		118°
2/5/78	924-954	Clay, sandy, reddish	100	118.5°		118.5°
	954-987	a/a	100	117°		119°
	987-995	Sand, very fine to very coarse, some granule gravel. Detrital quartz. Sand dark grey .. subangular to subrounded - HCL	30	102°		Temp. out not certain
		Basalt - dark, dense	10			
	995-1026	Gravel, granule & very coarse sand	85	102°		"
		Basalt a/a	10			"
		Clay, reddish, soft, gummy	5			"
		Quartz	TC			"
	1026-1052	Sand very fine to very coarse Granule gravel	70 20	102°		Mud out - not certain
		Clay, brownish, soft, gummy	10			
		Basalt, quartz	T			
	1053-1089	a/a	a/a	108°		118°
1083-1120	a/a	a/a	112		120	
1120-1152	Gravel, granule, volcanics and siltstone fragments	20	118°		125°	
	Sand, dark very fine to very coarse, quartz and sec. silica	80				
1152-1184	a/a	a/a	120°		125°	
1184-1213	Sand and granule gravel a/a	100	120°		128°	
1213-1244	Sand and granule gravel, volcanic, quartz grains and sec. silica, reddish silt.	100	120°		130°	

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CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/5/78	1244-1276	Gravel, granule-volc. red & blue sit. quartz pyrite	50	118°		128°
	1276-1304	Sand very fine to very coarse- volc., quartz det. a/a	50 a/a	124°		136°
	1306-1369	Clay, reddish, sandy	100	124°		136°
	1369-1400	No sample			(Crew did not take one)	
	1400-1432	Gravel, volcanic, granule to very fine pebble, subangular to subrounded. Sand, very fine to very coarse. Quartz detritus, pyrite. Red clay.	100	128°	Very poor recovery. Therm. damaged	134°
	1432-1492	No sample			(Driller did not take one)	
	1492-1522	Gravel, granule and sand, coarse to very coarse, sec. silica, quartz grains, pyrite.	80	121°		130°
		Clay, bluish	20			
	1522-1553	Sand and gravel a/a Clay a/a	35 5	129°		130°
	1553-1585	Sand and gravel a/a, pyrite Sandy clay, slight reaction to HCL	30 10	129°		133°
	1585-1615	Sand, coarse to very coarse Quartz detritus. Grains subrounded to subangular. Pyrite.	50	130°		132°
		Clay/silt, reaction to HCL positive; biotite	25			
		Gravel, granule, subangular to subrounded	25			

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CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/5/78	1615-1646	Sand, coarse to very coarse. Abundance of quartz detritus Gravel, granule, subrounded, silica fragments Clay/silt, grey, positive reaction to HCL	60 20 20	128°		135°
	1646-1678	Sand a/a Gravel, granule a/a Clay/silt a/a	65 20 15	127°		134°
	1678-1707	Gravel, granule and fine pebble, subrounded Sand, coarse and very coarse Clay/silt a/a, positive HCL	50 20 30	120°		123°
	1708-1741	Gravel, a/a Sand a/a, pyrite, biotite Clay/silt a/a, positive HCL, color changed from grey to reddish	50 30 20	120°		130°
2/6/78	1741-1906	Sand - fine to coarse, quartz predom., sec. silica Gravel, granule or fine pebble, subangular reddish and bluish siltstone, quartz Clay/silt, positive HCL, color- grey	50 30 20	120°	Sample not taken by mooring tower.	130°
2/7/78	1906-1948	Gravel-up to 5 mm fragments- generally dk green to grey quartz, volcanic (basalt) and siltstone fragments Fine grained clay 20% estimated pyrite - trace	80 20	116°		132°
	1948-1978	SS - dk greenish grey, coarse grained-up to 2 mm rounded grains, mainly quartz, some quartzite, some rhyolite & basalt? lt. green zeolite? common. trace pyrite	100	124°		136°

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CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/7/78		(1978-1989 - No sample - having circulation problems - Almost complete loss of returns @ 1989)				
	1989-2020	Fine to coarse ss & gravel Quartz fragments & an intermediate volcanic - Andesite ? Grains well rounded - trace pyrite Red silty clay	60     40	135°	Clay was playa deposit?- coarse, poorly sorted but well rounded grains alluvial or fan deposits?	138°
	2020-2052	Dk. red-brown silty clay	100	122°		138°
	2052-2081	AA	100	119°		140°
	2081-2114	Dk. grey green fine gr. ss Quartz, volcanics, some granite? Red Brown silty clay as above	30  70	118°		130°
	2114-2143	Fine-med. gr. quartz ss - with some volcanic (rhyolite)? Dk. red Brown silty clay	60  40	118°		134°
	2143-2171	SS - med-coarse gr., dk. green, mostly quartz & quartzite & quartz-mica schist. Lt. grey silty clay	70  30	114°		134°
2/8/78	2175-2205 (torco adjusted)	Sand, lithic - medium grained, greenish grey, composed of quartzite, massive quartz, quartz. micro- breccia, and volcanic frag- ments, mainly basalt - vesicular. Grains well rounded. Clay, green to grey & occasionally pink-silty. pyrite - trace.	70  30	120°		126°

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(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/8/78	2205-2236	Sand, med-coarse grained, well rounded, quartz grains and quartzite fragments, some veins from metamorphic Rx - foliated	20	109°		124°
		Clay, silty, green & lt. grey pyrite - trace - crystalline on clays -	80			
	2236-2267	Sand - lithic - mainly quartz, quartzite & quartz micro-breccia. greenish grey	60	111°	Joe - check mineralogy	127°
		Green & grey silty clay	30			
		Red-brown-sedimentary hemitite? - soft with occasionally striated surfaces - lustrous - like slickensides only too soft - Also gypsum as coating on clay grains - trace pyrite - possible galena some calcareous material - trace calcite?	10			
	2267-2300	Siltstone - fine grained, grey to greenish & brownish gray - moderately well compacted but not apparently cemented	50	118°		132°
		Clay - soft, brownish red trace massive quartz & pyrite trace green vein filling	50			
	2300-2330	Red & green silty clay	95	117°		132°
		Massive vein quartz & granite gneiss fragments trace pyrite	5			
	2330-2357	Siltstone, fine grained, moderately well cemented (siliceous)-medium to light greenish grey	90	120	Sample-spot check-	137
		Clay - lt. grey strong trace of sulfurs - crystalline coating on siltstone chunks, some blade-like crystals. Also trace	10		Check mineralogy	

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE 1-30-78 SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
1/30/78	0-70'	gummy clay alluvial sand secondary silica & calcite cement (* Note: % silica >>> % calcite), secondary quartz crystals are also present	40 30 30	54°F		73°F
	70-100	gummy clay <u>extremely</u> fine grained sand	97 3	55°		64°
* Somewhere in ) this interval ) ran out of ) clay ) (MAL) )	100-130	gummy clay very fine sand which consists of siliceous cement (with little calcite) with disseminated pyrite. The pyrite fraction of the sand is ~ 4%	90 10	54°		89°
	130-162	clay *pyrite is disseminated in clay gravel size fragments consist- of alluvial material and siliceous cement (% alluvial material >> % siliceous cement).	90 10	99°	*Mud out temperature is not reliable, see drilling notes.	77°
*	162-194	most of clay fraction was lost during the sample washing procedure gravel & coarse sand consisting of very fine-grained siliceous cement (jasperoid) and slightly coarse-grained silica & little calcite cement with disseminated pyrite	80 20	86°	As a result of the siliceous cement drilling is slow.	104°
10:30 AM 2/1/78	194-224	siltstone, very well cemented with minor pyrite Massive, non crystalline secondary quartz, sometimes fragmental, re-cemented	80 20	MI 90) MO 95)	Most of sample from	
3:15 PM	224-257	fine-grained siltstone-no noticeable cement strong trace pyrite clay - blue green	50 50	98°		105°



FILE COPY

*Will file  
NY - MDR  
12/20/2008 SAT  
KOSMOS*

<b>JOHNSTON</b>
<b>Schlumberger</b>

# technical report

COMPANY CHEVRON, U.S.A., INC. WELL KOSMOS #1-9 TEST NO. 1 COUNTY WAHDE STATE NEVADA

F.R. # 10690 D

NV/SE/CRC-10



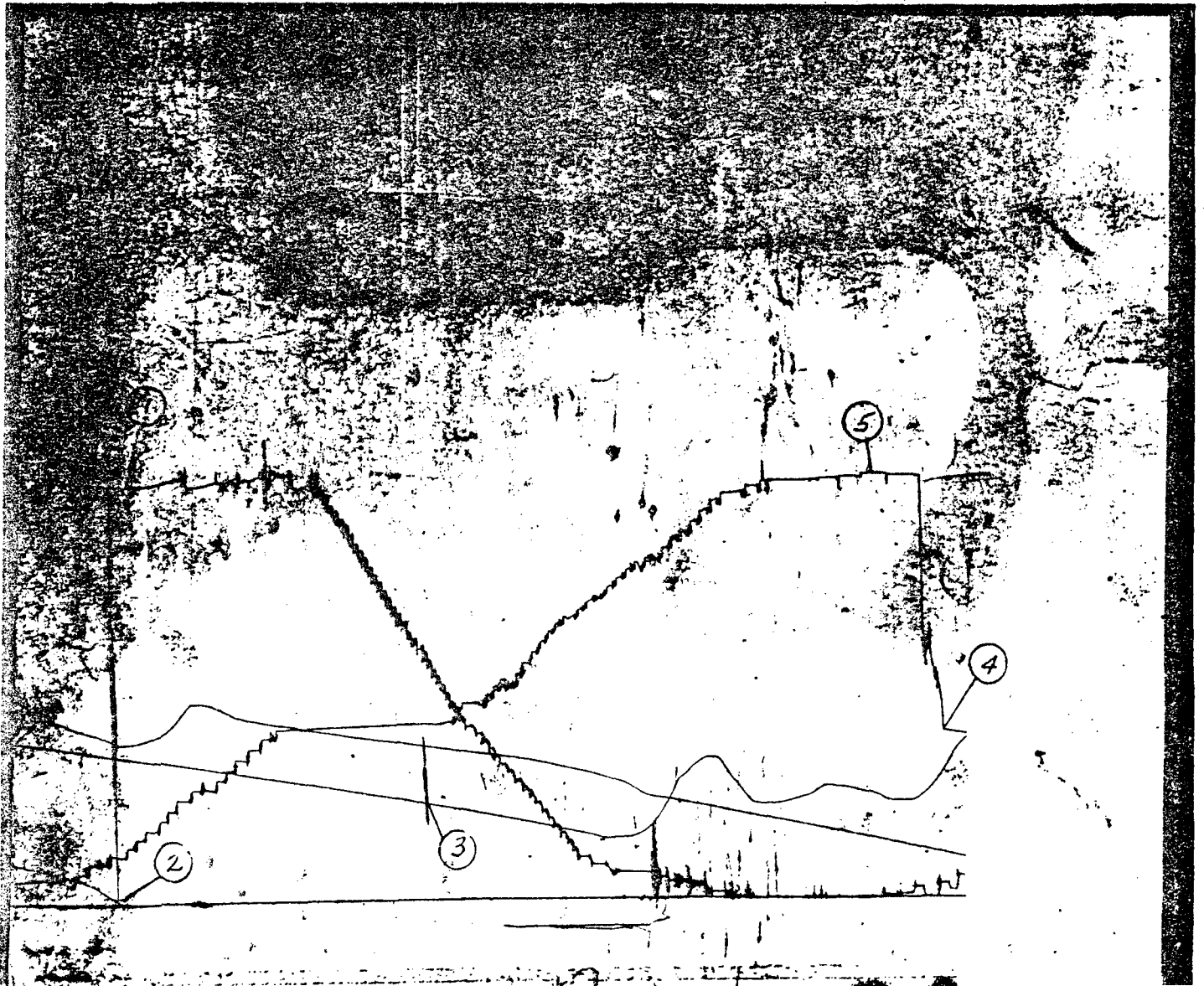
FIELD REPORT NO.: 10690 D

INSTRUMENT NO.: J-013

CAPACITY: 4700#

NO. OF REPORTS: 5+

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA



INSTRUMENT NO.: J-013      CAPACITY(P.S.I.): 4700      DEPTH: 5214 FT.  
 PORT OPENING: INSIDE      BOTTOM HOLE TEMP.: 250      PAGE 1 OF 3

DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	2386.9		
FINAL FLOW(1)	2	33.6		
FINAL FLOW(2)	3	562.3	465	467
FINAL SHUT-IN	4	943.0	129	127
FINAL HYDROSTATIC MUD	5	2412.5		

INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1		2386.9				HYDROSTATIC MUD FINAL FLOW(1)
2	0	33.6				
	5	84.8				
	10	133.3				
	15	162.7				
	20	187.4				
	25	210.2				
	30	231.0				
	35	251.0				
	40	272.8				
	45	295.6				
	50	315.5				
	55	336.4				
	60	358.2				
	65	378.2				
	70	397.2				
	75	416.1				
	80	435.1				
	85	453.2				
	90	473.1				
	95	493.0				
	100	512.0				
	105	531.0				
	110	550.0				
	115	567.1				
	120	585.1				
	125	612.7				
	130	667.7				
	135	700.9				
	140	728.5				
	145	749.4				
	150	771.2				
	155	792.1				
	160	809.2				
	165	822.5				
	170	834.8				
	175	847.1				
	180	861.4				

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	185	875.6				
	190	888.9				
	195	904.1				
	200	917.4				
	205	928.8				
	210	942.1				
	215	957.3				
	220	971.5				
	225	981.0				
	230	1005.7				
	235	1019.9				
	240	1036.0				
	245	1064.5				
	250	1110.1				
	255	1131.9				
	260	1063.6				
	265	966.7				
	270	937.3				
	275	917.4				
	280	933.5				
	285	967.7				
	290	996.2				
	295	1032.2				
	300	1056.9				
	305	987.6				
	310	882.3				
	315	737.0				
	320	610.8				
	325	555.7				
	330	555.7				
	335	590.8				
	340	615.5				
	345	635.4				
	350	644.9				
	355	589.9				
	360	564.2				
	365	545.3				
	370	551.9				
	375	638.3				
	380	764.5				
	385	810.1				
	390	740.8				
	395	610.8				
	400	460.8				
	405	383.9				
	410	364.9				
	415	363.0				
	420	385.8				
	425	405.7				
	430	425.6				
	435	445.6				
	440	463.6				
	445	483.6				

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	450	501.6				
	455	519.6				
	460	537.7				
	465	554.7				
3	467	562.3				FINAL FLOW(2)
3	0	562.3				STARTED SHUT-IN
	1	564.2	468.000	2.670	1.9	
	2	570.9	234.500	2.370	8.5	
	3	570.9	156.667	2.195	8.5	
	4	574.7	117.750	2.071	12.3	
	5	578.5	94.400	1.975	16.1	
	10	581.3	47.700	1.679	19.0	
	20	595.6	24.350	1.386	33.2	
	30	625.9	16.567	1.219	63.6	
	40	658.2	12.675	1.103	95.9	
	50	689.5	10.340	1.015	127.2	
	60	719.0	8.783	0.944	156.6	
	70	749.4	7.671	0.885	187.0	
	80	781.6	6.837	0.835	219.3	
	90	810.1	6.189	0.792	247.8	
	100	837.6	5.670	0.754	275.3	
	110	867.1	5.245	0.720	304.7	
	120	895.5	4.892	0.689	333.2	
4	127	943.0	4.677	0.670	380.7	FINAL SHUT-IN
5		2412.5				HYDROSTATIC MUD

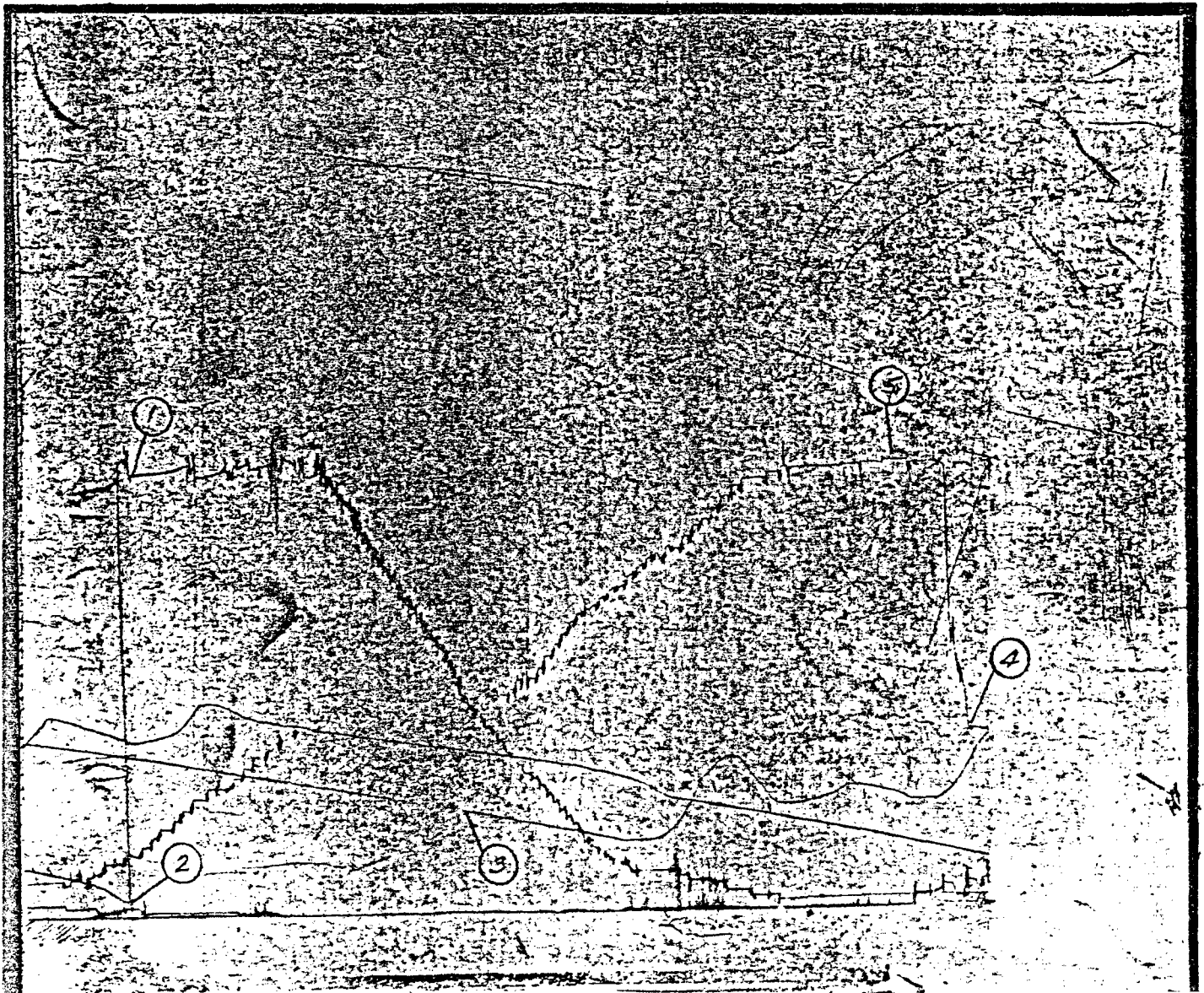
FIELD REPORT NO.: 10690 D

INSTRUMENT NO.: J-494

CAPACITY: 4700#

NO. OF REPORTS: 5+

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA



INSTRUMENT NO.: J-494      CAPACITY(P.S.I.): 4700      DEPTH: 5361 FT.  
 PORT OPENING: OUTSIDE      BOTTOM HOLE TEMP.: 250      PAGE 1 OF 3

DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	2452.5		
FINAL FLOW(1)	2	101.2		
FINAL FLOW(2)	3	586.2	465	467
FINAL SHUT-IN	4	987.2	129	127
FINAL HYDROSTATIC MUD	5	2471.9		

INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1		2452.5				HYDROSTATIC MUD FINAL FLOW(1)
2	0	101.2				
	5	141.8				
	10	189.9				
	15	217.6				
	20	240.7				
	25	261.9				
	30	280.4				
	35	301.7				
	40	322.0				
	45	342.3				
	50	361.7				
	55	382.0				
	60	403.3				
	65	422.7				
	70	441.2				
	75	459.6				
	80	479.0				
	85	497.5				
	90	516.0				
	95	532.6				
	100	550.2				
	105	567.7				
	110	584.4				
	115	601.9				
	120	618.6				
	125	649.0				
	130	701.7				
	135	734.0				
	140	760.8				
	145	782.1				
	150	802.4				
	155	821.8				
	160	838.4				
	165	852.3				
	170	864.3				
	175	876.3				
	180	890.2				



LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	185	905.0				
	190	918.8				
	195	934.5				
	200	950.2				
	205	961.3				
	210	975.2				
	215	990.9				
	220	1004.7				
	225	1016.8				
	230	1042.6				
	235	1055.6				
	240	1075.0				
	245	1097.1				
	250	1147.0				
	255	1173.8				
	260	1130.4				
	265	1025.1				
	270	990.9				
	275	970.6				
	280	979.8				
	285	1016.8				
	290	1044.5				
	295	1080.5				
	300	1104.5				
	305	1043.5				
	310	937.3				
	315	788.6				
	320	657.4				
	325	602.8				
	330	602.8				
	335	632.4				
	340	655.5				
	345	674.9				
	350	683.2				
	355	631.5				
	360	604.7				
	365	588.1				
	370	587.1				
	375	587.1				
	380	683.2				
	385	807.0				
	390	841.2				
	395	768.2				
	400	627.8				
	405	480.0				
	410	409.8				
	415	395.0				
	420	393.1				
	425	411.6				
	430	431.0				
	435	451.3				
	440	469.8				
	445	489.2				

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	450	507.7				
	455	526.2				
	460	544.6				
	465	562.2				
3	467	586.2				FINAL FLOW(2) STARTED SHUT-IN
3	0	586.2				
	1	589.0	468.000	2.670	2.8	
	2	595.5	234.500	2.370	9.2	
	3	596.4	156.667	2.195	10.2	
	4	600.1	117.750	2.071	13.9	
	5	603.8	94.400	1.975	17.6	
	10	620.4	47.700	1.679	34.2	
	20	654.6	24.350	1.386	68.4	
	30	693.4	16.567	1.219	107.2	
	40	720.2	12.675	1.103	134.0	
	50	753.4	10.340	1.015	167.2	
	60	786.7	8.783	0.944	200.5	
	70	820.0	7.671	0.885	233.7	
	80	852.3	6.837	0.835	266.1	
	90	882.8	6.189	0.792	296.6	
	100	914.2	5.670	0.754	328.0	
	110	942.8	5.245	0.720	356.6	
	120	968.7	4.892	0.689	382.5	
4	127	987.2	4.677	0.670	401.0	FINAL SHUT-IN HYDROSTATIC MUD
5		2471.9				

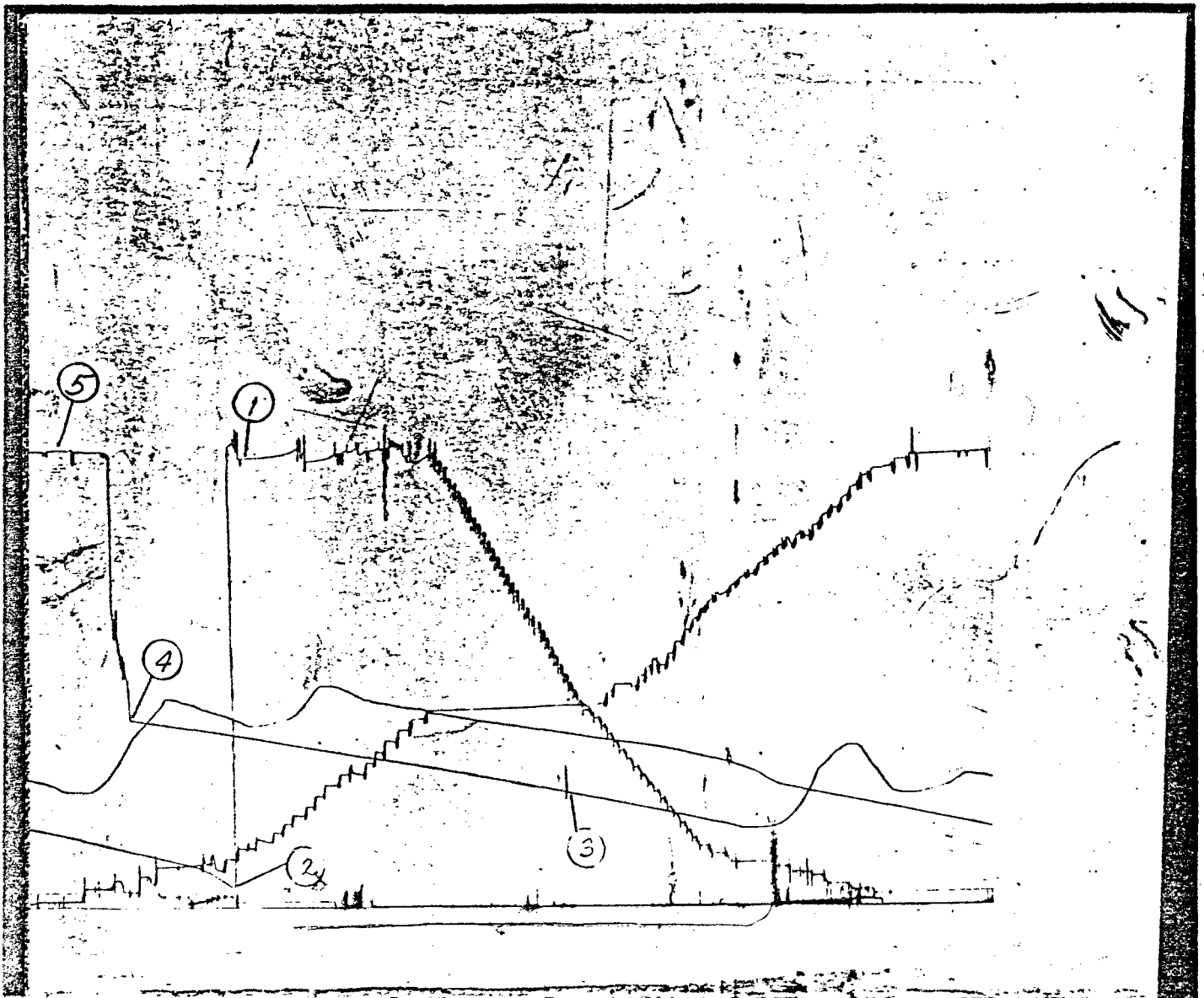
FIELD REPORT NO.: 10690 D

INSTRUMENT NO.: J-865

CAPACITY: 4700#

NO. OF REPORTS: 5+

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA

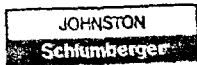


INSTRUMENT NO.: J-865      CAPACITY(P.S.I.): 4700      DEPTH: 5367 FT.  
 PORT OPENING: OUTSIDE      BOTTOM HOLE TEMP.: 250      PAGE 1 OF 3

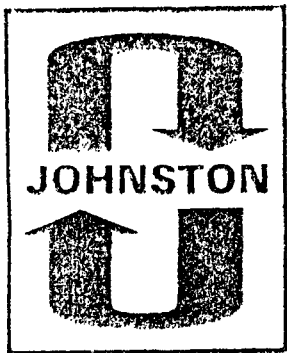
DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	2439.3		
FINAL FLOW(1)	2	107.8		
FINAL FLOW(2)	3	616.1	465	467
FINAL SHUT-IN	4	1014.4	129	127
FINAL HYDRUSTATIC MUD	5	2486.5		

INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1		2439.3				HYDROSTATIC MUD FINAL FLOW(1)
2	0	107.8				
	5	153.3				
	10	201.5				
	15	230.6				
	20	255.1				
	25	277.9				
	30	299.7				
	35	321.5				
	40	342.4				
	45	364.2				
	50	385.2				
	55	406.1				
	60	427.0				
	65	444.3				
	70	463.4				
	75	482.4				
	80	500.6				
	85	519.7				
	90	537.9				
	95	556.1				
	100	574.3				
	105	592.5				
	110	609.7				
	115	627.9				
	120	645.2				
	125	674.3				
	130	727.0				
	135	758.9				
	140	786.2				
	145	807.1				
	150	828.0				
	155	848.0				
	160	864.4				
	165	878.0				
	170	890.7				
	175	901.6				
	180	916.2				



LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	185	930.7				
	190	944.4				
	195	958.9				
	200	974.4				
	205	986.2				
	210	998.9				
	215	1015.3				
	220	1029.8				
	225	1039.8				
	230	1066.2				
	235	1078.9				
	240	1097.1				
	245	1124.4				
	250	1170.8				
	255	1192.6				
	260	1129.0				
	265	1029.8				
	270	999.8				
	275	979.8				
	280	995.3				
	285	1032.6				
	290	1058.9				
	295	1097.1				
	300	1122.6				
	305	1057.1				
	310	954.4				
	315	808.0				
	320	679.8				
	325	623.4				
	330	623.4				
	335	657.0				
	340	681.6				
	345	700.7				
	350	709.8				
	355	653.4				
	360	626.1				
	365	609.7				
	370	616.1				
	375	712.5				
	380	835.3				
	385	866.2				
	390	791.6				
	395	651.6				
	400	507.0				
	405	437.0				
	410	422.4				
	415	420.6				
	420	443.3				
	425	463.4				
	430	483.4				
	435	503.4				
	440	521.5				
	445	539.7				



# PRESSURE LOG\*

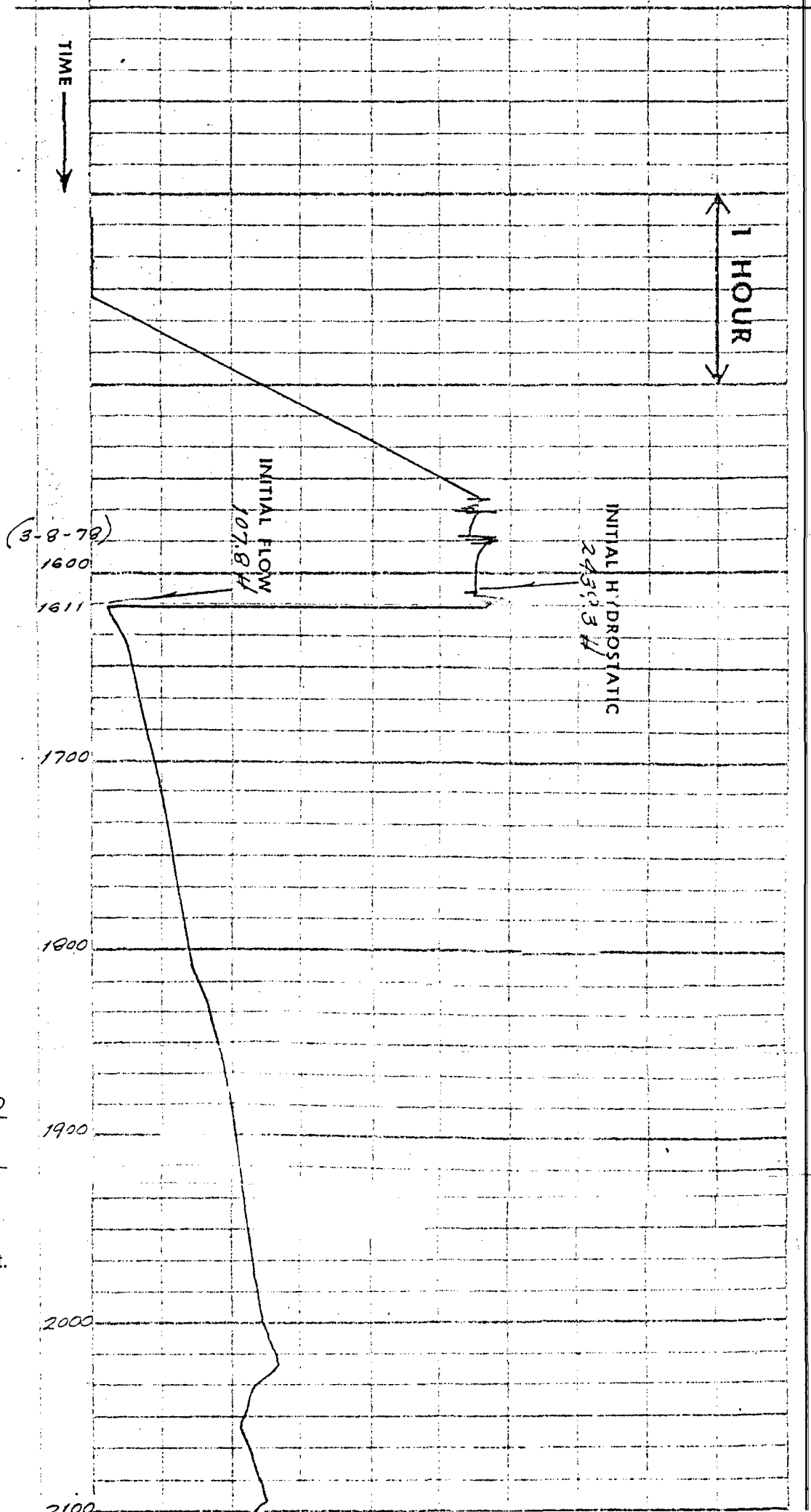
Field Report No. 10690 D

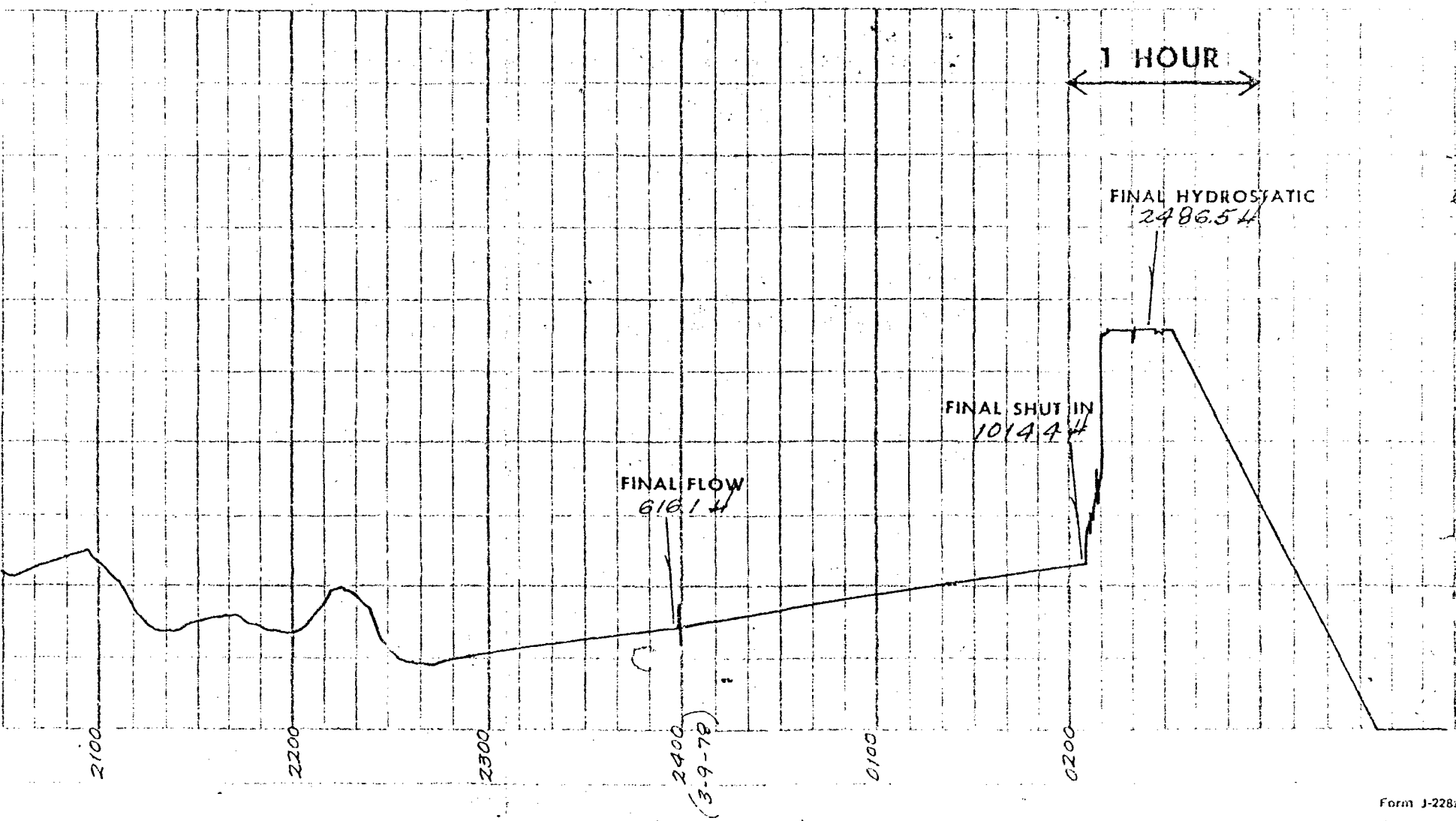
Instrument:  
Number J-865

Capacity 4700 p.s.i.

Depth 5357 ft.

\*a continuous tracing of the original chart





LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	450	557.9				
	455	576.1				
	460	593.4				
	465	609.7				
3	467	616.1				FINAL FLOW(2)
3	0	616.1				STARTED SHUT-IN
	1	619.8	468.000	2.670	3.6	
	2	626.1	234.500	2.370	10.0	
	3	627.0	156.667	2.195	10.9	
	4	630.7	117.750	2.071	14.5	
	5	634.3	94.400	1.975	18.2	
	10	650.7	47.700	1.679	34.6	
	20	685.2	24.350	1.386	69.1	
	30	718.0	16.567	1.219	101.8	
	40	749.8	12.675	1.103	133.7	
	50	779.8	10.340	1.015	163.7	
	60	810.7	8.783	0.944	194.6	
	70	842.5	7.671	0.885	226.4	
	80	873.4	6.837	0.835	257.3	
	90	903.5	6.189	0.792	287.3	
	100	933.5	5.670	0.754	317.3	
	110	962.6	5.245	0.720	346.4	
	120	992.6	4.892	0.689	376.5	
4	127	1014.4	4.677	0.670	398.3	FINAL SHUT-IN
5		2486.5				HYDROSTATIC MUD



LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/8/78	2330-2357 (cont'd)	of white prismatic lustrous - crystalline coating on siltstone - zeolite? trace pyrite			(No bagged sample - only vial)	
	2330-2363	Siltstone, AA, medium green Well cemented clay, silty, light grey trace vein quartz	20 80	120°	Most of this sample is from 2357-2363.	137°
2/9/78	2372	Reddish-brown claystone - some shows vein quartz Green-whitish altered basalt siltstone occasionally con- taining pyrite cubes & a blade mineral (?) Secondary (2°) microcrystal- line quartz, 2° coarse quartz (some containing black mineral (?), some showing FE-staining) Gypsum	80 15 5 5%		<u>Spot check</u>	
	2363-2394	Reddish-br. claystone (some shows vein quartz) gray & medium-to-dark green Well cemented siltstone (may be altered volcanics) secondary quartz/both micro- crystalline-vein quartz	45 53 2	119°	Note: the silt- stone is really altered basalt & the claystone is vein-filling material (see core)	138°
	2394-2422	Reddish-br. claystone gray & green (medium to dark) Well-cemented siltstone - 20% of green & grey siltstone is veined w/a black amorphous appearing mineral (?) - 5% of grey siltstone gives the appearance of being foliated due to the black mineral - 15% of green siltstone contains rounded quartz grains and 2 types of green minerals	25 70	120°	*have this sample X-rayed and sent for thin sections	139°

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
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CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/9/78	2394-2422 (cont'd)	- small % of siltstone shows fractures filled w/vein quartz 2° microcrystalline & vein quartz some of which has chlorite inclusions	5			
	2422-2455	Reddish-br. claystone grey-green siltstone exhibiting some characteristics as above foliation is very prevalent in some of the grey siltstone it almost appears to be gneissic in character 2° quartz as above	2 96 2	120°		139°
	2455-2486	Same as above only difference is started to pick up traces of basalt (?) or black siltstone		112°	*make a thin section of this sample	137°
	2486-2519	- Reddish-brown claystone - Gray & green siltstone (same as above) - Black siltstone or basalt some fractured & filled w/vein quartz - 2° quartz/microcrystalline & vein)  <u>Note:</u> green siltstone is much darker than before  - traces of pyrite present	2 10 86 2		*make a thin section of this sample	
	2514-2549	Missing				
	2549-2579	- Gray & green siltstone, as above - Black siltstone or basalt - 2° microcrystalline & vein quartz  *same general characteristics as above	5 95 2	125°		140°

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
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CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/9/78	2579-2609	-Reddish-br. claystone some showing microcrystalline quartz (or vein quartz) veining	22	124°		138°
		-Black siltstone (or basalt) exhibits small degree of alteration (green mineral possibly chlorite and some microcrystalline quartz)	30			
		-Dark brownish grey siltstone occasionally shows inclusion of chlorite (?) occasionally fractures filled w/Fe-oxides or vein quartz	45			
2/10/78		-Light green siltstone (tuff?)	3			
		-Light grey siltstone (tuff)				
		-Light grey-br.-white siltstone exhibiting foliation may be metamorphic	15			
		-2° microcrystalline & vein quartz occasionally containing pyrite and/or chlorite (?)	4			
		-Fine grained green quartz sandstone cemented by microcrystalline quartz & chlorite (?). Quartz grains are rounded	1			
		-Trace amounts of pyrite present				
	2623	Reddish-br. claystone - trace black siltstone (or basalt) shows chlorite and/or epidote (?) alteration assemblage, and occasionally chips exhibit veins of microcrystalline or vein quartz	70	132°	Spot check *make a thin section	144°
		Light grey-white-br. siltstone shows foliation texture probably metamorphic in origin	15			
		Dark grey siltstone shows fractures w/Fe-oxides and fractures w/vein or microcrystalline quartz	10			

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/10/78	2623 (cont'd)	2° vein quartz, microcrystalline quartz and a green colored quartz grains. Some of the vein quartz contains a pale green mineral (?)	5			
	2609-2640	Light grey siltstone (very fine grained ss) same character as above Light br.-white metamorphics as above Black siltstone (basalt) 2° silica vein & microcrystalline quartz (quartz crystals & green colored quartz also present) some of microcrystalline quartz is associated w/ Fe-oxides, green mineral, pyrite Greenish-white fine grained ss(?) Light green siltstone as above *Traces of orpiment (1)  light green clay & reddish-br. clay	55 20 5 15 2 3	134°	---thin section	146°
	Interval shows same character as samples above					
	2640-2670	Same as above, no basalt however traces of gypsum, pyrite A lot of 2° microcrystalline silica ~15%		128°	---make a thin section	142°
	2696	Light br.-white-grey siltstone (metamorphic) Light grey-dark grey fine-grained ss shows chlorite alteration in places, fractures filled w/vein quartz & chlorite, Fe-oxides Light grey-medium grey siltstone 10 parts altered to chlorite, fractures filled w/vein quartz & chlorite	15 70 10	117°	Spot check	129°

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
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 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/10/78	2696 (cont'd)	2° silica, microcrystalline and vein quartz associated w/chlorite (?), some FE-oxide, pyrite Trace of reddish-br. clay	5			
2/11/78	2670-2700	Same as above		116°		128°
	2701-2733	Same as above (see core description below)		114°		124°
CORE	2717-2727	Green, fine-grained sandstone (possibly tuff but doubt it). See the attached core description sheet.				
	2733-2766	Same as above  *Believe the material we have been calling meta- morphics (?) is vein fill - see core description		122°		127°
	2766-2795	Same as above		116°		130°
	2795-2827	Light grey siltstone shows some pyrite Reddish-clay associated w/silica Light-grey siltstone fracture filled w/green mineral (?), silica & clay parts show alteration to a green mineral (?) Metamorphic (same as above) shows alteration to same green mineral as above 2° silica-microcrystalline and vein traces of pyrite  *this sample is exactly like core	10 55 30 2	117°		130°
2/12/78	2827-2860	Same as above		116°		124°

2/11/78

GENERAL DESCRIPTION OF SAN EMIDIO CORE (Interval 2717' - 2727')

Green, fine-grained ss (possibly tuff)

JLI

- large grains (2x matrix size) of a dark green translucent mineral (not chlorite) = 15% of rock
- quartz grains of ~ same dimensions
- has streaks (zones), not fractures, of Fe-oxides, most likely hematite

The core shows generally moderate fracturing; in places the fracturing is intense creating small breccia zones. The main large fractures are irregular and occur predominantly vertically and horizontally with respect to the core and the small-scale fractures occur in all directions. Fracture dimensions range from  $< 0.5$  mm to  $> 15$  mm (1.5 cm). The larger fractures are filled with hematite, silica (microcrystalline and vein) green and red clays, a white brittle mineral (zeolite?), chlorite and another green mineral; minor amounts of limonite are also present. Small-scale fractures consist of hematite and/or silica. Zones (or streaks) and fractures of a green mineral (?) also occur but are subordinate to those described above. Chlorite, clays and the other green mineral in the fractures show slidenslide.

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
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 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out	
2/12/78	2860-2890	Light-grey gummy clay	35	115°		124°	
		Light medium grey siltstone	15				
		Light green siltstone	20				
		as in core					
		2° silica (microcrystalline and vein)	15				
		also green colored quartz-2° silica fracture					
	2887	Red clay (hematite)	5				thin section
	spot check	like fracture material in core					
	very similar	Quartz ss breccia	10				
		Traces of pyrite, meta-morphic (as above)					
	2840-2922	Light-grey clay	5	116°		126°	
	Light-medium-grey siltstone	30					
	Light green siltstone (as above)	15					
	Quartz ss breccia	20					
	2° silica	20					
	Light-brown tan siltstone	10					
	Traces of red-clay, meta-morphic						
	*similar to above						
	2922-2953	Quartz ss breccia	40	128°		136°	
	contains angular fragments of light green siltstone as in core						
	Light grey siltstone (as above)	10					
	Light green siltstone	15					
	Light-medium br. siltstone	10					
	2° silica (as above)	10					
	Slate (?)	15					
	Traces of pyrite						
	2953-2980	Siltstone - grey & green-grey, well cemented	80	120°		136°	
	Slate - black, well cem. rock?	15					
	Quartz ss breccia	5					
	2980-3048	No sample?					

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
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 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/12/78	3048-3077	Siltstone, quartz grey-green hydroth. min. - epidote? Altered silica?	100	122°		136°
	3077-3108	a/a	100	?		
	3108-3139	Siltstone-quartz grey green and brownish (or v. fine s-stone?)	100	124°		137°
	3139-3171	Siltstone a/a Sand medium & fine grained, quartz detritus Clay?	50 40 10	122°		138°
	3171-3199	Siltstone a/a? Clay - brownish, gummy sandy	50 50	117°		136°
	3200-3229	Siltstone, grey & greenish green min? Hydrotherm. epidote?	100	121°		137°
	3229-3261	Siltstone, grey, greenish Green alterations, altered clay	100	122°		138°
	3261-3293	a/a	100	124°		140°
	3232-3321	Siltstone, grey & reddish, altered clay		120°		132°
	3321-3351	Grey & red siltstone/claystone hematite, secondary silica	100	122°		132°
	3350-3381	Siltstone, grey, very well cemented, biotite - quartz cem. volcanic fragments, altered clay slicken-slides on surface? CaCO <sub>3</sub> TC	100	122°		134°
	3381-3411	Siltstone - grey some altered clay	100	122°		133°
	3411-3450	Siltstone a/a sec. silica, volc. fragments some altered clay	100	125°		145°



LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

(ft)

Review lithology to 2980

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
	3450-3476	Silt. a/a Dark, dense rock, foliation slate?	30 70	133°		148°
	3476-3506	Siltstone a/a Slate? Clay, red, altered Rhyolite, altered (ash flow)	40 40 10 10	132°		147°
	3506-3537	Rhyolite, altered (ash flow)	100	132°		142°
	3539-3570	Rhyolite, altered (ash flow)	100	122°		142°
	3570-3598	Rhyolite a/a Siltstone, grey	80 20	125°		140°
	3598-3629	Clay, brown, soft, gummy	100	128°		140°
	3629-3660	Rhyolite, altered Black, dense rock - slate	90 10	127°		141°
	3660-3692	Rhyolite, altered Siltstone, dark-grey & black	70 30	122°		138°
	3692-3722	Rhyolitic ash flow Siltstone-claystone grey & reddish	80 40	126°		146°
	3722-2752	Siltstone, grey and dark grey some reddish	100	125°		144°
	3752-3783	Slate Siltstone/mudstone grey & reddish	80 20	125°		144°
	3783-3813	Slate Siltstone/mudstone a/a	90 10	118°		136°
	3813-3825	Slate with Ca CO <sub>3</sub> Quartz, white-yellowish Siltstone/mudstone	40 40 20	120°		140°

LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
	3826-3858	Slate Siltstone/mudstone	70 30	124°		140°
	3858-3888	Dk. grey slate, numerous veins with well formed gypsum crystals	100	125°		140°
	3888-3920	Dk. grey slate Lt. grey clay	90 10	122°		142°
	3920-3952 - Depth adjusted -	Dk. grey slate	100	126°		145°
	3946-3981	Dk. grey slate trace vein quartz trace red clay	100	126°		145°
2/18/78	3981-4012	Dk. grey slate		124°		142°
	4012-4043	Dk. grey slate		125° (est) (pump 2 on)		147°
	4043-4072	Dk. grey slate		135°		149°
	4092-4103	Grey slate, mainly muscovite-chlorite, trace pyrite and vein quartz.		136°		149°
	4103-4135	Med. grey slate Lt. brownish grey impure quartzite Vein quartz common, terminated quartz crystals. Observed, also, well formed gypsum crystals. Trace pyrite	30 60	133°(est)		148°
	4135-4166	Medium grey slate - foliation moderately well developed, mainly muscovite. Very minor biotite. Minor silica rich zones which show more fracturing than cleavage. Very minor pyrite.		133°(est)		148°

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
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 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/18/78	4166-4196	Slate A/A minor gypsum very minor calcite		133°(est)		143°
	4196-4225	Slate A/A trace quartz (vein) and gypsum		133°(est)		148°
	4225-4255	Slate A/A well formed calcite crystals, in veins common.		133°(est)		148°
	4255-4288	Gray slate - well consolidated, probably quartz rich. Main mica is muscovite.				
	4288-4319	Gray slate, minor impure quartzite. Minor vein quartz, massive		131°		150°
	4319-4352	Gray slate A/A, except quartzite up to 1/2 of sample.		124°		152°
2/21/78	4352-4382	Medium gray slate & impure quartzite (50/50%). Some quartz/feldspar?? rich zones are softer, contain biotite and <u>may</u> show kaolinitization.		127°		155°
	4382-4402	Slate A/A Gypsum & secondary quartz common.		128° ...at 4400.....		161°
				98° ...at 4403.....	Fell to after cooling tower started.	122°
2/22/78	4402-4413	Gray slate A/A Gypsum?, silica & quartz	TC	113°		146°
	4413-4425	Gray slate A/A		124°		152°
	4425-4443	Dk. gray slate & quartzite occasional lt. gray muscovite phyllite		126°		154°
	4459-4478	CORE SLATE & QUARTZITE See separate description		100° ...at 4476.....		154°

4453-4482 - interval cored

CORE DESCRIPTION

0' - 1'	Slate with quartzite veins -	40% quartz 60% slate
1' - 2'	Slate with quartzite veins -	40% quartz 60% slate
	Veins with calcium crystals and quartz crystals. Pyrite and mica mineralization.	
	No. 6 & 8 - taken to the office.	
2' - 2.5'	Quartzite with open veins - No. 1 thin section Contact with slate - 45°.	
2.5' - 3.5'	Slate with 45° sealed fracture, some open veins. - this same direction as fractures. Fractures with calcium No. 2 - two thin sections	
3.5' - 4.5'	Quartzite - No. 3 thin section. Pyrite.	
4'6" - 6'10"	Fractured zone with blocky quartz, some clay minerals - sample for X-ray deff.	
6'10" - 9'4"	Slate with sealed fractures, filled with calcium? Phlozopite? 60° are direction of fractures. No. 4 thin section.	
9'4" - 9'7"	Brecciated zone. (Taken to Office - No. 7)	
9'7" - 12'	Slate a/a, intersecting white (calcium and ?) filled fractures.	
12' - 12.5'	Fractured zone with sec. mineralization, red brownish clay, gypsum? calcite? X-ray deff.	
12.5' - 21'	Slate with minor sealed fractures, mica foliation App. horizontal. No. 5 thin sec. No. 16 taken to office 17' - 18'	

LITHOLOGIC WELL LOG

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 WELL No. Kosmos 1-9 RANGE 23E

CHEVRON RESOURCES COMPANY

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
2/25/78	4478-4495	Gray slate Quartzite & vein quartz	80 20	132°		160° (162° at 4493)
2/26/78	4495-4524	NO SAMPLE		138°		162°
	4524-4556	Slate, dk. gray, common quartz, some gypsum, some pyrite clay and rhyolite-from up hole? numerous metal (bit?) fragments		140°		170°
	4571	Slate - dk. gray, some gneissic also impure quartzite Lt. gray to greenish gray very fine grained soft clay Angular, probably not from up hole Some small part of sample is calcareous - H <sub>2</sub> S odor emitted when HCL added	50 50	150°	Water being added " " Faster drilling-- fault zone? " "	168°
	4576	Clay, brownish red, gray & greenish gray. Minor quartz & slate fragments		150°	" "	167°
	4582	Clay, red & gray Black, aphanitic glassy rocks- basalt? or skarn Some blue green zeolite?	80 20	147°	" Check mineralogy	164°
	4584	Clay Impure quartzite Slate	5 75 20	A/A		
	4556-4587	Slate (more of a phyllite) some slate contains pyrite and/or microcrystalline qtz. 2° silica broken quartz crystals, microcrystalline qtz. with or without pyrite. subangular green colored quartz, Fe-stained qtz, Gypsum & pyrite, Quartzite 10% Trace amts of chlorite?, transparent yellow mineral, green mineral (?) like one present in Soda Lake 44-5 sulfides (?) & metal frags (from bit?)	75 12 3	146°	have x-ray analysis sulfide may be (black jact) sphalerite	162°

LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos 1-9

(ft)					
TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS Mud Out
2/27/78	4587-4607	Missing			
	4607(?) - 4648	Slate 70 -fractured and filled with either gypsum and quartz (micro-crystalline) Quartzite 5 -fractured & filled w/a green mineral (vial contains a sample for x-ray diffraction analysis) ② Fe-oxides -shows some pyrite Clay 10 2° silica 12 -qtz. xtals, microcrystalline qtz (shows some sphalerite, pyrite) -quartz microbreccia Gypsum 2 -fills fractures & free grains Trace amounts of -green mineral/fillings paces in slate (see vial) -green mineral #2 -sphalerite -pyrite -blue-green mineral (?) -phlogapite (mica) -white zeolite (?)		MI: 150°F MO: 170°F	*Good deal of rubber in sample from dyna-drill assembly
	4648'-4660'	Same as Above slate 80 quartzite 5 clay ~10 2° silica 12 gypsum 20		146(?)	166°

LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 WELL No. Kosmos #1-9 RANGE 23E

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
3/1/78	4660-4691	Slate -fractures filled w/gypsum and qtz. 2° silica -microcrystalline qtz w/or w/out pyrite -qtz. xtals traces of gypsum & quartzite	98  2	142° = MI 162° = MO		
	4691-4719	Same as above Slate 2° Silica Gypsum Traces of mica & pyrite	85 12 3	MI = 138° MO = 160°	This interval is more fractured than the one above if fractur- ing in this samples can be recognized by an increase in th silica gypsum content.	
	4721-4752	Same as above		MI = 152°		MO = 164°
	4752-4788	Basically same as above % vary somewhat but not appreciably.		MI = 148° MO = 168°		
	4785-4816	Same as above only less fractured slate quartzite 2° silica Trace of gypsum	90 8 2	MI = 140° MO = 167°	fractures in slate & quartzite are filled w/ gypsum w/o qtz.	
* Note: 50 gals. of cold water has been added to mud so that MO temperatures will show a decrease for awhile.						
	4816-4847	Same as above slate quartzite 2° silica Trace of gypsum	91 8 1	MI = 138° MO = 161°		
	4846-4877	Basically same as above slate & quartzite 2° silica	99 1	MI = 131° MO = 160°		

LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
3/1/78	4877-4906	Clay Slate and Qtzite	90 10	MI = 130°	MO = 161° I cannot determine accurately the amount of silica in sample.	
	4936	Spot check slate -fractures w/ gypsum & silica quartzite 2° silica traces of mica, gypsum & clay	85 9 6	MI = 138° MO = 163°		
	4906-4936	Same as above		MI, Mo same		
3/3/78	4936-4955	Slate -fractures filled w/2° silica Quartzite 2° Silica -microcrystalline & vein& fine grain fine-grained contains Pyrite & other minerals-see vial of unknowns. -large pieces of broken qtz. xtals are present up to 3mm Pyrite Traces of 1, green mineral (see vial) 2, Mica 3, clay & 4, ? (vial)	88 3 8 1	MI = 111° MO = 161°	@ 4944' there was a change in bits after completion of the temperature survey. Have X-ray diffraction analysis done on the unknowns.  *Green mineral is not like any seen before in hole	
		* Sample exhibits more hydrothermal minerals than previously encountered.				
	4955-4986	Slate Quartzite 2° Silica Traces of mica, gypsum, clay	90 3 3	MI = 128°	MO = 161°	



LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
3/1/78	4986-5016	Slate Quartzite 2° Silica -vein w/pyrite also contains 2 other minerals (See vial of unknowns) qtz. microbreccia fine-grained w/pyrite micro-crystalline Clay Trace of mica	86 5 8    1	MI = 133° MO = 161°	Have x-ray analysis done	
	5016-5052	Slate -as above 2° Silica -microcrystalline -fine-grained micro(fine-grained) vein fine-grained qtz contains py-smokey qtz? Quartzite traces of -fine-grained green rx (see vial) -red & dark green clay -white mineral (see vial)	85  10    3	MI = 158° MO = 165°	x-ray analysis  drill rate has decreased from 6-1/2 hr. to 2-1/2 hr.	
	5052-5080	Slate Quartzite 2° Silica Vein & fine-grained both w/py trace of white zeolites (?) (see vial), mico, and gyp.	90 4 6	MI = 135° MO = 165°	Drilling very, very slow Will PoH to Change bit.	
	5047-5078	Slate Quartzite 2° Silica Trace of clay and py.	80 5 15	MI = 122° MO = 164°	Same characteristics as up hole	

LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

(ft)

TIME	DEPTH	LITHOLOGY	%	Mud In	COMMENTS	Mud Out
3/1/78	5078-5109	Slate & Quartzite 2° Silica vein qtz. fine-grained qtz. microcrystalline qtz. vein (fine) micro silica contains py & other sulfides (?) check by X-ray diffraction analysis	25 75	MI = 138°	MO = 168°  TS, X-ray dyfraction  Vein minerology should be checked	
	5100-5142	Trace of 2 types of green grains, py, sulfides ? , clay (pyrite) Same as above.		MI = 124°	MO = 166° Cold Water was added	
	5150	Same only 2° Silica Slate and quartzite	40 60	MI = 126°	MO = 165°	
	5165	Same as above.		MI = 132°	MO = 158°  * Cold Water was added.	
	5170-5202	Same as above		MI = 140°	MO = 162°	
	5200-5231	Slate and quartzite 2° Silica -Vein -Microcrystalline -fine-grained Trace of clay, py, gypsum	70 30	MI = 140°	MI = 161°  Upon addition of is given off.	H <sub>2</sub> gas
	5234-5265	Same as above slate & quartzite 2° Silica	65 35	MI = 158°	MO = 165°	
	5265-5298	Slate & quartzite 2° Silica -Same as above.	60 40	MI = 136°	MO = 160°	

LITHOLOGIC WELL LOG

CHEVRON RESOURCES COMPANY

PROSPECT San Emidio  
 COUNTY Washoe STATE Nevada  
 DATE \_\_\_\_\_ SECTION 9  
 TOWNSHIP 29N  
 RANGE 23E  
 WELL No. Kosmos #1-9

TIME	DEPTH	LITHOLOGY	COMMENTS
3/1/78	5298-5329	Slate & quartzite 75 2° Silica 25 Same characteristics as above.	MI = 136° MO = 160°
	5329-5356	Slate & quartzite 75 2° Silica 25 Same characteristics	MI = 138° MO = 160°
	5367	TD Lithology same as above.	

11/11/78

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
01-30-78	1530	Spudded the surface and set conductor at 38'. (MAL)
	1622	First single down (30'-60').
	1630	Drilled out 8' cement, starting second single.
	1735	Second single down, 60'-90'.
	1935	MI = 60°F, MO = 74°F
	2035	Depth = 153'; MI = 54°, MO = 78° At 100' MO was reported as 98°.
	2100	Depth = 155'; MI = 53°, MO = 80° Drilling rate = 5'/hr in siltstone. It's very hard, maybe siliceous cement!?
	2200	Depth = 158'; MI = 52°, MO = 78° Drilling rate = 5'/hr Depth correction from G. Clark who says this kelly down will be 162', OK. This is 40' - 4 single.
	2235	Still Drilling 4th single.
	2315	MI = 50°, MO = 76° Weight on bit = 5,000 lbs. Drilling rate 1'/hr, virtually no progress - very hard silica cement = fine gray siltstone.
01-31-78	0015	4th single kelly down.
	0100	Very hard drilling - rig shaking badly.
	0130-0330	Down for repairs (pulled bit = ok) (JLI)
	0315	MI = 94°, MO = flow line thermometer reading is 80°, this is not correct. Check with a second thermometer and measured 96° in shaker.
	0435	MI = 86, MO = 100 Weight on bit range from 5,000-8,000 lbs., averaging 6,500 lbs. <u>NOTE:</u> Thermometer in flow line (MO) is not reading properly (see above). I replaced the thermometer with a new one and obtained the same reading (84°). Checked the temperature of mud emitting from end of flow line and T = 102°. Believe

### KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
		that the flow-out pipe has a scale of mud in it. All mud out readings will be taken right under flow-out pipe.
		Driller believes he broke out of the siliceous "cap rock" - drilling rate has increased.
	0450	Put on new single - depth = 194' which is the drillers recorded depth. 10' should be added to obtain true depth; depth = 204'.
	0645	MI = 98°; MO = 104° Drilling rate has decreased - back into siliceous cement.
	0825	220' (connected depth). Stuck in hole and trying to get loose.
	0915	Started drilling, kelly came up and got stuck again. MI = 100°, MO = 102° Mud man reports the following statistics: GPM (gals/min) = 220, average = 4 3/4 = 95'/min SPM (strokes/min) = 38, average = 3 1/2 = 60'/min Jet size = 13 - 13 - 13 min Pump pressure = 550 p.s.i. on gauge, driller report. 800 gauge wrong (?) Started drilling in siliceous cement.
	1000	POH to examine bit.
	1015	Completed POH, bit is completely worn - driller's now waiting on company (Camoy) pusher to return so they could determine the type of bit to use.
	1130	Run in hole after new bit - old one totally worn out (MAZ) and under gauge. Some bearings left in hole. MI = 97°, MO = 98° Difficult to obtain a good mud out temperature - flow line thermometer is no good. Totco well bagger being rigged up. Depth according to Gary Clark (tool pusher) = 217'.

(3)

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-01-78	1230	Reaming to 217' this kelly will be 229' (reliable driller on duty).
	1240	Difficulty of caving @ bottom of hole where starting to drill ahead.
	1245	Drilling ahead @ 217', drill rate 5'/hr. Bit and string torquing up. No progress.
	1305	Trying to circulate hole clear.
	1330	Trying to circulate bearing out.
	1545	POH to check bit - recovered 1/2 dozen small bearings from teeth. Bit is ruined, one cone is locked and ground down to body of bit. Running in hole with last new bit and circulate Totco partially rigged up, MI/MO still not working.
	0800	Last night - ran in with bit, tried to drill but torqued up. Fishing tools arrived. Ran in with magnet, recovered a few small pieces. Went in with mill-made only a few feet. Could not drill ahead. At 8:00 a.m. - prepared to run in again with magnet, then attempt to drill ahead.
	0840	Running in w/new bit - some communication here seems to be lost. Drilling last night - apparently reamed from then milled 217-218. Depth presently 218'.
	0945	Drilling ahead @ 218'. Totco kicked out because of reaming and trips in/out of hole. Will calibrate this kelly down (224'). Drilling rate 5'/hr. MI = 90°, MO = 95° from hand held thermometer near mud on pipe. Totco mud out = no good. Spent \$57,000 to date of which \$43,000 is for site preparation (\$17,000 for move in, \$26,000 on location). Survey taken @ 226'.
	1045	Drilling ahead @ 226'.
	1145	Comming out of hole. Bearing caught in bit, broke out of silica @ approx. 220'. Now in green clay.
	1200	Back on bottom drilling @ 234'. Appear to be stuck

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
		NOTE: Sample labeled 194'-224' is actually mostly from 218'-224'. Samples 194'-218' not taken due to poor return, fishing and reaming.
	1215	Rig down. Clutch trouble.
	1230	Drilling ahead.
	1515	Connection @ 257'. MI = 98°, MO = 105° Broke thru hard zone, 245'-240' check with geologist. Drilling in clays. Weight on bits = 5,000 lbs.
	1545	Drilling like mud.
	1615	Circulating and working on rig. Taking survey @ 318'.
	1650	Connection @ 348'. MI = 103°, MO = 118° Mud starting to gel - very hard drilling on last single.
	1745	Survey @ 408'.
	2055	Drilling @ 468'. MI = 122°, MO = 126° (highest on well)
	2120	Depth = 497'. MI = 126°, MO = 131°
	2135	Depth = 505'. MI = 120°, MO = 131° (jetting bits) Circulating and preparing to do a wiper run.
	2200	Circulating and jetting pits MI = 120°, MO = 123°
	2250	Wiper run, preparing to cementing.
02-02-78	1030	Cement setting. 7' casing set to 500'. Hole was cemented by 0350 02/02/78. Currently rigging up BOPE and waiting on cement to set.

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-03-78	0800	Working on BOPE (ZMS)
	1400	Testing BOPE
	1500	Started drilling thru cement.
	1605	Began drilling @ 505'. MI = 105°, MO = 105°
	1900	Depth = 610'; MI = 105°, MO = 105° One sample collected from 505'-589'. From 589'-610' no samples were collected. Circulating prior to dyna-drilling. Totco man fixing mud meter and geolograph. Fast drilling. Only the mud in pump is working Pump pressure = 850 psi. Weight on bit = 14,000 lbs. Bit #4 is being used : 6 1/2", GV541, Hug OSC-37-3-12.
02-04-78	2000	Kent Springer (Chev tool pusher) will bring RPM (drilling ratio) recorder and mud pressure device to replace Totco. POH
	2400	Circulating @ 610'. POH
	0230	Started drilling with dyna-drill. Bit #5: 6 1/4, LW 427, HTC-OWV
	0800	Depth = 768'. Taking survey. MI = 110°, MO = 120° Bottoms up = 5 min.
02-04-78	0900	Mud in pump broke down. Temperature out fixed. <u>Survey</u> @ 662': 3° N68W @ 692': 4° 30' N62W @ 730': 6° N53W
	0935	768'-783' - 15' down with kelly POH, survey and change bit. Bit #5 used from 610'-783' (3 1/2 hours) Weight on bit #5 = 5,000-6,000 lbs. Pump pressure = 750 p.s.i. Bit #6: 6 1/4", LW-427, HTC-OWV



KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	1220	Start dyna-drilling with bit #6.
	1800	Depth = 987', dyna-drill. MI = 117°, MO = 119° Weight on bit = 5,000-10,000 Pump pressure = 700 psi
	1815	POH, bit #6 (1 1/2 hrs.) End of directional drilling <u>Survey:</u> @ 762': 7°15' N62W @ 792': 8°45' N70W Dyna-drilled from 610'-987'
02-05-78	0000	Finishing survey and changing bit. Bit #7: 6 1/4", CV-331 HTC-OSC 37-3-12 Depth = 987'
	0800	Depth = 1308' MI = 124°, MO = 136° Bottoms up = 10 minutes Weight on bit = 5,000 lbs. Pump pressure = 1,000 p.s.i.
	0850	Pump broke down.
	1000	Crew is not catching samples or catching them from leftovers on night. Changed and calibrated thermometer - old one measured approximately 4°-5° too low. Depth = 1432' MO = 134°
	1100	Depth = 1432', POH Taking survey @ 1436'. Bit #8: 6 1/4", 62548 reed Y 125-3-11 Survey: @ 1206': 15°30' N89W @ 1120': 16°45' N88W @ 1245': 17°15' N87W
	1600	Started drilling @ 1436'. @ 1492' - bit plugged. @ 1512' - bit plugged. @ 1522' - bit unplugged. Weight on bit: 7000-8000 lbs. Pump Pressure: 900 psi MI = 121°, MO = 130°

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-06-78	0000	Depth = 1740' MI = 119°, MO = 128° <u>Survey</u> : @ 1804': 10°45' N86W @ 1896': 9°00' Due W.
	0625	POH @ 1906' MI = 120°, MO = 130° @ 1906' Bottoms up 8 minutes.
	0950	Started drilling with bit #9.
	1010	Depth = 1924' MI = 116°, MO = 136° Weight on bit = 5,000 lbs. Pump Pressure = 800-1,000 psi
	1130	Depth = 1980' MI = 119°, MO = 130°
	1135	Depth = 1989' Lost circulation
	1325	POH (MAL)
	1500	Out of hole, waiting on gel.
02-07-78	0545	Started drilling @ 1989'. (ZMS) Temperature after getting back circulation = 150° @ 1993': MI = 126°, MO = 136° Weight on bit = 5,000 lbs. Pump pressure = 800 psi
	0730	Depth = 2020' MI = 125°, MO = 138°
	0830	Drilling @ 2033' (MAL) MI = 122°, MO = 138° <u>NOTE</u> : Circulation lost @ 1989' not 2001'. The usual mixup with drillers as to where we are in the hole.
	1245	314'W 27 7 1/2° dropped 1°/100'
	1315	Connection @ 2111' MI = 118°, MO = 130° Survey @ 2081'

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-08-78	1515	Connection @ 2171' MI = 114°, MO = 134° Weight on bit = 9,000 lbs. Drilling rate = 20'-30'/hr.
	1600	Drilling @ 2180'. MI = 116°, MO = 134° Weight on bit = 9,000 lbs. Rain and sleet and high winds
	1730	Connection @ 2205' Totco adjusted 4° MI = 120°, MO = 126°
	2115	Drilling @ 2290' MI = 116°, MO = 130°
	2140	Connection @ 2290'
	0800	Depth = 2340' MI = 116°, MO = 134° Bit change last night. Slow drilling approximately 12'/hr.
	1000	Drilling @ 2355' MI = 120°, MO = 137° Weight on bit = 8,000 lbs. Drill rate = 5-6'/hr. Survey @ 2267': 5°30' N87W, TVD - 2227, N = 28.46' W = 335.56'
	1040	Connection @ 2363' Drill rate picked up over last 7'.
	1100	Survey @ 2363'
	1230	Drilling @ 2372'. MI = 117°, MO = 136° Well cemented siltstone
	1445	Drilling @ 2406'. MI = 116°, MO = 136° Drilling rate speeded up
	1800	Depth = 2455' (JI) Well is flowing, T = 141°, during survey

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-09-78	2145	<p>Well was not flowing above. It was a misinterpretation by the driller. One of the valves regulating mud flow was broken.</p> <p>Depth = 2492'  MI = 110°, MO = 137°  Weight on bit = 7,000 lbs.  Pump pressure = 600-750 psi</p>
	0900	<p>Depth = 2541'  Weight on bit = 5,000 lbs.  Pump Pressure = 700 psi  Totco recorders (Mud in/out) not functioning.  MI = 118°, MO = 136°</p> <p>Depth = 2549'  <u>Survey:</u> 4°45' N81W, TVD = 2907.93'  N = 3102', W = 360'</p> <p>Well is about 360' from vertical and will be about 460' out @ 4034'. The directional man states that we are not dropping as fast as we should be.</p>
	1300	<p>Depth = 2562'  MI = 125°, MO = 134°  Weight on bit = 5,000 lbs.  Pump pressure = 700 psi  Bottoms up = 27 minutes</p>
	1440	<p>Depth = 2581'  MI = 124°, MO = 141°  Weight on bit = 7,000 lbs.  Pump pressure = 850 psi</p>
	1630	<p>Depth = 2593'  MI = 122°, MO = 138°  Weight on bit = 10,000 lbs.  Pump pressure = 850 psi  Drill rate = 5'/hr.</p>
	2200	<p>Depth = 2623'  MI = 132°, MO = 144°  Weight on bit = 9,000 lbs.  Pump pressure = 850 lbs.</p>

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-10-78	0800	Depth = 2696' MI = 117°, MO = 129° Weight on bit = 14,000 lbs. Pump pressure = 700 psi Bottoms up = 28 minutes Drastic drop in MO @ 2685'; MO = 146°, MI = 134° - this is probably due to water thinning
	1130	POH to core
	1550	Have not gone into hole yet due to a slow crew and adverse weather conditions (light snow).
	1610	Reaming hole, bit was out of guage over last 90'. Not sure at this time whether we have to ream the whole 90' or just a portion of it.
	1810	Getting ready to core - will circulate for 20 minutes first.
	1835	Started coring.
	1935	Cut 3' of core thus far. Rate = 3'/hr.
	2400	Core finished - cored 10', recovered 10'. It took 3:15 hrs.
02-11-78	0015	Coring back into hole
	1215	Depth = 2845' MI = 114°, MO = 124° Weight on bit = 14,000 lbs. Pump pressure = 900 psi Bottoms up = 28 minutes
	1430	Depth = 2887' MI = 115°, MO 124° Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 900 psi Drilling fairly just = 14'/hr.
	1820	Depth = 2944' MI = 116°, MO = 132° Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 950 psi Survey @ 2922': 3°30' N72°W

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	2045	Depth = 2961' MI = 120°, MO = 134° Weight on bit = 11 x 10 <sup>3</sup> lbs. Pump pressure = 850 psi
02-12-78	0840	Depth = 3168' according to Totco Depth = 3171' according to driller MI = 122°, MO 137° Weight on bit = 10 x 10 <sup>3</sup> lbs. Pump pressure = 800 psi Bottoms up = 29 minutes * Lost 60' of sample because of (?).
	1230	Depth = 3199' Making a connection. Taking a survey. Sample catcher fell through shaker screen #1. Crew fishing it out. Until further noted, samples are being recovered from shaker screen #2.
	1330	Depth = 3209' MI = 117°, MO = 136° Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 750 psi
	1600	Depth = 3243' MI = 120°, MO = 136° Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 750 psi
	1915	Depth = 3278' MI = 123°, MO = 137° Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 750 psi
	2100	Depth = 3292' MI = 132°, MO = 122° Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 700 psi
02-13-78	0000	Depth = 3320' (ZMS)
	0600	Bottoms up = 31 minutes
	0630	Depth = 3381' <u>Survey:</u> 2°30' N75W

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-14-78	0700	POH @ 3411'
	1200	Rim bit # _____ 13 Rim bit #12 from 2727'-3411' = 44 1/2 hrs.
	1620	Run 3411'-3450' @ 3451' MI = 125°, MO = 1920°
	0000	Depth = 3494'
	0700	Depth = 3595' MI = 125°, MO = 140° Drilling ratio = 13'-15'/hr. Bottoms up = 21.6 minutes
	1000	Depth = 3634' MI = 128°, MO = 140° Weight on bit = 17 x 10 <sup>3</sup> lbs. Pump pressure = 700-800 psi
	1530	Depth = 368' MI = 123°, MO = 137° Weight on bit = 10,000 lbs. Pump pressure = 700-800 psi Adding meter.
02-15-78	1920	Depth = 3710' MI = 126°, MO = 145° Weight on bit = 60 x 10 <sup>3</sup> lbs. 7'/hr. = speed Pump pressure = 700-800 psi Totco man fixed equipment.
	0000	Depth = 3733'
	0600	Bottoms up = 29 minutes
	1000	Depth = 3433'; MI = 120°, MO = 140° Weight on bit = 12,000 lbs. (driller) Pump pressure = 700-800 psi Survey @ 3742': 3° N66W Slow drilling = 4'/hr.
	1200	Depth = 3800'; MI = 118°, MO = 138° Cooling tower has been on for several hours.
	1400	Depth = 3813'; POH, bit #14

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-16-78	2140	Start drilling
	2200	Depth = 3820' MI = 115°, MO = 140°
	0000	Depth = 3833' MI = 124°, MO = 140° Bottoms up = 32 minutes
	0755	Depth = 3865' MI = 123°, MO = 140°
	1235	Depth = 3888' MI = 125°, MO = 141° Cooling tower on.
	1335	Depth = 3898' MI = 104°, MO = 135° Weight on bit = 16,000 lbs. Pump pressure = 11,000 psi Cooling tower off - has been working for 2 hours.
	1730	Depth = 3916' MI = 120°, MO = 142° Weight on bit = 15,000 lbs. Pump pressure = 11,000 psi
02-17-78	0000	Depth = 3943'
	0600	Bottoms up = 38 minutes
	0750	Depth = 3975' MI = 127°, MO = 147° Weight on bit = 14,000 lbs. Pump pressure = 900-1,000 psi Survey @ 3951: 4°30' N42W
	1115	Depth = 3989' MI = 125°, MO = 145 Weight on bit = 16,000 lbs Drilling in slate. Adding water to mud steadily.

(MAZ)



KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-18-78	1440	Depth = 4000' MI = 125°, MO = 143° Adding H <sub>2</sub> O.
	2000	Depth = 4021' Down for repairs - rotary chain?
	2200	Depth = 4032' MO = 147°, shut pump before could measure MI making a wiper run.
	0430	Depth = 4090' MI = 137°, MO = 151° Weight on bit = 16,000 lbs. Drilling rate = 12'/hr. Have excessive mud loss.
	1100	MO = 152° Took 8 barrels of mud.
	1120	Depth = 4100' MI = 136°, MO = 151° Adding H <sub>2</sub> O
02-14-78	1420	Depth = 4022' MI = 134°, MO = 147° 7'/hr. thru slate
	1500	Depth = 4235' MI = 133°, MO = 148° Drilling rate = 5'/hr. thru slate
	2120	Depth = 4266' MI = 135°, MO = 151° Rate = 6-7'/hr. thru slate
02-20-78	1000	Depth = 1327'; MI = 135°, MO = 152° Bottoms up = 28 minutes Dark gray slate; 6'/hr. Steady rate 4-6'/hr. since midnight. Total mud system volume 319 bbls.

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	1115	Cut back in a main pump. MO = 152°.
	1245	Depth @ 4336'; MO 152°; MI 112°* * Pump back in - using flow line thermometer. Driller says temp. reached 145° a few minutes ago. Slow drilling 3'/hr.
	1400	Depth @ 4339'; MI = 122° - down from 128°; MO = 152° - adding H <sub>2</sub> O. 3'/hr.
	1500	Depth @ 4341'; MO = 152°; MI - not measured - working on pump and adding water to mud. Estimate 122° in; drilling very slow - 3'/hr.
	2010	Depth @ 4354'; MO = 152°; MI = 122°; some water added; 3'/hr.
	2235	Depth @ 4360'; MO = 154°; MI = 127°; some water being added and air temp ≈ 30°F; 2-1/2 - 3'/hr.
02-21-78	0700	Depth @ 4384'; 156° = MO; 126° = MI; small amt. of H <sub>2</sub> O being added; 3'/hr. Very little sample coming over shaker.
	0820	Depth @ 4388'; 157° = MO; 127° = MI; 3'/hr.
	1100	Depth 4398'; cooling tower on
	1120	4398'; MO = 1420°; MI = 124°.
	1135	MI = 121°, MO = 137°
	1145	133° MO @ 4400' 118° MI System total - circulated out (47 min)
	1200	Depth @ 4401'; 130° = MO, 112° = MI
	1310	Stopped drilling. 4404'; 122° = MO, 98° = MI. Total depth corrected by driller to 4402'. 29' kelly in -- (40' kelly).
	1445	Made wiper trip circulating prep. to POH and core.

**KOSMOS #1-9 DRILLING HISTORY**

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	2110	Begin circulating - 3 stands above bottom; 143° MO; 84° MI
	2114	150° MO
	2118	84° MI; 146° MO
	2205	Drilling @ 4402'; 144° MO; 90° MI
	2230	144° MO; 99° MI; drilling 4404' (ZMS)
	2335	Depth @ 4405.9'; MI = 104°; MO = 144°; Pump pressure = 750-850 psi; weight on bit = 14,000 lbs.
02-22-78	0100	@ 4412.4'; MI = 110°; MO = 146°; weight on bit, pump pressure as above. Talking to driller - hole is <u>not</u> taking any fluids.
	0135	@ 4413'; Making connection. MI = 113°; MO = 146°. Sample taken from both shakers.
	0400	@ 4420'; MI = 124°; MO = 150°
	0545	@ 4427.8'; MI = 124°; MO = 152°; weight on bit = 19,000; P = not working. No lost circulation. Water is being added to the mud. Steady overnight, bottom up 47 minutes.
	0700	@ 4432.8'; MI = 125°; MO = 153°; slate.
	1140	@ 4446'; 155° = MO; 130° = MI; Pump pressure = 7,000 psi; 3'/hr.
	1400	@ 4453'; 156° = MO; 132° = MI; 3'/hr. - slate.
	1445	@ 4454; 157° = MO; 133° = MI (ZMS)
	2320	@ 4459' started coring
	2345	MI = 97°; MO = 152°; weight on bit = 14,000 pounds; pump pressure = 750-800 psi.
02-23-78	0000	@ 4464, coring 5' in 40 minutes 8'/hr. MI = 97°F; MO = 153°F.

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	0145	@ 4476.4'; jammed core barrel - 17' MI = 100°F; MO = 154°F.
	0400	Core up - 17' drilled 15' recover. Slate sealed fractures more fractures to the bottom. Fractured bottom few inches. Will core another 10' to check on the fractured zone.
	0945	@ 4478' coring; MO = 152°; MI ?; pump 2 working.
	1045	@ 4481' coring ≈ 3-4'/hr. MO = 148°; large amt of water being added.
	1155	@ 4482' core barrel jammed; circulating till 1:00 p.m., then POH; MO = 149°
	1245	Stop circulating, POH
	1500	Out of hole 2/core; cut 6' recovered 4' Core 4459                      recover 4459-4474 4476
		Core 4476                      recover 4474-4478 4482
		Near bottom with first temp. Run - 230') 505') <u>Kicks</u>
		Tag bottom 4484'; max temp. 220°F. Schlumberger temperature log.

<u>Logging Tool</u>	<u>Thermometer Position</u>	<u>Time on Bottom</u>	<u>Temperature</u>
Temp.	22' above botm	2/23 1630	200°F (Botm)
DILFF	65' above botm	1845	210°F 212°F
CNL-FDC	32' above botm	2310	222° (Lost 1 Therm)
Temp	22' above botm	2/24 9415	Thermom 229°F-231°F Log 248°F
SLS-S(1)	46' above botm	0615 went to 4350@0625 went to 4170@0712	230°F, 231°F (Long run) (ReLogging)
SLS-S(2)	46' above botm	1130	232°F 233°F
HDT	24' above botm	1535	233° 236°
FIL	24' above botm	1715	234° 236°
Temp	22' above botm	2047	237°

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
02-25-78	2200	Finish logging; RIH 2/Y12J bit
	0430	--
	1030	Drilling ahead - lost cones from bit on morning tower, went in w/button bit - making hole - -
	1145	@ 4494'; 162° = MO; 130° = MI; Drilling at 6'/hr.
	1215	Stop drilling @ 4497'; MI = 132°; MO = 160°; corrected depth - driller 4495' circulating - -
	1310	@ 4495' POH; lost circulation, MI = 139°; MO = 162°
	2030	On bottom w/dyna drill - taking pictures.
	2215	Drilling with dyna drill 4499'; rate = 8'/hr MO = 158'; MI ? (pump 2)
02-26-78	1015	Dyna drill @ 4565' MO = 168°) 7-8/hr. Running water in mud MI = 149°)
		Temp. coming up overnight - @ 2 AM 4524' 138° = MI 162° = MO @ 8 AM 4556' 140° = MI 170° = MO
		Note: Pump strokes 36/min. normal 31-2/min. May be washing hole -
	1115	Drilling @ 4571' 150° = MI) Water added 168° = MO)
		Gray clay common in sample
	1215	4576' 150° = MI 167° = MO
		Drilling slowed down, water added.
	1335	164° = MO) Adding H <sub>2</sub> O 147° = MI)
		Drilling 5'/hr. in slate. Depth = 4582'

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	1600	4592' - 8'/hr. 162° = MO
	1845	4607' $\approx$ 3 <sup>5</sup> '/hr. 15 x 10 <sup>3</sup> = weight on bit 1350 = psi 163° = MO 143° = MI
02-27-78	0600	4648' Taking directional survey 4608': 8°00' S57E George's calculation (Directional Survey Man) TVD = 4559.88' N = 7.30' W = 456.05' Kent's calculation (Chev. Tool Pusher) TVD = 4560.7' N = 15.15' W = 450.3'
	0845	4650' splicing directional survey line - once fixed. Will probably POH for dyna drill is wasted. 4550' - bottoms up = 21 minutes Survey coordinates: 4515' 8°15' SIW S 01 W 4548' 6°15' S15E 4577' 6°45' S40E
	1210	Ran max reading thermometer in hole to find out mud T. Let stay on bottom 5 minutes reading just under 200°. Used the 200-500° thermometer. 4402' - going back in hole but tight have to recondition.
02-28-78	0200	Drilling started again.
	0550	4667' 15 x 10 <sup>3</sup> = weight on bit 10 <sup>3</sup> psi = Pump pressure MI = 146°F MO = 168°F Bottoms up = 24 minutes * No water is being added.

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION																																												
	0730	4674' 15 x 10 <sup>3</sup> lbs., 10 <sup>3</sup> psi MI = 144° MO = 164° Kent's calculations (Chev. Tool Pusher) 4718' Survey - 9°05' S75E TVD = 4669.4' N = 8.44' W = 435.32' George's calculation (Directional Survey Man) TVD = 4668.87 N = 0.69' W = 441.20'																																												
	1830	Depth = 4721' 15 x 10 <sup>3</sup> lbs. = weight on bit 1,000 psi = Pump pressure MI = 126° MO = 160°																																												
		<u>FROM DRILLERS' LOG</u>																																												
		<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Depth</u></th> <th style="text-align: left;"><u>Time</u></th> <th style="text-align: left;"><u>MI</u></th> <th style="text-align: left;"><u>MO</u></th> </tr> </thead> <tbody> <tr> <td></td> <td>6 AM</td> <td>148</td> <td>168</td> </tr> <tr> <td></td> <td>8 AM</td> <td>148</td> <td>166</td> </tr> <tr> <td></td> <td>9 AM</td> <td>148</td> <td>166</td> </tr> <tr> <td></td> <td>12</td> <td>146</td> <td>164</td> </tr> <tr> <td></td> <td>3:30</td> <td>141</td> <td>161</td> </tr> <tr> <td>4718</td> <td>5:30</td> <td>130</td> <td>160</td> </tr> <tr> <td>4732</td> <td>7:00</td> <td>146</td> <td>164</td> </tr> <tr> <td>4742</td> <td>10</td> <td>152</td> <td>164</td> </tr> <tr> <td>4752</td> <td>11</td> <td>152</td> <td>164</td> </tr> <tr> <td>4788</td> <td>6 AM</td> <td>148</td> <td>168</td> </tr> </tbody> </table>	<u>Depth</u>	<u>Time</u>	<u>MI</u>	<u>MO</u>		6 AM	148	168		8 AM	148	166		9 AM	148	166		12	146	164		3:30	141	161	4718	5:30	130	160	4732	7:00	146	164	4742	10	152	164	4752	11	152	164	4788	6 AM	148	168
<u>Depth</u>	<u>Time</u>	<u>MI</u>	<u>MO</u>																																											
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4732	7:00	146	164																																											
4742	10	152	164																																											
4752	11	152	164																																											
4788	6 AM	148	168																																											
03-01-78	0745	4796' Weight on bit = 15 x 10 <sup>3</sup> lbs. Pump pressure = 1,000 psi MI = 144° MO = 166°																																												
	0800-1030	Ran cold water. 50 gals. because of lost mud volume.																																												

### KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	1030	Survey @ 4816' 10°30' S67E TVD = 4765.18', S = 4.85', W = 425.11
	1305	4848' Weight on bit = $15_3 \times 10^3$ Pump pressure = $10^3$ MI = 138° MO = 161° Informed crew not to run any cold water. * Added in 50 gals. of cold water.
	1400	4856' Weight on bit = $15_3 \times 10^3$ Pump pressure = $10^3$ MI = 158° MO = 161°
	1610	4877' $15_3 \times 10^3$ = Weight on bit $10^3$ = Pump pressure MI = 131° MO = 160°
	1700	4883' Weight = $15 \times 10^3$ Pump pressure = $10^3$ psi MI = 130° MO = 160°
	0600	4933' Weight = $15 \times 10^3$ Pump pressure = $10^3$ psi MI = 134° MO = 162° Bottoms up = 24 minutes
	1000	4944' and circulating Survey @ 4944: 14° S60E TVD = 4890.27', S = 16.97', W = 400.80' MI = 125° MO = 162°
	1015	MO = 158° MI = 126°



KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	1023	MO = 161°F MI = 128°F
	1040	MI = 126° MO = 160° Time of last circulation 1040 Location of thermometers: 4891' 4896' Time drilled past the point where thermometers are: 4891' - 15 hrs. 40 min. 4896' - 13 hrs. 40 min. Temperatures survey = 4000' - TD Sit on TD for 9 hrs. TD - 4000'
	2230	Temperature survey tools is coming out of the hole.
	2325	Finished coming out of hole, circulating and will POH to change bit
03-03-78	1430	4997' Weight = $13 \times 10^3$ Pump pressure = 1,100 psi MI = 131° MO = 163° Bottoms up: 26 minutes
	2000	5036' Weight = $15 \times 10^3$ lbs. Pump pressure = 1,100 psi MO = 162° MI = 134° Lost 12 barrels of fluid about 7:00 AM where temperature climbed to 169°.
03-04-78	1015	5074' $20 \times 10^3$ lbs. = Weight on bit 1150 psi = Pump pressure MI = 136° MO = 167°
03-04-78	0030	MI = 136°, MO = 163°
	0330	MI = 138°, MO = 165°

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
	0600	Depth = 5066'
	0630	MI = 138°, MO = 165°
	0730	MI = 140°, MO = 169° Depth = 5070'
	1150	Depth = 5080' MI = 135°, MO = 165° Very slow drilling ≈ 1/2'/hr. Adding some water for 30 minutes to lower mud viscosity
	1300	5080' Taking a directional survey, then will POH to Δ bit. Survey @ 5079': @ 5079': 15°15' 553E TVD = 5020.97', S = 35.63', W = 372.61'
	1355	POH to change bit; bit completely worn out, ran cones off bit #19. Went in hole with new bit (#20). Had to ream between 5063'-5074'.
03-05-78	1000	5141' Weight on bit = 15 x 10 <sup>3</sup> lbs. Pump pressure = 1,100 psi MI = 120° MO = 160° Cold water has been to mud MO reached a max of 172° @ 5124'
	1140	5150' Weight on bit = 15 x 10 <sup>3</sup> lbs. Pump pressure = 1,150 psi MI* = 126°, MO = 165° * MI pump not working
	1430	5165' Weight on bit = 15 x 10 <sup>3</sup> lbs. Pump pressure = 850 psi MI = 132°, MO = 158° Added 30 barrels of fluid to mud.
	1915	5199' Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 1,150 psi MI = 140°, MO = 161°

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
03-06-78	0730	5265' MI = 137°, MO = 162° Making a connection. At 5247' lost 52 barrels. No T increase, but a decrease as a result of cold water added.
	0815	5270' Weight on bit = 15 x 10 <sup>3</sup> lbs. Pump pressure = 1,150 psi MI = 120°, MO = 158° Survey @ 5200': 14°45' S53E TVD = 5137.85', S = 54.48', W = 347.60'
	1325	5306' Weight on bit = 15 x 10 <sup>3</sup> lbs Pump pressure = 1150 psi MI = 178°, MO = 159° Adding cold water continuously to bring up mud volume = 2-3 gals/hr.
	1435	5315' Weight on bit = 14 x 10 <sup>3</sup> lbs. Pump pressure = 1,150 psi MI = 131°, MO = 158°  Will be logging hole from 4100' - TD
	1800	5336' Weight on bit = 12 x 10 <sup>3</sup> lbs. Pump pressure = 11 x 10 <sup>3</sup> lbs. MI = 133°, MO = 155°
	0215	TD = 5367', True depth = 5370' MO = 155° Time of last circulation = 0200  Location of max reading thermometers in various Schlumberger tools:  Temperature @ 5346' FDL/CNL @ 5337' DIL @ 5337' Sonic @ 5335'

KOSMOS #1-9 DRILLING HISTORY

NOTE: ALL TEMPERATURES ARE REPORTED  
IN °F.

DATE	TIME	DESCRIPTION
		<p>Time elapsed since drilled post point where max thermometers are located:</p> <p>5346' - 2 1/2 hrs. 5337' - 4 hrs. 10 min. 5335 -- 4 hrs. 10 min.</p>

**SKYLINE LABS, INC.**

SPECIALISTS IN EXPLORATION GEOCHEMISTRY

12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL.: (303) 424-7718

REPORT OF ANALYSIS

Job No. DEY006  
April 20, 1978

Chevron Resources Company  
Attention: Joe Iovenitti  
P.O. Box 3722  
San Francisco, California 94119

Analysis of 27 Water Samples

*file*  
*San Emidio*  
*1-9 well file*

*will file*  
*1-9 well file*

Item	Sample Number	Na (mg/l)	K (mg/l)	Ca (mg/l)	Mg (mg/l)	Li (mg/l)	Al (mg/l)	Mn (mg/l)	Fe (mg/l)
1. SED DST #1	Raw	2,400	90.	58.	.96	1.7	4.5	.05	6.2
2. SED DST #2	Raw	1,500	79.	100.	.26	1.9	<.1	.08	1.0
3. SED DST #3	Raw	1,400	79.	82.	.13	1.8	<.1	.18	.8
4. SED DST #4	Raw	1,400	77.	94.	.17	1.8	.2	.04	.6
5. SED DST #5	Raw	1,400	74.	88.	.72	1.8	<.1	.04	.8
6. SED DST #6	Raw	1,400	82.	89.	.71	1.8	.9	.02	.8
7. SED DST #7	Raw	1,200	79.	81.	.06	1.7	<.1	.02	.8
8. SED DST #8	Raw	1,200	73.	97.	.10	1.7	<.1	.03	.6
9. SED-DST #9	Raw	1,100	73.	93.	.26	1.6	<.1	.05	.8
10. SED DST #10	Raw	1,100	72.	92.	1.4	1.7	<.1	.07	.9
11. SED DST #11	Raw	1,100	72.	91.	.32	1.6	.4	.08	1.5
12. SED DST #12	Raw	1,100	73.	58.	.22	1.7	.1	.05	.5
13. SED DST #13	Raw	1,100	71.	90.	.34	1.7	.3	.14	1.8
14. SED DST #14	Raw	1,100	67.	91.	.36	1.7	.2	.10	.8
15. SED DST #15	Raw	1,100	62.	87.	.39	1.7	.3	.15	1.6
16. SED WELL WATER	Raw	1,400	150.	140.	2.2	3.1	<.1	.17	2.0
17. WILSON DST-2	Raw	73	7.9	19.	6.7	.04	<.1	.25	<.1
18. WILSON DST-3 #9A	Raw	150	5.3	7.5	2.8	.09	14.	.05	3.0
19. SED MUD FILTRATE		4,000	85.	100.	4.2	1.1	2.0	.21	3.8

Item	Sample Number	U (ppb)	As (mg/l)	B (mg/l)	SO <sub>4</sub> (mg/l)	F (mg/l)	Cl (mg/l)	CO <sub>3</sub> (mg/l)	HCO <sub>3</sub> (mg/l)	
1.	SED DST #1	Raw	<2	.06	**	800	6.3	3,540	2	445
2.	SED DST #2	Raw	<2	<.05	**	700	5.5	2,720	4	230
3.	SED DST #3	Raw	<2	<.05	**	450	5.1	2,180	2	165
4.	SED DST #4	Raw	<2	<.05	**	400	5.5	2,280	24	160
5.	SED DST #5	Raw	<2	<.05	**	450	5.5	2,300	16	150
6.	SED DST #6	Raw	<2	<.05	**	450	5.5	2,320	28	125
7.	SED DST #7	Raw	<2	<.05	**	300	5.5	2,280	16	110
8.	SED DST #8	Raw	<2	<.05	**	400	5.1	2,160	8	185
9.	SED DST #9	Raw	<2	<.05	**	400	5.1	1,980	<2	180
10.	SED DST #10	Raw	<2	<.05	**	375	5.1	1,860	<2	170
11.	SED DST #11	Raw	<2	<.05	**	350	5.1	1,920	<2	175
12.	SED DST #12	Raw	<2	<.05	**	450	5.1	2,280	<2	205
13.	SED DST #13	Raw	<2	<.05	**	450	5.1	2,000	<2	210
14.	SED DST #14	Raw	<2	<.05	**	300	5.1	1,880	<2	200
15.	SED DST #15	Raw	<2	<.05	**	250	5.1	1,760	<2	200
16.	SED WELL WATER	Raw	<2	<.05	**	200	4.3	2,680	<2	75
17.	WILSON DST-2	Raw	<2	<.05	**	50	.82	28	<2	160
18.	WILSON DST-3 #9A	Raw	8	<.05	**	50	.74	31	12	240
19.	SED MUD FILTRATE	I	I	**	I	I	I	4,560	<2	1,450

Item	Sample Number	Ag (mg/l)	Cu (mg/l)	Pb (mg/l)	Zn (mg/l)	Ba (mg/l)	Br (mg/l)	I (mg/l)	
16.	SED WELL WATER	Raw	<.01	.01	<.005	.09	.3	I	I
17.	WILSON DST-2	Raw	<.01	<.01	.015	.74	.2	I	I
18.	WILSON DST-3 #9A	Raw	<.01	.02	.009	.20	.4	I	I

Item	Sample Number		pH	Specific Conductance (micromhos/cm)	TDS (mg/l)	SiO <sub>2</sub> (mg/l)
1.	SED DST #1	Raw	8.3	7,300	7,368	80.
2.	SED DST #2	Raw	8.4	5,120	4,740	98.
3.	SED DST #3	Raw	8.4	4,680	4,172	80.
4.	SED DST #4	Raw	8.7	4,870	4,496	94.
5.	SED DST #5	Raw	8.6	4,860	4,400	80.
6.	SED DST #6	Raw	8.9	4,740	4,212	120.
7.	SED DST #7	Raw	8.6	4,770	3,984	94.
8.	SED DST #8	Raw	8.4	4,560	3,748	*
9.	SED DST #9	Raw	7.9	4,440	3,588	*
10.	SED DST #10	Raw	7.7	4,440	3,548	*
11.	SED DST #11	Raw	7.6	4,370	3,468	*
12.	SED DST #12	Raw	8.1	4,500	3,528	*
13.	SED DST #13	Raw	7.7	4,380	3,496	*
14.	SED DST #14	Raw	7.7	4,230	3,328	*
15.	SED DST #15	Raw	7.8	4,260	3,292	*
16.	SED WELL WATER	Raw	7.3	5,500	4,328	210.
17.	WILSON DST-2	Raw	7.9	437	264	7.3
18.	WILSON DST-3 #9A	Raw	8.8	603	444	94.
19.	SED MUD FILTRATE		7.8	10,700	I	40.
20.	SED DST #8	DILUTE	*	*	*	15.
21.	SED DST #9	DILUTE	*	*	*	12.
22.	SED DST #10	DILUTE	*	*	*	15.
23.	SED DST #11	DILUTE	*	*	*	17.
24.	SED DST #12	DILUTE	*	*	*	32.
25.	SED DST #13	DILUTE	*	*	*	17.
26.	SED DST #14	DILUTE	*	*	*	23.
27.	SED DST #15	DILUTE	*	*	*	49.

NOTE: - I = Insufficient Sample  
 \* = Analysis not requested  
 \*\* = Interference

cc: Mark Kehoe

*Charles E. Thompson*  
 Charles E. Thompson  
 Chief Chemist

SKYLINE LABS, INC.

SPECIALISTS IN EXPLORATION GEOCHEMISTRY

12090 WEST 50TH PLACE • WHEAT RIDGE, COLORADO 80033 • TEL.: (303) 424-7718

REPORT OF SPECTROGRAPHIC ANALYSIS

Job No. DEY006  
April 20, 1978

Chevron Resources Company  
Attention: Joe Iovenitti  
P.O. Box 3722  
San Francisco, California 94119

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the cube root of ten. The "accepted" value for each element is considered to be within  $\pm 1$  step of the range reported at the 68 percent confidence level and within  $\pm 2$  steps at the 95 percent confidence level.



ITEM NO.      SAMPLE NO.  
 2 = SED DST #2RAW  
 5 = SED DST #5RAW  
 10 = SED DST #10RAW  
 15 = SED DST #15RAW

ITEM	2	5	10	15
ELEMENT				
Fe	7%	5%	5%	5%
Ca	2%	1.5%	2%	1.5%
Mg	1%	1%	1%	1%
As	<1	<1	<1	<1
As	<500	<500	<500	<500
B	100	50	50	50
Ba	>10000	>10000	>10000	>10000
Ba	2	2	2	2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	<5	<5	5
Cr	700	700	700	700
Cu	50	100	200	70
Ga	<10	<10	10	10
Ge	<20	<20	<20	<20
La	50	50	50	50
Mn	500	500	500	500
Mo	2	5	20	50
Nb	20	20	20	20
Ni	20	20	30	30
Pb	20	30	100	30
Sb	<100	<100	<100	<100
Sc	<10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	1000	1000	1000	1000
Ti	5000	3000	3000	3000
V	100	70	70	70
W	<50	<50	<50	<50
Y	10	10	10	10
Zn	200	300	500	200
Zr	70	70	70	100

*Charles E. Thompson*  
 Charles E. Thompson  
 Chief Chemist

cc: Mark Kehoe

# DIRECTIONAL DRILLING, INC.

## SURVEY DATA SHEET

SHEET NO. 1

JOB NO. B2942



COMPANY CHEVRON USA

ADDRESS

WELL 1-9

FIELD KOSMOS

COUNTY WASHOE

STATE NEVADA

MEASURED DEPTH	COURSE LENGTH	TERMINAL DRIFT ANGLE	TERMINAL DIRECTION OF DEVIATION	AVERAGE DRIFT ANGLE	VERTICAL DEPTH		COURSE DEVIATION	AVERAGE DIRECTION OF DEVIATION	COURSE COORDINATES				TOTAL COORDINATES					
					COURSE	TOTAL			NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST		
610						610.00		ASSUMED VERTICAL TO 610'										
662	52	3.00	N 68 W	3.00	51.93	661.93	2.72	N 68 W	1.02			2.52	1.02					2.52
697	35	4.30	N 62 W	3.45	34.93	696.85	2.29	N 65 W	0.97			2.08	1.99					4.00
730	33	6.00	N 53 W	5.15	32.86	729.72	3.02	N 57°30 W	1.62			2.55	3.61					7.14
762	32	7.15	N 62 W	6.30	31.80	761.51	3.62	N 57°30 W	1.95			3.05	5.55					10.20
792	30	8.45	N 70 W	8.00	29.71	791.22	4.18	N 66 W	1.70			3.82	7.25					14.02
853	61	12.15	N 72 W	10.30	59.98	851.20	11.11	N 71 W	3.62			10.50	10.87					24.92
884	31	13.15	N 75 W	13.00	30.21	881.41	6.98	N 73°30 W	1.98			6.69	12.85					31.12
914	30	14.15	N 82 W	14.00	29.11	910.52	7.26	N 78°30 W	1.45			7.11	14.30					38.30
947	33	14.15	N 83 W	14.15	31.98	942.50	8.12	N 82°30 W	1.06			8.05	15.36					46.38
1026	29	15.30	N 89 W	14.30	76.48	1018.98	19.78	N 86 W	1.38			19.73	16.74					66.11
1120	94	16.45	N 88 W	16.00	90.36	1109.34	25.91	N 86°30 W	0.68			25.90	17.42					92.51
1245	125	17.15	N 87 W	17.00	119.54	1228.88	36.55	N 87°30 W	1.59			36.51	19.01					128.53
1339	94	17.30	N 86 W	17.15	89.77	1318.65	27.87	N 86°30 W	1.70			27.82	20.71					156.34
1432	93	17.45	N 86 W	17.30	88.69	1407.34	27.97	N 86 W	1.95			27.90	22.67					184.35
1522	90	16.00	N 86 W	16.30	86.29	1493.64	25.56	N 86 W	1.78			25.50	24.45					209.74
1615	93	13.45	S 89 W	14.30	90.03	1583.67	23.29	N 87°30 W	1.02			23.27	25.47					233.01
1709	94	11.45	N 88 W	12.45	91.68	1675.35	20.75	N 88°30 W	0.54			20.74	26.01					253.75
1804	95	10.45	N 86 W	11.15	93.18	1768.52	18.53	N 87°30 W	0.97			18.50	26.98					272.26
1896	92	9.00	WEST	9.45	90.68	1859.20	15.58	N 88 W	0.54			15.57	27.52					287.83
1989	93	8.30	N 88 W	8.45	91.92	1951.12	14.15	N 89 W	0.25			14.15	27.77					301.98
2082	93	7.30	N 89 W	8.00	92.10	2043.22	12.95	N 88°30 W	0.34			12.95	28.11					314.92
2174	92	6.30	N 87 W	7.00	91.31	2134.53	11.21	N 88 W	0.39			11.20	28.50					326.13
2267	93	5.30	N 87 W	6.00	92.49	2227.02	9.72	N 87 W	0.51			9.71	29.01					335.83
2363	96	5.15	N 82 W	5.15	95.60	2322.62	8.78	N 84°30 W	0.84			8.74	29.85					344.57
2455	92	4.45	N 86 W	5.00	91.65	2414.27	8.02	N 84°30 W	0.84			7.98	30.69					352.53
2549	94	4.45	N 81 W	4.45	93.68	2507.95	7.78	N 83°30 W	0.88			7.73	31.51					360.29
2640	91	4.45	N 80 W	4.45	90.69	2598.64	7.53	N 80°30 W	1.24			7.43	32.81					367.70
2717	77	4.15	N 75 W	4.30	76.76	2675.40	6.04	N 77°30 W	1.31			5.90	34.12					373.50
2828	111	3.45	N 73 W	4.00	110.71	2786.11	7.75	N 74° W	2.14			7.45	36.25					381.65
2922	94	3.30	N 72 W	3.30	93.82	2879.93	5.73	N 72°30 W	1.72			5.46	37.98					386.52
3015	93	3.00	N 70 W	3.15	92.85	2972.80	5.27	N 71° W	1.72			4.98	39.69					391.50
3108	93	2.45	N 55 W	2.45	92.89	3065.69	4.46	N 62°30 W	2.06			3.96	41.75					395.46
3200	92	2.00	N 38 W	2.30	91.91	3157.60	4.01	N 46°30 W	2.76			2.91	44.51					398.16
3292	92	2.00	N 38 W	2.00	91.94	3249.54	3.21	N 38 W	2.53			1.98	47.04					400.34
3381	89	2.30	N 45 W	2.15	88.91	3338.47	3.50	N 41°30 W	2.62			2.32	49.66					402.66
3476	95	3.00	N 61 W	2.45	94.89	3433.36	4.56	N 53 W	2.74			3.64	52.41					406.30
3570	94	2.45	N 44 W	2.45	93.89	3527.25	4.51	N 52°30 W	2.75			3.58	55.15					409.18
3660	90	3.00	N 40 W	3.00	89.87	3617.12	4.71	N 43 W	3.50			1.15	58.65					413.03
3742	82	3.00	N 66 W	3.00	81.89	3699.01	4.29	N 52 W	2.58			3.43	61.24					416.46
3838	110	3.45	N 47 W	3.15	115.81	3814.82	6.58	N 56°30 W	3.63			5.49	64.87					421.94
3951	93	4.30	S 79° W	4.00	92.78	3907.60	6.49	N 74 W	1.79			6.24	66.66					428.18
4043	92	5.15	S 72 W	5.00	91.65	3999.25	8.02	S 75°30 W		2.01		7.76	64.65					435.95
4135	92	5.45	S 53 W	5.30	91.58	4090.83	8.81	S 62°30 W		4.07		7.81	60.58					443.76
4225	90	6.00	S 41 W	5.45	89.55	4180.38	9.02	S 57 W		615		6.60	54.43					450.36
4319	94	6.45	S 24 W	6.30	93.40	4273.78	10.64	S 32°30 W		8.97		5.72	45.46					456.08
4402	83	7.30	S 19 W	7.15	82.34	4356.12	10.47	S 21°30 W		9.74		3.84	35.72					459.91
4485	83	8.30	S 20 W	8.00	82.19	4438.31	11.55	S 19°30 W		10.89		3.86	24.83					463.77
4515	30	8.15	S 01 W	8.15	29.69	4468.00	4.31	S 10°30 W		4.24		0.79	20.59					464.55
4548	33	6.45	S 15 W	7.30	32.72	4500.72	4.31	S 08 E		4.27	0.59		16.32					463.95
4577	29	6.45	S 40 E	6.45	28.80	4529.52	3.41	S 27°30 E		3002	1.57		13.30					462.38
4608	31	8.00	S 57 E	7.15	30.75	4560.27	3.91	S 48°30 E		2.59	2.93		10.70					459.45



# DIRECTIONAL DRILLING, INC.

SURVEY DATA SHEET

SHEET NO. 2

JOB NO. B2942

COMPANY CHEVRON USA

ADDRESS \_\_\_\_\_

WELL 1-9

FIELD KOSMOS

COUNTY WASHOE

STATE \_\_\_\_\_

NEVADA

MEASURED DEPTH	COURSE LENGTH	TERMINAL DRIFT ANGLE	TERMINAL DIRECTION OF DEVIATION	AVERAGE DRIFT ANGLE	VERTICAL DEPTH		COURSE DEVIATION	AVERAGE DIRECTION OF DEVIATION	COURSE COORDINATES				TOTAL COORDINATES						
					COURSE	TOTAL			NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	SEC		
4718	110	9.15	S 75 E	8.30	108.79	4669.06	16.26	S 66 E			6.61	14.85			4.09				444.50
4816	98	10.30	S 67 E	10.00	96.51	4765.57	17.01	S 71 E			5.54	16.08				1.45			420.51
4944	128	14.00	S 60 E	12.15	125.08	4890.65	27.16	S 63 E			17.12	24.31				13.57			400.52
5079	135	15.15	S 53 E	14.30	130.69	5021.35	33.80	S 56 E			18.65	28.19				32.22			370.53
5200	212	14.45	S 53 E	15.00	116.87	5138.22	31.31	S 53 E			18.84	25.00				51.06			351.52
5326	126	14.00	S 58 E	14.30	121.98	5260.20	31.55	S 55 E			17.87	26.00				60.93			305.50
5370	144	14.00	S 58 E	14.00	42.69	5302.89	10.64	S 58 E			5.64	9.02				74.57			315.51
CLCURE:				324.68				S 76° 43' W											

NORTH    SOUTH    EAST    WEST    NORTH    SOUTH    EAST    WEST



**Standard Oil Company of California,  
Western Operations, Inc.**

**Completion Report  
New Well PRO-318**

*W. B. ...*

Field San Emidio Property: Kosmos  
 Well No. Kosmos 1-9 Sec. 9 T. 29N R. 23E MD MD B.&M. B.&M.  
 Location 727.55'N and 13077.42E from the SW corner of Sec. 7  
 NOTE: This is 3608.04'S 2691.85'W from U.S. Mineral Monument #136  
 Elevation 4078.8 Derrick Floor D.F. is 24.5' ' above mat.  
 Date June 7, 1978

*MBG*

B.D. GARRETT/R.B. MURRAY  
(For Operations Manager, Producing Dept.)

Drilled By Camay #3  
 Date Commenced Drilling 1-30-78 Date Completed Drilling 3-10-78  
 Date of Initial Production \_\_\_\_\_  
 Production: Daily Average, 1st \_\_\_\_\_ Days Gravity \_\_\_\_\_ °API Pump \_\_\_\_\_  
 Oil \_\_\_\_\_ Bbls. T.P. \_\_\_\_\_ PSI Flowing \_\_\_\_\_  
 Water \_\_\_\_\_ Bbls. C.P. \_\_\_\_\_ PSI Gas Lift \_\_\_\_\_  
 Gas \_\_\_\_\_ Mcf. Bean \_\_\_\_\_ /64"

**Summary**

**CASING:**

10 3/4" LTC cemented at 38'  
 7" - 23# K55 LTC cemented at 500'

**CASING HEAD:**

6" 2000# x 7" S.O.W.

**TUBING:**

2 7/8" EUE and GST hung at 5338

**ELECTRIC LOGS:**

At 4485, Ran Schlumberger DIL, Sonic,  
 FDC-CNL-GR, Temp Survey

At 5370, Ran Schlumberger DIL, FDL-CNL-GR,  
 Temp. Survey, Dipmeter

KOSMOS 1-9

Prior to move-in, cemented 10 3/4" conductor at 38'

- 1-30-78 Spudded and drilled 209' of 9 7/8" hole.
- 1-31 Drilled to 217' Left bearings of all 3 cones in hole. Ran 8 1/2" flat bottom mill and milled on bearings and formation to 218'.
- 2-01 POOH with mill. RIH with magnet. POOH. RIH, drilled 9 7/8" to 505'. Wiped and circulated hole clean. Ran 503.65' of 7" x 23# K-55 LT&C casing with shoe at 500', float collar at 458' KKG centralizers at 490', 470', 450', 430', 288', 164', 47'. Cemented at 500' with 260 CUFT class G cement with 33% silica flour, preceded by 50 CUFT water, followed with 102 CUFT water. Bumped plug at 800 psi with good circulation and cement returns.
- 2-02 Installed 7" casing head and tested to 1000 psi. Installed class III BOPE.
- 2-03 BOPE test OK. Drilled out cement 452'-458', float collar, cement to 500', shoe, cement to 505'. Drilled to 610'. POOH. RIH with Dyna-drill. Drill ahead 662'. Survey hole, drill 6 1/4" to 705'.
- 2-04 Drill 6 1/4" to 1245'.
- 2-05 Drill 6 1/4" to 1896'. Hole took ~60 BBL fluid 1734' to 1896'.
- 2-06 Drill 6 1/4" to 1989' hole took ~75 BBL fluid. Pull up to shoe, Mix GEL in mud.
- 2-07,8,9 Drill 6 1/4" to 2717'.
- 2-10 Core 2717' to 2727'. POOH and recover 10' of core. Drill 6 1/4" to 2770'.
- 2-11 to 21 Drill 6 1/4" to 4429'.
- 2-22 Drill 6 1/4" to 4459'. Core to 4476'. Cored 17' - recovered 15'.
- 2-23,24 Core 4476'-4482' Cored 6', recovered 4'. POOH. Rig up Schlumberger. Run temperature survey, DIL-BHC, FDC-CNL, LSSonic, dipmeter, temperature survey. Drill 6 1/4" to 4485'.
- 2-25 POOH, lost bit cones. RIH, drill ahead to 4495' (No evidence of junk) POOH and ran Dyna-drill. Drill 6 1/4" to 4540'

- 2-26 Dyna-drill and survey to 4647'
- 2-27 to 3-02 Dyna-drill to 4651. POOH. RIH and ream at 4385'. Stuck drill pipe at 4498'. Jarred loose, ream to 4650' Drill to 4944' Spot GEL and Milchem lube pill across from bottom. Rigup temperature log inside drill pipe, run 4000' - 4896'. Log temp for 9 hrs. 4896' to 4000'. POOH.
- 3-03 RIH, drill 6 $\frac{1}{4}$ " to 5066'
- 3-04 Drill 6 $\frac{1}{4}$ " to 5079'. POOH and lost 3 cones. RIH and drill to 5122'. No evidence of junk.
- 3-05 Drill 6 $\frac{1}{4}$ " to 5256' Lost 50 BBL mud at 5247'.
- 3-06 Drill 6 $\frac{1}{4}$ " to 5370'. POOH. Rig up Schlumberger.
- 3-07 Run temperature survey to TD; DIL; FNC-CNL-GR, 3500' to TD temperature survey TD to surface; BHC, FIL Dipmeter 3500' to TD. Rig down Schlumberger.
- 3-08 Make up Johnson DST., Bottom packer at 5238' 130 tail (52.0 perf. 73.47 4 3/4 DG and 2 outside recorders) RIH. Rig up Nowsco. Set Johnson Tool. RIH with Nowsco, blow with N<sub>2</sub>. Fluid detected at ~3700' continue with N<sub>2</sub>. Rig down Nowsco. Shut in well, release packer. POOH and break down DST tools.
- 3-09 Circulate hole clean. POOH and lay down drill pipe.
- 3-10 Run 5313' 2 7/8" tubing with shoe at 5338'. Nipple down. Rig down and move out.

TUBING DETAIL

Ran 162 joints 2 7/8" x 6.5# J-55 GST and EUE  
 Tubing of unknown manufacture. (EUE top 850.95')

Total Footage	5313.49
Landing Nipple	0.60
<u>K. B. to ground</u>	<u>24.50</u>
Shoe at	5338.59'

**REPORT  
of  
SUB-SURFACE  
SURVEY**

**CHEVRON U.S.A.  
I-9  
KOSMOS**

**JOB NO. B 2942**

**DATE 3-25-78**

**DIRECTIONAL DRILLING, INC.**

**BAKERSFIELD**

**Phone: 324-3574**

