87-13S9.XLS

Calpine CD

plotted: 2/7/2005

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**	**Well Name**	**GMFU 87-13**
Casing	7" 660 to 2356	**Date**	7/21/92
		Zero Point	Swab Gate
Liner Description	4.5" 2158 to 3010	**Depth**	5935
	3.5" 2950 to 5935	**Elevation**	6697
Remarks	Fluid Level at ± 760 ft.		
	stops at: 2570, 4000, 5800 ± 10 min.		
Purpose	Temperature gradient traverse		

Element	temp 1	**Serial #**	K 2051	**Clock**	k 3057	**Well head Press.**	0
Element	temp 2	**Serial #**	Sandia	**Clock**	Electronic	**Pickup Depth**	n.a.
Element		**Serial #**		**Clock**		**Last Depth**	5866

1. Engage Stylus	8:41	**1. Disengage Stylus**	13:00		
2. Engage Stylus		**2. Disengage Stylus**			
3. Engage Stylus		**3. Disengage Stylus**		**Max. Temp (MRT)**	

Well Status	Static	**open swab gate**	9:00
injection rate		**time on bottom**	12:16
production rate		**time off bottom**	12:33
shut in	10/23/91	**close swab gate**	12:50

			k 2051					Sandia	
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
906	1000	0.566	222					251	
916	1200	0.946	325					312	
926	1400	1.145	379					364	
931	1500	1.18	388					386	
936	1600	1.173	386					395	
946	1800	1.347	433					402	
956	2000	1.479	468					459	
1006	2200	1.508	476					476	
1016	2400	1.531	482					481	
1025 - 35	2570	1.534	483					486	
1036	2600	1.535	483					486	
1046	2800	1.541	484					487	
1056	3000	1.549	487					490	
1101	3200	1.559	489					493	
1106	3400	1.568	492					495	
1111	3600	1.577	494					497	
1116	3800	1.587	497					500	
1121 - 31	4000	1.6	500					504	
1136	4200	1.62	506					507	
1141	4400	1.637	510					511	
1146	4600	1.654	515					515	
1151	4800	1.667	519					518	
1156	5000	1.683	523					521	
1201	5200	1.7	528					526	

Survey by: Sam Timmons

WELL 87-13

TELEPHONE FLATS

- Subsurface Temp Survey
- Post flow Temp
- Flowing TP
- Winter Temp
- Post injection Temp
- Pre injection Temp
- Pre flow Temp

1206	5400	1.716	532					530	
1211	5600	1.731	536					533	
1216 - 33	5800	1.741	539					537	

Survey by: Sam Timmons

87-13S3.XLS Calpine CD plotted: 2/7/2005

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**	**Well Name**	**GMFU 87-13**
Casing	7" 660 to 2356	**Date**	10/13/91
		Zero Point	Swab Gate
Liner Description	4.5" 2158 to 3010	**Depth**	5935
	3.5" 2950 to 5935	**Elevation**	6697
Remarks	Tools run on Cal Steam Cap Tubing		
Purpose	Post Flow Gradient Survey		

Element	Temp	**Serial #**	10172	**Clock**	k 5220	**Well head Press.**	
Element	Temp	**Serial #**	k 2051	**Clock**	k 1773	**Pickup Depth**	
Element		**Serial #**		**Clock**		**Last Depth**	5910

1. Engage Stylus	17:29	**1. Disengage Stylus**	21:10		
2. Engage Stylus	17:37	**2. Disengage Stylus**	21:05		
3. Engage Stylus		**3. Disengage Stylus**		**Max. Temp (MRT)**	
Well Status	Static			**open swab gate**	
injection rate				**time on bottom**	18:22
production rate				**time off bottom**	18:38
shut in	4:23:00 P	**10/13/91**		**close swab gate**	

		temp	**10172**		**temp**	**k 2051**		**press**	
time	**depth**	**deflection**	**p/t**	gradient	**time**	**depth**	**deflection**	**p/t**	**gradient**
1822 - 38	5500	1.242	537.8		1.703	534.2		1669.594	
41 - 46	5000	1.192	521.8		1.649	519.2		1505.844	
48 - 54	4500	1.153	509.3		1.601	505.9		1341.214	
57 - 1903	4000	1.104	493.5		1.545	490.5		1174.877	
1905 - 13	3750	1.083	486.7		1.516	482.6		1088.344	
14 - 23	3500	1.06	479.2		1.489	475.2		1002.66	
24 - 33	3250	1.033	470.5		1.467	466.5		916.538	
35 - 44	3000	1.008	462.4		1.435	460.5		829.685	
46 - 54	2750	1.023	467.3		1.449	464.3		743.154	
56 - 2005	2500	1.03	469.5		1.455	466		657.549	
2007 - 18	2000	0.935	438.7		1.344	435.9		484.494	
21 - ?	1000	0.635	339		0.95	331.6		126.158	

Survey by:

Survey by:

87-13S2.XLS Calpine CD plotted: 2/7/2005

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**	**Well Name**	**GMFU 87-13**
Casing	7" 660 to 2356	**Date**	10/13/91
		Zero Point	Swab Gate
Liner Description	4.5" 2158 to 3010	**Depth**	5935
	3.5" 2950 to 5935	**Elevation**	6697
Remarks	Tools run on Cal Steam Cap Tubing (pressure on seperate record)		
Purpose	Flowing Temperature and Pressure gradient survey		

Element	temp	**Serial #**	10172	Clock		**Well head Press.**	
Element		**Serial #**		Clock		**Pickup Depth**	
Element		**Serial #**		Clock		**Last Depth**	5910

1. Engage Stylus	13:23	**1. Disengage Stylus**	17:19		
2. Engage Stylus		**2. Disengage Stylus**			
3. Engage Stylus		**3. Disengage Stylus**		**Max. Temp (MRT)**	
Well Status	Flowing			**open swab gate**	
injection rate				**time on bottom**	14:22
production rate				**time off bottom**	17:04
shut in	4:23:00 PM on 10/13/91			**close swab gate**	

			temp						
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
1422-38	5500	1.249	540.1						
40 - 46	5000	1.212	528.2						
47 - 55	4500	1.145	522.8						
56 - 04	4010	1.158	510.9						
1505 - 12	3500	1.115	497						
14 - 21	3000	1.081	486						
23 - 30	2500	1.064	480.5						
32 - 41	2000	0.997	458.8						
44 - 49	1500	0.953	444.6						
51 - 58	1000	0.899	427						
Flowing1604	2600	1.06	479.2						
Shut in	2600	1.063	480.2						

Survey by:

Survey by:

87-13S8.XLS

Calpine CD

plotted: 2/7/2005

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**	**Well Name**	**GMFU 87-13**
Casing	7" 660 to 2356	**Date**	2/26/92
		Zero Point	Swab Gate
Liner Description	4.5" 2158 to 3010	**Depth**	5935
	3.5" 2950 to 5935	**Elevation**	6697
Remarks			
Purpose	Mid - Winter Gradient survey		

Element	T	**Serial #**	10172	**Clock**	K 3057	**Well head Press.**	0
Element	T	**Serial #**	K 2051	**Clock**	K 1746	**Pickup Depth**	NA
Element	P	**Serial #**	K 3582	**Clock**	K 3046	**Last Depth**	5866

1. Engage Stylus	10:17	**1. Disengage Stylus**	15:28		
2. Engage Stylus	10:17	**2. Disengage Stylus**	15:28		
3. Engage Stylus	14:45	**3. Disengage Stylus**	16:09	**Max. Temp (MRT)**	NA

Well Status	Static	**open swab gate**	10:29
injection rate		**time on bottom**	14:31
production rate		**time off bottom**	14:53
shut in	10/23/91	**close swab gate**	15:09

	TEMP	**10172**					**TEMP**	**K 2051**	
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
1033-53	1000	0.384	253			1000	0.655	246	
54-1104	1500	0.76	383			1500	1.123	373	
1105-12	1600	0.789	393			1600	1.179	388	
13-21	1700	0.757	382			1700	1.146	379	
22-32	2000	0.935	441			2000	1.355	435	
35-45	2250	1.038	474			2250	1.482	469	
46-56	2500	1.052	479			2500	1.502	474	
57-1205	2600	1.061	482			2600	1.511	476	
1206-13	2700	1.064	483			2700	1.514	477	
14-21	2800	1.066	483			2800	1.516	478	
21-28	2900	1.071	485			2900	1.52	479	
28-36	3000	1.084	489			3000	1.538	484	
37-46	3100	1.087	490			3100	1.542	485	
47-58	3250	1.093	492			3250	1.548	486	
59-1309	3500	1.102	495			3500	1.558	489	
1309-16	3600	1.107	496			3600	1.563	490	
17-25	3700	1.111	498			3700	1.569	492	
25-32	3800	1.116	499			3800	1.574	493	
33-40	3900	1.123	502			3900	1.581	495	
40-47	4000	1.128	503			4000	1.589	497	
48-58	4500	1.167	516			4500	1.633	509	
59-1409	5000	1.201	527			5000	1.672	520	
1413-29	5500	1.239	539			5500	1.716	532	
1431-53	5860	1.263	546			5860	1.743	540	

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		Pressure	K 3582						
1525-34	1200		175						
35-41	1500		288						
42-47	1800		409						
47-52	2000		485						

87-13S7.XLS

plotted: 2/7/2005

Calpine CD

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**					**Well Name**	**GMFU 87-13**
Casing	7"	660 to 2356				**Date**	10/24/91
						Zero Point	Swab Gate
Liner Description		4.5" 2158 to 3010				**Depth**	5935
		3.5" 2950 to 5935				**Elevation**	6697
Remarks		**Injection Test # 2**					
Purpose		**Post Injection Deep Gradient Survey**					
Element	Temp	**Serial #**	10172	**Clock**	K 3120	**Well head Press.**	
Element	Temp	**Serial #**	K 2051	**Clock**	K 1746	**Pickup Depth**	5866
Element		**Serial #**		**Clock**		**Last Depth**	5874
1. Engage Stylus		13:49	**1. Disengage Stylus**		16:11		
2. Engage Stylus		13:47	**2. Disengage Stylus**		16:15		
3. Engage Stylus			**3. Disengage Stylus**			**Max. Temp (MRT)**	
Well Status		Static				**open swab gate**	13:54
injection rate						**time on bottom**	15:36
production rate						**time off bottom**	15:50
shut in		10/23/91				**close swab gate**	

			10172				**k 2051**		
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
1402 - 22	4000	0.95	444				1.356	439	
22 - 32	4200	0.989	456				1.4	451	
32 - 42	4300	1.013	464				1.429	459	
42 - 51	4400	1.03	470				1.449	464	
52 - 1500	4500	1.049	476				1.472	471	
1501 - 10	4750	1.091	489				1.518	483	
1511 -21	5000	1.13	502				1.565	496	
22 - 33	5500	1.23	534				1.681	528	
36 - 50	5860	1.28	550				1.739	544	

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87-13S6.XLS

plotted: 2/7/2005

Calpine CD

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**					**Well Name**	**GMFU 87-13**
Casing	7"	660 to 2356				**Date**	10/22/91
						Zero Point	Swab Gate
Liner Description		4.5" 2158 to 3010				**Depth**	5935
		3.5" 2950 to 5935				**Elevation**	6697
Remarks		**Injection Test # 2**					
Purpose		**Pre - Injection Gradient Survey**					
Element	Temp	**Serial #**	10172	**Clock**	K 3046	**Well head Press.**	
Element	Press	**Serial #**	K 3582	**Clock**	K 1773	**Pickup Depth**	
Element		**Serial #**		**Clock**		**Last Depth**	5874
1. Engage Stylus		14:39	**1. Disengage Stylus**				
2. Engage Stylus		14:39	**2. Disengage Stylus**				
3. Engage Stylus			**3. Disengage Stylus**			**Max. Temp (MRT)**	
Well Status		Static				**open swab gate**	14:47
injection rate						**time on bottom**	17:16
production rate						**time off bottom**	17:29
shut in		10/14/91				**close swab gate**	

			10172					**K 3582 (press)**	
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
1452 - 1507	1500	0.668	352				0.181	276	
1508 - 20	2000	0.883	406				0.307		
22 - 32	2600	1.01	463				0.455		
33 - 47	2800	1.003	461				0.503	761	
48 - 59	3000	0.992	457				0.55		
1600 - 13	3250	1.013	464				0.61		
1614 - 25	3500	1.037	472				0.67		
25 - 34	3750	1.058	479				0.728	1095	
34 - 43	4000	1.077	485				0.787		
44 - 54	4250	1.1	492				0.845		
55 - 1705	4500	1.128	501				0.905		
1706 - 15	5000	1.18	518				1.02	1526	
16 - 29	5500	1.243	538				1.136		

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87-13S5.XLS plotted: 2/7/2005

Calpine CD

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**	**Well Name**	**GMFU 87-13**
Casing	7" 660 to 2356	**Date**	10/15/91
		Zero Point	Swab Gate
Liner Description	4.5" 2158 to 3010	**Depth**	5935
	3.5" 2950 to 5935	**Elevation**	6697
Remarks			

Purpose Post Injection Temperature Gradient with Traverse

Element	temp	**Serial #**	10172	**Clock**	K 1746	**Well head Press.**	
Element	temp	**Serial #**	K 2051	**Clock**	K 3057	**Pickup Depth**	5875
Element		**Serial #**		**Clock**		**Last Depth**	5910 10/1:

1. Engage Stylus	11:10	**1. Disengage Stylus**	15:49		
2. Engage Stylus	11:16	**2. Disengage Stylus**	15:45		
3. Engage Stylus		**3. Disengage Stylus**		**Max. Temp (MRT)**	

Well Status	Static	**open swab gate**	
injection rate		**time on bottom**	15:16
production rate		**time off bottom**	15:27
shut in	10/14/91	**close swab gate**	

			10172		k 2051				
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
1141 - 58	2000	0.68	356		357				
1200 - 10	2500	0.843	408.9		408				
1210 - 20	2600	0.835	406.3		407				
20 - 30	2800	0.828	404		405				
32 - 45	3000	0.827	403.7		404				
46 - 1300	3100	0.84	407.9		408				
1305	3200	0.845	409.5						
10	3300	0.86	414.4						
15	3400	0.876	419.6						
20	3500	0.894	425.4						
25 - 30	3600	0.916	432.6		432				
35	3700	0.925	435.5						
40	3800	0.938	439.7						
45	3900	0.951	443.9						
50	4000	0.966	448.8						
55 - 1400	4100	0.989	456.2		456				
1405	4200	0.998	459.2						
10	4300	1.013	464						
15	4400	1.03	469.5						
20	4500	1.045	474.4						
25	4600	1.06	479.2						
30 - 45	4700	1.084	487		487				
1446 - 1501	4993	1.124	499.9		499				
1502 - 14	5500	1.224	532.1		532				

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16 - 27	5874	1.272	547.4		547				

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87-13S4.XLS plotted: 2/7/2005

Calpine CD

UNOCAL SUBSURFACE SURVEY

FIELD	**Glass Mountain**					**Well Name**	**GMFU 87-13**
Casing	7"	660 to 2356				**Date**	10/14/91
						Zero Point	Swab Gate
Liner Description		4.5" 2158 to 3010				**Depth**	5935
		3.5" 2950 to 5935				**Elevation**	6697
Remarks		**Tools run and read by California Steam Services Steve Thompson**					
Purpose		**Injection Temperature Gradient**					
Element	temp	**Serial #**	K 2051	**Clock**	k 1773	**Well head Press.**	
Element	temp	**Serial #**	10172	**Clock**	k 3120	**Pickup Depth**	
Element		**Serial #**		**Clock**		**Last Depth**	5910
1. Engage Stylus		11:19	**1. Disengage Stylus**		17:18		
2. Engage Stylus		11:22	**2. Disengage Stylus**		17:18		
3. Engage Stylus			**3. Disengage Stylus**			**Max. Temp (MRT)**	
Well Status						**open swab gate**	
injection rate		218 kph				**time on bottom**	13:58
production rate						**time off bottom**	17:02
shut in		time unreadable	**14:03 or 15:03 ???**			**close swab gate**	

		k 2051					**10172**		
time	**depth**	**deflection**	**p/t**	**gradient**	**time**	**depth**	**deflection**	**p/t**	**gradient**
1210 - 18	5900	1.74	545				1.279	550	
21 - 41	5500	1.684	529				1.027	533	
44 - 51	4993	1.57	497				1.123	500	
55 - 01	4500	1.467	469				1.035	471	
1303 - 10	3943	1.193	395				0.801	395	
012 - 018	3840	1.092	368				0.729	372	
22 - 29	3337	0.698	262				0.436	276	
31 - 37	3000	0.351	166				0.17	185	
39 - 48	2600	0.106	97						
50 - 57	2500	.047 ?	80						
inj shut in									
1358 - pull	2600	0.106	97						

Survey by:

Survey by:

87-13S1.XLS plotted: 2/7/2005

Calpine CD

UNOCAL SUBSURFACE SURVEY

FIELD	Glass Mountain	Well Name	GMFU 87-13
Casing	7" 660 to 2356	Date	10/11/91
		Zero Point	Swab Gate
Liner Description	4.5" 2158 to 3010	Depth	5935
	3.5" 2950 to 5935	Elevation	6697
Remarks			
Purpose	Pre - Flow Gradient Survey		

Element	Press	Serial #	K 3582	Clock		Well head Press.	10 psig
Element	Temp	Serial #	10172	Clock	K 1773	Pickup Depth	5910
Element	Temp	Serial #	K 2051	Clock		Last Depth	

1. Engage Stylus	13:59	1. Disengage Stylus	17:23		
2. Engage Stylus	14:04	2. Disengage Stylus	17:30		
3. Engage Stylus	14:16	3. Disengage Stylus	17:27	Max. Temp (MRT)	

Well Status	Shut in	open swab gate	14:24
injection rate		time on bottom	17:15
production rate		time off bottom	16:56
shut in	X	close swab gate	17:06

10171					K 3582				
time	depth	deflection	p/t	gradient	time	depth	deflection	p/t	gradient
1428 - 48	2000	0.728	372			2000	0.304	473	
49 - 1503	2500	0.851	412			2500	0.433	660	
1505 - 23	3000	0.896	426			3000	0.557	851	
24 - 39	3250	0.961	447			3250	0.619	943	
40 - 49	3500	0.999	460			3500	0.68	1020	
50 - 1606	3750	1.036	472			3750	0.739	1122	
1608 - 22	4000	1.064	481			4000	0.8	1212	
24 - 36	4500	1.123	500			4500	0.918	1374	
37 - 46	5000	1.176	517			5000	1.035	1549	
47 - 55	5500	1.238	537			5500	1.15	1722	
56 - 1706	5900	1.276	549			5900	1.239	1858	

Survey by: Sam Timmons

Survey by: Sam Timmons

GM68-8 PT. DAT

PT TOOL DATA FILE SERIAL # V2_2
Log Date: 10-20-98
CT Tool Started at --- 10:28:05
EncoderStart Point--- 10:48:36, 0, 0,0.0

Depth Ft,Rate, Enc. Sec, TT(SEC),PRESSPSIA,EXTEMPDEGC,INTERNAL TEMP,PTEMPC,BAT VOLTS

WELL 68-8
TELEPHONE FLAT
- PT TOOL DATA - TEMP V Depth
- Subsurface Temp Survey (blank)
no data

0.00, 0.00, 1.00,1232, 13.07, 12.264, 0.
0.00, 0.00, 3.00,1234, 13.07, 12.248, 0.
0.00, 0.00, 5.00,1236, 13.08, 12.232, 0.
0.00, 0.00, 7.00,1238, 13.07, 12.218, 0.
0.00, 0.00, 9.00,1240, 13.07, 12.206, 0.
0.00, 0.00, 11.00,1242, 13.07, 12.193, 0.
0.00, 0.00, 13.00,1244, 13.07, 12.183, 0.
0.00, 0.00, 15.00,1246, 13.07, 12.172, 0.
0.00, 0.00, 17.00,1248, 13.07, 12.163, 0.
0.00, 0.00, 19.00,1250, 13.07, 12.155, 0.
0.00, 0.00, 21.00,1252, 13.07, 12.149, 0.
0.00, 0.00, 23.00,1254, 13.07, 12.143, 0.
0.00, 0.00, 25.00,1256, 13.07, 12.139, 0.
0.00, 0.00, 27.00,1258, 13.07, 12.132, 0.
0.00, 0.00, 29.00,1260, 13.07, 12.128, 0., 19.9, 17.7, 14.2
16.05, 963.00, 31.00,1262, 13.07, 12.123, 0.
32.10, 0.00, 33.00,1264, 13.07, 12.119, 0.
32.10, 0.00, 35.00,1266, 13.07, 12.116, 0.
32.10, 0.00, 37.00,1268, 13.07, 12.112, 0.
32.10, 0.00, 39.00,1270, 13.07, 12.110, 0.
32.10, 0.00, 41.00,1272, 13.07, 12.104, 0.
32.10, 0.00, 43.00,1274, 13.07, 12.099, 0.
32.10, 0.00, 45.00,1276, 13.07, 12.095, 0.
32.10, 0.00, 47.00,1278, 13.07, 12.089, 0.
32.10, 0.00, 49.00,1280, 13.07, 12.083, 0.
32.10, 0.00, 51.00,1282, 13.07, 12.076, 0.
32.10, 0.00, 53.00,1284, 13.07, 12.070, 0.
32.10, 0.00, 55.00,1286, 13.06, 12.064, 0.
32.15, 3.00, 57.00,1288, 13.07, 12.059, 0.
32.30, 6.00, 59.00,1290, 13.07, 12.051, 0., 20.0, 17.7, 14.2
33.00, 36.00, 61.00,1292, 13.06, 12.045, 0.
34.25, 39.00, 63.00,1294, 13.06, 12.035, 0.
35.55, 39.00, 65.00,1296, 13.06, 12.028, 0.
36.80, 36.00, 67.00,1298, 13.06, 12.020, 0.
38.00, 36.00, 69.00,1300, 13.06, 12.017, 0.
39.20, 36.00, 71.00,1302, 13.06, 12.015, 0.
40.40, 36.00, 73.00,1304, 13.07, 12.014, 0.
41.55, 33.00, 75.00,1306, 13.06, 12.007, 0.

PAT. PENDING

68-8S.XLS

Calpine CD

plotted: 2/7/2005

UNOCAL SUBSURFACE SURVEY

FIELD	Glass Mountain	Well Name	GMFU 68-8
Casing	9.625 0 to 3515	Date	
		Zero Point	Swab Gate
Liner Description	7" 3377 to 8410	Depth	8417
		Elevation	6991
Remarks			
Purpose			
Element	Serial #	Clock	Well head Press.
Element	Serial #	Clock	Pickup Depth
Element	Serial #	Clock	Last Depth 8065
1. Engage Stylus	1. Disengage Stylus		
2. Engage Stylus	2. Disengage Stylus		
3. Engage Stylus	3. Disengage Stylus	Max. Temp (MRT)	
Well Status		open swab gate	
injection rate		time on bottom	
production rate		time off bottom	
shut in		close swab gate	

time	depth	deflection	p/t	gradient	time	depth	deflection	p/t	gradient

Survey by: Sam Timmons

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