

**Table 1. Location, classification, and geochemical data for crude oil, seep oil, and tarball samples.**

[nc, not calculated due to lack of peaks; nm = not measured. n-alkanes: 0- not present; 1-present.]

Lab No.	Sample Date	Lat. N	Long. W	Type	Type Code	Model Group	Description
08-119	1/31/08	36.95027	-122.05728	tar	T	33	Natural Bridges
08-120	1/31/08	36.95035	-122.05745	tar	T	33	Natural Bridges
08-121	1/31/08	36.95036	-122.05733	tar	T	33	Natural Bridges
08-122	1/31/08	37.59787	-122.50318	tar	T	32	Pacifica
08-123	1/31/08	37.59790	-122.50317	tar	T	32	Pacifica
08-124	1/31/08	37.55225	-122.51369	tar	T	33	Montara
08-125	1/31/08	37.55175	-122.51377	tar	T	33	Montara
08-126	1/31/08	37.52371	-122.51762	tar	T	33	Moss Beach
08-127	1/31/08	37.46975	-122.44707	tar	T	212	Half Moon Bay
08-128	1/31/08	37.46978	-122.44728	tar	T	22	Half Moon Bay
08-129	1/31/08	37.32377	-122.40377	tar	T	33	San Gregorio
08-130	1/31/08	37.32488	-122.40337	tar	T	22	San Gregorio
08-131	1/31/08	37.27509	-122.40984	tar	T	22	Pescadero Beach
08-132	1/31/08	37.27544	-122.40971	tar	T	22	Pescadero Beach
08-133	1/31/08	37.19039	-122.39755	tar	T	33	Pigeon Point
08-134	1/31/08	37.18952	-122.39767	tar	T	33	Pigeon Point
08-143	2/1/08	37.16101	-122.36074	tar	T	31	Unnamed beach ~2 miles south of Pigeon Point
08-144	2/1/08	37.16135	-122.36102	tar	T	33	Unnamed beach ~2 miles south of Pigeon Point
08-145	2/1/08	37.16190	-122.36124	tar	T	33	Unnamed beach ~2 miles south of Pigeon Point
08-146	2/1/08	37.03831	-122.22866	tar	T	33	Pigeon Point
08-147	2/1/08	37.03813	-122.22853	tar	T	33	Scott Creek Beach
08-148	2/1/08	37.02477	-122.21751	tar	T	0	Scott Creek Beach
08-149	2/1/08	36.96645	-122.12291	tar	T	22	Davenport Landing
08-150	2/1/08	36.96643	-122.12277	tar	T	22	4-Mile Beach
08-151	2/1/08	36.96645	-122.12276	tar	T	33	4-Mile Beach
08-152	12/9/06	34.46897	-120.27189	tar	T	32	4-Mile Beach
08-153	12/5/06	34.46893	-120.27142	tar	T	0	Alegria tarball
08-154	9/8/07	34.16698	-119.23205	tar	T	13	Tarball in sand crab shell Alegria Beach
08-155	11/12/07	34.19000	-119.46000	oil slick	S	22	Hollywood Beach tarball
08-156	4/1/07	34.43080	-119.10439	oil seep	S	13	Orphan Slick near Platform Grace Hamp lease seep, Ojai Silverthread

**Table 1. Loc**

[nc, not calculate]

Lab No.	$\delta^{13}\text{C}$	Alkanes	Pr/Ph	Tm/Ts	Triplet	23Tri/C30	23Tri/C29	20/23Tri
08-119	-22.8	0	nc	4.45	2.65	0.96	1.31	0.11
08-120	-22.8	0	nc	5.27	3.25	1.31	1.52	0.08
08-121	-22.8	0	nc	5.45	3.24	1.32	1.51	0.09
08-122	-22.8	0	nc	5.82	3.38	1.32	1.56	0.08
08-123	-22.9	0	nc	4.98	2.62	0.83	1.21	0.11
08-124	-22.9	0	nc	5.59	3.24	1.39	1.64	0.08
08-125	-22.8	0	nc	5.85	3.28	1.43	1.64	0.09
08-126	-22.9	0	nc	5.70	3.19	1.47	1.72	0.08
08-127	-22.7	0	nc	3.13	4.85	1.26	1.80	0.20
08-128	-22.6	0	nc	4.41	3.74	1.69	1.93	0.14
08-129	-22.8	0	nc	5.71	3.10	1.59	1.76	0.09
08-130	-22.7	0	nc	4.65	3.71	1.62	1.90	0.14
08-131	-22.9	0	nc	3.75	3.73	1.34	1.72	0.15
08-132	-22.9	0	nc	4.02	2.93	1.41	1.79	0.14
08-133	-22.9	0	nc	5.61	3.26	1.39	1.58	0.09
08-134	-22.8	0	nc	5.74	3.09	1.52	1.75	0.08
08-143	-23.0	0	nc	5.94	2.61	2.57	2.55	0.09
08-144	-22.8	0	nc	5.93	2.84	1.99	2.07	0.09
08-145	-22.9	0	nc	6.34	2.77	1.86	2.01	0.09
08-146	-22.9	0	nc	6.07	2.80	2.21	2.31	0.09
08-147	-22.8	0	nc	5.24	2.91	1.88	2.17	0.11
08-148	-22.8	0	nc	4.18	2.17	4.59	4.48	0.16
08-149	-22.2	0	nc	4.82	2.90	1.68	2.18	0.12
08-150	-22.8	0	nc	6.27	2.82	2.00	2.09	0.10
08-151	-22.9	0	nc	5.89	3.02	1.81	1.96	0.09
08-152	-23.2	0	nc	4.34	2.52	0.99	1.21	0.18
08-153	-22.8	0	nc	2.28	4.79	nc	1.06	0.30
08-154	-23.3	0	nc	3.91	2.65	0.89	1.18	0.19
08-155	nm	0	nc	3.51	4.56	0.36	0.69	0.28
08-156	nm	0	nc	1.60	8.32	0.66	1.27	0.26

**Table 1. Loc**

[nc, not calculate]

Lab No.	22/21Tri	24Tri/23Tri	26/25Tri	Tri28/Tri29	C30/C29	29D/29H	C31 S/(S+R)	$\alpha\beta$ C31S/C30
08-119	0.82	0.29	0.69	0.74	1.36	0.08	0.64	0.52
08-120	1.06	0.26	0.75	0.67	1.16	0.09	0.64	0.57
08-121	1.09	0.26	0.78	0.75	1.15	0.09	0.63	0.57
08-122	1.16	0.24	0.76	0.75	1.19	0.08	0.63	0.55
08-123	0.90	0.29	0.70	0.88	1.46	0.08	0.63	0.51
08-124	1.09	0.26	0.75	0.70	1.18	0.08	0.62	0.54
08-125	1.12	0.26	0.73	0.73	1.15	0.08	0.64	0.54
08-126	1.11	0.25	0.74	0.66	1.17	0.09	0.63	0.52
08-127	0.41	0.53	0.78	0.78	1.43	0.17	0.63	0.44
08-128	0.65	0.37	0.75	0.73	1.14	0.13	0.63	0.51
08-129	1.11	0.26	0.73	0.75	1.10	0.08	0.63	0.54
08-130	0.66	0.37	0.74	0.68	1.18	0.13	0.63	0.51
08-131	0.57	0.42	0.74	0.76	1.28	0.12	0.62	0.46
08-132	0.67	0.36	0.70	0.82	1.27	0.12	0.61	0.42
08-133	1.13	0.26	0.76	0.69	1.14	0.08	0.63	0.54
08-134	1.08	0.25	0.74	0.69	1.15	0.08	0.61	0.51
08-143	1.05	0.24	0.65	0.87	0.99	0.13	0.63	0.39
08-144	1.02	0.24	0.70	0.81	1.04	0.10	0.61	0.46
08-145	1.10	0.25	0.71	0.77	1.08	0.10	0.62	0.46
08-146	1.05	0.24	0.70	0.81	1.05	0.11	0.62	0.43
08-147	0.91	0.28	0.73	0.77	1.15	0.09	0.62	0.50
08-148	0.75	0.28	0.63	1.09	0.98	0.14	0.62	0.37
08-149	0.84	0.30	0.66	0.79	1.30	0.12	0.59	0.39
08-150	1.00	0.25	0.73	0.80	1.05	0.10	0.65	0.45
08-151	1.09	0.25	0.73	0.71	1.09	0.10	0.58	0.47
08-152	0.50	0.37	0.71	1.27	1.23	0.14	0.60	0.35
08-153	0.21	0.78	0.86	1.01	nc	0.16	0.58	nc
08-154	0.47	0.42	0.72	1.08	1.33	0.13	0.60	0.35
08-155	0.28	0.57	0.88	0.88	1.95	0.15	0.60	0.33
08-156	0.20	0.90	0.89	0.90	1.92	0.19	0.60	0.24

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**Table 1. Loc**

[nc, not calculate]

Lab No.	35S/34S	BI	OI	GI	C29 S/(S+R)	C28/C29	a27R/Hop	nor26&27/Hop
08-119	2.16	0.76	0.03	0.12	nc	1.18	0.36	0.15
08-120	1.89	1.13	0.03	0.13	0.40	1.00	0.42	0.17
08-121	2.01	1.12	0.03	0.14	0.40	1.08	0.44	0.17
08-122	2.01	1.31	0.02	0.14	0.43	1.07	0.14	0.18
08-123	2.24	0.84	0.03	0.14	0.38	1.15	0.22	0.14
08-124	1.95	1.15	0.02	0.13	0.39	1.11	0.42	0.20
08-125	1.94	1.21	0.03	0.13	0.41	1.12	0.45	0.23
08-126	1.89	1.22	0.02	0.14	0.41	1.16	0.41	0.19
08-127	1.23	0.74	0.04	0.09	0.42	1.30	0.41	0.23
08-128	1.68	0.83	0.04	0.11	0.40	1.27	0.40	0.26
08-129	1.83	1.23	0.03	0.14	0.40	1.21	0.43	0.23
08-130	1.70	0.80	0.04	0.11	0.41	1.27	0.38	0.20
08-131	1.80	1.58	0.04	0.13	0.40	1.21	0.36	0.18
08-132	1.98	1.97	0.03	0.15	0.40	1.20	0.37	0.23
08-133	1.97	1.20	0.02	0.12	0.40	1.18	0.41	0.22
08-134	1.80	1.18	0.02	0.12	0.41	1.19	0.40	0.18
08-143	1.36	1.53	0.02	0.10	0.81	1.38	0.40	0.26
08-144	1.57	1.43	0.03	0.12	0.82	1.31	0.39	0.23
08-145	1.57	1.36	0.02	0.11	0.83	1.28	0.38	0.20
08-146	1.46	1.45	0.03	0.11	0.81	1.34	0.38	0.23
08-147	1.67	1.15	0.03	0.11	0.81	0.95	0.15	0.12
08-148	nc	1.22	0.08	0.12	0.61	1.42	0.20	0.32
08-149	1.35	1.41	0.02	0.10	0.81	1.50	0.40	0.20
08-150	1.58	1.40	0.02	0.11	0.83	1.35	0.39	0.22
08-151	1.60	1.35	0.02	0.12	0.84	1.30	0.39	0.23
08-152	1.36	2.69	0.03	0.10	0.76	1.33	0.09	0.25
08-153	0.58	nc	nc	nc	nc	nc	0.36	1.74
08-154	1.36	2.00	0.03	0.10	0.75	1.27	0.08	0.21
08-155	0.88	0.62	0.06	0.05	0.46	1.33	1.27	0.30
08-156	0.54	0.28	0.07	0.07	0.50	0.37	0.15	0.22

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**Table 1. Loc**

[nc, not calculate]

Lab No.	a27R/nor27	PAH-RI	$\Sigma$ C2D/ $\Sigma$ C2P	$\Sigma$ C3D/ $\Sigma$ C3P
08-119	3.84	127	2.49	2.74
08-120	4.35	179	2.67	4.26
08-121	4.36	143	2.65	4.08
08-122	1.15	123	2.74	3.36
08-123	2.66	206	3.05	3.55
08-124	3.28	138	2.70	3.28
08-125	3.05	117	2.86	3.32
08-126	3.79	107	2.87	3.42
08-127	2.99	51	1.57	1.58
08-128	2.29	51	2.25	2.33
08-129	2.82	42	2.79	3.35
08-130	3.26	62	2.09	2.40
08-131	3.61	62	1.95	2.15
08-132	2.49	62	2.19	2.47
08-133	2.73	69	2.83	3.28
08-134	3.48	54	2.90	3.31
08-143	2.17	212	3.18	3.82
08-144	2.60	51	3.34	3.85
08-145	2.86	51	3.06	3.34
08-146	2.49	52	3.28	4.18
08-147	2.20	45	3.40	4.17
08-148	1.03	nc	nc	nc
08-149	2.81	84	2.98	3.34
08-150	2.65	56	2.82	3.29
08-151	2.54	nc	nc	nc
08-152	0.50	37	2.31	3.16
08-153	0.54	12	0.17	0.44
08-154	0.60	37	1.75	2.06
08-155	6.78	183	0.91	1.13
08-156	4.84	6	0.26	0.43

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**Table 1. Location, classification, and geochemical data for crude oil, seep oil, and tarball samples.**

[nc, not calculated due to lack of peaks; nm = not measured. n-alkanes: 0- not present; 1-present.]

Lab No.	Sample Date	Lat. N	Long. W	Type	Type Code	Model Group	Description
08-168	1/11/08	34.33331	-119.56136	produced oil	O	13	Platform Henry well 3-B
08-169	1/11/08	34.33331	-119.56136	produced oil	O	13	Platform Henry well 11-B
08-170	1/11/08	34.33331	-119.56136	produced oil	O	11	Platform Henry well 16-B
08-171	1/11/08	34.33331	-119.56136	produced oil	O	13	Platform Henry well 23-B
08-172	1/11/08	34.33295	-119.63171	produced oil	O	12	Platform C well C-16
08-173	1/11/08	34.33295	-119.63171	produced oil	O	12	Platform C well C-27
08-174	1/11/08	34.33295	-119.63171	produced oil	O	11	Platform C well C-55
08-175	1/11/08	34.33295	-119.63171	produced oil	O	13	Platform C well C-59
08-176	1/11/08	34.33234	-119.62245	produced oil	O	11	Platform B well B-9
08-177	1/11/08	34.33234	-119.62245	produced oil	O	12	Platform B well B-26
08-178	1/11/08	34.33234	-119.62245	produced oil	O	13	Platform B well B-34
08-179	1/11/08	34.33234	-119.62245	produced oil	O	12	Platform B well B-36
08-180	1/11/08	34.33234	-119.62245	produced oil	O	12	Platform B well B-60
08-181	1/25/08	34.12505	-119.40102	produced oil	O	212	Platform Gail well E-10
08-182	1/25/08	34.12505	-119.40102	produced oil	O	13	Platform Gail well E-14
08-183	1/25/08	34.12505	-119.40102	produced oil	O	212	Platform Gail well E-17
08-184	1/25/08	34.12505	-119.40102	produced oil	O	212	Platform Gail well E-22 short
08-185	1/25/08	34.33502	-119.55303	produced oil	O	13	Platform Houchin well B-12
08-186	1/25/08	34.33502	-119.55303	produced oil	O	13	Platform Houchin well B-15
08-187	1/25/08	34.33502	-119.55303	produced oil	O	13	Platform Houchin well B-19
08-188	1/25/08	34.33502	-119.55303	produced oil	O	13	Platform Houchin well B-34
08-189	1/25/08	34.33502	-119.55303	produced oil	O	13	Platform Houchin well B 35
08-190	9/3/04	34.35327	-119.42920	tarball	T	22	Rincon Beach
08-191	1/18/05	34.35156	-120.28015	produced oil	O	22	Platform Heritage well HE-7
08-216	4/2/08	34.18229	-119.41944	produced oil	O	13	Platform Gilda well S-28
08-217	4/2/08	34.18229	-119.41944	produced oil	O	13	Platform Gilda well S-62
08-218	4/2/08	34.18229	-119.41944	produced oil	O	13	Platform Gilda well S-87
08-219	4/2/08	34.18229	-119.41944	produced oil	O	22	Platform Gilda well S-91
08-220	4/2/08	34.11750	-119.27718	produced oil	O	22	Platform Gina well H-5
08-221	4/2/08	34.11750	-119.27718	produced oil	O	22	Platform Gina well H-12
08-222	4/2/08	34.11750	-119.27718	produced oil	O	22	Platform Gina well H-14
08-223	4/2/08	34.33138	-119.60414	produced oil	O	13	Platform Hillhouse well 1A
08-224	4/2/08	34.33138	-119.60414	produced oil	O	13	Platform Hillhouse well 10A

**Table 1. Loc**

[nc, not calculate]

Lab No.	$\delta^{13}\text{C}$	Alkanes	Pr/Ph	Tm/Ts	Triplet	23Tri/C30	23Tri/C29	20/23Tri
08-168	-23.2	1	1.03	1.70	5.81	0.41	0.81	0.33
08-169	-23.3	1	1.03	1.64	6.29	0.39	0.77	0.36
08-170	-23.2	1	1.05	1.74	5.59	0.39	0.77	0.33
08-171	-23.2	1	0.98	1.93	5.78	0.43	0.80	0.33
08-172	-23.0	1	1.04	1.96	5.23	0.25	0.57	0.28
08-173	-23.1	1	1.08	1.97	4.75	0.23	0.52	0.27
08-174	-23.2	1	1.04	1.97	5.84	0.33	0.72	0.32
08-175	-23.3	1	1.07	1.98	5.96	0.19	0.42	0.57
08-176	-23.1	1	1.04	1.99	5.60	0.32	0.70	0.32
08-177	-23.0	1	1.13	2.02	5.27	0.31	0.68	0.28
08-178	-23.2	1	1.05	2.04	5.73	0.34	0.72	0.33
08-179	-22.9	1	1.12	2.05	5.29	0.32	0.71	0.29
08-180	-23.1	1	1.27	2.07	4.79	0.25	0.57	0.25
08-181	-23.5	1	0.83	2.07	4.51	0.81	1.30	0.25
08-182	-23.2	1	0.87	2.09	4.12	1.32	1.99	0.31
08-183	-23.2	1	0.86	2.11	4.31	0.79	1.18	0.24
08-184	-23.4	1	0.89	2.32	4.94	0.79	1.22	0.25
08-185	-23.3	1	0.99	2.34	5.46	0.46	0.90	0.32
08-186	-23.3	1	1.06	2.37	5.70	0.49	0.98	0.32
08-187	-23.3	1	1.00	2.39	5.37	0.47	0.88	0.32
08-188	-23.3	1	0.99	2.45	5.33	0.46	0.89	0.33
08-189	-23.0	1	1.02	2.47	5.18	0.52	0.95	0.33
08-190	-23.3	0	nc	2.49	3.19	0.65	0.91	0.16
08-191	-23.3	1	0.50	2.55	3.08	0.80	1.06	0.17
08-216	-23.9	1	0.83	2.61	4.26	0.40	0.74	0.33
08-217	-23.7	1	0.82	2.61	4.77	0.34	0.69	0.33
08-218	-23.5	1	0.88	2.64	5.17	0.31	0.61	0.30
08-219	-22.9	1	1.04	2.64	5.71	0.46	0.94	0.30
08-220	-23.4	1	0.58	2.69	3.73	0.80	0.96	0.19
08-221	-23.1	1	0.58	2.70	3.71	0.78	1.00	0.18
08-222	-23.4	1	0.57	2.71	3.59	0.88	1.03	0.19
08-223	-23.1	1	1.08	2.72	5.46	0.37	0.85	0.32
08-224	-23.1	1	1.15	2.76	5.36	0.25	0.58	0.30

**Table 1. Loc**

[nc, not calculate]

Lab No.	22/21Tri	24Tri/23Tri	26/25Tri	Tri28/Tri29	C30/C29	29D/29H	C31 S/(S+R)	$\alpha\beta$ C31S/C30
08-168	0.24	0.72	0.94	1.06	1.95	0.22	0.61	0.33
08-169	0.23	0.79	0.92	0.87	1.97	0.24	0.58	0.34
08-170	0.24	0.72	0.93	0.89	1.99	0.23	0.57	0.32
08-171	0.26	0.74	0.78	0.89	1.87	0.22	0.60	0.39
08-172	0.21	0.70	1.08	0.92	2.25	0.22	0.59	0.26
08-173	0.20	0.65	1.09	0.99	2.23	0.22	0.59	0.25
08-174	0.22	0.79	0.99	0.89	2.19	0.25	0.59	0.29
08-175	0.22	1.41	0.96	0.92	2.21	0.26	0.59	0.29
08-176	0.23	0.79	0.99	0.91	2.18	0.24	0.58	0.28
08-177	0.20	0.69	1.08	0.93	2.18	0.23	0.58	0.24
08-178	0.23	0.82	0.99	0.90	2.13	0.26	0.61	0.29
08-179	0.21	0.66	1.06	0.89	2.25	0.24	0.64	0.23
08-180	0.17	0.64	1.22	1.15	2.30	0.24	0.62	0.21
08-181	0.36	0.63	0.78	0.82	1.61	0.17	0.62	0.48
08-182	0.30	0.72	0.70	0.90	1.51	0.27	0.61	0.38
08-183	0.36	0.58	0.76	0.81	1.49	0.17	0.62	0.49
08-184	0.31	0.61	0.73	0.87	1.56	0.15	0.62	0.40
08-185	0.26	0.65	0.91	0.83	1.95	0.18	0.62	0.34
08-186	0.25	0.73	0.88	0.83	2.00	0.25	0.60	0.34
08-187	0.25	0.64	0.93	1.45	1.87	0.20	0.61	0.35
08-188	0.24	0.68	1.08	0.81	1.92	0.19	0.61	0.33
08-189	0.24	0.65	0.81	0.82	1.83	0.17	0.13	0.31
08-190	0.54	0.40	0.79	0.89	1.40	0.09	0.59	0.44
08-191	0.56	0.41	0.75	0.75	1.32	0.11	0.59	0.50
08-216	0.32	0.47	0.86	0.77	1.87	0.15	0.60	0.04
08-217	0.29	0.52	0.89	0.82	2.00	0.18	0.61	0.37
08-218	0.27	0.57	0.97	0.84	1.97	0.20	0.61	0.36
08-219	0.24	0.60	0.83	0.88	2.05	0.23	0.61	0.28
08-220	0.48	0.44	0.70	0.75	1.20	0.13	0.61	0.59
08-221	0.49	0.45	0.69	0.74	1.27	0.13	0.59	0.58
08-222	0.46	0.44	0.70	0.76	1.17	0.12	0.61	0.58
08-223	0.22	0.72	0.92	0.81	2.32	0.30	0.61	0.27
08-224	0.19	0.66	1.07	0.92	2.34	0.28	0.62	0.24



**Table 1. Loc**

[nc, not calculate]

Lab No.	35S/34S	BI	OI	GI	C29 S/(S+R)	C28/C29	a27R/Hop	nor26&27/Hop
08-168	0.75	0.05	0.10	0.07	0.41	1.25	0.81	0.29
08-169	0.76	0.05	0.10	0.07	0.41	1.20	0.84	0.28
08-170	0.80	0.40	0.10	0.07	0.42	1.24	0.92	0.29
08-171	0.84	0.52	0.10	0.08	0.43	1.26	0.82	0.30
08-172	0.74	0.25	0.08	0.06	0.43	1.22	1.18	0.41
08-173	0.68	0.22	0.08	0.06	0.42	1.18	1.18	0.36
08-174	0.70	0.31	0.09	0.07	0.44	1.20	1.13	0.37
08-175	0.70	0.31	0.09	0.07	0.45	1.17	1.02	0.31
08-176	0.72	0.32	0.09	0.07	0.45	1.23	1.14	0.35
08-177	0.67	0.23	0.08	0.05	0.39	1.23	1.08	0.33
08-178	0.71	0.32	0.09	0.08	0.45	1.20	1.11	0.34
08-179	0.65	0.23	0.08	0.05	0.40	1.25	1.07	0.34
08-180	0.49	0.09	0.08	0.04	0.36	1.21	0.91	0.28
08-181	1.13	1.43	0.06	0.08	0.59	1.38	0.40	0.18
08-182	0.86	0.51	0.09	0.08	0.47	1.47	0.34	0.22
08-183	0.96	0.88	0.06	0.07	0.56	1.40	0.41	0.20
08-184	0.54	1.59	0.06	0.06	0.48	1.53	0.82	0.27
08-185	0.83	0.54	0.09	0.07	0.43	1.35	0.73	0.22
08-186	0.78	0.49	0.09	0.06	0.40	1.11	0.76	0.28
08-187	0.81	0.55	0.09	0.05	0.33	1.30	0.76	0.27
08-188	0.82	0.54	0.09	0.05	0.36	1.34	0.73	0.26
08-189	0.75	0.54	0.09	0.06	0.41	1.45	0.74	0.30
08-190	1.63	1.98	0.03	0.12	0.28	1.18	0.35	0.28
08-191	1.35	1.20	0.04	0.12	0.25	1.21	0.44	0.23
08-216	1.10	0.82	0.05	0.05	0.35	1.25	1.36	0.36
08-217	1.02	0.63	0.05	0.05	0.17	1.21	1.42	0.37
08-218	0.97	0.55	0.06	0.05	0.18	1.20	1.61	0.41
08-219	0.83	0.75	0.06	0.05	0.18	1.45	1.81	0.52
08-220	1.50	0.61	0.05	0.07	0.15	1.36	0.65	0.19
08-221	1.22	0.66	0.04	0.07	0.33	1.39	0.64	0.21
08-222	1.13	0.63	0.05	0.06	0.32	1.38	0.66	0.26
08-223	0.71	0.28	0.08	0.06	0.31	1.14	1.18	0.34
08-224	0.67	0.18	0.07	0.05	0.21	1.14	1.17	0.32

**Table 1. Loc**

[nc, not calculate]

Lab No.	a27R/nor27	PAH-RI	$\Sigma$ C2D/ $\Sigma$ C2P	$\Sigma$ C3D/ $\Sigma$ C3P
08-168	5.36	35	0.66	0.66
08-169	6.12	30	0.67	0.69
08-170	7.07	29	0.69	0.68
08-171	5.33	22	0.70	0.80
08-172	5.62	49	0.60	0.56
08-173	7.66	46	0.62	0.53
08-174	6.89	25	0.74	0.70
08-175	7.45	16	0.73	0.64
08-176	7.48	32	0.72	0.66
08-177	7.59	33	0.50	0.45
08-178	7.65	19	0.70	0.74
08-179	7.98	50	0.56	0.56
08-180	7.42	31	0.22	0.18
08-181	4.87	22	1.62	1.57
08-182	2.56	8	1.57	1.42
08-183	4.65	30	1.81	1.73
08-184	9.53	18	1.46	1.47
08-185	9.29	44	0.78	0.79
08-186	6.21	243	0.70	0.64
08-187	5.91	63	0.72	0.68
08-188	5.76	44	0.75	0.71
08-189	4.79	50	0.67	0.75
08-190	2.48	124	2.12	2.72
08-191	3.52	158	2.30	2.53
08-216	8.69	nc	1.04	1.72
08-217	8.79	nc	0.92	1.49
08-218	9.28	nc	1.37	1.26
08-219	8.76	nc	1.32	1.40
08-220	7.42	39	0.26	2.54
08-221	5.95	52	2.50	2.78
08-222	4.40	nc	2.52	2.60
08-223	7.81	13	1.13	0.61
08-224	7.91	22	1.07	0.41

**Table 1. Location, classification, and geochemical data for crude oil, seep oil, and tarball samples.**

[nc, not calculated due to lack of peaks; nm = not measured. n-alkanes: 0- not present; 1-present.]

Lab No.	Sample Date	Lat. N	Long. W	Type	Type Code	Model Group	Description
08-225	4/2/08	34.33138	-119.60414	produced oil	O	13	Platform Hillhouse well 18A
08-226	4/2/08	34.33138	-119.60414	produced oil	O	13	Platform Hillhouse well 48A
08-227	4/2/08	34.33765	-119.54240	produced oil	O	13	Platform Hogan well A-1
08-228	4/2/08	34.33765	-119.54240	produced oil	O	13	Platform Hogan well A-7
08-229	4/2/08	34.33765	-119.54240	produced oil	O	13	Platform Hogan well A-18
08-230	4/2/08	34.33765	-119.54240	produced oil	O	13	Platform Hogan well A-53
08-231	3/17/08	34.39177	-119.84740	seep tar	S	31	COP tarmound 1 west sample 1
08-232	3/17/08	34.39255	-119.84740	seep tar	S	0	COP tarmound 1 west sample 2
08-233	3/17/08	34.39098	-119.84135	seep tar	S	31	COP tarmound east sample 3
08-234	3/17/08	34.39450	-119.86650	seep tar	S	0	COP tarmound west sample 4
08-235	3/18/08	34.39370	-119.87850	oil on sorbant	S	211	Trilogy seep composite grab
08-236	3/18/08	34.39370	-119.87850	oil on sorbant	S	211	Trilogy seep oil absorbent
08-237	3/18/08	34.40168	-119.88330	oil on sorbant	S	211	Pline Seep
09-102	6/1/09	32.68098	-117.18237	tarball	T	0	Coronado Beach, San Diego, tarball Pline seep -sediment covered tarry sand
09-103	6/16/09	34.40197	-119.88327	oily sediment	S	13	where some gas streams were bubbling Trilogy seep Mainly bubbles, collected very small chunk of sandy oil residue
09-104	6/16/09	34.39350	-119.87930	oily sediment	S	211	from area near a larger gas vent Gaviota 1 soiltary tar mound ~20m
09-105	6/17/09	34.44158	-120.26088	seep tar	S	31	diameter intermittant gas release Gaviota 2 soiltary tar mound ~5m
09-106	6/17/09	34.44064	-120.27002	seep tar	S	0	diameter Gaviota 5 3 coalesing tar mounds ~5m
09-107	6/17/09	34.44023	-120.27643	seep tar	S	0	diameter some gas release at bottom Gaviota 4 large ~20m dia tar mound with some colonization, sampled center, some
09-108	6/17/09	34.44021	-120.28021	seep tar	S	0	local gas seepage, tube worms? Naples 1 small tar mound, sample from center, two grabs. Redish flock around
09-109	6/17/09	34.41002	-119.98423	seep tar	S	0	tar mound - bacteria? Point Conception 4 ropey-textured tar
09-110	6/18/09	34.43289	-120.45236	seep tar	S	22	mound

**Table 1. Loc**

[nc, not calculate]

Lab No.	$\delta^{13}\text{C}$	Alkanes	Pr/Ph	Tm/Ts	Triplet	23Tri/C30	23Tri/C29	20/23Tri
08-225	-23.2	1	1.10	2.78	5.70	0.34	0.76	0.31
08-226	-22.9	1	1.11	2.87	5.41	0.28	0.64	0.32
08-227	-23.2	1	0.99	2.95	5.80	0.43	0.84	0.31
08-228	-23.2	1	1.01	3.15	6.33	0.40	0.80	0.36
08-229	-23.5	1	1.02	3.21	5.87	0.42	0.82	0.36
08-230	-23.0	1	1.22	3.38	5.34	0.27	0.63	0.31
08-231	-23.0	0	1.08	3.54	4.24	6.27	1.14	0.25
08-232	-22.8	0	0.97	4.06	4.04	0.76	1.11	0.24
08-233	-22.8	0	0.96	4.47	3.90	7.83	1.20	0.24
08-234	-22.9	0	1.12	5.02	3.72	0.93	1.29	0.22
08-235	-23.1	0	nc	5.37	4.69	0.85	1.13	0.21
08-236	-23.6	0	nc	5.49	4.77	0.79	1.13	0.22
08-237	-23.4	0	nc	5.49	4.80	0.85	1.22	0.22
09-102	-23.45	0	nc	3.50	0.41	0.36	0.29	0.15
09-103	-21.08	0	nc	0.59	3.76	nc	3.70	0.20
09-104	-22.28	0	0.96	2.70	4.78	0.69	1.08	0.22
09-105	-22.50	0	nc	2.47	4.12	4.92	0.92	0.23
09-106	-23.03	0	0.96	2.45	3.98	1.58	0.87	0.24
09-107	-22.58	0	0.96	2.47	3.87	1.08	0.89	0.23
09-108	-22.50	0	1.05	2.54	3.89	1.06	0.88	0.22
09-109	-23.08	0	nc	2.69	3.89	0.96	0.81	0.23
09-110	-23.49	0	nc	4.23	3.05	0.45	0.68	0.21

**Table 1. Loc**

[nc, not calculate]

Lab No.	22/21Tri	24Tri/23Tri	26/25Tri	Tri28/Tri29	C30/C29	29D/29H	C31 S/(S+R)	$\alpha\beta$ C31S/C30
08-225	0.21	0.69	0.97	0.88	2.26	0.28	0.61	0.27
08-226	0.19	0.70	1.02	0.84	2.27	0.27	0.61	0.25
08-227	0.24	0.64	0.89	0.92	1.95	0.24	0.60	0.36
08-228	0.24	0.65	0.95	0.79	2.01	0.24	0.48	0.35
08-229	0.23	0.66	0.87	0.87	1.97	0.25	0.62	0.36
08-230	0.18	0.65	1.04	0.89	2.35	0.29	0.74	0.23
08-231	0.30	0.53	0.83	1.02	0.18	0.10	0.62	0.41
08-232	0.31	0.52	0.84	1.11	1.46	0.10	0.61	0.37
08-233	0.31	0.54	0.81	0.87	0.15	0.10	0.62	0.61
08-234	0.38	0.48	0.81	0.99	1.39	0.07	0.62	0.40
08-235	0.39	0.54	0.84	0.83	1.34	0.14	0.62	0.48
08-236	0.39	0.56	0.87	0.76	1.43	0.15	0.38	0.50
08-237	0.37	0.54	0.80	0.76	1.43	0.12	0.38	0.50
09-102	0.26	0.31	0.62	1.02	0.82	0.10	0.39	0.57
09-103	0.44	0.49	0.74	nc	nc	nc	nc	nc
09-104	0.37	0.55	0.83	0.82	1.56	0.20	0.63	0.51
09-105	0.31	0.55	0.72	0.98	0.19	0.12	0.63	2.26
09-106	0.31	0.54	0.76	0.89	0.55	0.11	0.63	0.96
09-107	0.31	0.51	0.78	0.94	0.82	0.11	0.61	0.65
09-108	0.32	0.53	0.78	0.96	0.84	0.10	0.61	0.65
09-109	0.32	0.51	0.78	0.97	0.84	0.10	0.62	0.69
09-110	0.48	0.44	0.73	0.81	1.51	0.11	0.61	0.49

**Table 1. Loc**

[nc, not calculate]

Lab No.	35S/34S	BI	OI	GI	C29 S/(S+R)	C28/C29	a27R/Hop	nor26&27/Hop
08-225	0.69	0.27	0.08	0.06	0.23	1.03	1.12	0.32
08-226	0.64	0.23	0.07	0.05	0.20	1.21	1.09	0.31
08-227	0.85	0.50	0.09	0.06	0.23	1.22	0.82	0.25
08-228	0.76	0.46	0.09	0.07	0.28	1.21	0.78	0.24
08-229	0.81	0.49	0.10	0.07	0.29	1.23	0.83	0.24
08-230	0.65	0.16	0.09	0.05	0.29	1.12	1.30	0.34
08-231	1.34	2.40	0.41	0.18	0.21	0.11	1.42	1.86
08-232	1.22	0.67	0.05	0.06	0.15	0.20	0.15	0.22
08-233	1.63	0.16	0.24	0.36	0.20	1.12	1.66	3.26
08-234	1.46	1.00	0.04	0.07	0.25	0.21	0.18	0.23
08-235	1.61	0.88	0.07	0.08	0.17	1.04	0.32	0.28
08-236	1.57	0.82	0.07	0.07	0.34	1.09	0.32	0.22
08-237	1.68	0.88	0.07	0.07	0.37	1.12	0.35	0.21
09-102	0.50	0.01	0.03	0.09	0.37	0.56	nc	nc
09-103	nc	nc	nc	nc	0.48	1.05	nc	nc
09-104	1.31	0.77	0.07	0.08	0.37	1.08	0.38	0.18
09-105	0.87	0.37	0.23	0.48	0.30	2.41	1.49	0.45
09-106	0.90	0.72	0.11	0.14	0.26	1.72	0.48	0.14
09-107	0.98	0.63	0.08	0.10	0.29	3.08	0.35	0.09
09-108	1.02	0.62	0.08	0.10	0.38	3.40	0.36	0.09
09-109	1.12	0.64	0.07	0.10	0.48	3.26	0.32	0.07
09-110	1.99	1.70	0.03	0.10	0.28	0.91	0.07	0.15

**Table 1. Loc**

[nc, not calculate]

Lab No.	a27R/nor27	PAH-RI	$\Sigma$ C2D/ $\Sigma$ C2P	$\Sigma$ C3D/ $\Sigma$ C3P
08-225	8.55	13	1.12	0.62
08-226	8.21	19	1.32	0.52
08-227	6.89	31	2.37	0.70
08-228	6.54	26	2.51	0.72
08-229	7.09	26	2.52	0.73
08-230	9.05	18	0.72	0.45
08-231	3.20	6	0.48	0.86
08-232	2.18	7	0.47	0.99
08-233	0.97	nc	0.45	0.91
08-234	2.70	8	0.94	1.36
08-235	2.07	28	0.84	1.12
08-236	2.49	8	0.83	1.44
08-237	3.06	10	1.10	1.50
09-102	nc	66	1.96	2.38
09-103	3.70	45	1.17	2.83
09-104	3.48	9	1.13	1.17
09-105	3.28	50	0.68	1.03
09-106	3.53	15	0.60	1.00
09-107	3.81	21	0.47	0.86
09-108	3.84	46	0.77	0.94
09-109	4.31	28	0.61	0.73
09-110	0.49	82	2.04	2.42

**Table 1. Location, classification, and geochemical data for crude oil, seep oil, and tarball samples.**

[nc, not calculated due to lack of peaks; nm = not measured. n-alkanes: 0- not present; 1-present.]

Lab No.	Sample Date	Lat. N	Long. W	Type	Type Code	Model Group	Description
09-111	6/18/09	34.45000	-120.48967	seep tar	S	22	Point Conception 5 3 tar whips
09-112	6/18/09	34.43174	-120.42530	seep tar	S	211	Cojo 1 tarmounds with spires colonized by sea life, egg casings, rock fish
09-113	6/19/09	34.37510	-119.85320	oily sediment	S	13	La Goleta seeps 1 Oily sediment near very active gas seepage, Oil droplets seen rising with gas.
09-114	6/19/09	34.39192	-119.84578	oily sediment	S	0	Patch Seeps 1 grab sample of oily sediment from single gas vent.
09-115	6/19/09	34.37510	-119.85320	seep tar	S	0	COPTM 1 one large tar mound, not colonized, one single stream gas vent, ropey texture
09-116	3/8/09	34.46890	-120.27289	seep tar	S	31	Alegria Beach Asphalt seeping from cliff at barn plots collected by MMS agents
10-02	3/21/08	33.59579	-118.14087	produced oil	O	13	Platform Edith well B-9
10-03	3/21/08	33.58237	-118.12822	produced oil	O	13	Platform Ellen well A-20
10-04	3/21/08	33.58237	-118.12822	produced oil sediment with	O	13	Platform Ellen well A-45 Dockweiler State Beach sediment
10-05	2/25/10	33.94248	-118.44363	oil	T	12	between towers 45 - 47
10-06	3/21/08	33.59579	-118.14087	produced oil	O	13	Platform Edith well B-6
10-159	6/23/10	34.39973	-119.82477	seep tar	S	0	Goleta Pier 1, Low asphalt mounds, found 1 active vent
10-160	6/22/10	34.43268	-120.43802	seep tar	S	22	Cojo 2 sample 1, Multiple tar vents on 2m high asphalt accumulation sample 1 and 2.
10-161	6/22/10	34.432676	-120.43734	seep tar	S	22	Cojo 2 sample 2, Multiple tar vents on 2m high asphalt accumulation sample 1 and 2.
10-162	6/22/10	34.432683	-120.41910	seep tar	S	0	Cojo 3, multiple tar vents on 2m high asphalt accumulation.
10-163	6/23/10	34.369797	-119.784117	seep tar	S	0	Santa Barbara Point 2, 3m high old asphalt mounds covered with gorgonia and other invertebrates, many fish.



**Table 1. Loc**

[nc, not calculate]

Lab No.	$\delta^{13}\text{C}$	Alkanes	Pr/Ph	Tm/Ts	Triplet	23Tri/C30	23Tri/C29	20/23Tri
09-111	-23.23	0	nc	4.01	3.02	0.57	0.86	0.22
09-112	-23.12	0	nc	2.57	3.84	0.58	0.91	0.25
09-113	-22.40	0	nc	1.34	4.79	1.54	1.86	0.36
09-114	-22.21	0	nc	1.10	6.29	1.13	2.09	0.42
09-115	-22.73	0	nc	2.43	4.29	0.95	1.00	0.29
09-116	-22.61	0	nc	4.24	3.68	0.64	0.66	0.14
10-02	-23.23	1	nc	2.33	5.74	0.41	0.79	0.79
10-03	-22.96	1	nc	2.67	4.68	0.34	0.68	0.66
10-04	-23.2	1	nc	2.58	4.53	0.28	0.56	0.64
10-05	-24.34	0	nc	0.96	3.04	0.36	0.59	0.22
10-06	-23.36	1	1.00	2.91	5.70	0.36	0.74	0.66
10-159	-22.66	0	nc	2.06	5.38	9.07	0.82	0.29
10-160	-23.04	0	nc	4.11	3.34	0.45	0.68	0.17
10-161	-23.09	0	nc	4.04	3.61	0.46	0.69	0.18
10-162	-23.14	0	nc	1.93	3.52	0.81	0.80	0.18
10-163	-22.89	0	nc	2.88	4.49	0.41	0.68	0.28

**Table 1. Loc**

[nc, not calculate]

Lab No.	22/21Tri	24Tri/23Tri	26/25Tri	Tri28/Tri29	C30/C29	29D/29H	C31 S/(S+R)	$\alpha\beta$ C31S/C30
09-111	0.46	0.42	0.77	0.91	1.50	0.10	0.59	0.49
09-112	0.33	0.48	0.80	0.96	1.56	0.11	0.60	0.43
09-113	0.25	0.79	0.90	0.70	1.20	0.30	0.64	0.44
09-114	0.21	0.83	0.88	0.84	1.85	0.48	0.64	0.35
09-115	0.30	0.54	0.84	0.95	1.05	0.11	0.63	0.40
09-116	0.58	0.34	0.80	0.91	1.03	0.09	0.60	0.78
10-02	0.18	0.76	0.79	0.99	1.97	0.27	0.58	0.33
10-03	0.17	0.80	0.86	0.86	2.00	0.21	0.58	0.34
10-04	0.16	0.80	1.02	0.93	2.06	0.20	0.58	0.30
10-05	0.24	0.71	1.01	0.93	1.65	0.40	0.61	0.35
10-06	0.18	0.81	0.72	0.84	2.03	0.25	0.59	0.33
10-159	0.25	0.64	0.88	0.95	1.46	0.16	0.56	2.21
10-160	0.49	0.42	0.75	0.92	1.49	0.10	0.60	0.48
10-161	0.53	0.43	0.74	0.85	1.50	0.11	0.60	0.50
10-162	0.43	0.40	0.76	0.90	0.98	0.14	0.62	0.45
10-163	0.29	0.55	0.71	1.04	1.67	0.16	0.60	0.42

**Table 1. Loc**

[nc, not calculate]

Lab No.	35S/34S	BI	OI	GI	C29 S/(S+R)	C28/C29	a27R/Hop	nor26&27/Hop
09-111	1.91	1.42	0.04	0.12	0.31	0.72	0.14	0.03
09-112	1.63	0.89	0.05	0.08	0.39	1.29	0.26	0.10
09-113	0.79	0.62	0.38	0.14	0.61	2.02	0.18	0.13
09-114	0.61	0.30	0.25	0.10	0.72	3.67	0.30	0.19
09-115	1.42	0.26	0.08	0.10	0.34	2.69	0.11	0.07
09-116	1.97	2.59	0.05	0.16	0.21	1.09	0.69	0.43
10-02	1.11	0.42	0.09	0.12	0.22	1.33	1.91	0.40
10-03	1.06	0.50	0.07	0.10	0.29	1.25	1.00	0.28
10-04	1.11	0.96	0.06	0.11	0.24	1.31	1.40	0.34
10-05	0.77	0.13	0.13	0.07	0.42	0.67	0.12	0.27
10-06	1.06	0.45	0.07	0.08	0.22	1.37	1.65	0.37
10-159	1.78	1.83	0.09	0.12	0.52	1.16	0.51	2.31
10-160	2.15	1.63	0.03	0.11	0.34	0.98	0.18	0.02
10-161	2.13	1.69	0.03	0.11	0.23	0.74	0.01	0.20
10-162	1.73	1.18	0.09	0.13	0.52	2.75	0.08	0.20
10-163	1.06	1.41	0.04	0.08	0.50	0.60	0.10	0.16

**Table 1. Loc**

[nc, not calculate]

Lab No.	a27R/nor27	PAH-RI	$\Sigma$ C2D/ $\Sigma$ C2P	$\Sigma$ C3D/ $\Sigma$ C3P
09-111	5.07	60	1.28	1.52
09-112	2.54	31	0.71	1.19
09-113	2.36	6	0.70	0.64
09-114	3.08	2	0.21	0.21
09-115	1.51	7	0.43	0.71
09-116	3.86	41	25.00	14.00
10-02	6.95	nc	0.92	0.68
10-03	5.41	nc	0.96	0.94
10-04	6.38	nc	0.92	0.86
10-05	0.97	2	0.15	0.29
10-06	6.35	nc	1.00	0.92
10-159	2.21	25	0.31	0.59
10-160	12.01	52	1.77	2.45
10-161	0.29	nc	2.19	2.57
10-162	1.35	46	0.46	0.89
10-163	1.78	126	1.04	1.32

**Table 1. Location, classification, and geochemical data for crude oil, seep oil, and tarball samples.**

[nc, not calculated due to lack of peaks; nm = not measured. n-alkanes: 0- not present; 1-present.]

Lab No.	Sample Date	Lat. N	Long. W	Type	Type Code	Model Group	Description
10-231	11/30/10	33.58237	-118.12822	produced oil	O	13	Platform Ellen well A-30 14.7°API Perf Interval 3691-4481'
10-232	11/30/10	33.58237	-118.12822	produced oil	O	13	Platform Ellen well A-58R 18.9°API Perf Interval 3422-4225'
10-233	11/30/10	33.56378	-118.11649	produced oil	O	13	Platform Eureka well C-11 15.0°API Perf Interval 2868-4408'
10-234	11/30/10	33.56378	-118.11649	produced oil	O	13	Platform Eureka well C-18 11.4°API Perf Interval 3614-4693'
10-235	11/30/10	33.56378	-118.11649	produced oil	O	13	Platform Eureka well C-42 18.9°API Perf Interval 2941-3950'

**Table 1. Loc**

[nc, not calculate]

<b>Lab No.</b>	<b><math>\delta^{13}\text{C}</math></b>	<b>Alkanes</b>	<b>Pr/Ph</b>	<b>Tm/Ts</b>	<b>Triplet</b>	<b>23Tri/C30</b>	<b>23Tri/C29</b>	<b>20/23Tri</b>
10-231	-22.77	1	1.00	2.71	6.24	0.31	0.60	0.34
10-232	-23.12	1	1.08	2.72	6.42	0.36	0.70	0.35
10-233	-22.87	1	1.00	2.84	5.94	0.32	0.61	0.33
10-234	-22.85	1	0.89	2.67	5.38	0.24	0.45	0.35
10-235	-23.97	1	1.06	2.74	6.59	0.33	0.64	0.31

**Table 1. Loc**

[nc, not calculate]

<b>Lab No.</b>	<b>22/21Tri</b>	<b>24Tri/23Tri</b>	<b>26/25Tri</b>	<b>Tri28/Tri29</b>	<b>C30/C29</b>	<b>29D/29H</b>	<b>C31 S/(S+R)</b>	<b><math>\alpha\beta</math>C31S/C30</b>
10-231	0.18	0.84	0.68	0.83	1.92	0.22	0.60	0.35
10-232	0.17	0.82	0.64	0.83	1.97	0.26	0.60	0.33
10-233	0.18	0.76	0.66	0.83	1.91	0.23	0.61	0.35
10-234	0.16	0.78	0.70	0.85	1.89	0.19	0.60	0.33
10-235	0.17	0.84	0.66	0.82	1.97	0.26	0.61	0.35

**Table 1. Loc**

[nc, not calculate]

<b>Lab No.</b>	<b>35S/34S</b>	<b>BI</b>	<b>OI</b>	<b>GI</b>	<b>C29 S/(S+R)</b>	<b>C28/C29</b>	<b>a27R/Hop</b>	<b>nor26&amp;27/Hop</b>
10-231	1.07	0.52	0.07	0.10	0.20	1.40	1.46	0.54
10-232	1.09	0.42	0.08	0.11	0.18	1.41	1.83	0.67
10-233	1.11	0.57	0.07	0.11	0.19	1.33	1.44	0.57
10-234	1.11	0.81	0.06	0.11	0.19	1.28	0.52	0.49
10-235	1.12	0.42	0.09	0.12	0.18	1.40	1.78	0.67



**Table 1. Loc**

[nc, not calculate]

<b>Lab No.</b>	<b>a27R/nor27</b>	<b>PAH-RI</b>	<b><math>\Sigma</math>C2D/<math>\Sigma</math>C2P</b>	<b><math>\Sigma</math>C3D/<math>\Sigma</math>C3P</b>
10-231	6.09	129	1.18	1.07
10-232	5.74	113	1.23	1.01
10-233	5.85	148	1.48	1.14
10-234	2.43	97	1.32	1.24
10-235	5.47	97	1.13	1.08

**Table 2. Produced oil information for samples collected for inclusion in this study.**

[Depth, reservoir, and API gravity were obtained from BOEM databases and represent the time period around when the sample was collected as reported by the platform operator to BOEM and were not obtained from analysis of the specific sample collected.]

Platform	Lab no.	Date	Well	Production Depth (ft)	Reservoir rock	API Gravity	Operator
Platform B	08-176	1/11/08	B-9	-2611	Repetto Formation	22.5	Dos Cuadras Offshore Resources
Platform B	08-177	1/11/08	B-26	-1556	Repetto Formation	25.1	Dos Cuadras Offshore Resources
Platform B	08-178	1/11/08	B-34	-473	Repetto Formation	18.2	Dos Cuadras Offshore Resources
Platform B	08-179	1/11/08	B-36	-3488	Repetto Formation	29.6	Dos Cuadras Offshore Resources
Platform B	08-180	1/11/08	B-60	-3212	Repetto Formation	24.8	Dos Cuadras Offshore Resources
Platform C	08-172	1/11/08	C-16	-2030	Repetto Formation	19.0	Dos Cuadras Offshore Resources
Platform C	08-173	1/11/08	C-27	-2069	Repetto Formation	25.0	Dos Cuadras Offshore Resources
Platform C	08-174	1/11/08	C-55	-620	Repetto Formation	20.6	Dos Cuadras Offshore Resources
Platform C	08-175	1/11/08	C-59	-1084	Repetto Formation	21.0	Dos Cuadras Offshore Resources
Platform Edith	10-02	3/21/08	B-9	-4375	Puente Formation	17.0	Dos Cuadras Offshore Resources
Platform Edith	10-06	3/21/08	B-6	-4475	Puente Formation	17.0	Beta Operating Company
Platform Ellen	10-03	3/21/08	A-20	-2933	Puente Formation	13.2	Beta Operating Company
Platform Ellen	10-04	3/21/08	A-45	-4271	Puente Formation	17.0	Beta Operating Company
Platform Ellen	10-231	11/30/10	A-30	3691-4481'	Puente Formation	14.7	Beta Operating Company
Platform Ellen	10-232	11/30/10	A58R	3422-4225'	Puente Formation	18.9	Beta Operating Company
Platform Eureka	10-233	11/30/10	C-11	2868-4408'	Puente Formation	15.0	Beta Operating Company
Platform Eureka	10-234	11/30/10	C-18	3614-4693'	Puente Formation	11.4	Beta Operating Company
Platform Eureka	10-235	11/30/10	C-42	2941-3950'	Puente Formation	18.9	Beta Operating Company
Platform Gail	08-181	1/25/08	E-10	-5254	Upper Topanga Formation	17.9	Venoco Inc.
Platform Gail	08-182	1/25/08	E-14	-5576	Upper Topanga Formation	18.1	Venoco Inc.
Platform Gail	08-183	1/25/08	E-17	-4112	Monterey Formation	17.3	Venoco Inc.
Platform Gail	08-184	1/25/08	E-22 short	-7619	Sespe and Monterey Formations	19.3	Venoco Inc.
Platform Gilda	08-216	4/2/08	S-28	-7760	Lower Repetto Formation	25.5	Dos Cuadras Offshore Resources
Platform Gilda	08-217	4/2/08	S-62	-7624	Lower Repetto Formation	16.5	Dos Cuadras Offshore Resources
Platform Gilda	08-218	4/2/08	S-87	-4751	Upper Repetto Formation	23.0	Dos Cuadras Offshore Resources
Platform Gilda	08-219	4/2/08	S-91	-6863	Sespe/Monterey	25.0	Dos Cuadras Offshore Resources
Platform Gina	08-220	4/2/08	H-5	-5087	Monterey Formation	13.8	Dos Cuadras Offshore Resources
Platform Gina	08-221	4/2/08	H-12	-5054	Monterey Formation	13.6	Dos Cuadras Offshore Resources
Platform Gina	08-222	4/2/08	H-14	-4140	Monterey Formation	14.8	Dos Cuadras Offshore Resources
Platform Harmony	05-1	2/4/05	HA-4	-7230	Monterey Formation	21.5	Exxon Mobil Corp.
Platform Harmony	05-2	2/4/05	HA-7	-6869	Monterey Formation	20.2	Exxon Mobil Corp.
Platform Harmony	05-3	2/4/05	HA-11	-7249	Monterey Formation	19.5	Exxon Mobil Corp.
Platform Henry	08-168	1/11/08	3-B	-2789	Repetto Formation	25.7	Dos Cuadras Offshore Resources
Platform Henry	08-169	1/11/08	11-B	-2878	Repetto Formation	18.5	Dos Cuadras Offshore Resources
Platform Henry	08-170	1/11/08	16-B	-2911	Repetto Formation	20.3	Dos Cuadras Offshore Resources
Platform Henry	08-171	1/11/08	23-B	-2394	Repetto Formation	17.2	Dos Cuadras Offshore Resources
Platform Heritage	05-10	1/18/05	SA-1	-5622	Monterey Formation	15.6	Exxon Mobil Corp.
Platform Heritage	05-11	1/18/05	SA-9	No data	Monterey Formation	11.3	Exxon Mobil Corp.
Platform Heritage	05-7	1/18/05	HE-1	-6167	Monterey Formation	13.6	Exxon Mobil Corp.
Platform Heritage	05-8	1/18/05	HE-9	-6173	Monterey Formation	16.3	Exxon Mobil Corp.

**Table 2. Produced oil information for samples collected for inclusion in this study.**

[Depth, reservoir, and API gravity were obtained from BOEM databases and represent the time period around when the sample was collected as reported by the platform operator to BOEM and were not obtained from analysis of the specific sample collected.]

Platform	Lab no.	Date	Well	Production Depth (ft)	Reservoir rock	API Gravity	Operator
Platform Heritage	05-9	1/18/05	HE-12	-5975	Monterey Formation	13.8	Exxon Mobil Corp.
Platform Heritage	08-191	1/18/05	HE-7	-6080	Monterey Formation	15.5	Exxon Mobil Corp.
Platform Hillhouse	08-223	4/2/08	1A	-596	Repetto Formation	23.4	Dos Cuadras Offshore Resources
Platform Hillhouse	08-224	4/2/08	10A	-1865	Repetto Formation	24.3	Dos Cuadras Offshore Resources
Platform Hillhouse	08-225	4/2/08	18A	-1450	Repetto Formation	19.5	Dos Cuadras Offshore Resources
Platform Hillhouse	08-226	4/2/08	48A	-3307	Repetto Formation	24.0	Dos Cuadras Offshore Resources
Platform Hogan	08-227	4/2/08	A-1	No data	Repetto and Pico Formations	21.1	Pacific Offshore Operators
Platform Hogan	08-228	4/2/08	A-7	-1149	Repetto Formation	22.6	Pacific Offshore Operators
Platform Hogan	08-229	4/2/08	A-18	No data	Repetto and Pico Formations	22.8	Pacific Offshore Operators
Platform Hogan	08-230	4/2/08	A-53	No data	Repetto and Pico Formations	31.2	Pacific Offshore Operators
Platform Hondo	05-4	2/4/05	H-3	-8093	Monterey Formation	18.6	Exxon Mobil Corp.
Platform Hondo	05-5	2/4/05	H-15st	-10343	Monterey Formation	15.6	Exxon Mobil Corp.
Platform Hondo	05-6	2/4/05	H-23	-7518	Monterey Formation	17.0	Exxon Mobil Corp.
Platform Houchin	08-185	1/25/08	B-12	-2612	Repetto Formation	24.0	Pacific Offshore Operators
Platform Houchin	08-186	1/25/08	B-15	-2607	Repetto Formation	23.6	Pacific Offshore Operators
Platform Houchin	08-187	1/25/08	B-19	-2283	Repetto Formation	22.0	Pacific Offshore Operators
Platform Houchin	08-188	1/25/08	B-34	-2704	Repetto Formation	22.0	Pacific Offshore Operators
Platform Houchin	08-189	1/25/08	B-35	-2239	Repetto Formation	23.2	Pacific Offshore Operators

**Table 3. Location and description of oil residue samples collected by ROV, water samples, ROV observations, and towed video observations 2008-2010.**  
**[ROV note: locations are within a 30 meter diameter circle around the ship location]**

Location	Latitude N	Longitude W	Date	Depth m	Sample type	Dive no.	Description
<b>2008</b>							
COP tarmound 1 sample 1	34.39177	-119.84740	3 17 08	49	asphalt	dive 1	COP tarmound ~ 3-4 small <0.5 m diameter, 0.25m high tar mound. Claw grabbed top for sample.
COP tarmound 1 sample 2	34.39255	-119.84740	3 17 08	49	asphalt	dive 3	COP tarmound fresh tar on ~ small <0.5 m diameter, 0.25m high with gas bubbles from summit
COP tarmound 1 gas sample 1	34.39255	-119.84740	3 17 08	49	gas	dive 5	Gas sample 1 40ml from asphalt mound.
COP tarmound 1 gas sample 2	34.39255	-119.84740	3 17 08	49	gas	dive 6	Gas sample 2 60ml from asphalt mound.
COP tarmound east sample 3	34.39098	-119.84135	3 17 08	50	asphalt	dive 10	COP tarmound east asphalt from small volcano 0.25m diameter in asphalt mound, not colonized.
COP tarmound west sample 4	34.39450	-119.86650	3 17 08	49	asphalt	dive 11	COP tarmound west area older well covered asphalt mound indicating older mound.
Holoi seep gas sample	34.40860	-119.90790	3 18 08	26	gas	dive 6	Gas sample from small vents in sand alinged ~E-W.
Pline seep	34.40168	-119.88330	3 18 08	21	gas	dive 11	Gas sample from copious seep. Seeps are mainly inline.
Pline seep gas	34.40168	-119.88330	3 18 08	21	oil on sorbant		Seep oil from on surface collected onto sorbant.
Trilogy seep	34.39370	-119.87850	3 18 08	53	oil on sorbant		Seep oil from on surface collected onto sorbant.
Gas Trilogy seep	34.39370	-119.87850	3 18 08	53	gas	dive 15	Gas from mixed vents taken ~5 feet above seafloor.
Trilogy seep	34.39370	-119.87850	3 18 08	53	oil on sorbant		Seep oil from on surface collected onto sorbant during transect for GC testing.
<b>2009</b>							
Pline Seep	34.40192	-119.88327	6 16 09	22	sandy tar	dive 1	Gas vents found in sand with some asphalt.
Trilogy Seep	34.39350	-119.87930	6 16 09	49	sandy asphalt	dive 2	Mainly bubbles, collected very small chunk of sandy oil residue from area near a larger gas vent.
Gaviota 1	34.44158	-120.26088	6 17 09	57	asphalt mound	dive 3	Solitary asphalt mound ~20m diameter intermittent gas release.
Gaviota 2	34.44064	-120.27002	6 17 09	59	asphalt mound	dive 4	Solitary tar mound ~5m diameter.
Gaviota 5	34.44023	-120.27643	6 17 09	58	asphalt mound	dive 5	3 coalescing asphalt mounds ~5m diameter some gas release at bottom.
Gaviota 4	34.44021	-120.28021	6 17 09	45	asphalt mound	dive 6	Large ~20m diameter asphalt mound with some colonization; sampled center area; some local gas seepage.
Naples 1	34.41002	-119.98423	6 17 09	65	asphalt mound	dive 7	Small asphalt mound, sample from center, two grabs. Redish flock around tar mound - bacteria?
Point Conception 4	34.43289	-120.45236	6 18 09	50	asphalt mound	dive 8	Ropey-textured tar mound.
Point Conception 5	34.45000	-120.48967	6 18 09	37	asphalt whip	dive 9	3 tar whips extruding from asphalt vent.
Cojo 1	34.43174	-120.42530	6 18 09	42	asphalt mound	dive 10	Small asphalt mounds with spires colonized by sea life, egg casings, rock fish.
La Goleta Seeps 1	34.37510	-119.85320	6 19 09	65	oily sediment	dive 11	Oily sediment near very active gas seepage, some rockfish, sea cucumber, Oil droplets seen rising with gas.
Gas La Goleta Seeps 2	34.37510	-119.85320	6 19 09	65	gas	dive 14	Gas sample from single vent.
Gas Patch Seeps1	34.36420	-119.82980	6 19 09	79	gas	dive 15	Gas sample from single vent.
COP tarmound 1	34.39192	-119.84578	6 19 09	47	asphalt mound	dive 16	One large asphalt mound, not colonized, one single stream gas vent, ropey texture.
<b>2010</b>							
Santa Barbara Point 1	34.39170	-119.68465	6 21 10	20	unknown	dive 1	No samples, no obvious asphalt, may have been some very weathered asphalt under sediment.
Carpenteria 4	34.34542	-119.61142	6 21 10	48	rock	dive 2	Beautiful rocky outcrop covered with invertebrates and fish.
Carpenteria 5	34.34720	-119.61959	6 21 10	48	rock	dive 3	Beautiful rocky outcrop covered with invertebrates and fish.
Cojo 2 sample 1	34.43268	-120.43802	6 22 10	48	asphalt mound	dive 4	Multiple tar vents on 2m high asphalt accumulation sample 1 and 2.
Cojo 2 sample 2	34.43268	-120.43734	6 22 10	49	asphalt mound	dive 5	Multiple tar vents on 2m high asphalt accumulation sample 1 and 2.
Cojo 3	34.43558	-120.41910	6 22 10	34	asphalt mound	dive 5	Multiple tar vents on 2m high asphalt accumulation.
Trilogy Seep	34.39351	-119.87831	6 23 10	49	gas and small asphalt mound	dive 6-10	Multiple dive to release flourocene dye and measure water advective rates; measured 20 to 40 cm/min.
Goleta Pier 1	34.39973	-119.82477	6 23 10	38	asphalt mound	dive 11	Low asphalt mounds, found 1 active vent.
Santa Barbara Point 2	34.36980	-119.78412	6 23 10	75	old asphalt mounds	dive 12	3m high old asphalt mounds covered with gorgonia and other invertebrates and many fishes.
<b>Surface operations</b>							
Surface oil slick	34.42754	-120.38053	6 22 10	38	surface oil slick	sighting	Surface oil slick, over 250 m long also seen in previous years, near old well heads. Atmospheric methane increase.
Niskin 1	34.38256	-119.88992	6 19 10	80	water samples		Upcurrent seep tent 80m water depth, water samples at 75, 40, and 10 m deep.
Niskin 2	34.38374	-119.88983	6 19 10	68	water samples		Water samples in seep tent bubble plume 68m deep, samples at 60, 40, and 7 m water depth.
Niskin 3	34.38509	-119.89016	6 19 10	65	water samples		Downcurrent from seep tent bubble 65 m deep, samples at 60, 40, and 5 m water depth.
Niskin 4	34.39378	-119.87878	6 19 10	50	water samples		Water samples in trilogy seep plume water depth 50m water samples at 45, 20 and 5 m water depth.
Niskin 5	34.37500	-119.85337	6 19 10	65	water samples		Water samples in La Goleta plume, water depth 65m, water samples at 60m 40 m, and water depth..
Picarro methane sensor							Picarro methane sensor run contiuously on June 22 and 23.
<b>USGS Towed video sightings of seafloor oil residues or gas seepage</b>							
Naples	34.41016	-119.98330	7 10 07	67			Extruding asphalt recorded by video.
Naples	34.41015	-119.98256	7 10 07	67			Extruding asphalt recorded by video.
Santa Barbara Point	34.36564	-119.77129	10 1 08	73			Gas bubbles venting from a 2m deep depression within an area of pervasive joint fracture patterns; several vents.

Table 4. Distribution of modeled chemometric families by each sample type with percentages of sample types represented in each family. The data set includes samples from this study and from Lorenson and others (2009). The distribution reveals that the tribe 3 tarballs have no known produced oil source. The most frequent tarball family (22) occurs in 55.6 percent of the samples and in 16.5 percent of all seeps and from 17.5 percent of produced oils from Southern California. The most frequent produced oil family (13) comprises almost 40 percent of the produced oils, but only 7.0 percent of all seeps and 0.4 percent of the tarballs, indicating that produced oil spillage is not contributing to tarball deposition. Of the total seep samples, 36.7 percent could not be classified by our model due to typically extreme biodegradation.

[ Southern California oils: SC oils]

Family	Sample Type						Total no. smpls.	Percentage of Sample Type within each Family					
	All Oils	SC Oils	Seeps	Unlocated seep oil	All Seeps	Tarballs		% All Oils	%SC Oils	% Seeps	% Unlocated Seeps	% All Seeps	% Tarballs
0	8	0	56	2	58	18	84	7.5	0.0	46.3	5.4	36.7	3.4
<b>Tribe 1</b>													
11	5	5	8	5	13	4	22	4.7	6.3	6.6	13.5	8.2	0.8
12	13	7	4	3	7	5	25	12.3	8.8	3.3	8.1	4.4	1.0
13	42	31	11	0	11	2	55	39.6	38.8	9.1	0	7.0	0.4
14	2	2	3	4	7	28	37	1.9	2.5	2.5	10.8	4.4	5.4
<b>Tribe 2</b>													
22	15	14	18	8	26	291	84	14.2	17.5	14.9	21.6	16.5	55.6
211	2	2	11	11	22	32	56	1.9	2.5	9.1	29.7	13.9	6.1
212	5	5	5	3	8	20	33	4.7	6.3	4.1	8.1	5.1	3.8
213	14	14	0	0	0	1	15	13.2	17.5	0	0	0	0.2
<b>Tribe 3</b>													
31	0	0	4	0	4	8	12	0	0	3.3	0	2.5	1.5
32	0	0	1	1	2	12	14	0	0	0.8	2.7	1.3	2.3
33	0	0	0	0	0	54	54	0	0	0	0	0	10.3
34	0	0	0	0	0	27	27	0	0	0	0	0	5.2
35	0	0	0	0	0	21	21	0	0	0	0	0	4.0
<b>Total no. type</b>	<b>106</b>	<b>80</b>	<b>121</b>	<b>37</b>	<b>158</b>	<b>523</b>	<b>787</b>						