Unocal Corporation
San Luis Obispo Tank Farm
Comprehensive Fairy Shrimp Wet and Dry Season Survey Report

90-Day Report: 2005 Dry Season Survey
90-Day Report: 2004-2005 Wet Season Survey
2003 and 2004 Dry Season Survey Reports

USFWS Reference: PAS 1772.2138.4131

Prepared for
Unocal Corporation

Prepared by
Rincon Consultants, Inc.

In collaboration with
David Wolff Environmental

October 18, 2005

1.0 INTRODUCTION AND PURPOSE

Rincon Consultants, David Wolff Environmental (DWE), and EcoAnalysts, Inc., have conducted vernal pool branchiopod dry and wet season surveys on the Unocal Corporation San Luis Obispo Tank Farm (SLO Tank Farm) beginning in the summer of 2003 and concluding in the summer of 2005. The purpose of these surveys was to determine the presence or absence of listed vernal pool branchiopods (fairy shrimp) in the seasonal wetland habitats on the 365-acre Unocal SLO Tank Farm (Figure 1). Prior to the discovery of the federally listed threatened vernal pool fairy shrimp (*Branchinecta lynchi*) resulting from the 2003 dry season survey, no fairy shrimp had been recorded on the SLO Tank Farm or the San Luis Obispo area south of the Cuesta Grade within San Luis Obispo County.

Although fairy shrimp had not been previously observed in the City of San Luis Obispo, numerous documented occurrences of the federally threatened *Branchinecta lynchi* have been reported on Camp Roberts and in the greater Paso Robles area in northern San Luis Obispo County, and several species of fairy shrimp including *Branchinecta lynchi* and the federally endangered longhorn fairy shrimp (*Branchinecta longiantenna*) have been observed in the California Valley in eastern San Luis Obispo County. Additionally, the California fairy shrimp (*Linderiella occidentalis*) has been reported in greater San Luis Obispo County including Camp San Luis, which is approximately 8-miles to the northwest of the property. The positive identification of vernal pool fairy shrimp on the SLO Tank Farm prompted Unocal to complete the presence/absence survey protocol in all the seasonal wetlands because future remediation and site planning alternatives were being studied in conjunction with the Ecological Risk Working Group as the facility no longer supports active petroleum supply operations.

This comprehensive report fulfills the 90-day reporting requirements for the 2004-2005 wet season and 2005 dry season surveys. In order to compile all the survey data under one report, the results data from the 2003 and 2004 dry season surveys are incorporated in this report with copies previously submitted to Unocal and the USFWS included as appendices.

2.0 METHODS

2.1 2003 Dry Season Survey

The 10-day survey approval request to conduct the initial dry season survey under EcoAnalysts permit TE796284-3 was submitted by Rincon Consultants on July 28, 2003 and approved by letter from Christopher Kofron of the USFWS on August 8, 2003. EcoAnalysts lead biologist Christopher Rogers collected the soil samples under the EcoAnalysts permit on August 12 and 13, 2003 with the aid of then Rincon Consultants biologists David Wolff and Jason Kirschenstein. Within the SLO Tank Farm, several seasonal wetlands were determined to have potential to support fairy shrimp and were selected for dry season sampling. Samples were collected from 36 seasonal wetland areas on the Unocal SLO Tank Farm. EcoAnalysts biologist Christopher Rogers conducted the laboratory processing of the soil samples.

2.2 2004 Dry Season Survey

EcoAnalysts collected soil samples from an additional 31 seasonal wetland habitats on the SLO Tank Farm as a follow-up to the 2003 survey effort under the prior USFWS dry season authorization issued on August 8, 2003. The decision to conduct an additional dry season survey was based on the identification of the federally threatened *B. lynchi* in several of the seasonal wetland areas during the 2003 Dry Season Survey. EcoAnalysts biologist Christopher Rogers conducted the soil collection and laboratory analysis for the 2004 dry season survey under permit TE706284-3.

2.3 2004-2005 Wet Season Survey

The wet season fairy shrimp survey approval request was submitted to the USFWS on behalf of Unocal by DWE on November 17, 2004 and authorized by Steve Kirkland of the USFWS via e-mail on December 13, 2004. The request and approval correspondences are included at the beginning of Appendix A, which also includes the completed wet season survey data forms. The purpose of the wet season survey was to conclusively determine the presence or absence of listed fairy shrimp in the seasonal wetland habitats on site that had negative results from the prior two dry season survey efforts. The fairy shrimp wet season survey was conducted in 54 seasonal wetland features on the Unocal SLO Tank Farm property. David Wolff, DWE Principal Ecologist, conducted the wet season survey protocol under permit TE090849-0 from January 18 to May 13, 2005. Assisting Mr. Wolff with the survey under his direct on-site supervision were Rincon Consultants biologists Kevin Merk and John Davis. Surveys were conducted by wading through the ponded wetland features with pool skimmer nets that cover approximately one square foot of area. These nets are ideal for providing good coverage sweeping through the water column and allowing for readily observing aquatic life in the net. Aquatic life observed were identified to the extent necessary to distinguish and record the major groups of aquatic life present for inclusion on the data sheet. Air temperature, water temperature, and water depth were recorded on the data sheets during each survey event.

2.4 2005 Dry Season Survey

The 2005 dry season survey approval request was submitted to the USFWS on July 29, 2005 by DWE on behalf of Unocal and Rincon Consultants as part of the 90-day wet season survey summary report. The USFWS authorized the final dry season survey effort by e-mail from Julie Vanderwier on August 4, 2005. The request and approval correspondences are included at the beginning of Appendix B, which also includes the completed dry season survey data forms. David Wolff, DWE Principal Ecologist, collected soil samples from nine seasonal wetland habitats surveyed during the 2004-2005 wet season but which had not been subjected to previous dry season surveys, thereby completing the survey protocol for these locations. Soil samples were collected by David Wolff on August 5, 2005 under permit TE090849-0. Soil samples were processed and analyzed for listed vernal pool branchiopods by Debby Martin, Biota Biological Permit TE795931-3, under September 1, 2005 e-mail approval by Julie Vanderwier of the USFWS.

4.0 CONTRIBUTORS

This report was prepared by Rincon Consultants, Inc. while under contract to the Unocal Corporation. John Ljung was the project manager for Unocal, It is currently Rick Rittenberg. Persons involved in data gathering, analysis, project management and quality control include the following.

Rincon Consultants, Inc. (Prime Consultant)
Duane Vander Pluym, D. ESE, Principal-in-Charge
Kevin Merk, Project Manager
John Davis, Biologist

David Wolff Environmental
David Wolff, Principal Ecologist

3.0 RESULTS

The Unocal SLO Tank Farm site has been the subject of the wet and dry season fairy shrimp presence/absence survey protocol over a three year period from 2003 through 2005. A total of 86 seasonal wetland features have been identified and surveyed to determine if listed fairy shrimp occur using dry season sampling, wet season sampling, or both wet and dry season survey efforts. As a result of completing the wet/dry season survey protocol, 60 of the 86 pools sampled have either recorded the positive identification of *Branchinecta lynchi* or are assumed to support the species based on observed hydrologic connectivity to occupied pools. Table 1 provides a summary of the presence/absence data collected from the wet and dry season surveys. Representative photographs of the 86 seasonal wetland habitats taken during the 2004-2005 wet season survey are included as Appendix C to this comprehensive report.

The pool numbering scheme from the separate survey efforts had different pool name prefix and number designations. The 2004 dry season and 2004-2005 wet season pool prefix/number designations have been changed to continue with the original FS-# naming convention. Table 1 provides the cross reference naming convention. Figure 2 is a geo-referenced aerial photograph map delineating the pool locations, designating presence/absence, and labeling pool numbers based on the final naming convention shown in the "Pool #" far left column in Table 1. All future references to fairy shrimp habitat pools should use this final naming convention.

Under several circumstances, presence was determined by observed hydrology during the 2005 wet season of ponded areas that were connected to areas of confirmed wet or dry season observations of vernal pool fairy shrimp (*B. lynchi*). These are noted in Table 1 and discussed further in Section 3.3 below.

3.1 2003 Dry Season Survey

A total of 36 pools were sampled during the first dry season survey of the SLO Tank Farm site in 2003 (FS-1 through FS-36). Positive identification of the federally listed threatened *Branchinecta lynchi* was established in 27 of the 36 pools sampled as shown in Table 1. The 2003 dry season report with data sheets is included as Appendix D to this comprehensive report.

3.2 2004 Dry Season Survey

A total of 31 pools were sampled during the second dry season survey of the SLO Tank Farm site in 2004 (FS-37 through FS-67). Positive identification of the federally listed threatened *Branchinecta lynchi* was established in two of the 31 pools sampled as shown in Table 1. EcoAnalysts documented the occurrence of *Branchinecta lynchi* as swimming adults in two additional locations during the 2004 wet season prior to conducting the 2004 dry season soil collection (FS-61 and FS-62). The 2004 dry season report with data sheets is included as Appendix E to this comprehensive report.

3.3 2004-2005 Wet Season Survey

A total of 54 ponded features on the Unocal SLO Tank Farm site were surveyed during the 2004-2005 wet season survey. Pools identified for wet season sampling were areas mapped as

seasonal wetlands that had been subject to the dry season soil analysis with negative results. The purpose of these surveys was to complete the wet/dry season presence/absence protocol. In addition, the wet season survey was conducted in 19 areas that had not been subject to dry season surveys and/or mapped previously as seasonal wetlands. *Branchinecta lynchi* were positively identified in 16 pools from the 2005 wet season survey where dry season surveys were negative. Two additional survey areas (FS-47 & FS-48) are assumed to support vernal pool fairy shrimp based on observed hydrologic connection (flow down slope over a small berm) from positive occurrence pools FS-42 and FS-75. However, FS-47 and FS-48 provide low quality habitat as these areas are subject to flooding and flow from the West Drainage that was observed throughout most of the 2005 wet season. Pools FS-47 and FS-48 were surveyed throughout the 2004-2005 wet season with no *Branchinecta lynchi* observed; again, presence is assumed based on connection to occupied habitat.

Hydrologic connections or pool extensions were observed and recorded during the 2004-2005 wet season survey. The pool complex composed of FS-27, FS-45, and FS-80 were observed connected as one pond during the peak parts of the 2005 wet season. *Branchinecta lynchi* were positively identified throughout the extent of this pool complex feature. Two pool extensions, FS-6 extension and FS-79 extension of FS-12, were observed and mapped with positive observation of *Branchinecta lynchi*. Presence of *Branchinecta lynchi* was assumed in FS-58 as it was a continuous pool with positive 2003 dry season occurrence in pool FS-28. It should be noted that the 2004-2005 wet season was the one of the wettest on record.

In addition *Branchinecta lynchi* were positively identified in 10 of 19 pools surveyed during the 2005 wet season that had not been subjected to a dry season survey. This left nine pools remaining to be sampled for the dry season survey to complete the wet/dry survey protocol. Table 1 provides the presence/absence data for the 2004-2005 wet season survey.

Voucher specimens were collected from 20 pools where there were sufficient numbers of captured individuals to make a collection. These specimens are preserved and will be accessioned in accordance with the survey guidelines. The July 29, 2005 90-day summary report stated 25 pools had vouchers collected. The correct number is 20 as five vials counted for the 90-day summary report were duplicates from the same pools. Table 2 provides a list of pools and number of male and female voucher specimens collected. The data sheets providing the details of observations and physical pond factors recorded for the 2004-2005 wet season survey are included as Appendix A to this comprehensive report.

3.4 2005 Dry Season Survey

A total of nine pools were sampled during the 2005 dry season survey of the SLO Tank Farm site in 2004 (FS-70 through FS-74 and FS-83 through FS-86) to complete the wet/dry season survey protocol. Positive identification of the federally threatened *Branchinecta lynchi* was established in two of the nine pools sampled as shown in Table 1 (FS-85 & FS-86). The 2005 dry season survey data sheets are included as Appendix B to this comprehensive report. Voucher specimens of cysts collected from the two pools will be accessioned in accordance with the survey guidelines.

Table 1. Unocal San Luis Obispo Tank Farm Comprehensive Fairy Shrimp Survey Summary Table

Pool Numbering			Survey Effort – Y=Present N=Absent			Summary		
Pool #	Old #	2003 Dry	2004 Dry	2004-2005 Wet	2005 Dry	Absent	Present	Acres
FS-1	FS-1	Y					X	0.951
FS-2	FS-2	N		N		X		0.504
FS-3	FS-3	N		N		X		0.112
FS-4	FS-4	Y					X	0.800
FS-5	FS-5	Y					X	0.250
FS-6	FS-6	Y		Y (Note 1)			X	0.413
FS-7	FS-7	Y					X	0.556
FS-8	FS-8	Y					X	0.362
FS-9	FS-9	Y					X	0.143
FS-10	FS-10	Y					X	0.260
FS-11	FS-11	Y					X	0.210
FS-12	FS-12	Y					X	0.311
FS-13	FS-13	Y					X	0.950
FS-14	FS-14	N		N		X		0.051
FS-15	FS-15	N		N		X		0.176
FS-16	FS-16	N		N		X		0.044
FS-17	FS-17	Y					X	1.162
FS-18	FS-18	N		Y			X	3.393
FS-19	FS-19	Y					X	0.044
FS-20	FS-20	Y					X	0.039
FS-21	FS-21	N		(Note 2)				0.010
FS-22	FS-22	Y					X	0.779
FS-23	FS-23	Y					X	0.026
FS-24	FS-24	Y					X	0.071
FS-25	FS-25	Y					X	0.055
FS-26	FS-26	Y					X	0.083
FS-27	FS-27	Y		Y			X	0.055
FS-28	FS-28	Y					X	1.251
FS-29	FS-29	Y					X	0.564
FS-30	FS-30	Y					X	0.003
FS-31	FS-31	Y					X	0.068
FS-32	FS-32	Y					X	0.007
FS-33	FS-33	N		Y			X	0.342
FS-34	FS-34	Y					X	0.165
FS-35	FS-35	Y					X	0.062
FS-36	FS-36	N		N		X		0.222
FS-37	X-1		Y				X	0.069
FS-38	X-2		N	N		X		0.158
FS-39	X-3		N	N		X		0.100
FS-40	X-4		N	N		X		0.526
FS-41	X-5		N	N		X		0.046
FS-42	X-6		N	Y			X	0.179
FS-43	X-7		N	N		X		3.358
FS-44	X-8		N	N		X		0.153
FS-45	X-9		N	Y			X	0.142
FS-46	X-10		N	N		X		0.389
FS-47	X-11		N	Y (Note 3)			X	1.601

Table 1. Unocal San Luis Obispo Tank Farm Comprehensive Fairy Shrimp Survey Summary Table

Pool Numbering			Survey Effort – Y=Present N=Absent			Summary		
Pool #	Old #	2003 Dry	2004 Dry	2004-2005 Wet	2005 Dry	Absent	Present	Acres
FS-48	X-12		N	Y (Note 3)			X	X-11 *
FS-49	X-13		N	Y			X	0.811
FS-50	X-14		N	N		X		5.863
FS-51	X-15		N	Y			X	0.096
FS-52	X-16		N	N		X		X-14 *
FS-53	X-17		N	Y			X	0.690
FS-54	X-18		N	N		X		3.060
FS-55	X-19		N	Y			X	0.781
FS-56	X-20		N	N		X		0.048
FS-57	X-21		N	Y			X	0.762
FS-58	X-22		N	Y (Note 4)			X	FS-28 *
FS-59	X-23		N	Y			X	1.499
FS-60	X-24		Y				X	0.510
FS-61	X-25		Y **				X	1.356
FS-62	X-26		Y **	Y			X	3.970
FS-63	X-27		N	Y			X	0.658
FS-64	X-28		N	Y			X	0.807
FS-65	X-29		N	Y			X	0.003
FS-66	X-30		N	N		X		0.042
FS-67	X-31		N	Y			X	0.273
FS-68	DW-1			Y			X	0.096
FS-69	DW-2			Y			X	0.285
FS-70	DW-3			N	N	X		0.229
FS-71	DW-4			N	N	X		0.086
FS-72	DW-5			N	N	X		0.340
FS-73	DW-6			N	N	X		0.031
FS-74	DW-6a			N	N	X		0.023
FS-75	DW-7			Y			X	1.677
FS-76	DW-8			Y			X	0.160
FS-77	DW-9			Y			X	0.549
FS-78	DW-10			Y			X	0.032
FS-79	DW-11			Y			X	0.159
FS-80	DW-12			Y			X	1.232
FS-81	DW-13			Y			X	0.068
FS-82	DW-14			Y			X	0.137
FS-83	DW-15			N	N	X		0.086
FS-84	DW-16			N	N	X		0.721
FS-85	DW-17			N	Y		X	0.050
FS-86	DW-18			N	Y		X	0.098

NOTES:

** = Acreage included in total of pool listed in cell*
*** = Adults observed by EcoAnalysts during 2004 wet season*
Note 1: Observed ponding extension from FS-6
Note 2: No ponding observed in 2004-2005 wet season survey
Note 3: No adults observed; assumed presence from observed connection to flow from FS-75 & FS-42; low suitability because of observed flood flows from west drainage
Note 4: Assumed presence because observed connection to FS-28

Table 2. Unocal San Luis Obispo Tank Farm Fairy Shrimp Survey *Branchinecta lynchi* Voucher Specimen Collection Data

2004-2005 Wet Season Survey			
Pool #	**Male**	**Female**	**Total**
FS-6	4	3	7
FS-18	4	4	8
FS-33	0	9	9
FS-42	7	5	12
FS-51	12	8	20
FS-53	4	5	9
FS-55	1	0	1
FS-59	0	1	1
FS-63	6	6	12
FS-64	4	4	8
FS-65	6	6	12
FS-67	10	11	21
FS-69	8	5	13
FS-76	6	6	12
FS-77	11	5	16
FS-78	5	4	9
FS-79	5	3	8
FS-80	4	4	8
FS-81	5	5	10
FS-82	3	4	7
TOTALS	**105**	**98**	**203**

2005 Dry Season Survey		
Pool #	**Voucher**	**# Cysts**
FS-85	Cysts	1
FS-86	Cysts	50+

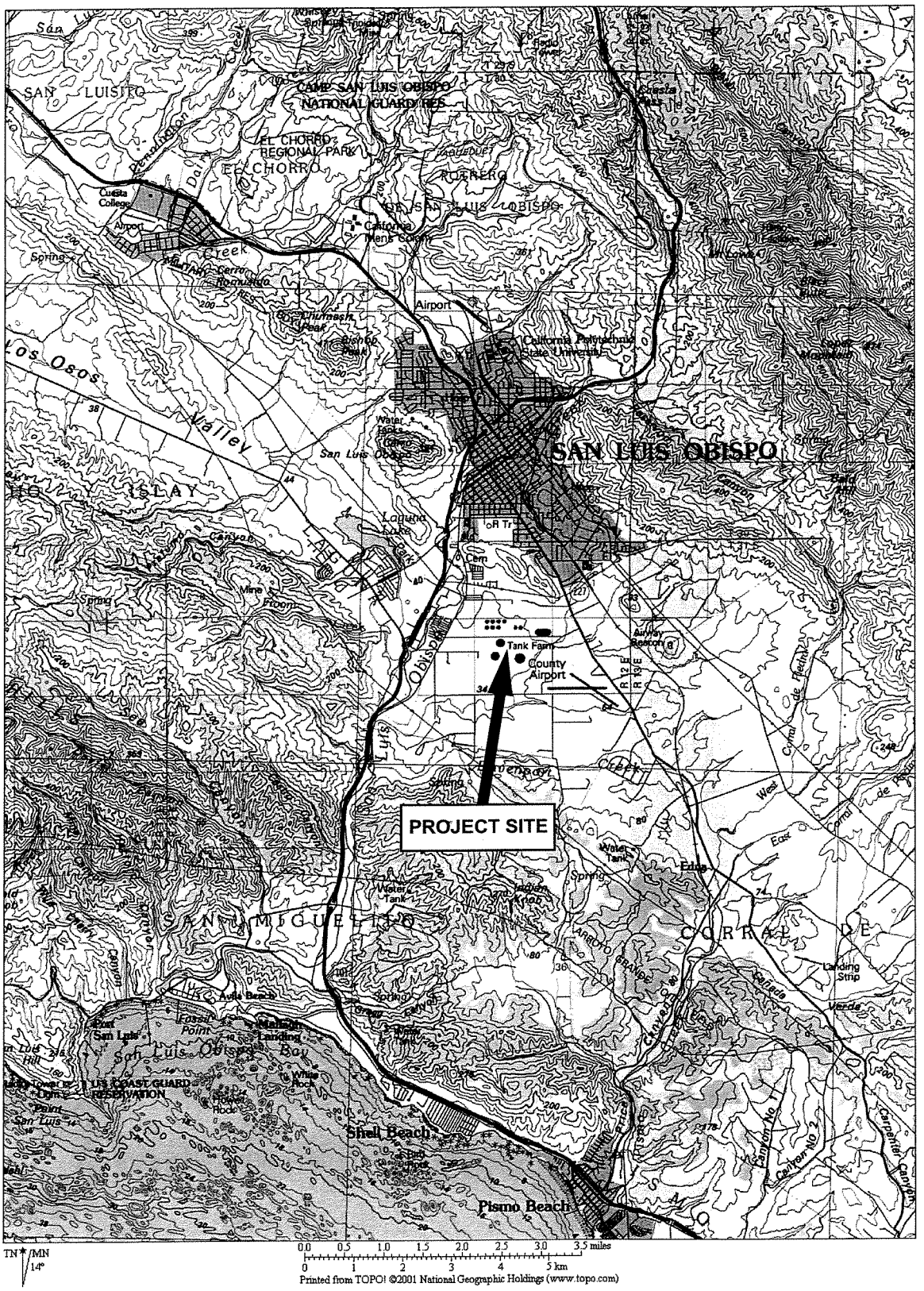
Table 3. Fairy Shrimp Survey Wetland Habitat Coordinates

New Name	Old Name	Latitude (N) (decimal degrees)	Longitude (W) (decimal degrees)
FS-1	FS-1	33.41603059	119.6283803
FS-2	FS-2	33.4166222	119.6280792
FS-3	FS-3	33.41643141	119.6275114
FS-4	FS-4	33.41688345	119.628383
FS-5	FS-5	33.41741492	119.6271217
FS-6	FS-6	33.41769302	119.6270137
FS-7	FS-7	33.41603013	119.6270756
FS-8	FS-8	33.41579215	119.625768
FS-9	FS-9	33.41714461	119.6247879
FS-9	FS-9	33.4168621	119.6244297
FS-10	FS-10	33.41576803	119.6218507
FS-10	FS-10	33.4159694	119.6221265
FS-10	FS-10	33.41584582	119.6220051
FS-11	FS-11	33.41622254	119.6204999
FS-12	FS-12	33.41529162	119.6213886
FS-13	FS-13	33.41469836	119.6221022
FS-14	FS-14	33.41522898	119.616683
FS-15	FS-15	33.4144985	119.6177868
FS-16	FS-16	33.41434588	119.6171953
FS-17	FS-17	33.40936688	119.6266571
FS-18	FS-18	33.41047898	119.6264788
FS-19	FS-19	33.41124179	119.6275377
FS-20	FS-20	33.41060661	119.6248643
FS-20	FS-20	33.4107572	119.6250396
FS-21	FS-21	33.41053392	119.6252552
FS-22	FS-22	33.40920232	119.624821
FS-23	FS-23	33.41079642	119.6241132
FS-24	FS-24	33.41071784	119.6233756
FS-25	FS-25	33.4136342	119.6240442
FS-26	FS-26	33.41365618	119.623027
FS-27	FS-27	33.41217241	119.6238083
FS-28	FS-28	33.40910328	119.622263
FS-29	FS-29	33.4114012	119.6200881
FS-30	FS-30	33.41106191	119.6201641
FS-31	FS-31	33.41090016	119.6198822
FS-31	FS-31	33.41084498	119.6197389
FS-32	FS-32	33.41067254	119.6192555
FS-33	FS-33	33.41176757	119.619952
FS-34	FS-34	33.41171614	119.6184852
FS-35	FS-35	33.4135592	119.6169412
FS-36	FS-36	33.41384269	119.614856
FS-37	X-1	33.41719327	119.6261102
FS-37	X-1	33.41743154	119.6258728
FS-38	X-2	33.41762969	119.6142855
FS-39	X-3	33.41740015	119.6145948
FS-40	X-4	33.41449302	119.6133612
FS-41	X-5	33.41445251	119.6128975
FS-42	X-6	33.41364661	119.6263088
FS-43	X-7	33.41309361	119.625362
FS-44	X-8	33.41331041	119.6238189
FS-45	X-9	33.41217241	119.6238083
FS-46	X-10	33.41280841	119.6226463
FS-47	X11	33.41222724	119.6276153
FS-48	X-12	33.41222724	119.6276153
FS-49	X-13	33.41169898	119.6272891

Table 3. Fairy Shrimp Survey Wetland Habitat Coordinates

New Name	Old Name	Latitude (N) (decimal degrees)	Longitude (W) (decimal degrees)
FS-50	X-14	33.40899382	119.6273463
FS-51	X-15	33.41079578	119.6275099
FS-52	X-16	33.40899382	119.6273463
FS-53	X-17	33.41159485	119.6257827
FS-54	X-18	33.40992239	119.6238722
FS-55	X-19	33.40886175	119.6229766
FS-56	X-20	33.40929646	119.6230764
FS-57	X-21	33.41071784	119.6233756
FS-58	X-22	33.40910328	119.622263
FS-59	X-23	33.41139846	119.6217333
FS-60	X-24	33.41181188	119.621645
FS-61	X-25	33.41295891	119.6195831
FS-62	X-26	33.40941289	119.6210581
FS-63	X-27	33.40885835	119.6203419
FS-64	X-28	33.41240774	119.6162014
FS-65	X-29	33.41328872	119.6140987
FS-65	X-29	33.41324087	119.6140048
FS-66	X-30	33.41367479	119.6139605
FS-67	X-31	33.41370703	119.6132691
FS-68	DW-1	33.41445321	119.6220551
FS-69	DW-2	33.41558996	119.6222031
FS-70	DW-3	33.41633548	119.6192961
FS-71	DW-4	33.41623051	119.6190155
FS-72	DW-5	33.41587636	119.6179514
FS-73	DW-6	33.41597189	119.6177291
FS-74	DW-6a	33.41506952	119.6154361
FS-75	DW-7	33.4119717	119.6256525
FS-76	DW-8	33.41124258	119.6255429
FS-77	DW-9	33.41399911	119.6183118
FS-78	DW-10	33.41635401	119.6267922
FS-79	DW-11	33.41529162	119.6213886
FS-80	DW-12	33.41217241	119.6238083
FS-81	DW-13	33.41325337	119.6244026
FS-82	DW-14	33.41366676	119.6173225
FS-83	DW-15	33.41686212	119.6150384
FS-84	DW-16	33.41731029	119.6156133
FS-85	FS-85	33.41124347	119.6281967
FS-86	FS-86	33.40917439	119.620274

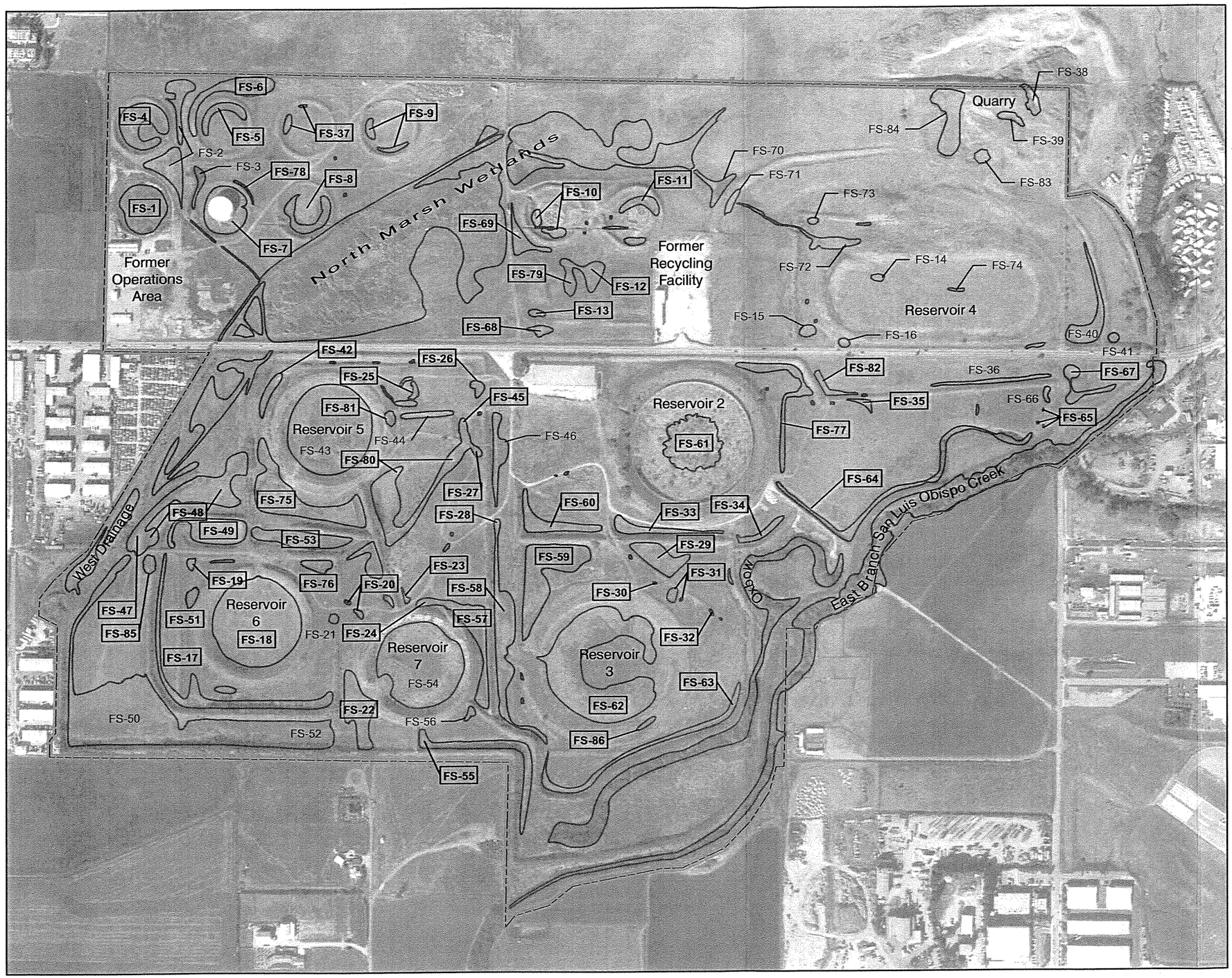
Figures



Vicinity Map

Figure 1

Unocal Corporation



Legend

- Approximate Site Boundary
- Approximate Wetland Extent
- FS-7 *Branchinecta lynchi* Cysts and/or Adults Observed
- FS-15 No *Branchinecta lynchi* Cysts or Adults Observed

Source:

1. Fairy shrimp dry-season sampling performed in August 2003 under permit #TE-796284-3 and laboratory analysis conducted by EcoAnalysts in September 2003.
2. Extent of wetlands delineated by Jenesis Ecological Services, 2003, David Wolff Environmental 2004-2005 wet season observations.
3. Fairy shrimp dry-season sampling performed in August 2004 under permit #TE-796284-3 and laboratory analysis conducted by EcoAnalysts in September 2004.
4. Fairy shrimp wet-season survey performed during winter 2004/2005 under permit #TE-090849-0 by David Wolff Environmental.
5. Fairy shrimp dry-season soil samples collected in August 2005 by David Wolff Environmental under permit #TE-090849-0 and laboratory analysis conducted by Biota Biological under permit #TE-795931-3.

0 250 500 1,000

Approximate Scale (Feet)

Fairy Shrimp Comprehensive Wet and Dry Season Protocol Survey Results

Figure 2

Source: Avocet Environmental, Inc., 10/17/05

Unocal Corporation

Appendix A

2004-2005 Wet Season Survey Approval & Data Forms

David Wolff Environmental

From: Steve_Kirkland@r1.fws.gov
Sent: Monday, December 13, 2004 2:56 PM
To: david@dkwenvironmental.com
Cc: Steve_Henry@r1.fws.gov
Subject: vernal pool branchiopod wet season survey request (TE-090849-0)

David,

We have reviewed your request, dated November 17, 2004, and received in our office on November 19, 2004, for approval to conduct wet season surveys
for vernal pool branchiopods, You requested to conduct wet season
surveys at 3 locations in San Luis Obispo County, California: The 365-acre former Unocal Tank Farm site in San Luis Obispo, Unocal's Martinelli property, located in San Luis Obispo, south of Prado Road, and Unocal's Avila Terminal in Avila Beach.

We hearby approve the requested surveys for federally-listed vernal pool branchiopods in the above mentioned locations for the remainder of the
2004-2005 wet season. The surveys must be conducted in accordance with the Interim Survey Guidelines to Permittees under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods, dated April 19, 1996. The surveys must also be conducted following the conditions of your recovery permit (TE-090849-0). Please report any observations of listed branchiopods to us by letter or phone within 10 days of an observation. Please refer to your permit for other requirements and any special conditions that must be met.

Sincerely,

Steve Kirkland
Fish & Wildlife Biologist
Ventura Fish & Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003

805-644-1766

steve_kirkland@r1.fws.gov

1

David Wolff Environmental
P.O. 6552, Los Osos, CA 93412
(805) 235-5223
(805) 528-3504 FAX

November 17, 2004

Ms. Diane Noda
USFWS Ventura Field Office
2493 Portola Road, Suite B
Ventura, CA 93003

SUBJECT: **Proposal request for approval to conduct listed vernal pool banchiopod (fairy shrimp) wet season surveys for the Unocal Former San Luis Obispo Tank Farm under Recovery Permit TE-090849-0.**

Dear Ms. Noda:

On behalf of Unocal Corporation, David Wolff Environmental (DWE) is submitting this proposal request for approval to conduct wet season fairy shrimp survey for the Unocal Former San Luis Obispo Tank Farm site in San Luis Obispo, California. The study area includes the approximately 365-acre area located to the north and south of Tank Farm Road between South Higuera and Broad streets. A map is attached showing the location of the study area on the northern edge of USFWS Pismo Beach 7.5 minute quadrangle map. David Wolff, DWE Principal Ecologist, will conduct the study under Recovery Permit TE-090849-0 issued on November 5, 2004. I have attached the permit cover sheet and authorized individuals sheet for your reference.

The purpose of the study is to complete the wet season survey protocol as detailed in the currently accepted April 19, 1996 Interim Survey Guidelines to determine presence or absence of listed fairy shrimp in the site wetland habitats. Given the early rains, this study is proposed to commence the week of November 29, 2004 and continue every two weeks until listed fairy shrimp are discovered or until March 31, 2005 presuming continuous ponding throughout the study period. Previously approved dry season protocol surveys have been completed in 2003 and 2004 resulting in approximately 29 occurrences. Negative dry season results in approximately 30 seasonal wetland features will be the focus of completing the protocol. The dry season report and map is being finalized and should be submitted to your office shortly.

No more that 20 individuals or 10 percent of the subpopulation, whichever is less, of each listed species discovered will be collected as voucher specimens from each wetland feature as allowed under the 1996 Interim Survey Guidelines. All other conditions of the permit and guidelines will be implemented.

Thank you for your consideration of this request. Please call me if you have any questions or need any additional information to complete your approval process.

Very truly yours,

David K. Wolff, Principal Ecologist
Certified Professional Wetland Scientist

Attachments: Location Map, Permit

C: Rick Rittenberg, Unocal; Duane Vander Pluym, Rincon Consultants

Biological Resources Analysis, Planning & Monitoring
Regulatory Compliance Specialist
David@DKWEnvironmental.com
www.dkwenvironmental.com

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: FS-2
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0	Photo Date(s):	
Land Use/Habitat: Grazing		Max Area:	Max Depth:

Survey Date:	12/14/05	1/3/05	1/19/05	1/31/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature		51°F	70°F	64°F	60°F	58°F	64°F	76°F	76°F
Water Temperature		54°F		56°F	58°F	58°F	64°F	62°F	70°F
Water Depth	12"	12"	12"-18"	6"-24"	6"-24	3"-12"	3"-12"	2"-10"	4"
Species Observed									
Branchinecta lynchi — vernal pool fairy sh.									
Linderiella occidentalis — linderiella									
Notostraca — tadpole shrimp									
Platyhelminthes — flatworms									
Erpobdellidae — leeches									
Mollusca — snails									
Amphipoda — scuds									
Cladocera — water fleas						✓	✓	✓	✓
Conchostraca — clam shrimp									
Copepoda — copepods	✓		✓	✓	✓				
Decapoda — cray fish									
Ostracoda — seed shrimp	✓			✓	✓	✓	✓	✓	✓
Arachnida — mites									
Anisoptera — dragon flies								✓	
Belostomatidae — giant water bug									
Corixidae — water boatmen	✓			✓	✓	✓	✓	✓	✓
Culicidae — mosquitoes					✓	✓	✓	✓	✓
Diptera — midges						✓	✓	✓	✓
Dytiscidae — pred. diving beetles									
Ephemeroptera — mayflies									
Gerridae — water striders									
Hydrophilidae — water scav. beetles					✓		✓	✓	✓
Notonectidae — backswimmers									
Zygoptera — damsel flies									
Frogs							Wylie Adult tadpoles		
Fish									
Salamanders									
Water Fowl					Mallard Yellow-legs				
Other Species									

Voucher Specimens:

Notes: 12/14 - only ponded in ditch 1/3 Ponded + Flowing to extent of mapped wetland; NO Ag life in flowing water 3/2 - Flowing w/ side ponds

1/19 - Flowing 1/31 Side pond shallow + drying Flow in channel 2/18 Ponded + Flowing Drainage 3/21 Flowing w/ side ponds 4/1 Flowing w/ drying sides 4/14 - 4/21 Slight flow

David Wolff Environmental
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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-3
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth: 10"

		Survey Date: 12/14/04	1/3/05	1/19/05	1/31/05	2/18/05	3/7/05	3/21/05	4/1/05	4/14/05
Air Temperature			51°F	70°F	64°	60°F	58°	64°F	74°F	76°F
Water Temperature			51°F			58°F	58°	68°F	64°F	
Water Depth		6"		8"	<6"	<6"	3"-8"	3"-6"	<6"	DRY
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella									
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches			✓		✓				
Mollusca	snails									
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	
Conchostraca	clam shrimp									
Copepoda	copepods	✓		✓	✓	✓				
Decapoda	cray fish									
Ostracoda	seed shrimp	✓		✓	✓	✓	✓	✓		
Arachnida	mites									
Anisoptera	dragon flies							✓	✓	
Belostomatidae	giant water bug									
Corixidae	water boatmen	✓	✓	✓		✓	✓	✓	✓	
Culicidae	mosquitoes							✓	✓	
Diptera	midges							✓		
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies						✓		✓	
Gerridae	water striders									
Hydrophilidae	water scav. beetles					✓	✓	✓	✓	
Notonectidae	backswimmers									
Zygoptera	damsel flies						✓ lg.		✓	
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 1/3/05 Floods from Drainage FS-2 may have flow unsuitable to FS 1/31 Drying down

2/18/05 Ponded from overflow of drainage (FS-2)

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-6 Extension
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/14/05	1/3/05	1/19/05							
	Air Temperature		51°F	70°F							
	Water Temperature		51°F								
	Water Depth	6"	12"	12"							
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.			>100							
Linderiella occidentalis	linderiella										
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓							
Conchostraca	clam shrimp										
Copepoda	copepods	✓	✓	✓							
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓							
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/19/05 4 of 3♀

Notes: Hydrologic connection to FS-6

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-14
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:	12/14/04	1/2/05	1/19/05	2/1/05	2/18/05	3/5/05	3/21/05	4/1/05	4/14/05
Air Temperature				65°F	70°F	62°F	68°F	76°F	72°F
Water Temperature				53°F	64°F	62°F	70°F	77°F	
Water Depth	6"-12"	6"-12"	6"	<6"	<6"	6"	<4"	<3"	Dry

Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella				Few ♀			Ø		
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches					✓				
Mollusca	snails									
Amphipoda	scuds									
Cladocera	water fleas	✓			✓	✓		✓	✓	
Conchostraca	clam shrimp									
Copepoda	copepods									
Decapoda	cray fish									
Ostracoda	seed shrimp		✓	✓	✓			✓	✓	
Arachnida	mites									
Anisoptera	dragon flies								✓	
Belostomatidae	giant water bug									
Corixidae	water boatmen		✓							
Culicidae	mosquitoes						✓	✓		
Diptera	midges						✓		✓	
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies				✓			✓	✓	
Gerridae	water striders									
Hydrophilidae	water scav. beetles							✓	✓	
Notonectidae	backswimmers									
Zygoptera	damsel flies							✓		
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 4/1 - drying

David Wolff Environmental
www.dkwenvironmental.com

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-15
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/14/05	1/3/05	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05	
	Air Temperature				65°F+	70°F	62°F	68°F	76°F	72°F	
	Water Temperature		56°		53°F	68°F	62°F	68°F	72°F		
	Water Depth	12"	6-12"	6-12"	<6"	6"-10"	3"-12"	2"-6"	<3"	DRY	
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella		100's mature		<100	0	0	0	0		
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches				✓	✓	✓				
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓		
Conchostraca	clam shrimp										
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓		
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓		✓					✓		
Culicidae	mosquitoes				✓		✓	✓			
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies								✓		
Gerridae	water striders										
Hydrophilidae	water scav. beetles						✓	✓	✓		
Notonectidae	backswimmers										
Zygoptera	damsel flies								✓		
Frogs	Hyla					Tads ✓	✓ tads				
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes: 3/21 - 50% dry 4/1 - drying w/ veg covering

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-16
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05			
Air Temperature		65°F+	70°	62°F	68°F	76°F	72°F			
Water Temperature	54°	53°F	68°	62°F	68°F	72°F				
Water Depth	6"	<6"	6"	<4"	<3"	<3"	DRY			
Species Observed										
Branchinecta lynchi — vernal pool fairy sh.										
Linderiella occidentalis — linderiella										
Notostraca — tadpole shrimp										
Platyhelminthes — flatworms										
Erpobdellidae — leeches			✓	✓						
Mollusca — snails										
Amphipoda — scuds										
Cladocera — water fleas						✓				
Conchostraca — clam shrimp										
Copepoda — copepods										
Decapoda — cray fish										
Ostracoda — seed shrimp	✓	✓	✓	✓	✓	✓				
Arachnida — mites										
Anisoptera — dragon flies										
Belostomatidae — giant water bug										
Corixidae — water boatmen										
Culicidae — mosquitoes		✓		✓	✓	✓				
Diptera — midges										
Dytiscidae — pred. diving beetles										
Ephemeroptera — mayflies										
Gerridae — water striders										
Hydrophilidae — water scav. beetles						✓				
Notonectidae — backswimmers										
Zygoptera — damsel flies										
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 4/1 - Drying w/ veg covering

David Wolff Environmental
www.dkwenvironmental.com

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-18 Res 6
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/15/04	1/3/05								
	Air Temperature										
	Water Temperature		57°F								
	Water Depth		12"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	Early?	100's								
Linderiella occidentalis	linderiella	Early?									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓								
Conchostraca	clam shrimp	✓									
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓									
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/3/05 2/2/05 - None found

Notes: 4♀ 4♂ B. lynchi

David Wolff Environmental
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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm				County: San Luis Obispo				Vernal Pool #: FS-27			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.		Range: 12 E.		Section:		Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0				Photo Date(s):					
Land Use/Habitat: Grazing						Max Area:			Max Depth:		
	Survey Date:	12/15/04	1/6/05	1/19/05							
	Air Temperature										
	Water Temperature										
	Water Depth										
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.			Few							
Linderiella occidentalis	linderiella	1,000'S matur									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓									
Conchostraca	clam shrimp										
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp	✓									
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges	✓									
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓									
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs	Hyla	✓									
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: Ø

Notes: Connected to X-9 as of 1/6. Observation Confirms presence to extent of Ponding
see DW-12 too.

David Wolff Environmental
www.dkwenvironmental.com

[illegible] Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm				County: San Luis Obispo				Vernal Pool #: FS-33			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.		Range: 12 E.		Section:		Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0				Photo Date(s):					
Land Use/Habitat: Grazing						Max Area:			Max Depth:		
	Survey Date:	12/16/04	1/11/05	1/21/05							
	Air Temperature										
	Water Temperature										
	Water Depth										
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	L100	~~0~~	~~0~~							
Linderiella occidentalis	linderiella	1,000's									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓									
Conchostraca	clam shrimp	✓									
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp	✓									
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓									
Notonectidae	backswimmers										
Zygoptera	damsel flies	✓									
Frogs	Hyla	✓									
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 12/16 9 ♀ B. lynchi No mats obs; (PID)

Notes: none Found 1/11 or 1/21

David Wolff Environmental
www.dkwenvironmental.com

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: FS-36
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/17/04	1/11/05	1/21/05	2/2/05	2/21/05	3/4/05	3/17/05	3/31/05	4/19/05	
	Air Temperature				65°F	60°F	62°F	62°F	78°F	72°F	
	Water Temperature				52°F	58°F	60°F	62°F	74°F	66°F	
	Water Depth	18"			12"-36"	12"-36"	12"-36"	12"-36"	12"-36"	8"-24"+	
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella	1mm	1,000's	1,000's	100's	<100	Ø	Ø	Ø	Ø	
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches				✓				✓	✓	
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Conchostraca	clam shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Copepoda	copepods	✓	✓	✓	✓	✓	✓				
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Arachnida	mites										
Anisoptera	dragon flies								✓		
Belostomatidae	giant water bug										
Corixidae	water boatmen				✓	✓	✓	✓	✓	✓	
Culicidae	mosquitoes					✓					
Diptera	midges				✓						
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies						✓			✓	
Gerridae	water striders										
Hydrophilidae	water scav. beetles				✓	✓	✓	✓	✓	✓	
Notonectidae	backswimmers										
Zygoptera	damsel flies					✓					
Frogs	Hyla	✓	✓	✓	Tads eggs	Tads w/legs	Tads	tads	tads	tads w/legs	
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes: 4/19 - 50% Dry

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (X-2) FS-38
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

		Survey Date:	12/14/04	1/3/05	1/14/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
		Air Temperature		50°F		65°F+	70°F	62°F	68°F	78°F	72°F
		Water Temperature		54°F	56°F	53°F	68°F	62°F	64°F	68°F	
		Water Depth	3'+	48"	48"	36"	24"	36"	3'-10"	15"	Dry
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella		10's			100's	✓	✓	✓	✓	↓
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches							✓			
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas			✓	✓	✓	✓	✓	✓		
Conchostraca	clam shrimp							✓	✓	✓	
Copepoda	copepods			✓							
Decapoda	cray fish										
Ostracoda	seed shrimp		✓	✓	✓	✓	✓	✓	✓		
Arachnida	mites								✓		
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen		✓					✓	✓	✓	
Culicidae	mosquitoes			✓							
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies		✓		✓	✓	✓				
Gerridae	water striders								✓		
Hydrophilidae	water scav. beetles		✓	✓				✓	✓		
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes: 2/18/05 - Substantial drying down. 3/21 - substantial dry down; clam shrimp molting?

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-3) FS-39
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:	12/14/04	1/3/05	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature		50°F	70+		70°F	62°F	68°F	70°F	72°F
Water Temperature		58°F	74		68°F	62°F			
Water Depth	2"	12"	4"	Dry	10"	6"	DRY	DRY	DRY
Species Observed									
Branchinecta lynchi — vernal pool fairy sh.									
Linderiella occidentalis — linderiella									
Notostraca — tadpole shrimp									
Platyhelminthes — flatworms									
Erpobdellidae — leeches			✓			✓			
Mollusca — snails									
Amphipoda — scuds									
Cladocera — water fleas									
Conchostraca — clam shrimp									
Copepoda — copepods						✓			
Decapoda — cray fish									
Ostracoda — seed shrimp			✓			✓			
Arachnida — mites									
Anisoptera — dragon flies									
Belostomatidae — giant water bug									
Corixidae — water boatmen									
Culicidae — mosquitoes									
Diptera — midges									
Dytiscidae — pred. diving beetles									
Ephemeroptera — mayflies									
Gerridae — water striders									
Hydrophilidae — water scav. beetles									
Notonectidae — backswimmers									
Zygoptera — damsel flies									
Frogs									
Fish									
Salamanders									
Water Fowl									
Other Species									

Voucher Specimens:

Notes: 1/19 - rapidly drying 2/18 Ponded from Recent rain 330 Off-Line Obs

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-4) FS-40
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:		12/17/04	1/11/05	1/21/05	2/1/05	2/14/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature					65°F+	70°F	62°F	68°F	78°F	74°F
Water Temperature				56°F	53°F	63°F	62°F	58°F	64°F	60°F
Water Depth		22"	6'+	6'+	6'+	6'+	6'+	6'+	6'+	6'+
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella	1,000's x 1,000's	1,000's	1,000's	1,000's	1,000's	Few	0	0	0
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches							✓ lots	✓	✓
Mollusca	snails									
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓		
Conchostraca	clam shrimp							✓	✓	✓
Copepoda	copepods	✓	✓	✓	✓	✓	✓	✓		
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Arachnida	mites									✓
Anisoptera	dragon flies									
Belostomatidae	giant water bug									
Corixidae	water boatmen								✓	✓
Culicidae	mosquitoes					✓				
Diptera	midges									
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies							✓		✓
Gerridae	water striders									
Hydrophilidae	water scav. beetles						✓	✓	✓	✓
Notonectidae	backswimmers								✓	✓
Zygoptera	damsel flies									
Frogs	Hyla						Frogs	tadpoles	✓	✓
Fish										
Salamanders										
Water Fowl								MALLARD HOME GRE		MALLARD EGGS WHITE 3.9
Other Species										

Voucher Specimens:

Notes: 1/11 Deep flooding after rains 4/14 - Garter snake

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-5) FS-41
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:	12/17/04	1/11/05	1/21/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature			62°	65°F	70°F	64°F	68°F	78°F	74°F
Water Temperature			58°F	56°F	68°F	62°F	68°F	72°F	72°F
Water Depth	3"		8"	3"-8"	3"-12"	3"-12"	3"-12"	6"	4"
Species Observed									
Branchinecta lynchi — vernal pool fairy sh.									
Linderiella occidentalis — linderiella			Few ✓	Few	✓	✓	✓	✓	✓
Notostraca — tadpole shrimp									
Platyhelminthes — flatworms									
Erpobdellidae — leeches									
Mollusca — snails								Turbine	
Amphipoda — scuds					NA				
Cladocera — water fleas					✓		✓	✓	✓
Conchostraca — clam shrimp					✓	✓	✓		
Copepoda — copepods					✓				
Decapoda — cray fish									
Ostracoda — seed shrimp	✓	✓		✓	✓	✓	✓		
Arachnida — mites									✓
Anisoptera — dragon flies								✓	
Belostomatidae — giant water bug									
Corixidae — water boatmen								✓	✓
Culicidae — mosquitoes				✓	✓	✓	✓	✓	✓
Diptera — midges					✓		✓	✓	✓
Dytiscidae — pred. diving beetles									
Ephemeroptera — mayflies								✓	✓
Gerridae — water striders									
Hydrophilidae — water scav. beetles							✓	✓	✓
Notonectidae — backswimmers								✓	
Zygoptera — damsel flies									✓
Frogs — Hyla				Tadpoles	tads & eggs	tads	tads		tads
Fish									
Salamanders									
Water Fowl									
Other Species									

Voucher Specimens:

Notes: 4/14 - 1/2 dry 1/2 very shallow

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo					Vernal Pool # (X-6) FS-42			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.	Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0			Photo Date(s):						
Land Use/Habitat: Grazing					Max Area:			Max Depth:			
Survey Date:		12/15/04	1/6/05								
Air Temperature											
Water Temperature			50°F								
Water Depth			18"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	?	100's immature								
Linderiella occidentalis	linderiella	?	1,000's immature								
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓								
Conchostraca	clam shrimp										
Copepoda	copepods	✓	✓								
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges	✓									
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓									
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/6/05 B. lynchi 7-♂ 5♀

Notes: Connected to OW-7 that drains to X-11 X-12 that are all one pond

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm				County: San Luis Obispo				Vernal Pool #: (X-7 Res 5) PS-43		
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.		Range: 12 E.		Section:		Lat/Lon: 35N. 15'/ 120W. 40'		
Surveyor: David Wolff		Permit #: TE090849-0				Photo Date(s):				
Land Use/Habitat: Grazing						Max Area:			Max Depth:	
	Survey Date:	12/15/04	1/6/05	1/19/05	2/2/05	2/21/05	3/1/05	3/17/05	3/31/05	4/19/05
	Air Temperature				65°F	60°F	64°F	60°F	72°F	72°F
	Water Temperature			60°	58°-60°F	58°F	64°F	60°F	60°F	66°F
	Water Depth	6"-18"	36"+	36"+	36+	36"+	36"+	36"+	36"+	36"+
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella	1,000's	1,000's	Few						
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches									
Mollusca	snails	✓	✓							
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	
Conchostraca	clam shrimp	✓	✓	✓						
Copepoda	copepods	✓	✓	✓	✓	✓	✓	✓		
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓			
Arachnida	mites			✓					✓	✓
Anisoptera	dragon flies								✓	✓
Belostomatidae	giant water bug									
Corixidae	water boatmen	✓	✓	✓			✓	✓	✓	✓
Culicidae	mosquitoes	✓	✓							
Diptera	midges	✓						✓		✓
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies	✓								
Gerridae	water striders									
Hydrophilidae	water scav. beetles	✓	✓	✓			✓	✓	✓	✓
Notonectidae	backswimmers	✓						✓		✓
Zygoptera	damsel flies	✓						✓	✓	✓
Frogs	Hyla	✓							Toad	toads
Fish										
Salamanders									Newts	
Water Fowl										
Other Species										

Voucher Specimens:

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo			Vernal Pool #: (X-8) FS-44				
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.		Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'		
Surveyor: David Wolff	Permit #: TE090849-0				Photo Date(s):					
Land Use/Habitat: Grazing					Max Area:			Max Depth:		
Survey Date:	12/15/04	1/6/05	1/19/05	2/2/05	2/21/05	3/7/05	3/17/05	3/31/05	4/19/05	
Air Temperature				65°F	60°F	64°F	59°F	72°F	72°F	
Water Temperature		49°F		56°F	56°F	64°F	58°F	60°F	70°F	
Water Depth	24"	36"		24"+	36"+	36"+	36"+	36"+	36"	
Species Observed										
Branchinecta lynchi / vernal pool fairy sh.										
Linderiella occidentalis / linderiella	1,000's	1,000's	Immature	1,000's	Fewer	Ø	Ø	Ø	✓	
Notostraca / tadpole shrimp										
Platyhelminthes / flatworms										
Erpobdellidae / leeches										
Mollusca / snails Planis Horn	✓						✓	✓	✓	
Amphipoda / scuds										
Cladocera / water fleas	✓	✓		✓	✓	✓	✓	✓	✓	
Conchostraca / clam shrimp	✓	✓		✓	✓			✓		
Copepoda / copepods	✓	✓		✓	✓	✓	✓	✓		
Decapoda / cray fish										
Ostracoda / seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓		
Arachnida / mites										
Anisoptera / dragon flies							✓	✓		
Belostomatidae / giant water bug										
Corixidae / water boatmen	✓	✓		✓		✓	✓	✓	✓	
Culicidae / mosquitoes							✓	✓		
Diptera / midges							✓	✓	✓	
Dytiscidae / pred. diving beetles										
Ephemeroptera / mayflies						✓		✓	✓	
Gerridae / water striders										
Hydrophilidae / water scav. beetles	✓	✓		✓		✓	✓		✓	
Notonectidae / backswimmers							✓		✓	
Zygoptera / damsel flies	✓	✓						✓		
Frogs / Hyla	✓	✓	✓	tads		Tads		Tads	tads	
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-9) FS-45
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat:			Max Area:	Max Depth:

		Survey Date:	12/16/04	1/6/05								
		Air Temperature										
		Water Temperature										
		Water Depth										
Species Observed												
Branchinecta lynchi	vernal pool fairy sh.											
Linderiella occidentalis	linderiella		1,000's mature									
Notostraca	tadpole shrimp											
Platyhelminthes	flatworms											
Erpobdellidae	leeches											
Mollusca	snails											
Amphipoda	scuds											
Cladocera	water fleas		✓									
Conchostraca	clam shrimp		✓									
Copepoda	copepods		✓									
Decapoda	cray fish											
Ostracoda	seed shrimp		✓									
Arachnida	mites											
Anisoptera	dragon flies											
Belostomatidae	giant water bug											
Corixidae	water boatmen		✓									
Culicidae	mosquitoes											
Diptera	midges		✓									
Dytiscidae	pred. diving beetles											
Ephemeroptera	mayflies											
Gerridae	water striders											
Hydrophilidae	water scav. beetles											
Notonectidae	backswimmers											
Zygoptera	damsel flies		✓									
Frogs												
Fish												
Salamanders												
Water Fowl												
Other Species												

Voucher Specimens: Ø

Notes: Connected to FS-27 as of 1/11/05 survey 2/2 None observed

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-10) FS-46
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/15/04	1/6/05	1/19/05	2/1/05	2/2/05	3/1/04	3/17/05	3/31/05	4/19/05
	Air Temperature		49°F		65°F+	60°F	64°F	55°F	72°F	72°F
	Water Temperature		48°F	54°F	58°F	56°F	61°F	57°F	57°F	68°F
	Water Depth	12"-24"	[illegible]	36"	36"+	36"+	36"+	36"+	36"+	12"-36"+
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.			2nd Zimm						
Linderiella occidentalis	linderiella	1,000's	1,000's	1,000's	mature	✓ 100's+	Few 100's	Few <100's	Few <100's	—
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches									
Mollusca	snails						Ramshorn	Ramshorn	Ramshorn	Ramshorn
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca	clam shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Copepoda	copepods	✓	✓	✓	✓	✓	✓			
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Arachnida	mites							✓		
Anisoptera	dragon flies									✓
Belostomatidae	giant water bug									
Corixidae	water boatmen	✓	✓	✓	✓		✓	✓	✓	✓
Culicidae	mosquitoes									
Diptera	midges	✓	✓		✓			✓	✓	✓
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies	✓	✓		✓		✓		✓	✓
Gerridae	water striders									
Hydrophilidae	water scav. beetles	✓	✓		✓		✓	✓	✓	
Notonectidae	backswimmers							✓	✓	
Zygoptera	damsel flies							✓	✓	✓
Frogs	Hyla					Tads	Tads	tads	Tads	tads
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens: 1/19/05 Nauplius? 2/1/05 water fleas

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-11) FS-47
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:	12/16/04	1/6/05	1/21/05	2/2/05	2/21/05	3/7/05	3/17/05	3/31/05	4/19/05
Air Temperature				65°F	60°F	66°F	82°F	77°F	72°F
Water Temperature				56°F	58°F	69°F	60°F	65°F	70°F
Water Depth				36"+	36"+	36"+	36"+	36"+	36"+
Species Observed									
Branchinecta lynchi — vernal pool fairy sh.									
Linderiella occidentalis — linderiella	1,000's	1,000's		[illegible]					
Notostraca — tadpole shrimp									
Platyhelminthes — flatworms									
Erpobdellidae — leeches									✓
Mollusca — snails								✓ [illegible]	✓
Amphipoda — scuds									
Cladocera — water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca — clam shrimp									
Copepoda — copepods	✓	✓		✓	✓	✓	✓		
Decapoda — cray fish									
Ostracoda — seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Arachnida — mites									
Anisoptera — dragon flies	✓							Adults	
Belostomatidae — giant water bug									
Corixidae — water boatmen								✓	✓
Culicidae — mosquitoes	✓							✓	
Diptera — midges				✓					
Dytiscidae — pred. diving beetles									
Ephemeroptera — mayflies								✓	✓
Gerridae — water striders									
Hydrophilidae — water scav. beetles									
Notonectidae — backswimmers									
Zygoptera — damsel flies								✓	✓
Frogs						Bullfrog tadpole		Hylid tads	
Fish — Stickleback							✓		
Salamanders									
Water Fowl									
Other Species									

Voucher Specimens:

Notes: 1/6 connected to X-12 which is connected to DW-7 w/ B. lynchi

2/21 Flowing + Flooded from W. Drainage connected to X-12, DW-7, X-6 + W. Drainage

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo				Vernal Pool #: (X-12): FS-48			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.	Range: 12 E.		Section:		Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0			Photo Date(s):					
Land Use/Habitat: Grazing					Max Area:			Max Depth:		
	Survey Date:	12/15/04	1/6/05	1/21/05	2/2/05	2/21/05	3/4/05	3/17/05	3/31/05	4/19/05
	Air Temperature				65°F+	60°F	62°F	62°F	72°F	72°F
	Water Temperature				56°F	56°F	62°F	60°F	60°F	70°F
	Water Depth	6"	24"+	24"+	36"	36"+	36"+	36"+	36"+	36"+
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella	<100's	1,000's	1,000's	1,000		Few	Ø	Ø	Ø
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches									
Mollusca	snails Ram's Horn	✓					✓	✓	✓	✓
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca	clam shrimp									
Copepoda	copepods				✓	✓	✓	✓		
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	
Arachnida	mites								✓	
Anisoptera	dragon flies									
Belostomatidae	giant water bug									
Corixidae	water boatmen							✓	✓	✓
Culicidae	mosquitoes								✓	
Diptera	midges								✓	
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies									
Gerridae	water striders									
Hydrophilidae	water scav. beetles									
Notonectidae	backswimmers									
Zygoptera	damsel flies							✓	✓	✓
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 1/6 Rec. Flow from X-11 + DW-7 w/ B. lynchi 2/21 - Flowing and Flooded from W. Drainage - one large connected area w/ X-11, DW-7, X-6 + w-drainge
1/21 Still Flowing down from X-11 DW-7

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (X-13) PS-49
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/15/04	1/3/05	1/19/05	2/2/05	2/21/05	3/7/05				
	Air Temperature					60°F	66°F				
	Water Temperature		60°F			58°F	62°F				
	Water Depth		48"+	48"+		48"+	48"+				
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.				✓ 1 ♀						
Linderiella occidentalis	linderiella	1,000's	1,000's	Fewer	mature ♂	Few	∅				
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches						✓				
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓	✓	✓	✓				
Conchostraca	clam shrimp		✓								
Copepoda	copepods	✓	✓		✓	✓	✓				
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓				
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓		✓			✓				
Culicidae	mosquitoes		✓	✓							
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies	✓		✓							
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓		✓							
Notonectidae	backswimmers										
Zygoptera	damsel flies	✓									
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: ∅

Notes: 2/2/05 - 1 ♀ B. lynchi - Not Collected

3/7/05 - Voucher Complete w/ OBS.

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-14) FS-50
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/16/05	1/6/05 1/3/05	1/21/05	2/2/05	2/21/05	3/4/05	3/17/05	3/31/05	4/19/05	
	Air Temperature					60°F	62°F	62°F		72°F	
	Water Temperature					56°F	62°F	60°F	62°F	68°F	
	Water Depth	6"-3'				12"-48"+	12"-48"+	48"+	48"+	48"+	
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella	1,000's 1000's	✓	✓	Few mature			⊖	⊖	⊖	
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches								✓	✓	
Mollusca	snails	✓					✓	✓	✓		
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Conchostraca	clam shrimp	✓	✓	✓	✓	✓	✓			✓	
Copepoda	copepods	✓	✓	✓	✓	✓	✓	✓			
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓		
Arachnida	mites										
Anisoptera	dragon flies								✓		
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓	✓	✓			✓	✓	✓	✓	
Culicidae	mosquitoes								✓		
Diptera	midges								✓	✓	
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓	✓	✓	✓	✓	✓	✓	✓		
Notonectidae	backswimmers										
Zygoptera	damsel flies								✓	✓	
Frogs	Hyla						Tads	Eggs	✓ other		
Fish	Carp							Carp Fry?	Stickleback	✓	
Salamanders											
Water Fowl	Ducks - LB Dowitcher							✓	Egrets, LB Dow Peeps	✓	
Other Species											

Voucher Specimens:

Notes: connected to X-16 as of 1/3 + ponded to X-11 then flows to w. drainage offsite

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2/21 - connected to X-16 + flowing out to W. Drainage
3/4 - connected to X-16 flowing down to W. Drainage

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-15) FS-51
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

		Survey Date: 12/15/04	1/3/05	2/2/05
	Air Temperature			65°F
	Water Temperature		54°F	62°
	Water Depth	6"-10"		12"
Species Observed				
Branchinecta lynchi	vernal pool fairy sh.	? 1mm	1,000's 1mm	? 100s
Linderiella occidentalis	linderiella	? 1mm		1000's
Notostraca	tadpole shrimp			
Platyhelminthes	flatworms			
Erpobdellidae	leeches			
Mollusca	snails			
Amphipoda	scuds			
Cladocera	water fleas		✓	✓
Conchostraca	clam shrimp			
Copepoda	copepods			
Decapoda	cray fish			
Ostracoda	seed shrimp	✓	✓	✓
Arachnida	mites			
Anisoptera	dragon flies			
Belostomatidae	giant water bug			
Corixidae	water boatmen			
Culicidae	mosquitoes			
Diptera	midges			
Dytiscidae	pred. diving beetles			
Ephemeroptera	mayflies			
Gerridae	water striders			
Hydrophilidae	water scav. beetles			
Notonectidae	backswimmers			
Zygoptera	damsel flies			
Frogs				
Fish				
Salamanders				
Water Fowl				
Other Species				

Voucher Specimens: 1/3/05 5-♀ 607 2/2/05 B. lynchi 3♀ 607

Notes: B. lynchi

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (X-16) FS-52
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:
Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff	Permit #: TE090849-0	Photo Date(s):	
Land Use/Habitat: Grazing		Max Area:	Max Depth:

		Survey Date:	12/16/04	1/3/05	1/21/05	2/2/05	2/21/05	3/4/05	3/17/05	3/31/05	4/19/05
		Air Temperature					60°F	62°F	62°F	78°F	72°F
		Water Temperature					58°F	62°F	60°F	68°F	68°F
		Water Depth	6"-3'+				>36"	>36"	>36"	>36"	>36"
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella		1,000's		1,000's	1,000's	Fewer	0			
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails									✓	
Amphipoda	scuds										
Cladocera	water fleas		✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca	clam shrimp		✓			✓	✓	✓		✓	✓
Copepoda	copepods		✓	✓	✓	✓	✓	✓			
Decapoda	cray fish										
Ostracoda	seed shrimp		✓	✓	✓	✓	✓	✓	✓	✓	✓
Arachnida	mites										
Anisoptera	dragon flies									Adults	
Belostomatidae	giant water bug										
Corixidae	water boatmen				✓	✓	✓	✓	✓	✓	✓
Culicidae	mosquitoes										
Diptera	midges									✓	
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles				✓					✓	
Notonectidae	backswimmers								✓	✓	✓
Zygoptera	damsel flies								✓	✓	✓
Frogs	Bull Frog							Adult	Hylu	Bull Frogs	Hylu-Bullfrog
Fish									carp	Carp	✓
Salamanders											
Water Fowl	DUCKS					✓		✓	✓	✓	✓
Other Species											

Voucher Specimens:

Notes: Rcv. Flow from FS-22 sheet flow down berm connected to X-14 2/4 - Flooding from FS-22 + connected to X-14

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-17) FS-53
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/15/04	1/11/05	1/21/05							
	Air Temperature										
	Water Temperature										
	Water Depth	2"-18"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	?		100's mature							
Linderiella occidentalis	linderiella	?									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas		✓								
Conchostraca	clam shrimp										
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp	✓									
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓									
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/21/05 B lynchi 5♀ 4♂

Notes: Big Ponded Area 12/15 Early stages of Anostr.

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-18 Res 7) FS-54
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:	12/15/04	1/11/05	1/21/05	2/2/05	2/21/05	3/7/05	3/17/05	3/31/05	4/19/05
Air Temperature				65°F	60°F	66°F	62°F	78°F	72°F
Water Temperature				55°F	56°F	62°F	60°F	67°F	68°F
Water Depth	12"-18"	48"+	48"+	48"+	48"+	48"+	48"+	48"+	48"+
Species Observed									
Branchinecta lynchi — vernal pool fairy sh.									
Linderiella occidentalis — linderiella									
Notostraca — tadpole shrimp									
Platyhelminthes — flatworms									
Erpobdellidae — leeches									
Mollusca — snails									
Amphipoda — scuds									
Cladocera — water fleas	✓	✓	✓	✓			✓	✓	✓
Conchostraca — clam shrimp									
Copepoda — copepods	✓	✓	✓						
Decapoda — cray fish									
Ostracoda — seed shrimp	✓	✓	✓		✓	✓			
Arachnida — mites									
Anisoptera — dragon flies							✓	✓	✓
Belostomatidae — giant water bug									
Corixidae — water boatmen	✓	✓	✓	✓	✓	✓	✓	✓	✓
Culicidae — mosquitoes	✓	✓							
Diptera — midges				✓					
Dytiscidae — pred. diving beetles									
Ephemeroptera — mayflies	✓		✓	✓	✓	✓	✓		
Gerridae — water striders									
Hydrophilidae — water scav. beetles			✓						
Notonectidae — backswimmers	✓								
Zygoptera — damsel flies	✓			✓	✓		✓	✓	✓
Frogs — Hyla				Adult				Bullfrog Adults	Bullfrog Hyla
Fish									
Salamanders									
Water Fowl									
Other Species									

Voucher Specimens:

Notes: Very Deep as of 1/11 survey

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-19) FS-55
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:		12/16/05	1/11/05	1/21/05							
Air Temperature											
Water Temperature											
Water Depth											
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.			Few							
Linderiella occidentalis	linderiella	1,000's	1,000's	✓	✓						
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails	✓									
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓							
Conchostraca	clam shrimp	✓	✓	✓							
Copepoda	copepods	✓	✓	✓							
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓							
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓		✓							
Notonectidae	backswimmers										
Zygoptera	damsel flies	✓									
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/21/05 10 collected too few Others B lynchi

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-20) PS-56
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/16/04	1/11/05	1/21/05	2/2/05	2/21/05	3/4/05	3/17/05	3/31/05	4/19/05
	Air Temperature				65°F+	60°F	62°F	62°F	78°F	72°F
	Water Temperature				56°F	58°F	59°F	58°F	62°F	60°F
	Water Depth	12"-36"			12"-48"	12"-48"	12"-48"	12"-36"	12"-36"	8"-24"
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella	1,000's mature	✓	✓	100's ✓	✓ 100's+	100's	100's	Fran	✓
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches									
Mollusca	snails									✓ Ramshorn
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca	clam shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Copepoda	copepods	✓	✓	✓	✓	✓	✓	✓	✓	
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Arachnida	mites									
Anisoptera	dragon flies									✓
Belostomatidae	giant water bug									
Corixidae	water boatmen									✓
Culicidae	mosquitoes									
Diptera	midges									
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies									
Gerridae	water striders									✓
Hydrophilidae	water scav. beetles	✓	✓	✓		✓	✓			✓
Notonectidae	backswimmers									
Zygoptera	damsel flies	✓				✓ large	✓	✓	✓	✓
Frogs	bullfrog				Tads+eggs	Tads	Tads	Tads	tads	tads w/ eggs
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo					Vernal Pool #: (X-2.1) FS-57			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.	Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0			Photo Date(s):						
Land Use/Habitat: Grazing					Max Area:			Max Depth:			
	Survey Date:	12/16/04	1/11/05	1/21/05							
	Air Temperature										
	Water Temperature										
	Water Depth	14"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella	1,000's mature									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓							
Conchostraca	clam shrimp	✓	✓	✓							
Copepoda	copepods	✓	✓	✓							
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓							
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles			✓							
Notonectidae	backswimmers										
Zygoptera	damsel flies	✓									
Frogs											
Fish											
Salamanders											
Water Fowl	yellow legs			✓							
Other Species											

Voucher Specimens: Ø

Notes: None obs. but connected to FS-24 2/2 none observed

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (X-23) BS-59
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 16' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:		12/16/04	1/11/05								
Air Temperature											
Water Temperature			54°F								
Water Depth		12"	36"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	? imm	1,000's								
Linderiella occidentalis	linderiella	? imm	1,000's								
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓								
Conchostraca	clam shrimp										
Copepoda	copepods	✓	✓								
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes		✓								
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/11/05 imm. B lynchi 1 07

Notes: NO mature found on follow up searches for vouchers

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-26 Res 3) FS-62
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/16/05	1/11/05	2/21/05							
	Air Temperature			60°F							
	Water Temperature			56°F							
	Water Depth	12"-18"		12"-18"							
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		1 ♀ 0.95								
Linderiella occidentalis	linderiella	1,000 x 1,000	Mature	Few							
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓		✓							
Conchostraca	clam shrimp										
Copepoda	copepods	✓		✓							
Decapoda	cray fish										
Ostracoda	seed shrimp	✓		✓							
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs	Hyla			Tads							
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/11 non collected; too few only ♀ ∅

Notes: 2/21 Non observed

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo					Vernal Pool #: (X-27) FS-63			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.	Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0			Photo Date(s):						
Land Use/Habitat: Grazing					Max Area:			Max Depth:			
	Survey Date:	12/16/04	1/11/05								
	Air Temperature										
	Water Temperature										
	Water Depth	12"-24"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		1005								
Linderiella occidentalis	linderiella	1,000 x 1,000	mature								
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓									
Conchostraca	clam shrimp	✓									
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp	✓									
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓									
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓									
Notonectidae	backswimmers										
Zygoptera	damsel flies	✓									
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/11/05 B. lynchi 1♂ 1♀ 3/4/05 B. lynchi 5♂ 5♀ John Davis

Notes: 1/11 Need Add'l Vouchers

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (X-28) FS-64
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:
Surveyor: David Wolff	Permit #: TE090849-0		Lat/Lon: 35N. 15' / 120W. 40'
Land Use/Habitat: Grazing		Photo Date(s):	
		Max Area:	Max Depth:

Survey Date:	12/17/04	1/11/05	1/21/05							
Air Temperature										
Water Temperature										
Water Depth	8"-30"									
Species Observed										
Branchinecta lynchi — vernal pool fairy sh.		1000's								
Linderiella occidentalis — linderiella	1,000's									
Notostraca — tadpole shrimp										
Platyhelminthes — flatworms										
Erpobdellidae — leeches	✓									
Mollusca — snails										
Amphipoda — scuds										
Cladocera — water fleas	✓									
Conchostraca — clam shrimp	✓									
Copepoda — copepods	✓									
Decapoda — cray fish										
Ostracoda — seed shrimp	✓									
Arachnida — mites										
Anisoptera — dragon flies										
Belostomatidae — giant water bug										
Corixidae — water boatmen										
Culicidae — mosquitoes										
Diptera — midges										
Dytiscidae — pred. diving beetles										
Ephemeroptera — mayflies										
Gerridae — water striders										
Hydrophilidae — water scav. beetles										
Notonectidae — backswimmers										
Zygoptera — damsel flies	1									
Frogs — Hyla	✓									
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens: 1/11/05 B. lynchi 4♀ 4♂

Notes: Separate out 28a mostly mosq. larvae small break willows; 28a smelly

None found 1/21/05

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-29) FS-65
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/17/04	1/11/05	1/21/05							
	Air Temperature										
	Water Temperature										
	Water Depth	6"-10"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	1 mm?	100's	✓							
Linderiella occidentalis	linderiella	1 mm?									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓									
Conchostraca	clam shrimp										
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp	✓									
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓									
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓									
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/11/05 B lynchi 6♀ 6♂

Notes: 1/21/05 confirmed presence in complex of connected small ponds

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (X-30) FS-66
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/17/05	1/11/05	1/21/05	2/1/05	2/21/05	3/4/05	3/17/05	3/31/05	4/19/05	
	Air Temperature					60°F	62°F	62°F	78°F	72°F	
	Water Temperature					58°F	61°F	62°F	68°F	64°F	
	Water Depth	8"				6"-24"	6"-29"+	6"-24"	6"-24"	6"-18"+	
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella	1MM?		1,000x1,000	Mature	1000'/few	Few	∅	∅	∅	
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches						✓	✓	✓		
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Conchostraca	clam shrimp				✓	✓	✓	✓	✓	✓	
Copepoda	copepods	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen			✓		✓	✓	✓	✓	✓	
Culicidae	mosquitoes							✓			
Diptera	midges									✓	
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies						✓		✓		
Gerridae	water striders										
Hydrophilidae	water scav. beetles					✓	✓	✓	✓	✓	
Notonectidae	backswimmers									✓	
Zygoptera	damsel flies										
Frogs	Hyla			✓		Tad w/ logs	Tads	tads	tads	tads	
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #(X-31) FS-67:
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

		Survey Date: 12/19/04	1/11/05	1/21/05
	Air Temperature			
	Water Temperature			
	Water Depth	6"	24"+	24"+
Species Observed				
Branchinecta lynchi	vernal pool fairy sh.		1 mature	1,000s mature
Linderiella occidentalis	linderiella	100's		1,000's
Notostraca	tadpole shrimp			
Platyhelminthes	flatworms			
Erpobdellidae	leeches			
Mollusca	snails			
Amphipoda	scuds			
Cladocera	water fleas	✓		✓
Conchostraca	clam shrimp			
Copepoda	copepods			
Decapoda	cray fish			
Ostracoda	seed shrimp	✓		✓
Arachnida	mites			
Anisoptera	dragon flies			
Belostomatidae	giant water bug			
Corixidae	water boatmen			
Culicidae	mosquitoes			
Diptera	midges	✓		
Dytiscidae	pred. diving beetles			
Ephemeroptera	mayflies			
Gerridae	water striders			
Hydrophilidae	water scav. beetles			
Notonectidae	backswimmers			
Zygoptera	damsel flies			
Frogs	Hyla		✓	
Fish				
Salamanders				
Water Fowl				
Other Species				

Voucher Specimens: 1/11 & 1/21/05 mature B. lynchi 5♀ 6♂
→ B. lynchi 6♀ 4♂

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm				County: San Luis Obispo				Vernal Pool #: (DW-1) FS-68			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.		Range: 12 E.		Section:		Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0				Photo Date(s):					
Land Use/Habitat: Grazing						Max Area:			Max Depth:		
	Survey Date:	12/14/04	1/3/05	1/19/05							
	Air Temperature			70°							
	Water Temperature		54°F								
	Water Depth	6"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.			L100							
Linderiella occidentalis	linderiella			1,000's	mature						
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas										
Conchostraca	clam shrimp										
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp		✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: Too Few Obs. NO collection Ø

Notes: 12/14/04 NO Ag life obs.

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-2) FS-69
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:		12/14/04	1/3/05								
Air Temperature											
Water Temperature			51°F								
Water Depth		8"	10"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		100's	mature							
Linderiella occidentalis	linderiella		1,000's	mature							
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas		✓								
Conchostraca	clam shrimp										
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp		✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/3/05 B. lynchi 5♀ 8♂

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-3) FS-70
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15'/ 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:	12/14/04	1/3/05	1/14/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature				56°F	72°F	60°F	68°F	76°F	72°F
Water Temperature		57°F	56°F	51°F	60°F	59°F	64°F	62°F	56°F
Water Depth	24"+	24"+	24"+	12"-36"	12"-36"	12"-36"	12"-24"	12"-24"+	12"-24"+
Species Observed									
Branchinecta lynchi / vernal pool fairy sh.									
Linderiella occidentalis / linderiella									
Notostraca / tadpole shrimp									
Platyhelminthes / flatworms									
Erpobdellidae / leeches	✓								
Mollusca / snails - Ram's horn	✓			✓	✓	✓	✓	✓	✓
Amphipoda / scuds									
Cladocera / water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca / clam shrimp									
Copepoda / copepods	✓		✓	✓			✓		
Decapoda / cray fish									
Ostracoda / seed shrimp	✓	✓	✓	✓	✓	✓	✓		✓
Arachnida / mites									
Anisoptera / dragon flies	✓					✓		✓	
Belostomatidae / giant water bug									
Corixidae / water boatmen	✓	✓	✓	✓	✓	✓	✓	✓	
Culicidae / mosquitoes									
Diptera / midges							✓		
Dytiscidae / pred. diving beetles									
Ephemeroptera / mayflies	✓	✓	✓	✓	✓			✓	✓
Gerridae / water striders									
Hydrophilidae / water scav. beetles	✓		✓	✓	✓	✓	✓	✓	✓
Notonectidae / backswimmers									
Zygoptera / damsel flies	✓	✓	✓					✓	
Frogs / Hyla							tads	Hyla	
Fish / Ictalurid						✓			
Salamanders									
Water Fowl								Sora	
Other Species									

Voucher Specimens:

Notes: 2/18/05 - Recent rains has outflow down swale

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo				Vernal Pool #: (DW-4) PS-71		
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.		Range: 12 E.		Section:		Lat/Lon: 35N. 15' / 120W. 40'		
Surveyor: David Wolff	Permit #: TE090849-0				Photo Date(s):				
Land Use/Habitat: Grazing					Max Area:			Max Depth:	
Survey Date:	12/14/04	1/3/05	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature			70+	64°F+	72°F	60°F	68°F	76°F	72°F
Water Temperature		56°F	56°F	50°F	68°F	58°F	66°F	63°F	54°F
Water Depth	12"-18"	12"-18"	12"-18"	12"-18"	12"-24"	12"-24"	10"-18"	18"	18"
Species Observed									
Branchinecta lynchi	vernal pool fairy sh.								
Linderiella occidentalis	linderiella		1,000's	1,000's	1,000's	100's	✓		✓
Notostraca	tadpole shrimp								
Platyhelminthes	flatworms								
Erpobdellidae	leeches			✓					
Mollusca	snails								
Amphipoda	scuds								
Cladocera	water fleas		✓	✓	✓	✓	✓	✓	✓
Conchostraca	clam shrimp			✓	✓	✓	✓	✓	✓
Copepoda	copepods								
Decapoda	cray fish								
Ostracoda	seed shrimp	✓	✓		✓	✓	✓	✓	✓
Arachnida	mites								
Anisoptera	dragon flies								
Belostomatidae	giant water bug								
Corixidae	water boatmen	✓		✓			✓	✓	
Culicidae	mosquitoes						✓		
Diptera	midges							✓	
Dytiscidae	pred. diving beetles							✓	
Ephemeroptera	mayflies								✓
Gerridae	water striders								
Hydrophilidae	water scav. beetles					✓	✓	✓	✓
Notonectidae	backswimmers							✓	
Zygoptera	damsel flies						✓	✓	✓
Frogs	Hyla						Tads	Tads	Tads
Fish									
Salamanders									
Water Fowl									
Other Species									

Voucher Specimens:

Notes: 2/1 - L.o. mature + breeding 2/14/05 same

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-5) FS-72
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

Survey Date:	12/14/05	1/3/05	1/14/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature				65°F	70°F	66°F	68°F	76°F	
Water Temperature		56°F		50°F	68°F	58°F	68°F	70°F	DRY
Water Depth	6"-10"			<6"	6"-10"	<4"	<5"	<3"	
Species Observed									
Branchinecta lynchi — vernal pool fairy sh.									
Linderiella occidentalis — linderiella									
Notostraca — tadpole shrimp									
Platyhelminthes — flatworms									
Erpobdellidae — leeches			✓	✓	✓	✓			
Mollusca — snails									
Amphipoda — scuds									
Cladocera — water fleas		✓	✓	✓	✓	✓	✓	✓	
Conchostraca — clam shrimp									
Copepoda — copepods	✓		✓	✓	✓	✓	✓		
Decapoda — cray fish									
Ostracoda — seed shrimp	✓	✓	✓					✓	
Arachnida — mites								✓	
Anisoptera — dragon flies								✓	
Belostomatidae — giant water bug									
Corixidae — water boatmen	✓						✓		
Culicidae — mosquitoes				✓					
Diptera — midges									
Dytiscidae — pred. diving beetles									
Ephemeroptera — mayflies								✓	
Gerridae — water striders									
Hydrophilidae — water scav. beetles	✓					✓	✓	✓	
Notonectidae — backswimmers									
Zygoptera — damsel flies					✓				
Frogs — Hyla				Tads	✓ tads				
Fish									
Salamanders									
Water Fowl									
Other Species									

Voucher Specimens:

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm				County: San Luis Obispo				Vernal Pool #: (DW-6) FS-73		
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.		Range: 12 E.		Section:		Lat/Lon: 35N. 15' / 120W. 40'		
Surveyor: David Wolff		Permit #: TE090849-0				Photo Date(s):				
Land Use/Habitat: grazing						Max Area:			Max Depth:	
Survey Date:		12/14/05	1/3/05	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05
Air Temperature				64°F	61°F	70°F	60°F	68°F	76°F	72°F
Water Temperature			56°	56°F	50°F	68°F	58°F	68°F	70°F	
Water Depth		6"		26"	26"	26"	28"	24"	23"	DRY
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella			100's	✓	✓	✓	✓	✓	
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches				✓	✓	✓			
Mollusca	snails									
Amphipoda	scuds									
Cladocera	water fleas		✓		✓	✓	✓	✓	✓	
Conchostraca	clam shrimp									
Copepoda	copepods	✓								
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	
Arachnida	mites									
Anisoptera	dragon flies									
Belostomatidae	giant water bug									
Corixidae	water boatmen	✓								
Culicidae	mosquitoes				✓		✓	✓	✓	
Diptera	midges							✓	✓	
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies								✓	
Gerridae	water striders									
Hydrophilidae	water scav. beetles					✓	✓	✓	✓	
Notonectidae	backswimmers						✓			
Zygoptera	damsel flies									
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 2/1 - Dry w/ veg growth 2/18 - flooded again from recent rain

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: DW-6a FS-74
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/14/04	1/3/05	1/19/05	2/1/05	2/18/05	3/5/05	3/21/05	4/1/05	4/14/05	
	Air Temperature			70°F+	65°F+	70°F	62°F	68°F	76°F	72°F	
	Water Temperature			64°F	53°F	68°F	62°F	68°F	70°F		
	Water Depth			12"	25"	16"	6"	2"-6"	2"-6"	DRY	
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella			100's	mature	✓		✓	✓		
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches			✓	✓	✓					
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas				✓	✓		✓	✓		
Conchostraca	clam shrimp										
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp			✓	✓	✓		✓	✓		
Arachnida	mites										
Anisoptera	dragon flies							✓	✓		
Belostomatidae	giant water bug										
Corixidae	water boatmen	✓						✓	✓		
Culicidae	mosquitoes					✓	✓	✓			
Diptera	midges				✓		✓	✓	✓		
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies								✓		
Gerridae	water striders										
Hydrophilidae	water scav. beetles			✓	✓	✓		✓	✓		
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs									Tadg Hylg		
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes: complex of puddles in center of race-track

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo					Vernal Pool #: (DW-7) FS-75			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.	Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0			Photo Date(s):						
Land Use/Habitat: Grazing					Max Area:			Max Depth:			
Survey Date:		12/15/05	1/6/05								
Air Temperature											
Water Temperature											
Water Depth		6"-24"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		Few								
Linderiella occidentalis	linderiella	1mm ?									
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓								
Conchostraca	clam shrimp										
Copepoda	copepods	✓	✓								
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/6/05 X-6 vouchers

Notes: connected to X-6 w/ individuals obs in DW-7. Flows to X-11 X-12

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (Dw-8) F8-76
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:
Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:
Max Depth:			

	Survey Date:	12/15/04	1/6/05	1/19/05							
	Air Temperature										
	Water Temperature										
	Water Depth	6"-10"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	1 mm?	1 mm?	100's							
Linderiella occidentalis	linderiella	1 mm?	1 mm?								
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas		✓	✓							
Conchostraca	clam shrimp										
Copepoda	copepods			✓							
Decapoda	cray fish										
Ostracoda	seed shrimp										
Arachnida	mites			✓							
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/19/05 B. lynchi 6♂ 6♀

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (DW-9) FS-77
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/17/04	1/11/05								
	Air Temperature										
	Water Temperature										
	Water Depth										
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	? immature	1,000's mature								
Linderiella occidentalis	linderiella	? immature	1,000's mature								
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓									
Conchostraca	clam shrimp										
Copepoda	copepods	✓									
Decapoda	cray fish										
Ostracoda	seed shrimp	✓									
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs	Hyla	✓									
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/11/05 B. lynchi 50 ♀ 1:07

Notes:

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo					Vernal Pool #: (DUS-10) FS-78			
USGS 7.5 min Quad: Pismo Beach		Township: 32 S.	Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'			
Surveyor: David Wolff		Permit #: TE090849-0			Photo Date(s):						
Land Use/Habitat: Grazing					Max Area:			Max Depth:			
	Survey Date:	1/3/05	1/19/05								
	Air Temperature	57	70								
	Water Temperature	51F	54F								
	Water Depth	12"	12"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		100's	mature							
Linderiella occidentalis	linderiella		100's	mature							
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas										
Conchostraca	clam shrimp										
Copepoda	copepods		✓								
Decapoda	cray fish										
Ostracoda	seed shrimp		✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/19/05 B. lynchi 4♂ 5♀

Notes: 1/3/05 First flooding of year Obs. NO Aquatic life

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (Dw-11) FS-79
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:		1/3/05	1/19/05								
Air Temperature			70°F								
Water Temperature		54°F									
Water Depth		18"	18"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		100's	mature							
Linderiella occidentalis	linderiella										
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas										
Conchostraca	clam shrimp										
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp		✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/19/05 B. lynchi 3♂ 5♀:

Notes: 1/3 recently ponded No ag. Life obs. 1/19 male Dominated overflow From FS-12; High ground Bfw.

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-12) FS-80
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat:			Max Area:	Max Depth:

Survey Date:	1/6/05	1/19/05	
Air Temperature			
Water Temperature	50°F		
Water Depth	6"-48"+		
Species Observed			
Branchinecta lynchi	vernal pool fairy sh.	100's immature	
Linderiella occidentalis	linderiella	1,000's immature	
Notostraca	tadpole shrimp		
Platyhelminthes	flatworms		
Erpobdellidae	leeches		
Mollusca	snails		
Amphipoda	scuds		
Cladocera	water fleas	✓✓	
Conchostraca	clam shrimp		
Copepoda	copepods		
Decapoda	cray fish		
Ostracoda	seed shrimp		
Arachnida	mites		
Anisoptera	dragon flies		
Belostomatidae	giant water bug		
Corixidae	water boatmen	✓	
Culicidae	mosquitoes		
Diptera	midges	✓	
Dytiscidae	pred. diving beetles		
Ephemeroptera	mayflies		
Gerridae	water striders		
Hydrophilidae	water scav. beetles		
Notonectidae	backswimmers		
Zygoptera	damsel flies		
Frogs			
Fish			
Salamanders			
Water Fowl			
Other Species			

Voucher Specimens: 1/6/05 B. lynchi 4 ♀ 4 ♂

Notes: 1/19 ♀ obs in westernmost area of complex demonstrating presence throughout

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (DW-13) FS-B1
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	1/6/05	1/19/05								
	Air Temperature	54°F									
	Water Temperature	49°F									
	Water Depth	12"									
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.		100's mature								
Linderiella occidentalis	linderiella		100's mature								
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas										
Conchostraca	clam shrimp										
Copepoda	copepods		✓								
Decapoda	cray fish										
Ostracoda	seed shrimp		✓								
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen		✓								
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies		✓								
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/19/05 B. lynchi 5♀ 5♂

Notes: 1/6 First Ponding Obs NO Ag life obs

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-14) FS-82
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	1/11/05	8/21/05								
	Air Temperature		60°F								
	Water Temperature		56°F								
	Water Depth		6-12"								
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.	1MM									
Linderiella occidentalis	linderiella										
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas										
Conchostraca	clam shrimp										
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp										
Arachnida	mites										
Anisoptera	dragon flies										
Belostomatidae	giant water bug										
Corixidae	water boatmen										
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies										
Gerridae	water striders										
Hydrophilidae	water scav. beetles										
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs											
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens: 1/11/05 B. lynchi 4♀ 3♂

Notes: 1/11 - First obs. of ponding 2/21 - NO Aq. life obs

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm			County: San Luis Obispo					Vernal Pool #: (Dw-15) FS-03		
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.		Range: 12 E.		Section:			Lat/Lon: 35N. 15' / 120W. 40'		
Surveyor: David Wolff	Permit #: TE090849-0				Photo Date(s):					
Land Use/Habitat: Grazing					Max Area:			Max Depth:		
Survey Date:	1/2/05	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/15/05		
Air Temperature	50°F							72°F		
Water Temperature	58°F									
Water Depth	13"	6"	DRY	DRY	DRY	DRY	DRY	DRY		
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella									
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches									
Mollusca	snails									
Amphipoda	scuds									
Cladocera	water fleas									
Conchostraca	clam shrimp									
Copepoda	copepods									
Decapoda	cray fish									
Ostracoda	seed shrimp									
Arachnida	mites									
Anisoptera	dragon flies									
Belostomatidae	giant water bug									
Corixidae	water boatmen									
Culicidae	mosquitoes									
Diptera	midges									
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies									
Gerridae	water striders									
Hydrophilidae	water scav. beetles									
Notonectidae	backswimmers									
Zygoptera	damsel flies									
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 1/19 drying fast no Aq. life obs

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U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo		Vernal Pool #: (DW-16) PS-84
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):	
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	1/2/05	1/19/05	2/1/05	2/18/05	3/3/05	3/21/05	4/1/05	4/14/05		
	Air Temperature	~~[illegible]~~	70+	65°F+	70°F	62°F	68°F	78°F	72°F		
	Water Temperature	54°F	56°F	51°F	63°F	62°F	64°F	70°F	56°F		
	Water Depth	48"	48"	48"	12"-36"	12"-36"	12"-36"	36"+	24"+		
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella		1,000's	✓	✓ 100's	∅	∅	∅	∅		
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas			✓	✓	✓	✓	✓	✓		
Conchostraca	clam shrimp			✓	~~[illegible]~~	✓					
Copepoda	copepods										
Decapoda	cray fish										
Ostracoda	seed shrimp		✓	✓	✓	✓	✓	✓	✓		
Arachnida	mites										
Anisoptera	dragon flies						Adult				
Belostomatidae	giant water bug										
Corixidae	water boatmen					✓	✓	✓	✓		
Culicidae	mosquitoes					✓					
Diptera	midges						✓		✓		
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies						✓	✓	✓		
Gerridae	water striders										
Hydrophilidae	water scav. beetles		✓	✓	✓	✓	✓	✓	✓		
Notonectidae	backswimmers						✓	✓	✓		
Zygoptera	damsel flies							✓			
Frogs	Hyla					Tads	tads	tads	tads		
Fish											
Salamanders											
Water Fowl							MADU				
Other Species											

Voucher Specimens:

Notes: 1/2/05 - New ponding in depression; no sq life obs. 2/1 Lindo. Not dense mature breeding.

David Wolff Environmental
www.dkwenvironmental.com

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-17) FS-85
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:	Lat/Lon: 35N. 15' / 120W. 40'
Surveyor: David Wolff	Permit #: TE090849-0		Photo Date(s):
Land Use/Habitat: Grazing			Max Area:	Max Depth:

	Survey Date:	12/16/04	1/6/05	1/21/05	2/2/05	2/21/05	3/7/05	3/17/05	3/31/05	4/14/05
	Air Temperature				65°F	60°F	66°F	62°F	72°F	72°F
	Water Temperature				56°F	56°F	68°F	60°F	60°F	68°F
	Water Depth	24"	30"	30"	30"	30"	30"	24"	18"	18"
Species Observed										
Branchinecta lynchi	vernal pool fairy sh.									
Linderiella occidentalis	linderiella									
Notostraca	tadpole shrimp									
Platyhelminthes	flatworms									
Erpobdellidae	leeches									
Mollusca	snails									
Amphipoda	scuds									
Cladocera	water fleas	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conchostraca	clam shrimp									
Copepoda	copepods	✓	✓	✓	✓	✓	✓	✓	✓	✓
Decapoda	cray fish									
Ostracoda	seed shrimp	✓	✓	✓	✓	✓	✓	✓	✓	✓
Arachnida	mites									
Anisoptera	dragon flies									
Belostomatidae	giant water bug									
Corixidae	water boatmen	✓	✓		✓	✓				
Culicidae	mosquitoes									
Diptera	midges			✓		✓		✓		
Dytiscidae	pred. diving beetles									
Ephemeroptera	mayflies									
Gerridae	water striders									
Hydrophilidae	water scav. beetles		✓	✓		✓				
Notonectidae	backswimmers									
Zygoptera	damsel flies									
Frogs										
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes:

David Wolff Environmental
www.dkwenvironmental.com

U.S. Fish and Wildlife Service Vernal Pool Branchiopod Wet Season Survey Data Sheet

Survey Site/Name: Unocal San Luis Obispo Tank Farm		County: San Luis Obispo	Vernal Pool #: (DW-18) FS-86
USGS 7.5 min Quad: Pismo Beach	Township: 32 S.	Range: 12 E.	Section:
Surveyor: David Wolff	Permit #: TE090849-0		Lat/Lon: 35N. 15' / 120W. 40'
Land Use/Habitat:			Photo Date(s):
			Max Area: / Max Depth:

Survey Date:		3/4/05	3/17/05	3/31/05	4/19/05						
Air Temperature			65°F	78°F	70°F						
Water Temperature		67°F	62°F	64°F	78°F						
Water Depth		8"-12"	8"-12"	8"	<6"						
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella	<100's	<100's	✓	✓						
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches										
Mollusca	snails										
Amphipoda	scuds										
Cladocera	water fleas	✓	✓	✓	✓						
Conchostraca	clam shrimp			✓	✓						
Copepoda	copepods	✓	✓	✓							
Decapoda	cray fish										
Ostracoda	seed shrimp	✓	✓	✓	✓						
Arachnida	mites										
Anisoptera	dragon flies				✓						
Belostomatidae	giant water bug										
Corixidae	water boatmen		✓		✓						
Culicidae	mosquitoes										
Diptera	midges										
Dytiscidae	pred. diving beetles										
Ephemeroptera	mayflies	✓									
Gerridae	water striders										
Hydrophilidae	water scav. beetles	✓			✓						
Notonectidae	backswimmers										
Zygoptera	damsel flies										
Frogs	Hyla	tads	tads								
Fish											
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes:

David Wolff Environmental
www.dkwenvironmental.com

Appendix B

2005 Dry Season Survey Approval & Data Forms

David Wolff Environmental

From: Julie_Vanderwier@fws.gov
Sent: Thursday, September 01, 2005 1:43 PM
To: david@dkwenvironmental.com
Subject: Fw: dry season sampling -- unocal slo tank farm

when you send in your reports for this, reference PAS 1772.2138.4131. thx.

Julie M. Vanderwier, Fish & Wildlife Biologist U.S. Fish & Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003
Phone: 805-644-1766 extension 222
Facsimile: 805-644-3958
julie_vanderwier@fws.gov
e ola ke kai, e ola kakou -- as the ocean thrives, so do we

----- Forwarded by Julie Vanderwier/VFWO/R1/FWS/DOI on 09/01/2005 01:37 PM -----

Julie Vanderwier
09/01/2005 12:03 PM

To: <david@dkwenvironmental.com>
cc: Steve_Henry@r1.fws.gov
Subject: RE: dry season sampling -- unocal slo tank farm(Document link: Julie Vanderwier)

david. i apologize for being so tardy with this. debbie martin (te-795931) is on the service's region 1 list of individuals authorized to identify branchiopod cysts. as such, your original request and approval have been amended by this email to indicate that she will be the party responsible for cyst identification in completion of dry season sampling at the unocal slo tank farm site.

Julie M. Vanderwier, Fish & Wildlife Biologist U.S. Fish & Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003
Phone: 805-644-1766 extension 222
Facsimile: 805-644-3958
julie_vanderwier@fws.gov
e ola ke kai, e ola kakou -- as the ocean thrives, so do we

"David Wolff Environmental" <david@dkwenvironmental.com>
09/01/2005 09:09 AM
Please respond to david

To: <Julie_Vanderwier@fws.gov>
cc: <Steve_Henry@r1.fws.gov>
Subject: RE: dry season sampling -- unocal slo tank farm

1

Julie,

I have not heard back from you on my August 11, 2005 e-mail request regarding approval of Debbie Martin, Biota, (permit #TE795931-3) for processing the soils for my Unocal SLOTF fairy shrimp dry season approval request. I intended to use her lab but neglected to add her to my original request. Can you respond to this e-mail with approval? Thank you very much for your continued assistance on this survey.

David Wolff Environmental
David K. Wolff, Principal Ecologist
P.O. Box 6552
Los Osos, CA 93412
(805) 235-5223
(805) 528-3504 FAX
david@DKWEnvironmental.com
www.dkwenvironmental.com

-----Original Message-----
From: Julie_Vanderwier@fws.gov [mailto:Julie_Vanderwier@fws.gov]
Sent: Thursday, August 04, 2005 2:17 PM
To: david@dkwenvironmental.com
Cc: Steve_Henry@r1.fws.gov
Subject: dry season sampling -- unocal slo tank farm
Importance: High

the ventura fish & wildlife office is in receipt of your facsimile request dated 29 july 2005 to conduct final dry season sampling for listed vernal pool branchiopods at the unocal san luis obispo tank farm site, san luis obispo, california as part of the 90-day summary report for wet season surveys conducted at this same location. this e-mail transmission authorizes you to complete your dry season sampling for listed vernal pool branchiopods as required to complete protocol surveys at this site. it is noted that the final surveys will be conducted in accordance with the interim survey guidelines for listed fairy shrimp (service 1996). if you have any questions, feel free to call me. we look forward to receiving the results of the unocal surveys.

Julie M. Vanderwier, Fish & Wildlife Biologist U.S. Fish & Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003
Phone: 805.644.1766 extension 222
Facsimile: 805.644.3958
julie_vanderwier@fws.gov
e ola ke kai, e ola kakou - as the ocean thrives, so do we

David Wolff Environmental

From: Julie_Vanderwier@fws.gov
Sent: Thursday, August 04, 2005 2:17 PM
To: david@dkwenvironmental.com
Cc: Steve_Henry@r1.fws.gov
Subject: dry season sampling – unocal slo tank farm

Importance: High

the ventura fish & wildlife office is in receipt of your facsimile request dated 29 july 2005 to conduct final dry season sampling for listed vernal pool branchiopods at the unocal san luis obispo tank farm site, san luis obispo, california as part of the 90-day summary report for wet season surveys conducted at this same location. this e-mail transmission authorizes you to complete your dry season sampling for listed vernal pool branchiopods as required to complete protocol surveys at this site. it is noted that the final surveys will be conducted in accordance with the interim survey guidelines for listed fairy shrimp (service 1996). if you have any questions, feel free to call me. we look forward to receiving the results of the unocal surveys.

Julie M. Vanderwier, Fish & Wildlife Biologist U.S. Fish & Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003
Phone: 805.644.1766 extension 222
Facsimile: 805.644.3958
julie_vanderwier@fws.gov
e ola ke kai, e ola kakou – as the ocean thrives, so do we

1

David Wolff Environmental
P.O. 6552, Los Osos, CA 93412
(805) 235-5223
(805) 528-3504 FAX

July 29, 2005

Ms. Diane Noda, Field Supervisor
USFWS Ventura Field Office
2493 Portola Road, Suite B
Ventura, CA 93003

SUBJECT: 90-DAY SUMMARY REPORT FOR THE VERNAL POOL BRANCHIOPOD WET SEASON SURVEY AND FINAL DRY SEASON SURVEY REQUEST FOR THE UNOCAL SAN LUIS OBISPO TANK FARM SITE, SAN LUIS OBISPO, CALIFORNIA

Dear Ms. Noda:

On behalf of Unocal Corporation and Rincon Consultants, David Wolff Environmental (DWE) is pleased to submit this vernal pool branchiopod wet season survey 90-day summary report in accordance with terms and conditions of my Recovery Permit TE-090849-0. As a result of two dry season survey efforts and one wet season survey, there remain approximately 10 locations that require dry season soil collection and analysis to complete the protocol. I would like to request approval to complete the dry season survey protocol as detailed in the currently accepted April 19, 1996 Interim Survey Guidelines (survey guidelines) to determine presence or absence of listed fairy shrimp in these remaining seasonally ponded areas. Julie Vanderwier of your staff has indicated to me that this summary report would satisfy the 90-day reporting requirements for the 2005 wet season survey with a detailed and complete report, data sheets, and required exhibits documenting the methods and results from both the wet and dry season surveys to follow the completion of the final dry season soil collection and analysis. I anticipate all work to be completed in August 2005.

1.0 INTRODUCTION & PURPOSE

The fairy shrimp wet season survey was conducted in 54 ponded features on the Unocal San Luis Obispo Tank Farm property on the north and south sides of Tank Farm Road (Figure 1). The purpose of the study was to complete the wet season survey protocol as detailed in the currently accepted survey guidelines to determine presence or absence of listed fairy shrimp in the wetland habitats on site. The wet season fairy shrimp survey request was submitted by DWE on November 17, 2004 and authorized by Steve Kirkland of your office via e-mail on December 13, 2004.

2.0 METHODS

David Wolff, DWE Principal Ecologist, conducted the wet season survey protocol under Recovery Permit TE-090849-0 from December 14, 2004 to April 19, 2005. Assisting with the survey under direct on-site supervision of David Wolff were Rincon Consultants biologists Kevin Merk and John Davis. Surveys were conducted by wading through the ponded features with pool skimmer nets that cover approximately one square foot of area. These nets are ideal for providing good coverage sweeping through the water column and allowing for readily observing aquatic life in the net. Aquatic life observed was identified to the extent necessary to distinguish and record the major groups of aquatic life present for inclusion on the data sheet.

3.0 Results

The following summarizes the observations of the vernal pool fairy shrimp (*Branchinecta lynchi*) from the 2003 and 2004 dry season surveys and the 2005 wet season survey conducted for the Unocal San Luis Obispo Tank Farm site:

- 29 pools from dry season surveys in 2003 and 2004. This includes two extensions of the mapped extent of ponded habitat.
- 16 pools from the 2005 wet season survey where dry season surveys were negative.
- 8 of 16 pools surveyed during the 2005 wet season that had not been sampled in the dry season.

Voucher specimens were collected from 25 pools where there were sufficient numbers of captured individuals to make a collection. These specimens are preserved and will be accessioned in accordance with the survey guidelines. As discussed above, there remain approximately 10 locations for soil collection and analysis to complete the wet and dry season survey protocol for the Unocal San Luis Obispo Tank Farm site.

§§§§§

Thank you for your continued assistance, and that of your staff, in reviewing and approving these important vernal pool branchiopod surveys in the San Luis Obispo region. Please call me directly if you have any questions or need any additional information so I can ensure permit compliance and keep my permit in good standing.

Very truly yours,

David K. Wolff
Principal Ecologist
Certified Professional Wetland Scientist

Attachment: Figure 1 – Location Map

C: Rick Rittenberg, Unocal
Kevin Merk, Rincon Consultants.
Julie Vanderweir, USFWS

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8 / 5 / 05 Time: 3:26 PM County: San Luis Obispo Quad: _____

Collector(s): David Wolff Permit #: TE090849-0

Site/Project Name: Unocal San Luis Obispo Tank Farm Pool #: (DW-3) FS-70

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

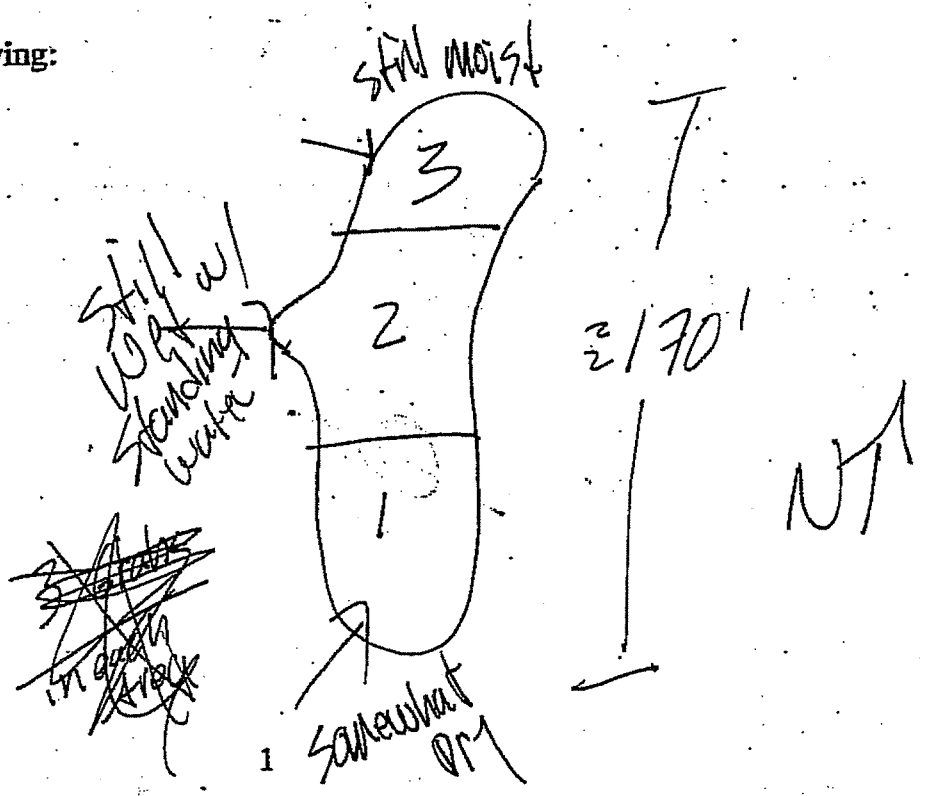
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed (grazed:) (cattle) horses sheep other _____
  (light) moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay soils

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



(USF&WS rev.4/96)

FS-70

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
		Lindenella occidentalis		
		CYZICUS californicus (clam shrimp)		

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #
	Ø		

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8 / 5 / 05 Time: 2:55 County: San Luis Obispo Quad: _____

Collector(s): David WOLFF Permit #: TE090849D

Site/Project Name: Unocal San Luis Obispo Tank Farm Pool #: (DW-4) FS-7

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

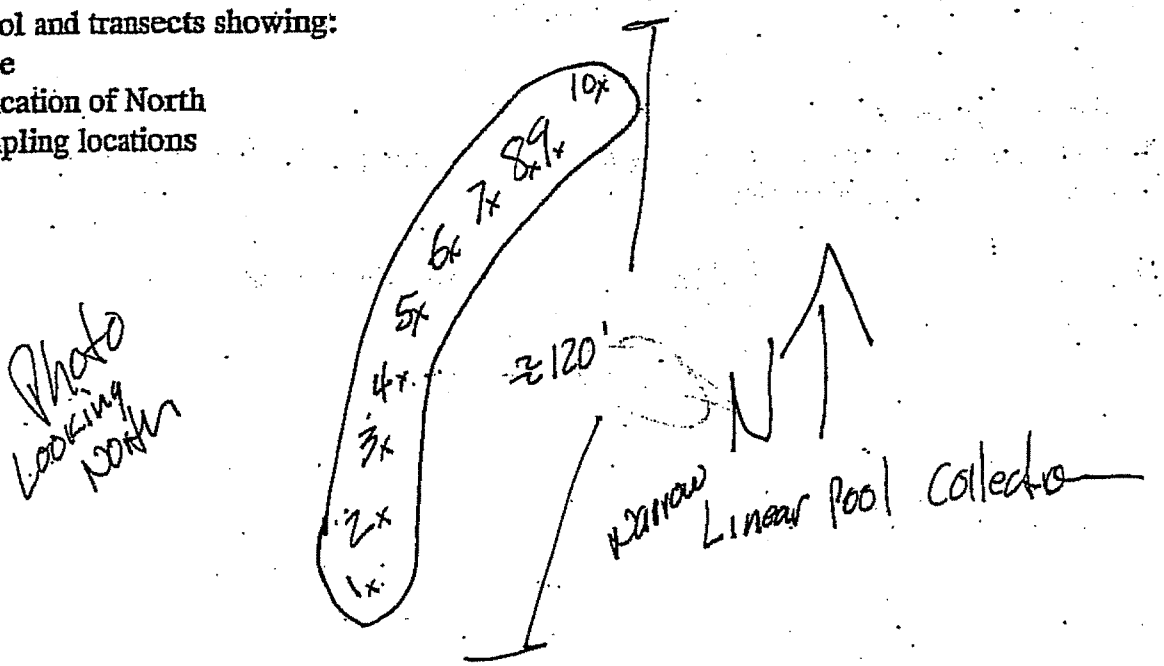
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other _____
  light moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



(USF&WS rev.4/96)

FS-71

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
		Linderiella occidentalis		
		Cyzicus californicus (Clam shrimp)		

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ___✓___ yes

Required color slides and/or photographs for the project site are included: _____ no ___✓___ yes

Date: 8/15/05 Time: 2:30PM County: _____ Quad: _____

Collector(s): David Wolff Permit #: TE090849-0

Site/Project Name: Unocal San Luis Obispo Tank Farm Pool #: (DW-5) FS-72

Township: _____ Range: _____ Section: _____ _____lat. _____ long.

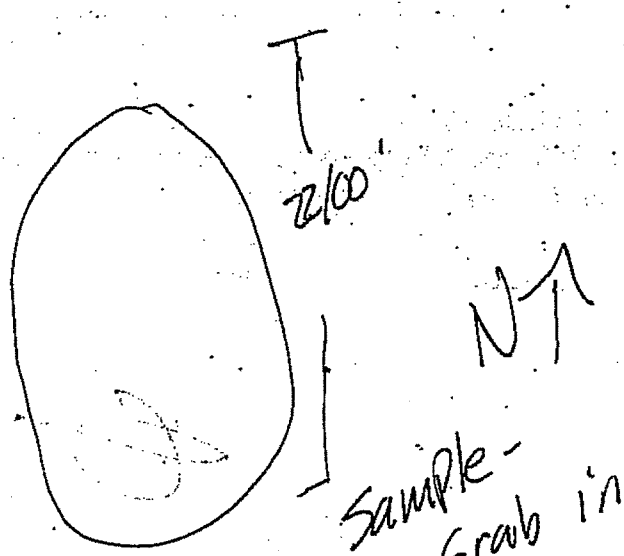
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed (grazed) (cattle) horses sheep other_____
  (light) moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay soil w/surface Tar

Pool Depth: _____cm (estimated maximum) Surface Area: _____m² (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



(USF&WS rev.4/96)

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

FS-72

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
		Cyzicus californicus (clam shrimp)		

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8 / 5 / 05 Time: 2:40 PM County: San Luis Obispo Quad: _____

Collector(s): David Woiff Permit #: TE090849-0

Site/Project Name: Unocal / San Luis Obispo Tank Farm Pool #: (DW-6) FS-73

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

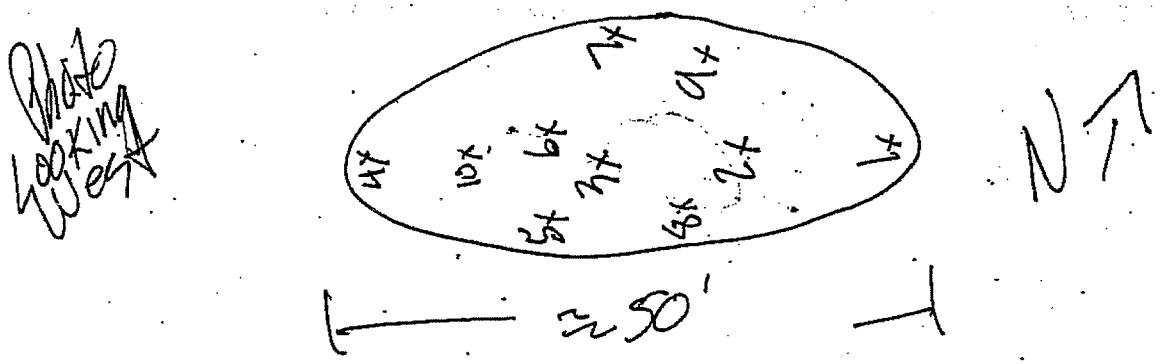
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed (grazed:) (cattle) horses sheep other _____
  (light) moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay Some surface Tar

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



1

(USF&WS rev.4/96)

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

F3-73

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
		Cyzicus californicus (clam shrimp)		

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8/5/05 Time: 12:41 County: San Luis Obispo Quad: _____

Collector(s): David WOLFF Permit #: TE090849-0

Site/Project Name: Unocal SLO Tank Farm Pool #: DW-6a FS-74

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

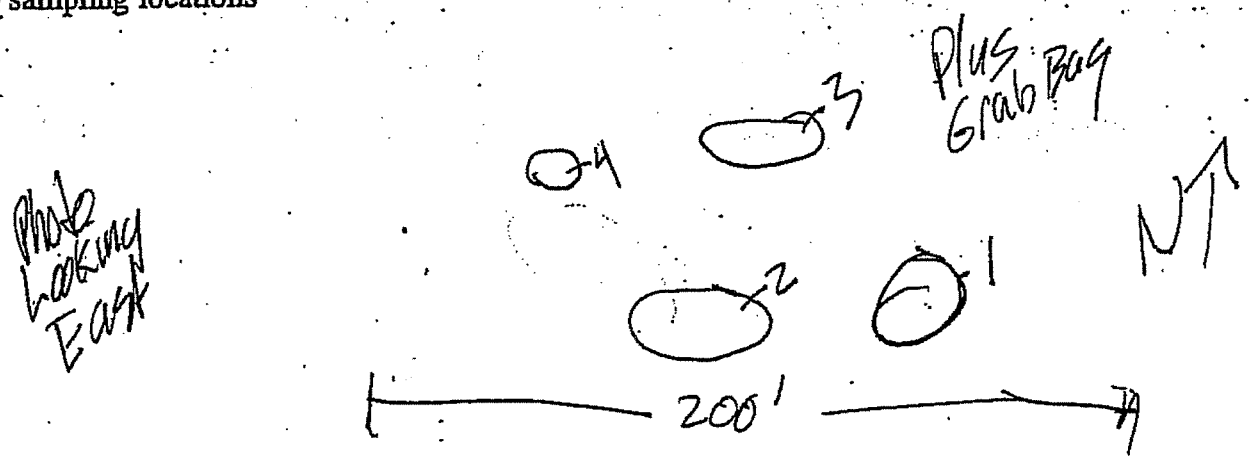
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other _____
  light moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay Soil

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



6a Complex of Shallow Pools in "Race Track"

(USF&WS rev.4/95)

1

FS-74

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8/5/05 Time: 11:56 County: San Luis Obispo Quad: _____

Collector(s): David Wolff Permit #: TE090849-0

Site/Project Name: Unocal SLO Tank Farm Pool #: (DW-15) FS-83

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

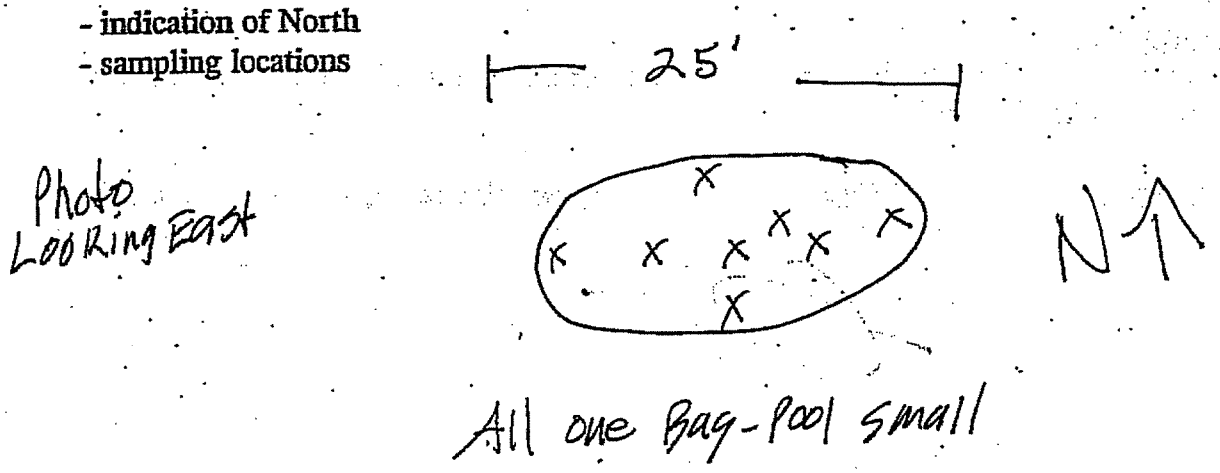
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other _____
  light moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Red Rock/Chert Loam

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



All one Bag - Pool small

(USF&WS rev.4/96)

FS-83

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

(USF&WS rev.4/96)

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8/5/05 Time: 11:15 Am County: San Luis Obispo Quad: San Luis Obispo / Pismo

Collector(s): David Wolff Permit #: TE090849-0

Site/Project Name: Unocal San Luis Obispo Tank Farm Pool #: DW-16 FS-84

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

Habitat Condition: (circle where appropriate)

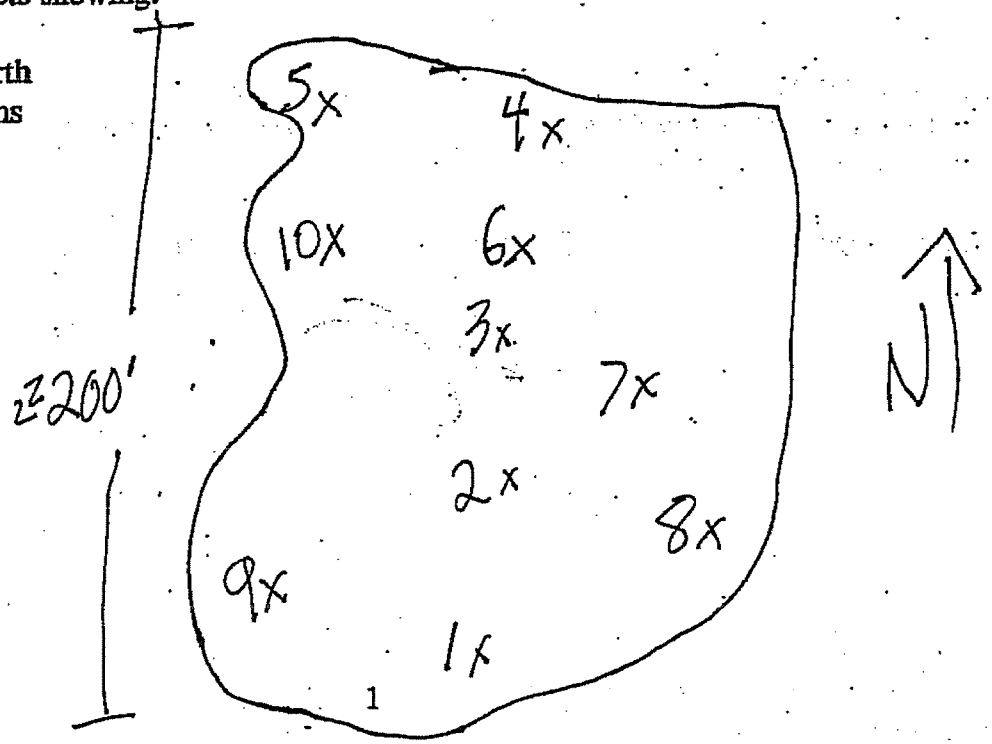
- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other _____
  light moderate heavy
- land use of habitat: Grazing Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly rocky lava flow other Red Rock / Chert / Loam

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations

Photo Looking North



(USF&WS rev.4/96)

FS-84

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
		CYZICUS californicus (Clam shrimp)		

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8/5/05 Time: 4:30pm County: San Luis Obispo Quad: _____

Collector(s): David Wolff Permit #: TE090849-0

Site/Project Name: Unocal San Luis Obispo Tank Farm Pool #: (DW-17) PS85

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

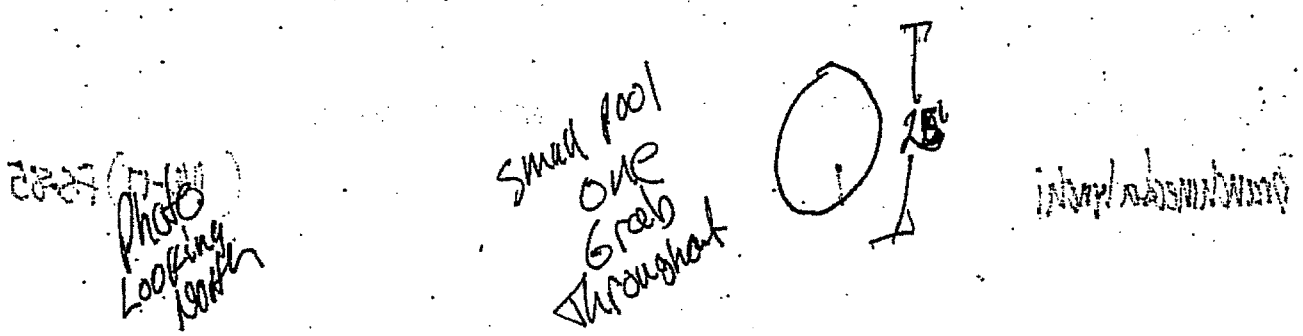
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed (grazed:) (cattle) horses sheep other _____
  (light) moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay Soil

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



(USF&WS rev.4/96)

FS-85

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1		~~0~~		
2		Branchinecta lynchi	1	
3		Branchinecta lynchi	1	
4		~~0~~		
5		~~0~~		
6		~~0~~		
7		~~0~~		
8		~~0~~		
9		~~0~~		
10		~~0~~		

Syncus californicus
Clam Shrimp

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #
Branchinecta lynchi	1		(DW-17) FS-85

(USF&WS rev.4/96)

2

Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no ✓ yes

Required color slides and/or photographs for the project site are included: _____ no ✓ yes

Date: 8/15/05 Time: 5:08PM County: San Luis Obispo Quad: _____

Collector(s): David Wolff Permit #: TE090849-0

Site/Project Name: Unocal San Luis Obispo Tank Farm Pool # (DW-18) FS-86

Township: _____ Range: _____ Section: _____ _____ lat. _____ long.

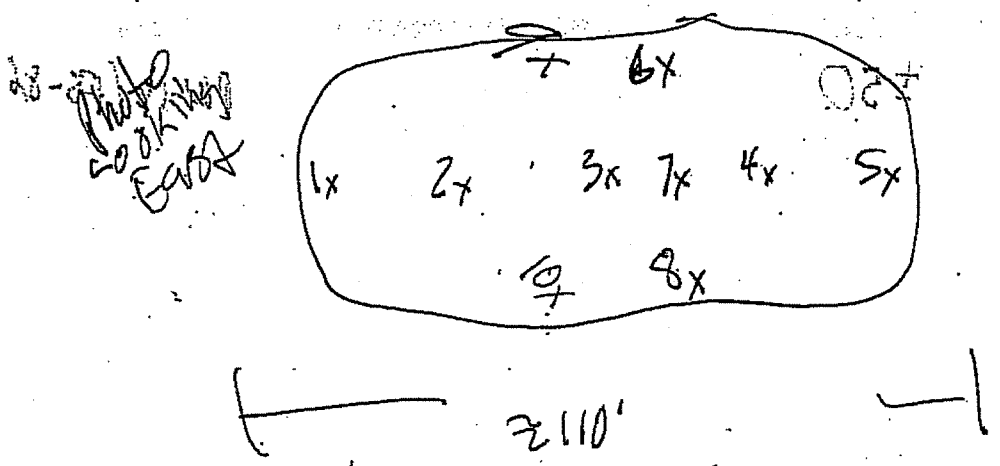
Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other _____
  light moderate heavy
- land use of habitat: Grazed Annual Grassland

Pool Bottom Surface: (circle where appropriate)
hardpan claypan cobbly/rocky lava flow other Clay Soil

Pool Depth: _____ cm (estimated maximum) Surface Area: _____ m^2 (estimated maximum)

Sketch of pool and transects showing:
- scale
- indication of North
- sampling locations



(USF&WS rev.4/96)

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

FS-86

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1		Ø		
2		Branchinecta lynchi	3	
3		Branchinecta lynchi	11	
4		Branchinecta lynchi	>100	
5		Ø		
6		Ø		
7		Branchinecta lynchi	39	
8		Ø		
9		Ø		
10		Ø		

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #
Branchinecta lynchi	±50		PW-18 (FS-86

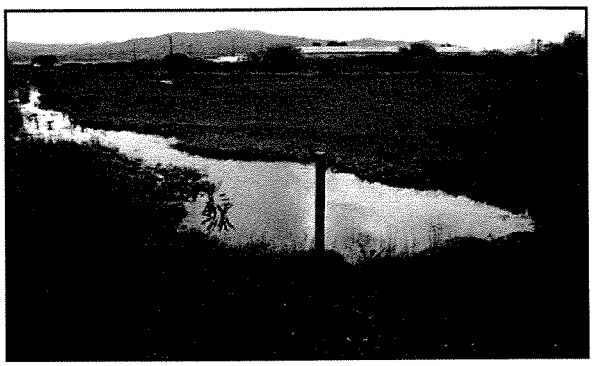
(USF&WS rev.4/96)

2

Appendix C

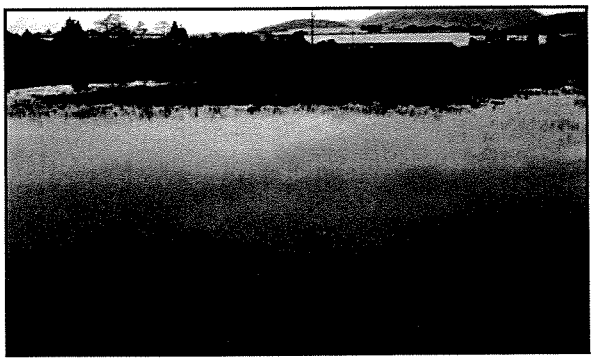
Representative Pool Photographs

FS-1: View N 3/3/05. *B lynchi* observed 2003 dry season survey.



FS-2: View SW 3/3/05. No *B. lynchi* observed 2003 dry or 2005 wet season surveys.

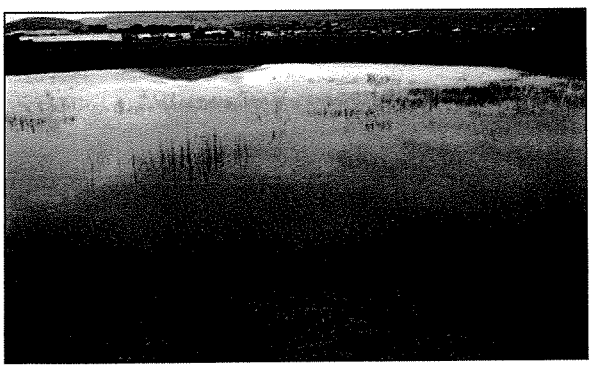
FS-3: View S 3/3/05. No *B lynchi* observed 2003 dry season survey or 2005 wet season survey.



FS-4: View N 3/3/05. *B. lynchi* observed 2003 dry season survey.

FS-5: View N 3/3/05. *B. lynchi* observed 2003 dry season survey.

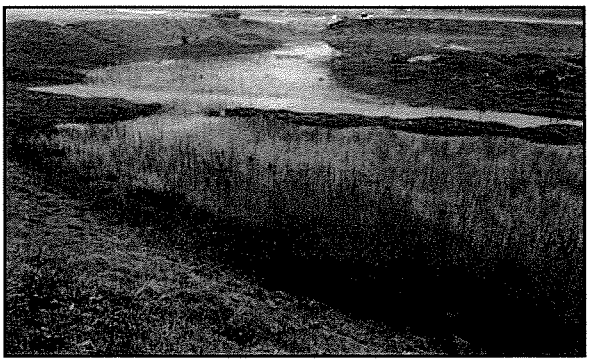
FS-6: View N 3/3/05. *B. lynchi* observed 2003 dry season survey.



FS-7: View N 3/3/05. *B. lynchi* observed 2003 dry season survey.

FS-8: View W 3/3/05. *B. lynchi* observed 2003 dry season survey.

FS-9: View NW 3/3/05. *B lynchi* observed 2003 dry season survey.



FS-10: View NW 3/3/05. *B lynchi* observed 2003 dry season survey.

FS-11: View E 3/3/05. *B lynchi* observed 2003 dry season survey.

FS-12: View E 3/3/05. *B. lynchi* observed 2003 dry season survey.

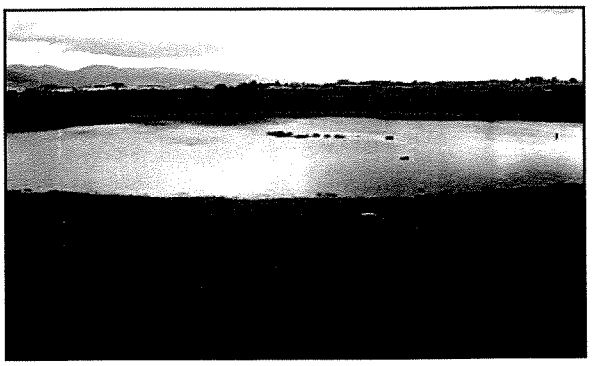
FS-13: View E 3/3/05. *B. lynchi* observed 2003 dry season survey.

FS-14: View E 3/3/05. No *B. lynchi* observed 2003 dry or 2005 wet season surveys.

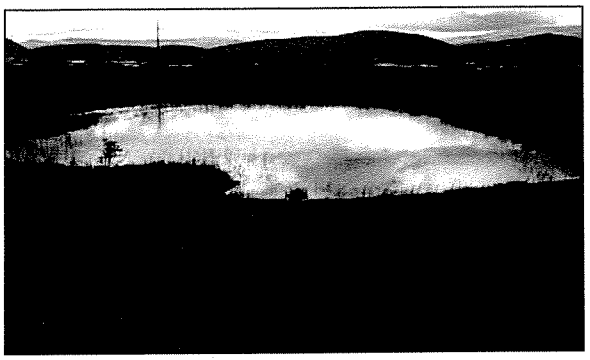
FS-15: View W 3/3/05. No *B. lynchi* observed 2003 dry or 2005 wet season surveys.

FS-16: View W 3/3/05. No *B. lynchi* observed 2003 dry or 2005 wet season surveys.

FS-17: View S 3/4/05. *B lynchi* observed 2003 dry season survey.



FS-18: View E 3/4/05. *B. lynchi* observed 2005 wet season surveys.

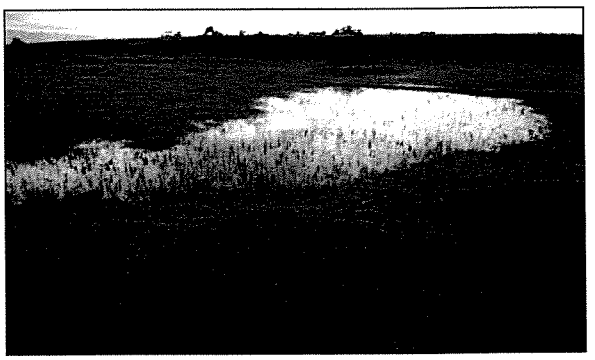


FS-19: View E 3/4/05. *B. lynchi* observed 2003 dry season survey.

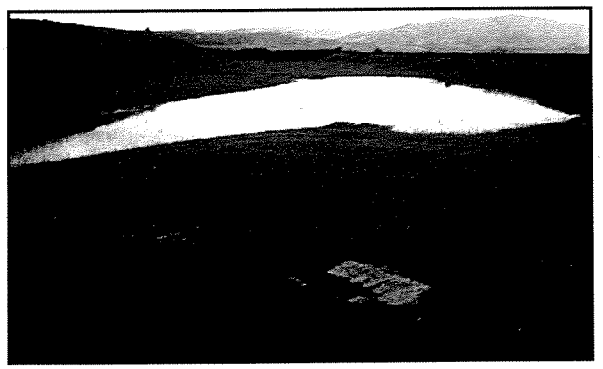
FS-20: View N 3/3/05. *B. lynchi* observed 2003 dry season survey.

No Photo Available

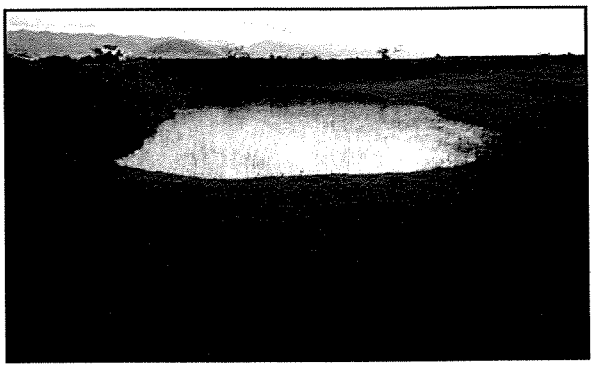
FS-21: *B. lynchi* observed 2003 dry season survey.



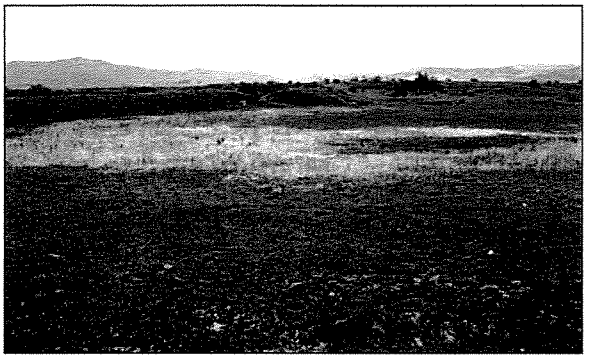
FS-22: View S 3/3/05. *B. lynchi* observed 2003 dry season survey.



FS-23: View W 3/3/05. *B. lynchi* observed 2003 dry season survey.

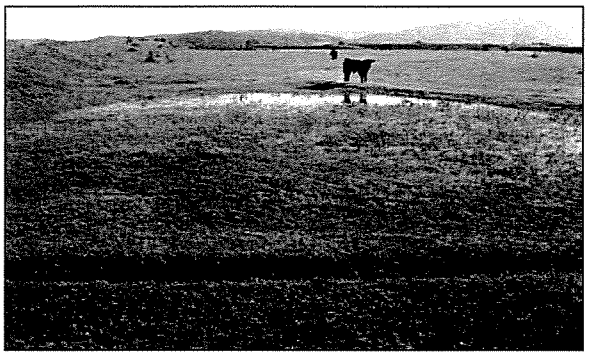


FS-24: View S 3/3/05. *B. lynchi* observed 2003 dry season survey.



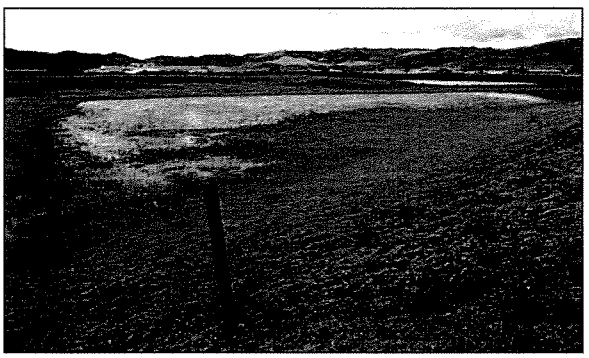
FS-25: View N 3/4/05. *B lynchi* observed 2003 dry season survey.

FS-26: View W 3/4/05. *B. lynchi* observed 2003 dry season survey.



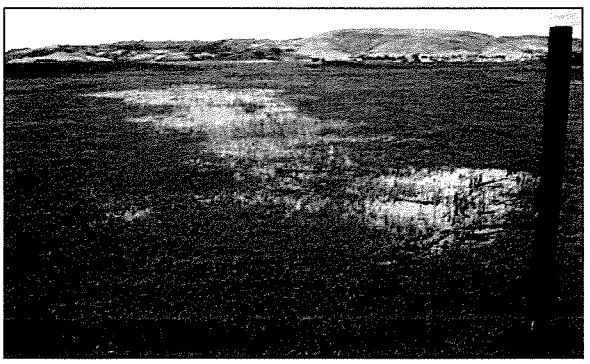
FS-27: View S 3/7/05. *B. lynchi* observed 2003 dry and 2005 wet season surveys.

FS-28: View N 3/4/05. *B. lynchi* observed 2003 dry season survey.

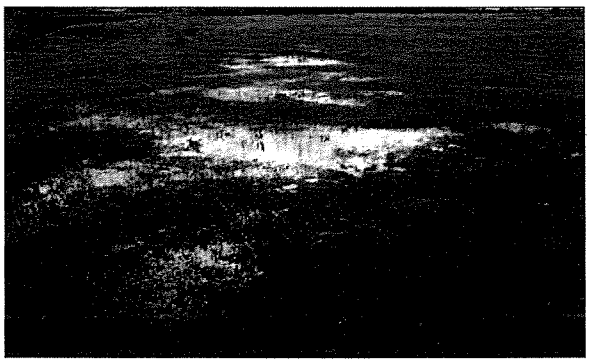


FS-29: View N 3/4/05. *B. lynchi* observed 2003 dry season survey.

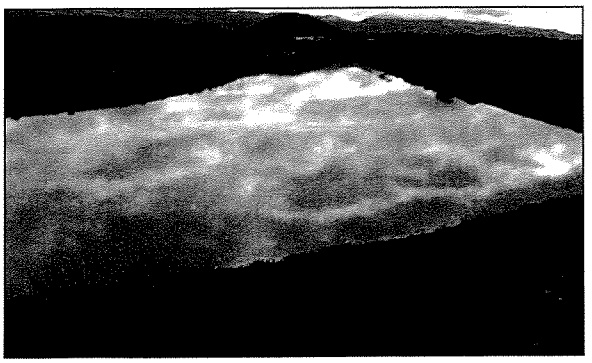
FS-30: View N 3/4/05. *B. lynchi* observed 2003 dry season survey.



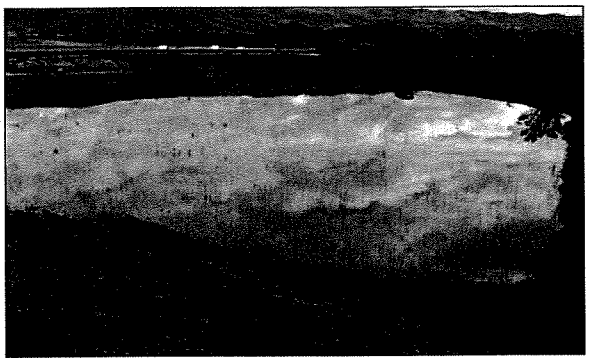
FS-31: View N 3/4/05. *B. lynchi* observed 2003 dry season survey.



FS-32: View W 3/4/05. *B. lynchi* observed 2003 dry season survey.



FS-33: View N 3/4/05. *B lynchi* observed 2005 wet season survey.



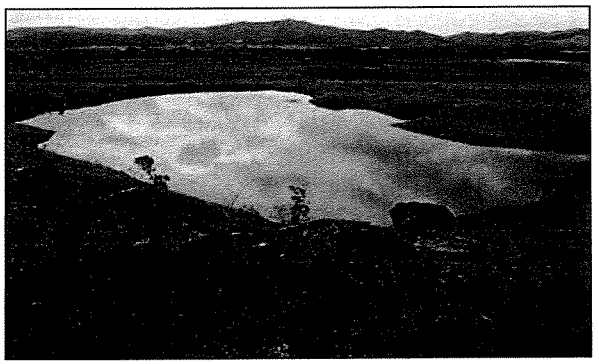
FS-34: View NW 3/4/05. *B. lynchi* observed 2003 dry season survey.

FS-35: View W 3/4/05. *B lynchi* observed 2003 dry season survey.

FS-36: View N 3/4/05. No *B. lynchi* observed 2003 dry or 2005 wet season surveys.

FS-37: View W 3/4/05. *B. lynchi* observed 2004 dry season survey.

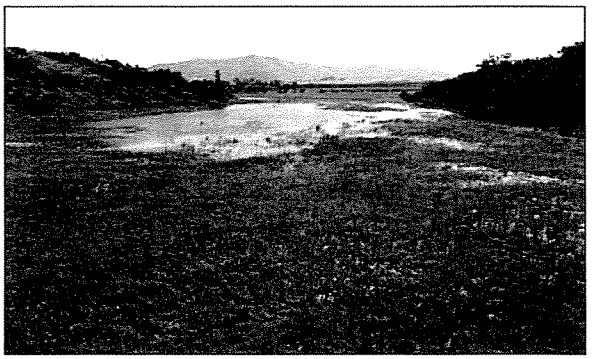
FS-38: View SW 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.



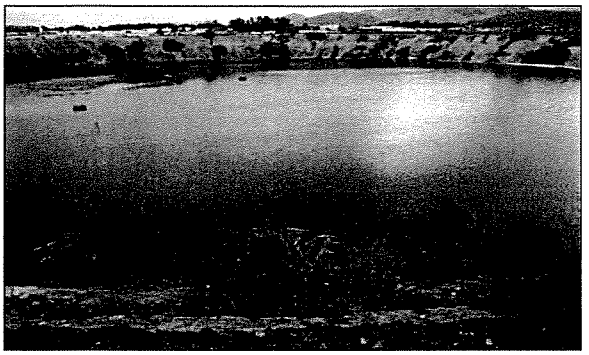
FS-39: View N 3/3/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

FS-40: View N 3/3/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

FS-41: View N 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

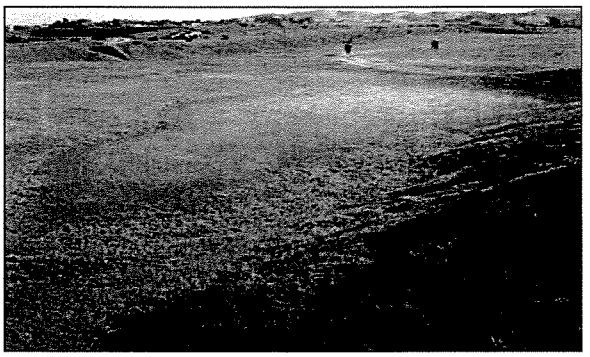


FS-42: View E 3/3/05. *B. lynchi* observed 2005 wet season survey.



FS-43: View S 3/4/05. No *B lynchi* observed 2004 dry season survey or 2005 wet season surveys.

FS-44: View S 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.



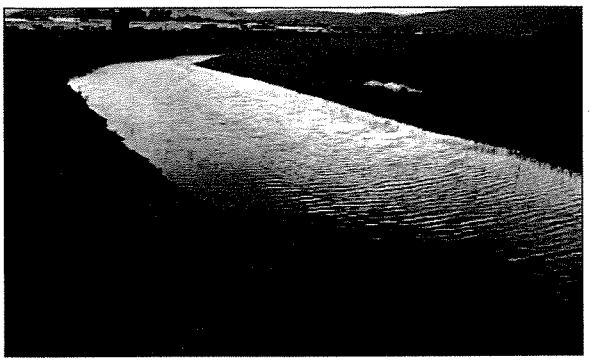
FS-45: View SE 3/4/05. *B. lynchi* observed 2005 wet season survey.

FS-46: View N 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

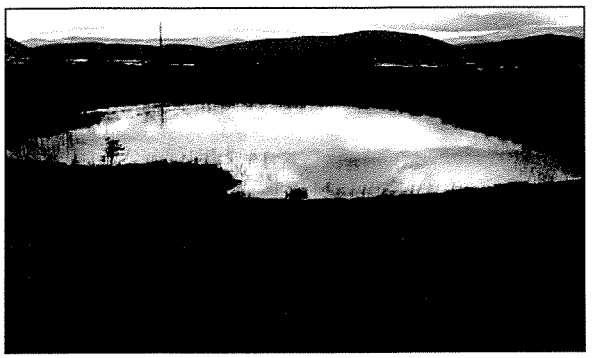
FS-47: View N 3/3/05. *B. lynchi* observed 2005 wet season survey.

FS-48: View N 3/3/05. *B. lynchi* observed 2005 wet season survey.

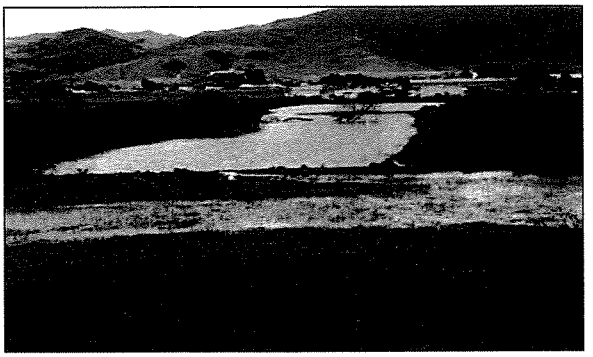
FS-49: View S 3/4/05. *B lynchi* observed 2005 wet season survey.



FS-50: View N 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

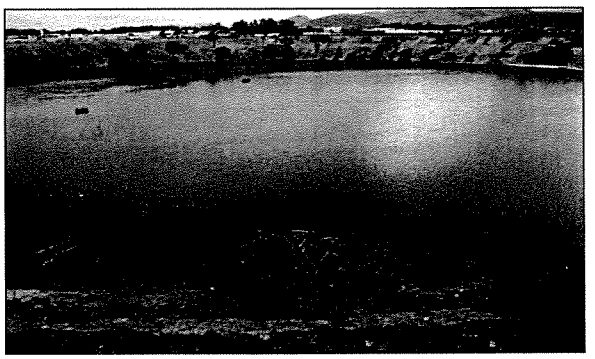


FS-51: View S 3/4/05. *B lynchi* observed 2005 wet season survey.

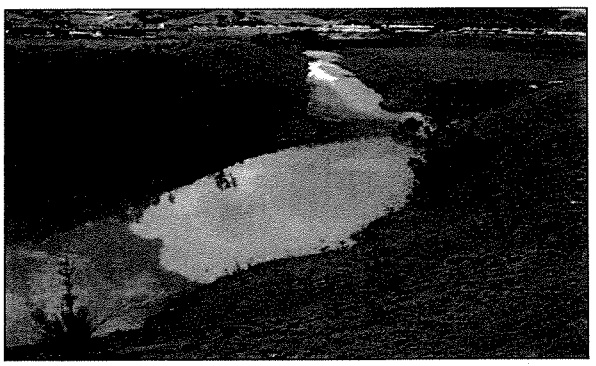


FS-52: View W 3/3/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

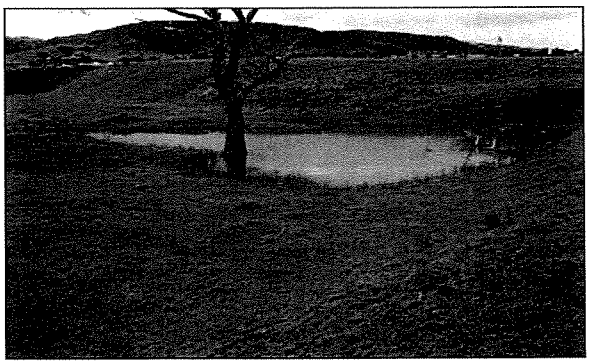
FS-53: View E 3/4/05. *B. lynchi* observed 2005 wet season survey.



FS-54: View N 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.



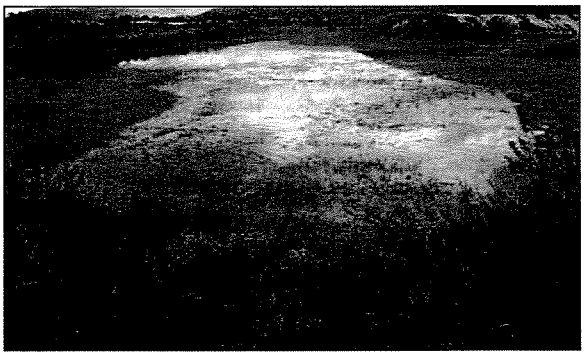
FS-55: View W 3/4/05. *B. lynchi* observed 2005 wet season survey.



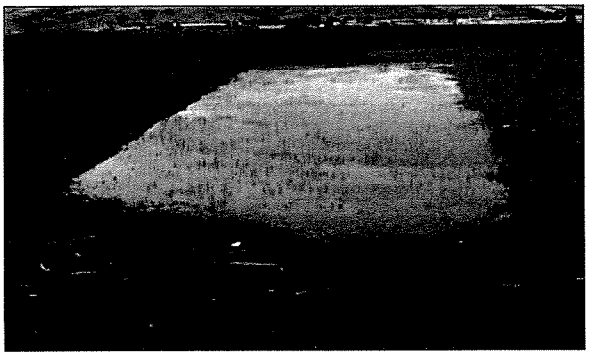
FS-56: View W 3/4/05. No *B. lynchi* observed 2004 dry or 2005 wet season surveys.

FS-57: View N 3/4/05. *B lynchi* observed 2005 wet season survey.

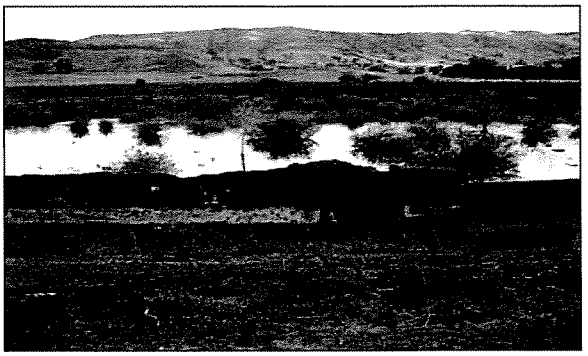
FS-58: View N 3/4/05. *B. lynchi* observed 2005 wet season survey.



FS-59: View N 3/4/05. *B lynchi* observed 2005 wet season survey.

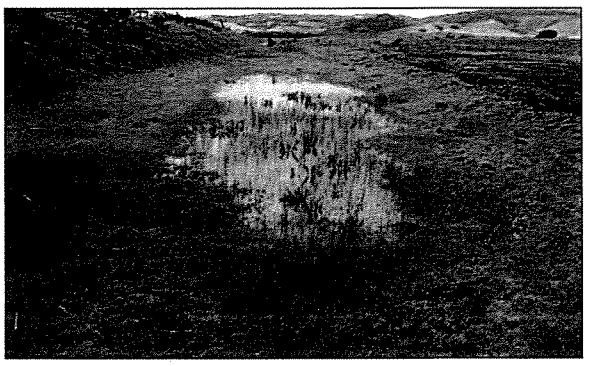


FS-60: View W 3/3/05. *B. lynchi* observed 2004 dry season survey.

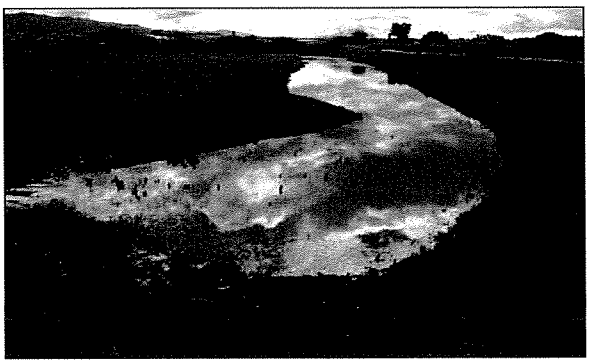


FS-61: View NE 3/4/05. *B. lynchi* observed 2004 dry season survey.

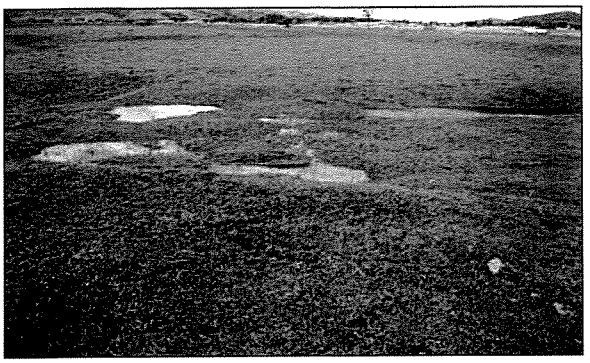
FS-62: View W 3/4/05. *B. lynchi* observed 2005 wet season survey.



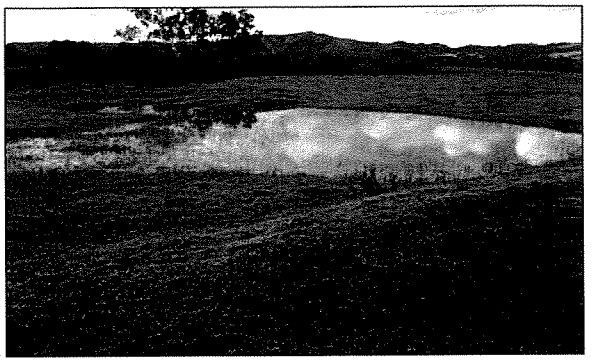
FS-63: View S 3/4/05. *B. lynchi* observed 2005 wet season survey.



FS-64: View E 3/4/05. *B. lynchi* observed 2005 wet season survey.

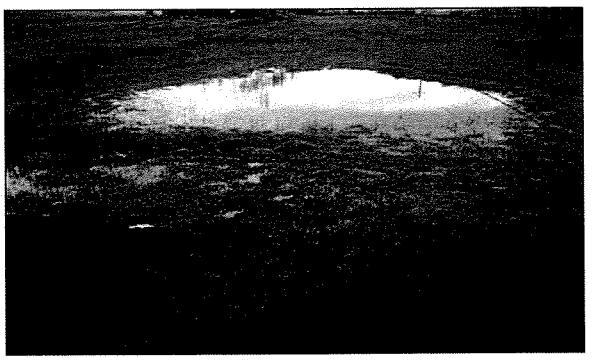


FS-65: View NW 3/4/05. *B lynchi* observed 2005 wet season survey.



FS-66: View SW 3/4/05. No *B. lynchi* observed 2003 dry or 2005 wet season surveys.

FS-67: View E 3/4/05. *B lynchi* observed 2005 wet season survey.



FS-68: View E 3/4/05. *B. lynchi* observed 2005 wet season survey.

FS-69: View SW 3/4/05. *B. lynchi* observed 2005 wet season survey.

FS-70: View NE 3/4/05. No *B. lynchi* observed 2005 wet or 2005 dry season surveys.

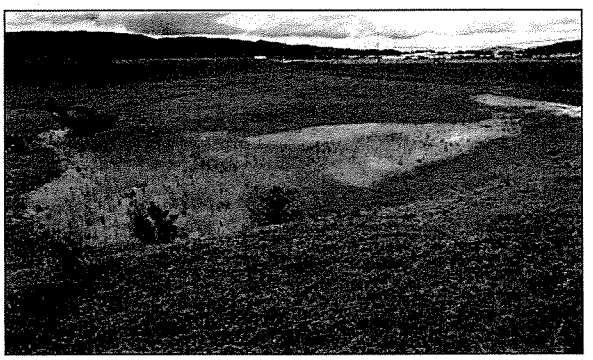
FS-71: View NE 3/4/05. No *B. lynchi* observed 2005 wet or 2005 dry season surveys.

FS-72: View E 3/4/05. No *B. lynchi* observed 2005 wet or 2005 dry season surveys.

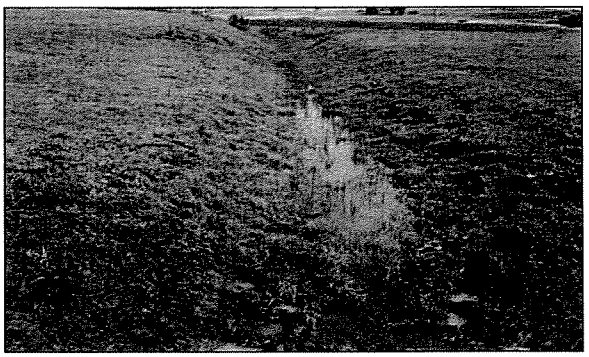
FS-73: View SE 3/4/05. No *B. lynchi* observed 2005 wet or 2005 dry season surveys.

FS-74: View E 3/4/05. No *B. lynchi* observed 2005 dry or 2005 wet season surveys.

FS-75: View S 3/4/05. *B lynchi* observed 2005 wet season survey.



FS-76: View N 3/4/05. *B. lynchi* observed 2005 wet season survey.

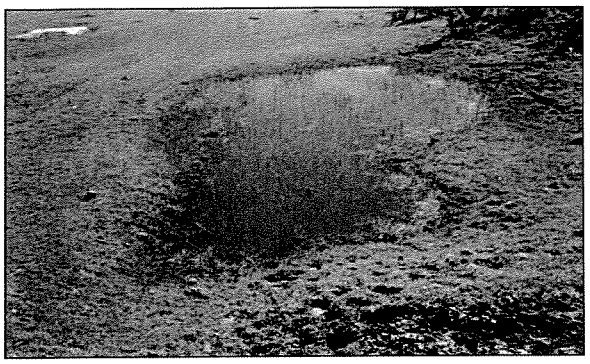


FS-77: View N 3/4/05. *B. lynchi* observed 2005 wet season survey.

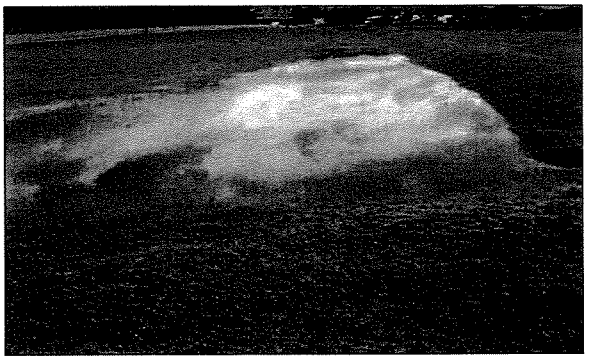
FS-78: View NW 3/4/05. *B. lynchi* observed 2005 wet season survey.

FS-79: View N 3/4/05. *B. lynchi* observed 2005 wet season survey.

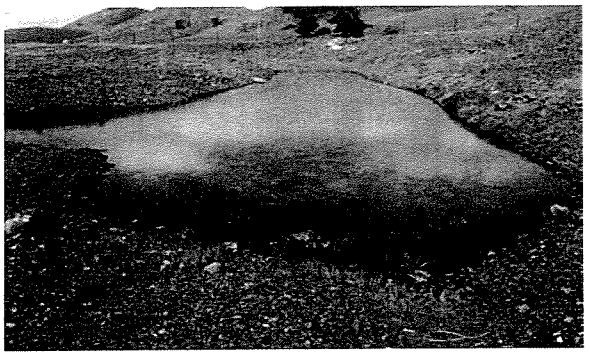
FS-80: View NW 3/4/05. *B. lynchi* observed 2005 we season survey.



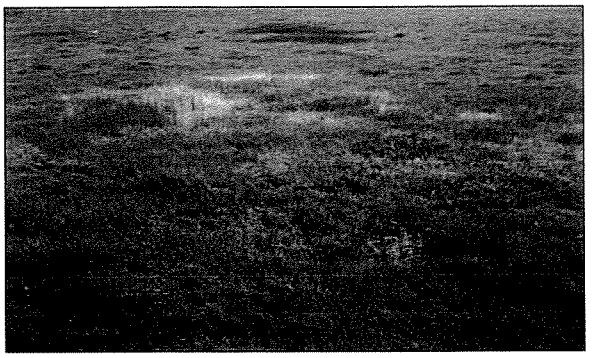
FS-81: View S 3/3/05. *B lynchi* observed 2005 wet season survey.



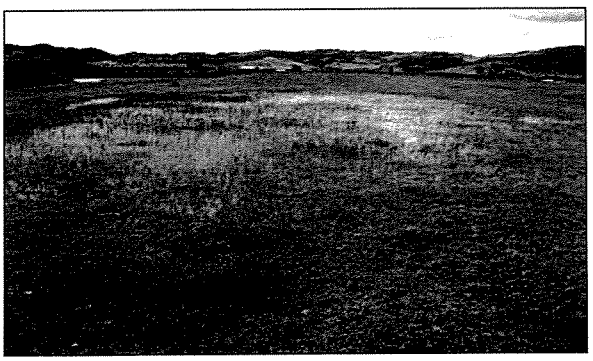
FS-82: View E 3/3/05. *B. lynchi* observed 2005 wet season survey.



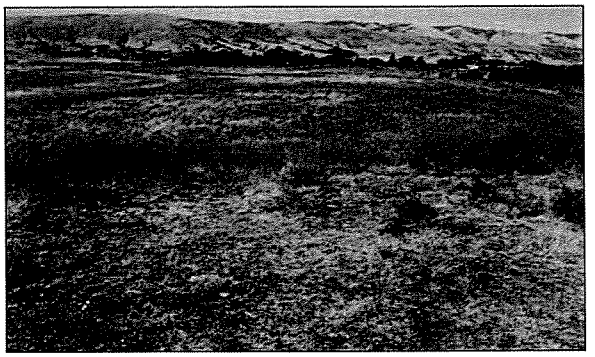
FS-83: View E 3/3/05. No *B lynchi* observed 2005 wet or 2005 dry season surveys.



FS-84: View S 3/3/05. No *B. lynchi* observed 2005 wet or 2005 dry season surveys.



FS-85: View S 3/3/05. *B. lynchi* observed 2005 dry season survey.



FS-86: View N 3/3/05. *B. lynchi* observed 2005 dry season survey.

Appendix D

2003 Dry Season Report

ECOANALYSTS, INC.

166 Buckeye Street
Woodland, California 95695 USA
Phone/Fax: 530-406-1178
eco@ecoanalysts.com • www.ecoanalysts.com

29 September 2003

Mr. Duane Vander Pluym
Rincon Consultants, Inc.
1530 Monterey Street, Suite D
San Luis Obispo, CA 93401

Dear Mr. Vander Pluym,

EcoAnalysts, Inc. conducted collection oversight and analysis of soil samples collected from potential special-status shrimp habitats at the former Unocal Tank Farm in San Luis Obispo, San Luis Obispo County, California, for Rincon Consultants, Inc. (Rincon).

It is EcoAnalysts, Inc. understanding that Rincon will submit this report and all other pertinent materials and information to the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (DFG), as required by the USFWS guidelines for a protocol-level survey. EcoAnalysts, Inc. will deposit all cultured special status shrimp and recovered cysts at a USFWS approved museum, such as the Bohart Museum of Entomology at the University of California, Davis, or the California Academy of Sciences in San Francisco.

For the purpose of this report, special status shrimp are defined to include shrimp species listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species).

Species Accounts

Two special-status fairy shrimp species (*Branchinecta lynchi* Eng et al., 1990, and *B. longiantenna* Eng et al., 1990) have the potential to occur at the proposed project site. In addition, two non-listed fairy shrimp species (*B. lindahli* Packard, 1883 and *Linderiella occidentalis* (Dodds, 1924)) are known from the proposed project vicinity.

Branchinecta longiantenna Eng, Belk, & Eriksen, 1990

Branchinecta longiantenna is federally listed as an endangered species. This species is reported from small, shallow rock outcrop vernal pools, and grassy-bottomed vernal pools. This species of fairy shrimp has an extremely disjunct distribution, and is known only from three locations; *B. longiantenna* is known from sandstone outcrop vernal pools along the Contra Costa/Alameda County line, a couple of grassy bottomed vernal pools at the Pixley National Wildlife Refuge in Merced County in the San Joaquin Valley, and from a

couple of grassy bottomed vernal pools and roadside scrapes on the Carrizo Plain in San Luis Obispo County (Eriksen & Belk, 1999; Rogers, in prep).

Branchinecta lynchi Eng, Belk & Eriksen, 1990

Branchinecta lynchi is federally listed as a threatened species. This shrimp species is found in vernal pools throughout the Central Valley and western Riverside County in California, and near Medford, Oregon (Eriksen & Belk, 1999). This fairy shrimp species occurs in neutral to slightly alkaline vernal pools throughout the California Central Valley, and in rock outcrop and vernal pools along the Interior Coast Ranges, south of the Sacramento River Delta. This species is known to occur in grassland areas of San Luis Obispo County.

Methods

Rincon prepared a 10-day notification letter, requesting permission to collect soil samples from the potential special-status shrimp habitats at the former Unocal Tank Farm site from the Ventura Branch of the USFWS. Permission was granted on 9 August 2003.

Field Methods

Soil samples were collected by Rincon field biologists under the EcoAnalysts, Inc. 10(A) 1(a) permit (#TE-796284-3) on 12 and 13 August 2003 from potential special-status shrimp habitats at the proposed project site according to USFWS (1996) Interim Survey Guidelines to Permittees. A hand trowel was used to take approximately one liter of soil from the potential habitats, unless taking such a large quantity would have been injurious to the habitat. Each soil sample was placed in a plastic zip-lock bag, labeled with the locality number, and taken to EcoAnalysts, Inc. California laboratory for analysis. All sampled potential habitats were identified according to the numbers assigned to them by Rincon.

Some areas had been previously identified as potential habitat, and were not sampled during this study. These sites were not sampled due to the presence of large amounts of apparent hydrocarbon in the habitats (i.e. all soil was black and tarry, or pools of black liquid substances were present). Some habitats that contained small amounts (i.e. blackened soil patches) of apparent hydrocarbon were sampled (potential habitats 18, 21, 33 and 37) however if the majority of the pool bottom contained apparent hydrocarbon, then it was not sampled due to the inability of most Crustacea to live with hydrocarbon pollutants (for example: Leifer et al., in press; Gerhardt et al., 2002; Burger & Gochfeld, 1992; Krebs & Burns, 1977; Teal et al., 1992).

Other habitats were not sampled because they were permanently inundated, or contained plants that required permanently wet soil. The cysts of special-status shrimp species must dry out before they can hatch. If the cysts do not dry out they will fungus and decay. Other sites were not sampled because the size and depth as well as vegetation was indicative of either too short a ponding duration to support special-status shrimp species, or only the soil would be saturated and no standing water would be present during the wet-season.

Laboratory Analysis

Soil samples were prepared for examination in the laboratory by dissolving the clumps of soil in water and sieving the material through 300- and 150- μm pore size screens. The small size of these screens ensures that the cysts from the shrimp species will be retained. The portion of each sample retained in the screens was dissolved in a brine solution to separate the organic material from the inorganic material. The organic fraction was then examined under a microscope.

Scanning electron micrographs and reference specimens were used to identify shrimp cysts to the lowest justifiable taxon. Cysts from the genus *Branchinecta* were identifiable only to genus level, due to cyst character overlap among species, and the potential for three species, *B. longiantenna*, *B. lindahli,* and *B. lynchi* to occur in this region. Cysts from the genus *Linderiella* are readily separated from *Branchinecta* cysts by their dense covering of spines.

Culture Analysis

Adult shrimp were reared from the recovered cysts using methods following U.S. Environmental Protection Agency (1985), Belk, et al. (1990), Maeda-Martinez, et al., (1995a and 1995b), and Jawahar and Dumont (1995). All dry cysts were removed from the filtered debris left over from the soil sieving. These undamaged cysts were placed in a hatching chamber. A combination of de-chlorinated tap water and de-ionized water with an ultimate conductivity of 30 µS (microsiemens) was added to the chamber, which was then incubated at 9-12 °C, 14-17°C, 9-22°C and 23-27°C.

Nauplii (newly hatched shrimp) were transferred to 2.5-liter culture chambers. Nauplii were fed a standard *Daphnia* food that includes; fish food, fish oil, baker's yeast, and the alga *Selenastrum capricornutum*. The nauplii were then reared to maturity. Adult shrimp reared from culture were killed in 90% ethyl alcohol, and examined under a stereo dissection microscope. Identifications were made based upon comparisons with specimens in our collections, the original species descriptions and professional experience.

Results

The specific results and localities of special-status shrimp habitats are in Table 1. Shrimp cysts belonging to the genus *Branchinecta* were identified from 27 of the 36 potential habitats surveyed on the proposed project site (potential habitat numbers:1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, and 35). Cysts of the non-listed fairy shrimp species *Linderiella occidentalis* were found in eleven of the potential habitats. No shrimp cysts, indeed no crustacean cysts, ephippia or eggs, or flatworm cysts, were found in any of the sampled sampling locations that contained apparent hydrocarbon deposits.

The *Branchinecta* cysts were cultured and determined to be the federally threatened *B. lynchi*. Cultured material and remaining cysts were deposited at the Bohart Museum of Entomology, at University of California, Davis. The *B. lynchi* and the *L. occidentalis* cysts occurred in extremely high densities. This means that the species is well established in the habitats where the cysts were found. The cysts of *L. occidentalis* were found in lower quantities, but were still abundant. This is typical as the cysts of *L. occidentalis* are densely covered in long spines, which tend to attach to debris camouflaging the cyst. *Branchinecta* cysts are smooth, and do not adhere to debris.

All associated wetland habitats within an occupied habitat's complex are also considered as 'occupied habitat', as water moves between sampling locations within complexes, particularly during years with heavy rain fall. The sampling locations included in complexes with the identified occupied habitat in this study are listed in Table 1. It should be stressed however, that wetland habitat complex determinations were made when the sampling locations were dry, and hydrological connectivity should be verified when the sampling locations are inundated, preferably during an El Niño event, with higher than normal rainfall, to accurately assess the connectivity of the habitats.

All habitats sampled are artificial or are natural habitats that were altered during modifications to the landscape for the maintenance of the Tank Farm when it was a functioning facility years ago. Regardless of the origins of the habitats, they are currently functioning as special-status shrimp habitat (i.e. as seasonal wetlands)

without outside artificial management. It is difficult to estimate how long the populations have been present, however the density of the cysts bank suggests that these shrimp have been present for many years time.

If you have any questions please call me.

Sincerely,

D. Christopher Rogers
Senior Invertebrate Ecologist and Taxonomist
EcoAnalysts, Inc.
166 Buckeye Street
Woodland, CA 95695, USA

Table 1. Sampling locations containing vernal pool crustacean cysts.

Habitat Number	*Branchinecta lynchi* (# of cysts)	*Linderiella occidentalis* (# of cysts)	In a shared wetland complex with habitats
1	100+	0	--
4	100+	100+	--
5	100+	100+	--
6	100+	100+	2, 3
7	100+	0	--
8	100+	0	--
9	100+	0	--
10	100+	0	11
11	100+	0	10
12	100+	100+	--
13	100+	0	--
17	100+	0	19
19	100+	100+	17
20	100+	0	--
22	100+	100+	--
23	100+	100+	24
24	100+	100+	23
25	100+	0	26, 27
26	100+	0	25, 27
27	100+	0	25, 26
28	100+	0	--
29	100+	100+	30, 31, 32
30	100+	100+	29, 31, 32
31	100+	0	29, 30, 32
32	100+	0	29, 30, 31
34	100+	0	--
35	100+	100+	--

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Belk, D., G. Anderson & S-Y. Hsu. 1990. Additional observations on variations in egg size among populations of *Streptocephalus sealii* (Anostraca). Journal of Crustacean Biology 10: 128-133.

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Krebs, C. T. & K. A. Burns. 1977. Long-term effects of an oil spill on populations of the salt-marsh crab *Uca pugnax*. Science 197:484-487.

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U. S. Fish & Wildlife Service. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under the Endangered Species Act for the Listed Vernal Pool Branchiopods. Sacramento, CA.

ECOANALYSTS, INC.

166 Buckeye Street
Woodland, California 95695
USA
Phone/Fax: 530-406-1178
eco@ecoanalysts.com • www.ecoanalysts.com

29 September 2003

Mr. David K. Wolff
Manager, Biological Resources Group
Rincon Consultants, Inc.
1530 Monterey Street, Suite D
San Luis Obispo, CA 93401

Dear Mr. Wolff,

EcoAnalysts, Inc. conducted a preliminary survey of potential Morro shoulderband snail habitats at the former Unocal Tank Farm in San Luis Obispo, San Luis Obispo County, California, for Rincon Consultants, Inc. (Rincon).

EcoAnalysts, Inc. will submit this report to the U.S. Fish and Wildlife Service (USFWS) as required by the USFWS guidelines for a protocol-level survey.

Methods

EcoAnalysts, Inc. requested permission to conduct surveys for the federally endangered Morro shoulderband snail (*Helminthoglypta walkeriana*) at the former Unocal Tank Farm site from the Ventura Branch of the USFWS. Permission was granted on 4 August 2003.

Fieldwork commenced 12 August, and was completed by 3:00 PM on 13 August 2003. The entire site was surveyed for suitable habitat.

Results

Potential habitat for the Morro shoulderband snail was observed in various portions of the northern and southern parts of the site, however; neither Morro shoulderband snails nor empty shells were observed. This survey by itself is insufficient to determine that the species does or does not occur, and four additional surveys during rains or heavy fog events must be conducted during the 2003/2004-winter season to establish whether or not the site supports this species.

If you have any questions please call me.

Sincerely,

D. Christopher Rogers
Senior Invertebrate Ecologist and Taxonomist
EcoAnalysts, Inc.
166 Buckeye Street
Woodland, CA 95695, USA

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 2,3 N

Date: August / 17 /2003 **Time:** 9:51 Am **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS1

Township: 31S **Range:** 12E **Section:** 11 **Lat.** 35° 14'55.15N **Long.** 120° 39' 44.83" W

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

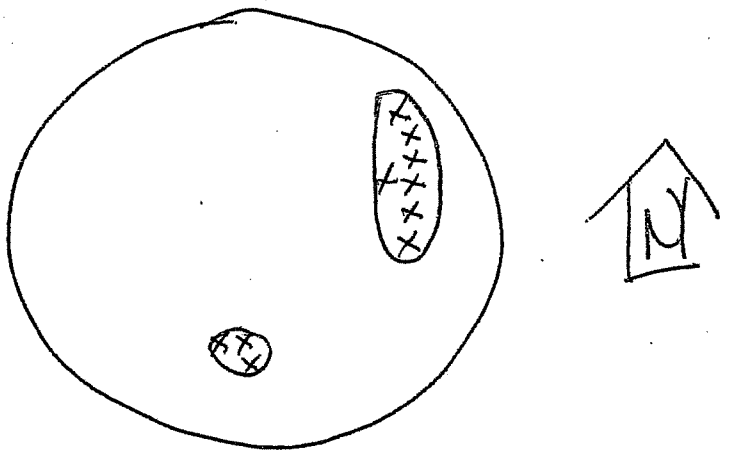
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: 12" cm (est. maximum) **Surface Area:** 30 x 10 m2 (est. maximum) 3.5 x 4.5

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	B. lynchi / [redacted]	100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 4N 5N

Date: August / 12 /2003 **Time:** _____ **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS2

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

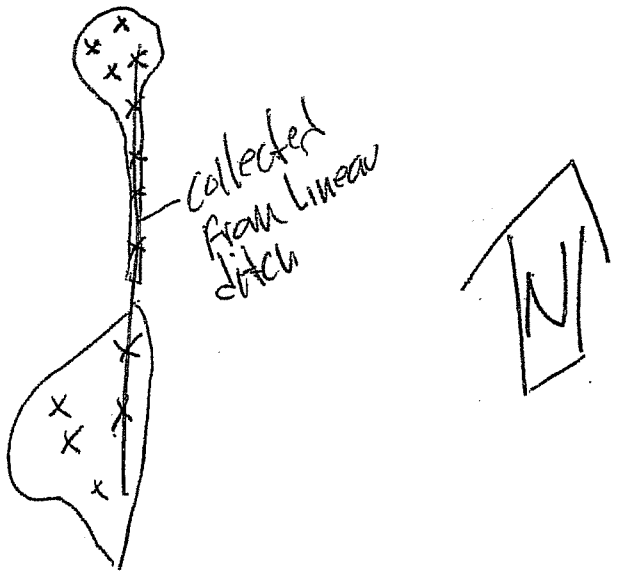
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** see map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11 – 13				

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 6N

Date: August / 12 /2003 **Time:** 10:30 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS3

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

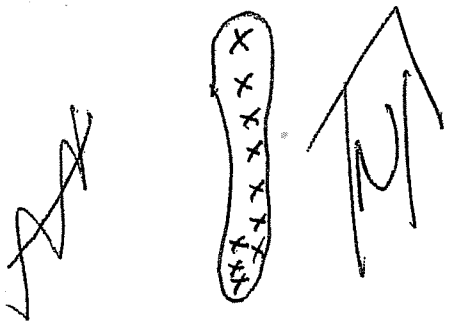
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: 21' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		0	
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes Pict 7N

Date: August / 12 /2003 **Time:** 10:40AM **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS4

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

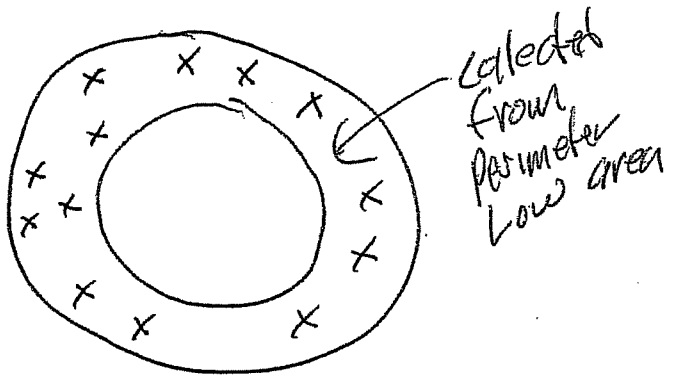
- ***Land Use of Habitat***: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other compacted clay

Pool Depth: <1" cm (est. maximum) **Surface Area:** see map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY / LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes

Date: August / 12 /2003 **Time:** 10:46 AM **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS5

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

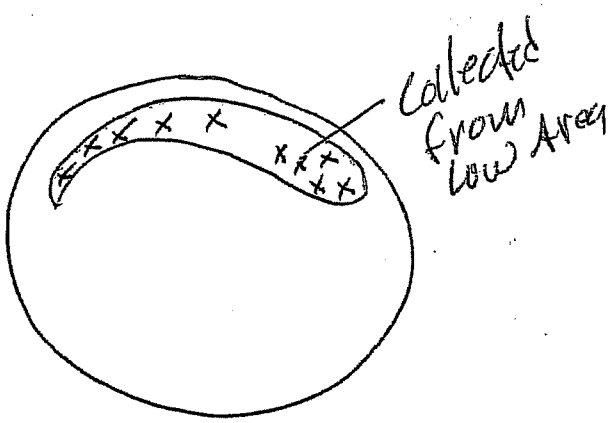
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY /LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 8N

Date: August / 12 /2003 **Time:** 11:00 Am **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS6

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

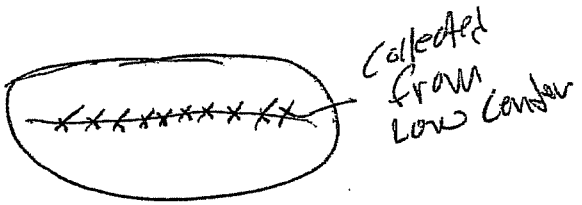
- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy
- *Land Use of Habitat*:	Former oil	tank farm;	tanks removed	grazing, open space	

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY /LIOC	100+/100+	100+

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 10 N

Date: August / 12 /2003 **Time:** 11:26 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** 57

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks, garbage, discing/plowing
- ungrazed — grazed: cattle, horses, sheep, other_____
  - light, moderate, heavy
- ***Land Use of Habitat***: Former oil tank farm; tanks removed; grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan, claypan, cobbly/rocky, lava flow, other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	600	BRLY	100+	11

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 11 N

Date: August / 12 /2003 **Time:** 11:30 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS8

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

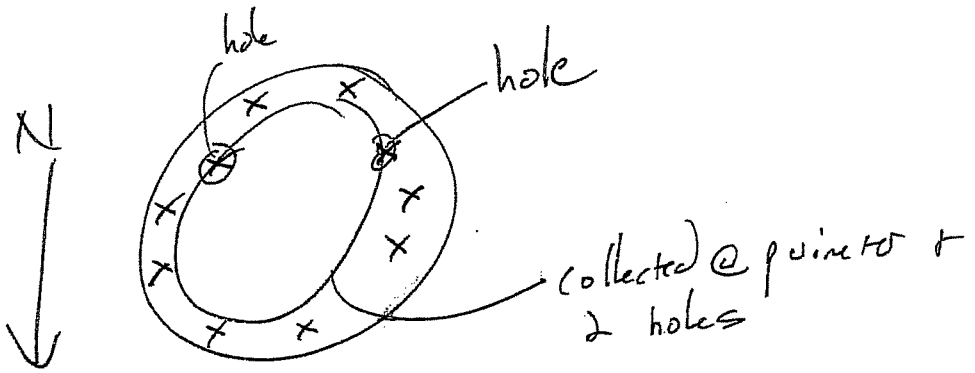
- undisturbed — disturbed: tire tracks, garbage, discing/plowing
- ungrazed — grazed: cattle, horses, sheep, other _____
- light, moderate, heavy
- *Land Use of Habitat*: Former oil tank farm; tanks removed; grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	11

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 12 ~~13~~

Date: August / 12 /2003 **Time:** 11:50 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS9

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

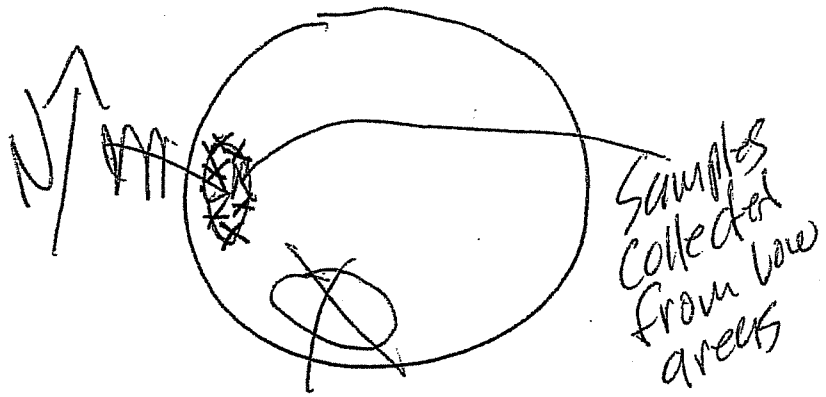
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: 41' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRCY	100+	11

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 1300

Date: August / 12 /2003 **Time:** 1200 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS10

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	"

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 14N

Date: August / 12 /2003 **Time:** 12:30 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS11

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

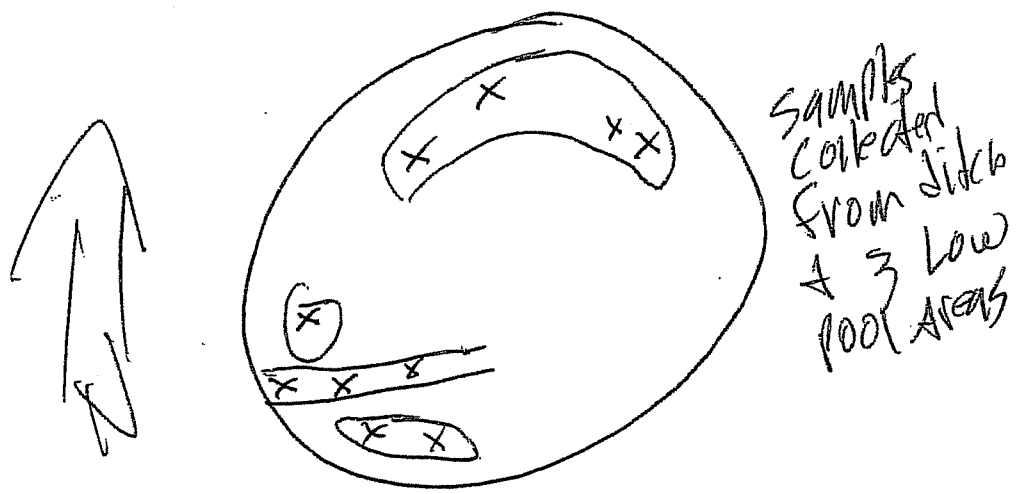
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: 1'-2' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	1

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 15 W

Date: August / 12 /2003 **Time:** 12:43 PM **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS12

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

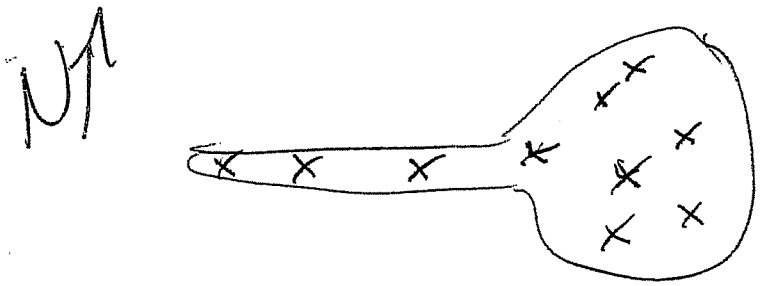
- ***Land Use of Habitat***: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: 1'-2' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRKY / LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 16 W

Date: August / 12 /2003 **Time:** 12:48 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS13

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

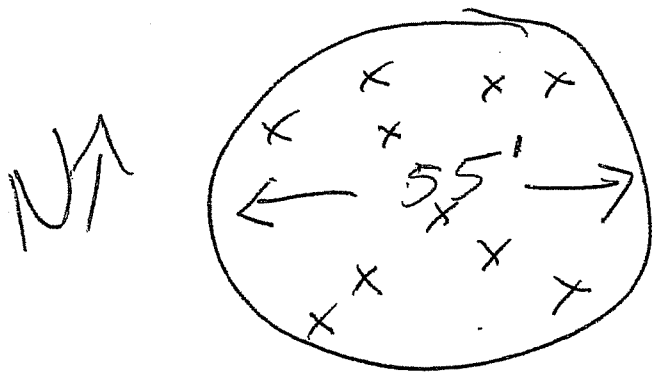
- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy
- *Land Use of Habitat*:	Former oil	tank farm;	tanks removed	grazing, open space	

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** 4 cemp m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 17W

Date: August / 12 /2003 **Time:** 2:31PM **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** PS14

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

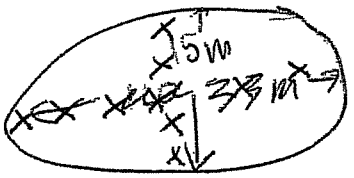
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		Ø	
2	11			
3	11			
4	11			
5	11			
6	11			
7	11			
8	6			
10	6			
10	6			

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 18W

Date: August / 12 /2003 **Time:** 2:44pm **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS15

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

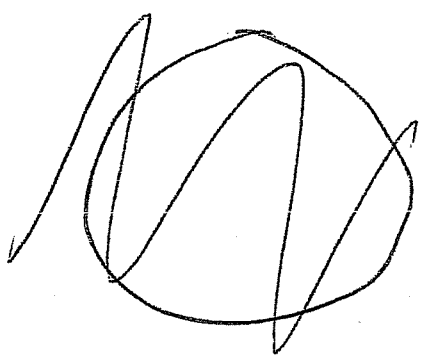
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

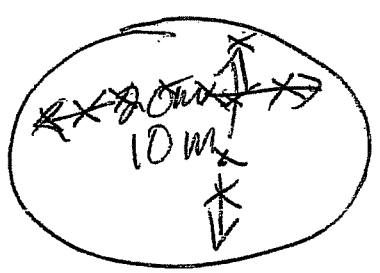
Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations





U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		Ø	
2	"			
3	"			
4	"			
5	"			
6	"			
7	"			
8	"			
9	"			
10	"			

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes

Date: August / 12 /2003 **Time:** 2:52 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS16 19W

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

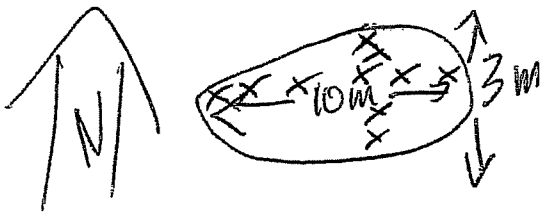
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		0	
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes ZON

Date: August / 12 /2003 **Time:** 3:43 pm **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS17

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

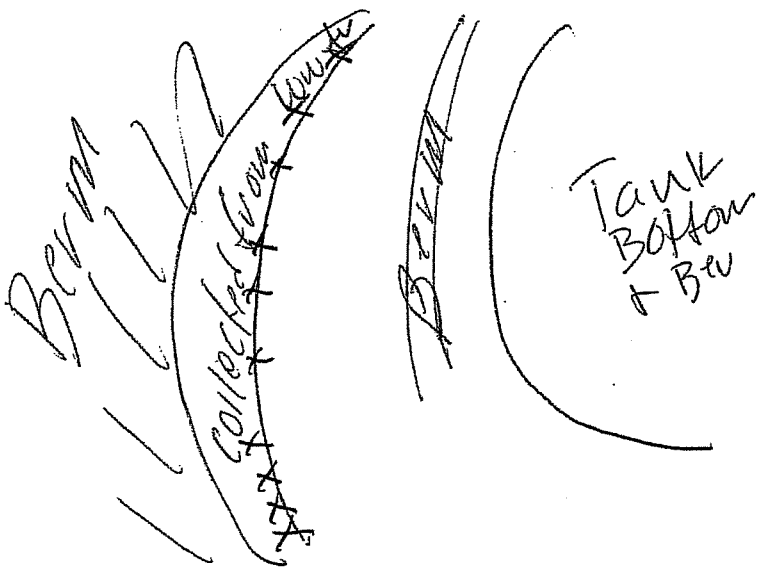
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: 1-2' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY /	100+	100+

Voucher Specimens

Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 205

Date: August / 12 /2003 **Time:** 401 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** PS18

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

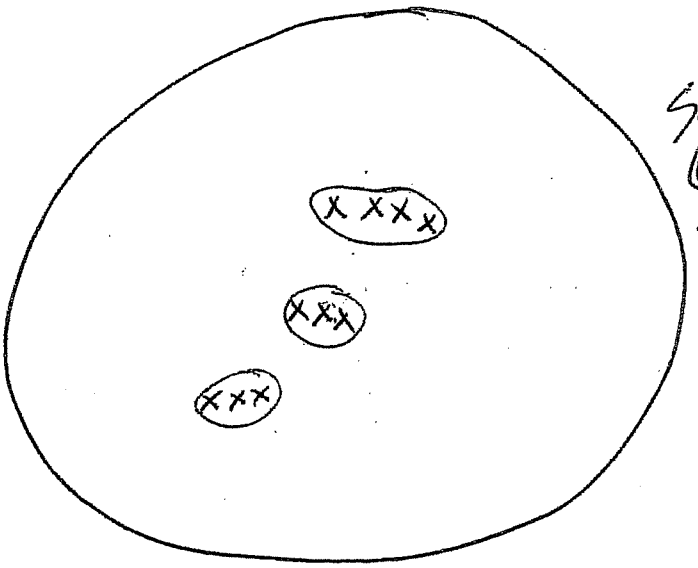
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



Samples collected from small/low areas Estimated 5m x 5m

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		0	
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes 2

Required color slides and/or photographs for the project site are included: _____ no _____ yes 21W

Date: August / 12 /2003 **Time:** 4:30pm **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS19

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

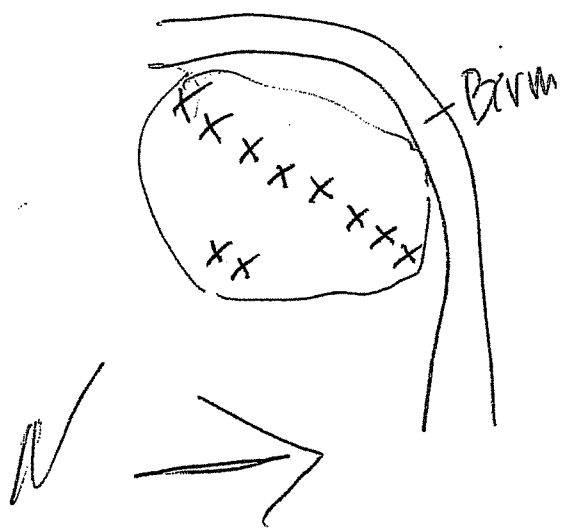
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted clay

Pool Depth: <1' cm (est. maximum) **Surface Area:** seemal m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY/LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes MIC 23NS

Required color slides and/or photographs for the project site are included: _____ no _____ yes 24E

Date: August / 12/2003 **Time:** 4:34 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS20

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

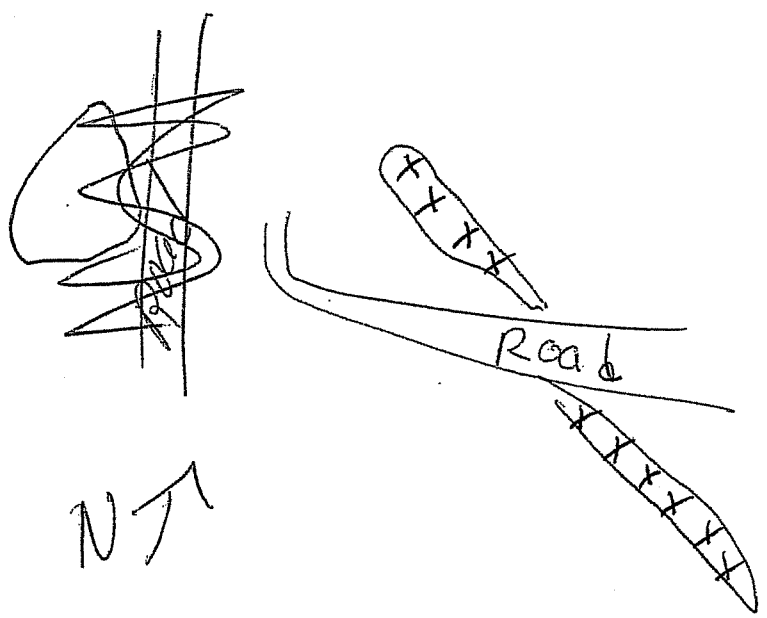
- ***Land Use of Habitat***: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: 1' cm (est. maximum) **Surface Area:** see map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	11

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 255

Date: August / 12 /2003 **Time:** 4:40 PM **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS21

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

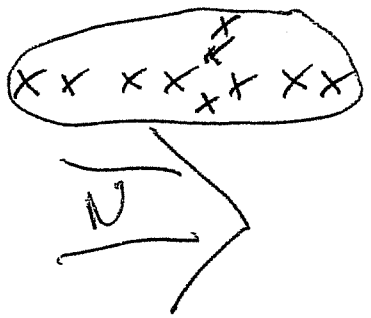
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other Compacted Clay

Pool Depth: 21' cm (est. maximum) **Surface Area:** _____ m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



27 x 8m

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		0	
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 265

Date: August / 12 /2003 **Time:** 4:47 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS22

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: 1'-2' cm (est. maximum) **Surface Area:** See map m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

See map

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY / LZOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 27 N

Date: August / 13 /2003 **Time:** 9:00 am **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS23

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy
- *Land Use of Habitat*:	Former oil tank farm;		tanks removed	grazing, open space	

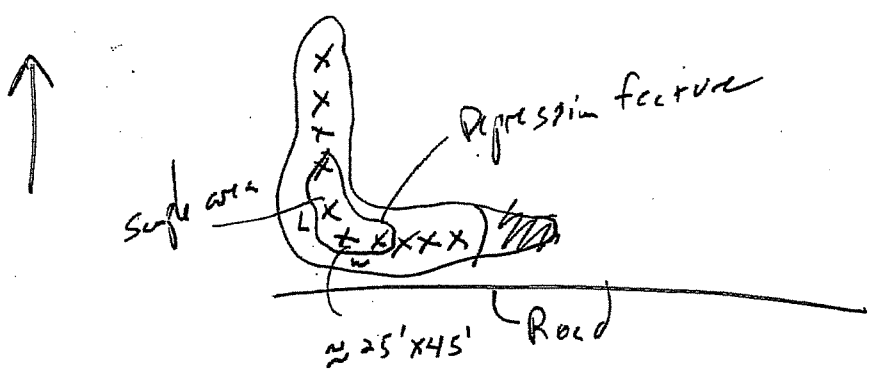
Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

— see map



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY / LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 28E

Date: August / 13 /2003 **Time:** 9:10am **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS 24

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

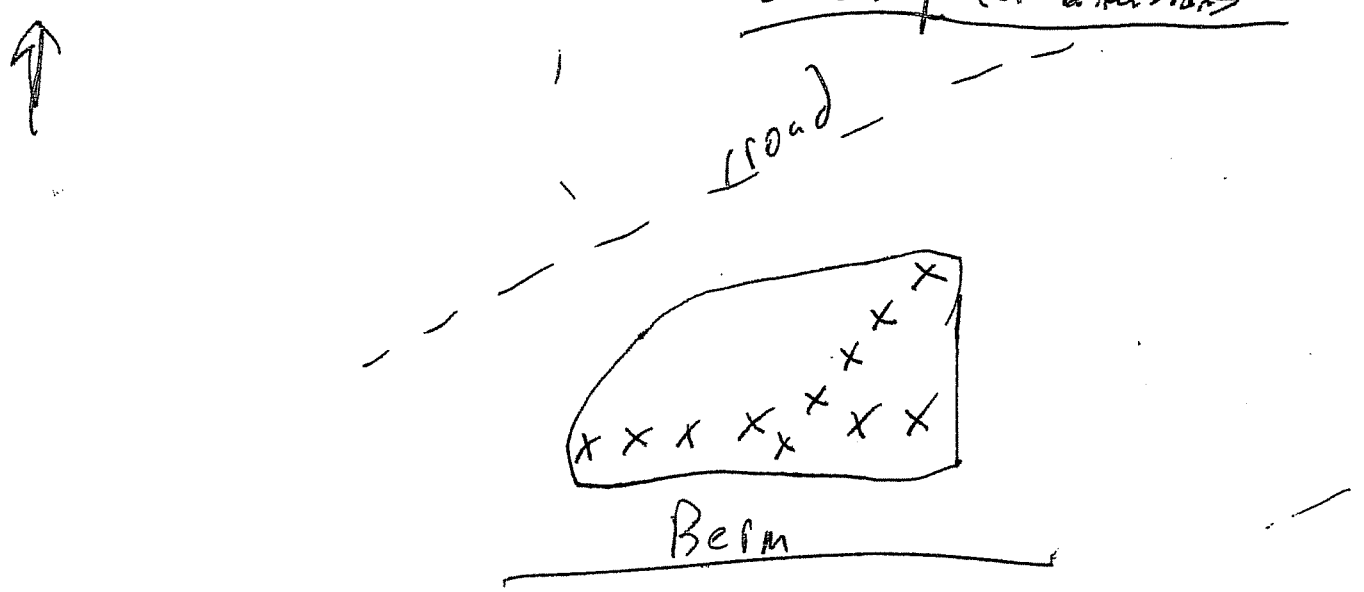
Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

see map for dimensions



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY / LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 29 N

Date: August / 13 /2003 **Time:** 9:30am **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS25

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

see map for pool dimensions

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	11

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 30 E

Date: August / 13 /2003 **Time:** 9:40 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** PS26

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	(cattle)	horses	sheep	other_____
			light	(moderate)	heavy

- ***Land Use of Habitat:*** Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan (claypan) cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

see map for pond dimensions

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLK	100+	"

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 31 S

Date: August / 13 /2003 **Time:** _____ **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS27

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

See map for pond dimensions

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	"

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 323

Date: August / 13 /2003 **Time:** 10:25 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #** B28

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

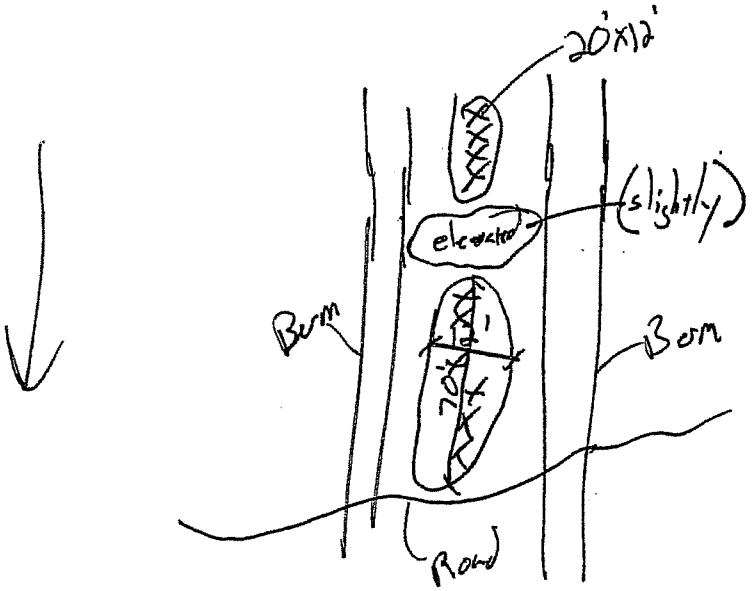
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	"

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 33 E

Date: August / 13 /2003 **Time:** 11:10am **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS29

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	(cattle)	horses	sheep	other_____
			light	(moderate)	heavy

- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

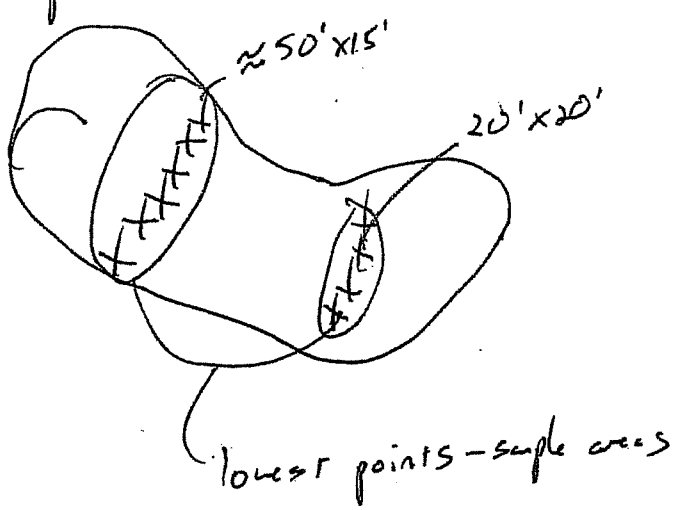
Pool Bottom Surface: (circle where appropriate)

hardpan (claypan) cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

See map for overall pool dimensions.



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY / LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 34 E

Date: August / 13 /2003 **Time:** 11:20 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS30

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

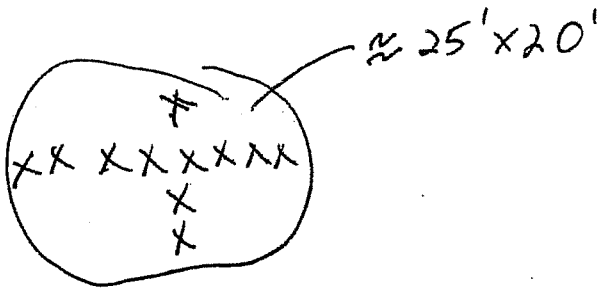
- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRVY/LIOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 35F

Date: August / 13 /2003 **Time:** 11:30 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS31

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

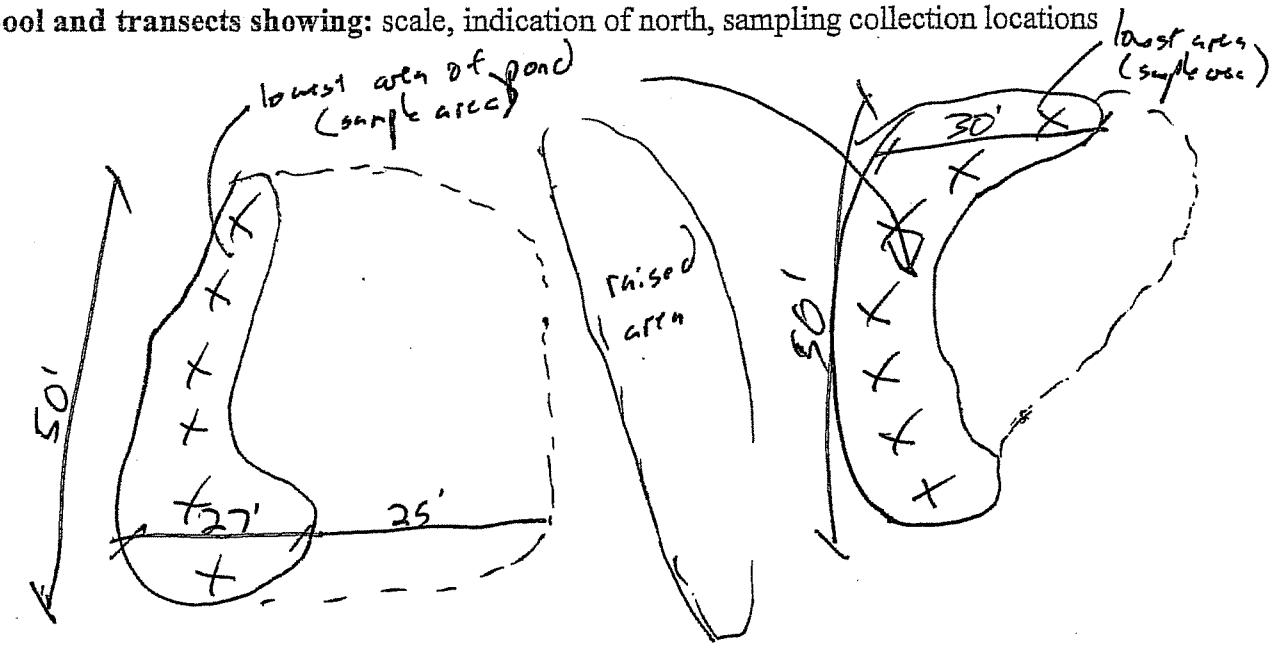
- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRL4	100+	"

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 36 E

Date: August / 13 /2003 **Time:** 11:40 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS32

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

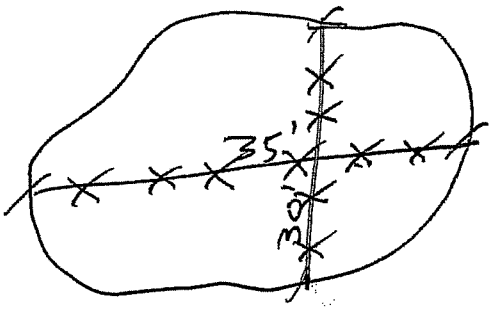
- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	106+	11

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 40E

Date: August / 13 /2003 **Time:** 11:30 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** PS33

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- ***Land Use of Habitat***: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

See map

80m X 15m

L western section

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		6	
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes

37 E

Date: August / ~~14~~ 13 /2003 **Time:** 11:45 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS34

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	(cattle)	horses	sheep	other_____
			light	(moderate)	heavy

- *Land Use of Habitat*: Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan (claypan) cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

78m x 10m — see map

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY	100+	"

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 38E

Date: August / 13 /2003 **Time:** 12:05 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS35

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

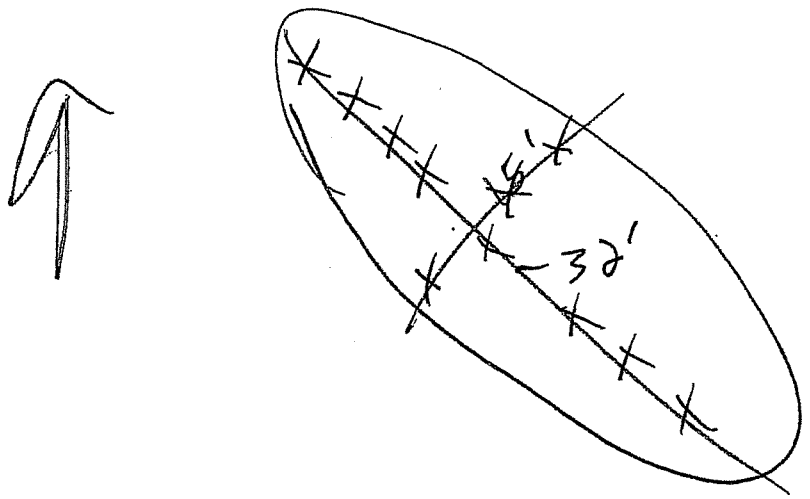
- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy
- *Land Use of Habitat*:	Former oil tank farm;		tanks removed	grazing, open space	

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations



U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	100	BRLY/LEOC	100+/100+	100+

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet Dry Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: _____ no _____ yes

Required color slides and/or photographs for the project site are included: _____ no _____ yes 39 E

Date: August / ~~12~~ 13 /2003 **Time:** 12:00 **County:** San Luis Obispo **Quad:** Pismo Beach

Collector(s): Christopher Rogers (EcoAnalysts, lead), David Wolff, Jason Kirschenstein (Rincon)

Permit #: TE-796284-3

Site/Project Name: Unocal, San Luis Obispo Former Tank Farm **Pool #:** FS36

Township: 31S **Range:** 12E **Section:** 11 **Lat.** _____ **Long.** _____

Habitat Condition: (circle where appropriate)

- undisturbed	disturbed:	tire tracks	garbage	discing/plowing	
- ungrazed	grazed:	cattle	horses	sheep	other_____
			light	moderate	heavy

- ***Land Use of Habitat:*** Former oil tank farm; tanks removed grazing, open space

Pool Bottom Surface: (circle where appropriate)

hardpan claypan cobbly/rocky lava flow other_____

Pool Depth: _____cm (est. maximum) **Surface Area:** _____m2 (est. maximum)

Sketch of pool and transects showing: scale, indication of north, sampling collection locations

Crude Oil

Sample Cancelled

U.S Fish and Wildlife Service Vernal Pool Data Sheet
Dry Season Survey
Soil Analysis

Note: Please fill out the required information completely for each site visit.

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None)	Cyst Density (#/100ml)
1	10		0	
2				
3				
4				
5				
6				
7				
8				
9				
10				

Voucher Specimens
Cysts shall be stored dry and shall be preserved according to the standards of the institution in which they will be accessioned.

Genus (/species)	# Cysts	Catalog/Accession #	Pool #

Appendix E

2004 Dry Season Report

ECOANALYSTS, INC.

166 Buckeye Street
Woodland, California 95695
USA
Phone/Fax: 530-406-1178
eco@ecoanalysts.com • www.ecoanalysts.com

11 October 2004

Dr. Duane Vander Pluym
Rincon Consultants, Inc.
1530 Monterey Street, Suite D
San Luis Obispo, CA 93401

Dear Dr. Vander Pluym,

EcoAnalysts, Inc. conducted additional dry season sampling from previously unsurveyed potential special-status shrimp habitats at the former Unocal Tank Farm in San Luis Obispo, San Luis Obispo County, California, for Rincon Consultants, Inc. (Rincon).

This survey is a follow – up to the prior dry season surveys conducted by EcoAnalysts, Inc. in 2003. During the original survey the federally listed fairy shrimp *Branchinecta lynchi* was recovered from 27 of 36 sampled habitats. No protocol wet season surveys were conducted during the 2003/2004 winter; however, during other field surveys both listed and non - listed fairy shrimp species were observed swimming in habitats not previously sampled and/or not previously identified during or prior to the original dry season sampling event. During this follow – up survey, an additional 31 potential special – status shrimp habitats were surveyed.

It is EcoAnalysts, Inc. understanding that Rincon will submit this report and all other pertinent materials and information to the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (DFG), as required by the USFWS guidelines for a protocol-level survey. EcoAnalysts, Inc. will deposit all cultured special status shrimp and recovered cysts at a USFWS approved museum, such as the Bohart Museum of Entomology at the University of California, Davis, or the California Academy of Sciences in San Francisco.

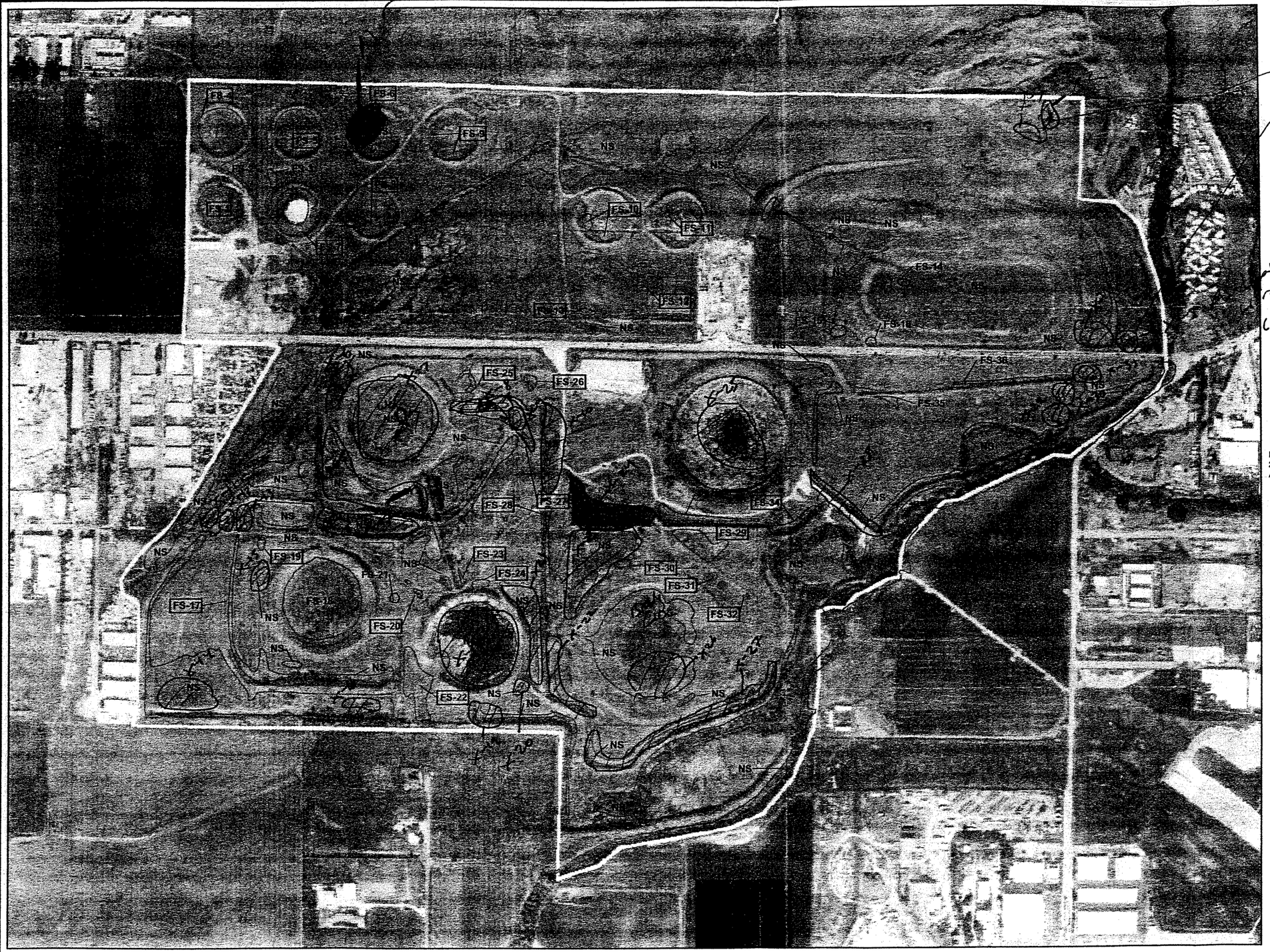
For the purpose of this report, special status shrimp are defined to include shrimp species listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species).

Methods

Rincon had previously prepared a 10-day notification letter, requesting permission to collect soil samples from the potential special-status shrimp habitats at the former Unocal Tank Farm site from the Ventura Branch of the USFWS. Permission was granted on 9 August 2003.

Typical habitats for special-status fairy shrimp in California include vernal pools, ponded areas within vernal swales, rock outcrop ephemeral pools, playas and alkali flats (Eng et al. 1990). Other kinds of depressions that hold water of a similar volume, depth, area, and for a similar duration and seasonality as vernal pools and ponded areas within swales also may be potential habitat. These other depressions, however, are typically artificial habitats and are partially or completely unvegetated. Examples are; railroad toe-drains, road side ditches, abandoned agricultural drains, ruts left by heavy construction vehicles and depressions in fire breaks (Eng et al. 1990; Eriksen & Belk, 1999).

Purple pools w/ BRLX



Areas that had sustained water after Feb 2004 rains

N

EXPLANATION

FAIRY SHRIMP SURVEY RESULTS

FS-36	SOIL SAMPLE COLLECTION LOCATIONS
NS	NOT SUITABLE
FS-34	OBSERVED-CYSTS CULTURED TO BRANCHINEATA LYNCHII IN SAMPLE LOCATIONS
	STATE JURISDICTIONAL WETLAND
	NON-STATE JURISDICTIONAL SOIL SAMPLE COLLECTION LOCATIONS

NOTE:
FAIRY SHRIMP SAMPLING PERFORMED BY RINCON CONSULTANTS IN AUGUST 2003 UNDER THE ECOANALYSTS, INC. PERMIT #TE-796284-3 AND LABORATORY ANALYSIS CONDUCTED BY ECOANALYSTS IN SEPTEMBER 2003.

0 250 500 1000 FEET

APPROXIMATE SCALE

FIGURE 1

PHASE II BIOLOGICAL RESOURCES STUDY
FAIRY SHRIMP DRY SEASON
SURVEY RESULTS

FORMER UNOCAL TANK FARM
SAN LUIS OBISPO, CALIFORNIA

PREPARED FOR

UNOCAL CORPORATION
SAN LUIS OBISPO, CALIFORNIA

ENGLAND GEOSYSTEM
ENVIRONMENTAL ENGINEERING

NOTE:
STATE WETLANDS DELINEATION BY JENESIS ECOLOGICAL SERVICES, 2003.

Y:\GIS_PROJECTS\0147_SolTankFarm\ARC8_MapDocuments\FairyShrimpSurveyMap.mxd 101003

Appendix F

CNDDB Form

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: WHDAB@dfg.ca.gov

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work mm/dd/yyyy: 10/01/2005

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Branchinecta lynchi*

Common Name: vernal pool fairy shrimp

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,0000's Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: 25.00 Number Los Angels Museum Museum / Herbarium

Reporter: David Wolff
Address: P.O. Box 6552
Los Osos, CA 93412
E-mail Address: david@dkwenvironmental.com
Phone: (805) 235-5223

Plant Information

Phenology: ____ % vegetative ____ % flowering ____ % fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
1,000				

☑ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Unocal San Luis Obispo Tank Farm 365 acre site located on the north and south sides of Tank Farm Road between South Higuera and Broad Streets at the border of the City of San Luis Obispo.

County: San Luis Obispo Landowner / Mgr.: Unocal Corporation

Quad Name: Pismo Beach Elevation: _____

T 32 S R 12 E Sec ____ , ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): _____

T____ R ___ Sec ____ , ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

Datum: NAD27☐ NAD83☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: Easting/Longitude 120W.40' Northing/Latitude 35N.15'

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):*

Former petroleum tank farm supporting annual grassland habitat with scattered seasonal wetland ponded habitats.

Other rare taxa seen at THIS site on THIS date:

Site Information Overall site quality: ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Current / surrounding land use: Former petroleum tank farm, tanks have been removed, used for grazing

Visible disturbances:

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

☑ Keyed (cite reference): Fairy Shrimps, Eriksen and Belk
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? ☐ yes ☐ no

FG/WHDAB/1747 Rev.10/20/03