Biological Report

for

Prado Park Commercial Development

Tentative Parcel Map CO 06-0143

APN 076-341-012

Prado Road
San Luis Obispo, California

Prepared for

Prado Park, LLC.
Attention: Byron Davis
625 Mulligan Lane
Arroyo Grande, CA 93420

by

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES
1875 Wellsona Road
Paso Robles, CA 93446
(805) 467-1041

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Synopsis

- This biological report examines a ±20.15-acre property on Prado Road at the south edge of the City of San Luis Obispo, California. As per Mitigation Measure BIO-1.1 from the 2003 Final EIR for the Airport and Margarita Area Specific Plans, this report provides an assessment of affected habitats and describes wetland resources, sensitive natural communities, and special status species on the subject property.
- The applicant proposes development of a commercial subdivision consisting of seven buildings. The property is located on the south side of Prado Road at the southeast corner of San Luis Obispo.
- The property consists of two habitat types: emergent wetland, and ruderal/pasture habitats. Floristic surveys of the property identified 35 species of plants.
- Six special status plants and four special status animals have the potential to occur on or near the property. One special status species, Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) was observed on the property during site surveys conducted in 2008.
- Biological resources that could be impacted by a proposed commercial development project on the property include freshwater emergent wetland, ruderal pasture, common plant and animal species, nesting birds, and special status plant and animal species. The applicant intends to minimize impacts to wetlands and special status plants on the property. Impacts to biological resources can be mitigated to a less than significant level.
- Potential impacts to biological resources are outlined, and mitigation recommendations are provided.

1.0 Introduction

This biological report examines botanical, zoological, and aquatic resources associated with a ±20.15-acre property on Prado Road in the City of San Luis Obispo, California (Figure 1 and 2, pages 37 and 38). Results are reported for floristic and wildlife surveys of the property conducted on March 29, 2007 and September 15, 2008. Also reported is a habitat inventory, and results of database and literature searches of special status species reports in 7.5-minute topographic quads within five miles of the property. Natural communities on the site are identified, special status species that could occur on the property or be affected by the proposed project are discussed, and lists of plant and animal species that were identified or are expected on the property are provided. This report provides agencies and decision makers with information regarding biological resources on the site, and assesses potential impacts to biological resources that could occur from the proposed project. An evaluation of the effect of the proposed project on biological resources is included, and mitigation measures are provided.

This report addresses the requirements of Mitigation Measure BIO-1.1 from the 2003 Final EIR for the Airport and Margarita Area Specific Plans (City of San Luis Obispo/Jones & Stokes, 2003). Mitigation Measure BIO-1.1 requires survey and mapping of special status plant species and special status wildlife species, identification and mapping of sensitive natural communities, if present; delineation of waters and wetlands of the United States, identification of special status species and species of local concern, and mapping and quantification of habitat loss. Measures recommended in this report to protect biological resources associated with the property are consistent with mitigation requirements of the 2003 EIR.

1.1 Project Location and Description

The Prado Park Commercial Center property ("Property"), APN 076-341-012, is located on the south side of Prado Road, east of South Higuera Street, just inside the city limits of San Luis Obispo, California (Figure 1 and 2). The Property is immediately east of Higuera Commerce Park on Prado Road, and immediately north of the Chevron-Unocal Tank Farm, in the City of San Luis Obispo. Other current projects in the vicinity include Tract 2342, Tract 2353, Tract 2428, and the Prado Stormwater Basin, which occurs on the Prado Park property. These nearby projects will collaborate with Prado Park Commercial Development on wetland mitigation. Approximate coordinates for the center of the property are 35.25225° N, 120.66372° W, in the San Luis Obispo United States Geological Survey (USGS) 7.5 minute quadrangle (Figure 2). Elevation varies from approximately 125 to 135 feet above sea level.

1.2 Responsible Parties

TABLE 1. RESPONSIBLE PARTIES. Applicant, agent, biological consultant, and lead agency are provided.

Applicant (Owner)	Engineer
Prado Park, LLC. 625 Mulligan Lane Arroyo Grande, CA 93420 (805) 260-6008 Attention: Byron Davis	Above Grade Engineering 778 Osos Street, Ste. A San Luis Obispo, CA 93401 (805) 540-5115 Contact: Scott Stokes
Biological Consultant	**Lead Agency**
Althouse and Meade, Inc. 1875 Wellsona Road Paso Robles, CA 93446 (805) 467-1041 Contact: LynneDee Althouse	City of San Luis Obispo 990 Palm Street San Luis Obispo, CA 93401 (805) 781-7211 Contact: Neil Havlik

2.0 Methods

The ±20.15-acre property was surveyed for biological resources on March 29, 2007 and September 15, 2008. LynneDee Althouse and Meg Perry, biologists, conducted the surveys. Surveys were conducted on foot in order to compile species lists, to search for special status plants and animals, and to photograph the property. Wildlife documentation included observations of animal presence, nests, tracks, and sign. Birds were identified by sight, using 10 power binoculars, or by vocalizations. Identification of botanical resources included field observations and laboratory analysis of collected material. Botanical nomenclature follows the Jepson Manual, unless otherwise noted. Each habitat type on the property was inspected, described, and catalogued. All plant and animal species observed on the property were identified and recorded.

TABLE 2. BIOLOGICAL SURVEY DATES. Survey dates, times, weather observations, and biologist.

Survey Date	Start Time & Stop Time	Temp.	Wind	Weather Observations	Biologist
3/29/2007	2 to 4 p.m.	–	–	–	LD Althouse
9/15/2008	2:00 p.m. to 4:30 p.m.	75° F	3-5 mph	Warm with steady breeze.	M. Perry

We conducted a search of the California Natural Diversity Database (CNDDB August 31, 2008 data) and the California Native Plant Society (CNPS) On-line Inventory of Rare and Endangered Plants of California (August 22, 2008 update) for special status species known to occur in 7.5 minute topo quads within five miles of the project site. The search area included the Arroyo Grande northeast, Lopez Mountain, Pismo Beach, and San Luis Obispo 7.5 minute USGS quadrangles.

Additional special status species research consisted of reviewing previous biological reports for the area and searching on-line museum and herbarium specimen records for locality data within San Luis Obispo County. We reviewed online databases of specimen records maintained by the Museum of Vertebrate Zoology (MVZ) at the University of California, Berkeley, and the Consortium of California Herbaria. Additional special status species with potential to occur on or near the subject property were added to our special status species list.

Special status species lists produced by database and literature searches were cross-referenced with the known habitat types on the property to identify all potential special status species that could occur on or near the project site. Each special status species with a potential for occurrence on or near the project site is individually discussed.

3.0 Results

3.1 Existing Conditions

The Property consists of approximately twenty acres of gently-sloped to nearly level pasture that was once part of the Unocal Tank Farm, just outside current city limits of San Luis Obispo. The project site is situated on the south side of Prado Road, just east of existing business parks accessed from Empressa or Granada Drive. East of the property are open fields, grazing land, several rural residences, and a small commercial development. A portion of the Unocal Tank Farm, currently managed by Chevron, is located immediately south of the subject site. On the subject property, topsoil and subsoil contaminated with 100 parts per million (ppm) or more total petroleum hydrocarbons (TPH) were identified and mapped by Union Oil Company, the owner of the Tank Farm. The subject property was sold to Prado Park LLC, the current owner, with restrictions on uses of contaminated locations.

Topography is uneven, and has clearly been manipulated by human activities, including placement of fill. Change in relief is limited, with only a few feet difference between the highest and lowest contours on site. Low areas support emergent freshwater wetland. A large swale along the west edge of the property collects and transports stormwater and nuisance water from adjacent neighborhoods. Soil in parts of this swale was moist to the surface in September 2008, and wetland vegetation was dominant. Water flows from uplands into wetlands, and ultimately offsite onto neighboring Unocal Tank Farm property. The Property is currently used for grazing cattle, and has been heavily grazed in the last year. By September 2008, most palatable plants, particularly wetland plants, had been eaten and/or trampled, while less-palatable species, particularly tarweeds and

yellow star thistle, were abundant on uplands. In September 2008, cattle were being fed hay since on-site forage was depleted.

Previous work performed on the subject property include reconnaissance level surveys as part of the Margarita and Airport Areas EIR (City of San Luis Obispo and Jones and Stokes 2003), a protocol level survey for vernal pool fairy shrimp (Wolff 2005), and a preliminary wetland delineation (Wolff 2005). The results of previous work on the property have contributed to this biological report.

3.2 Soils

The United States Department of Agriculture (USDA) Soil Survey of San Luis Obispo County, California, Coastal Part (1984) and USDA SSURGO Data (2008) indicate two soil map units occur on the property: Marimel sandy clay loam, occasionally flooded (169), and Xererts-Xerolls-Urban land complex, 0-15 percent slopes (221). Map units typically encompass one or two dominant soils, which cover more than 50 percent of the mapped area, and one to several included soils, which occur in small patches that are not differentiated in mapping. The subject site is located at the toe of South Hills, a serpentine ridge. Serpentine is a metamorphic rock that has high levels of metals such as iron, nickel, copper, manganese, and magnesium, while calcium levels are very low. Soils derived from serpentine have cation and nutrient balances that can restrict plant growth. Soils on the subject site have been manipulated for the tank farm, and fill was placed on some areas of the Property. Therefore, soils conditions on site vary somewhat from characteristics of soil map units delineated by the NRCS.

3.3 Habitat Types

Two habitat types, freshwater emergent wetland and ruderal/pasture were mapped on the property (Figure 4, Biological Resource Map). All areas of the property are substantially disturbed by historic manipulation of the site and current use as a cattle feeding area.

3.3.1 Freshwater emergent wetland

A managed drainage swale runs along the western edge of the property, transporting stormwater from outfalls at Prado Road southward onto the tank farm. The floor of this swale supports wetland plants, including spikerush (*Eleocharis macrostachya*), flat-stem rush (*Juncus phaeocephalus*), curly rush (*Juncus mexicanus*), and rabbits-foot grass (*Polypogon monspeliensis*). Near the south end of the parcel, the low-lying area is broader and the channel is less well defined; wetland occupies all of this broad low-lying area. Some additional wetland plants are present in the southern wetland, including bird's foot trefoil (*Lotus corniculatus*), curly dock (*Rumex crispus*), meadow barley (*Hordeum brachyantherum*) and Mediterranean barley (*Hordeum marinum*).

A finger of seasonal wetlands extends from the eastern border southward between a natural hill to the east and artificial fill to the west. This wetland extends southward where it meets wetlands in the western drainage swale. On the original wetland delineation map (Figure 5, Wolff, 2005) this "finger" was described as wetland waters; however, no bed or bank features indicative of waters are visible on the site, and the wetland merely represents a low topographic area where water sits for long periods and hydrophytic vegetation is dominant. A revised wetland delineation is provided as Figure

6. Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), a special status plant (CNPS List 1B.2), is present in the southern wetland and intermittently in the "finger" of seasonal wetlands that occur near the eastern edge of the site, occurring near the interface between wetlands and upland. In 2008, wetlands on site were trampled and nearly stripped of vegetation by cattle. The Wolff Environmental 2005 delineation identifies the locations of wetlands and waters on site (Figure 5). An updated map has been prepared by Althouse and Meade, Inc. to include additional areas of potentially jurisdictional wetland along the eastern edge of the property and to correct areas labeled as wetland waters that do not actually have bed and bank features (Figure 6). The updated wetland delineation determined that freshwater emergent wetland occupies approximately 2.59 acre of the subject site.

3.3.2 Ruderal pasture

The remainder of the property, approximately 17.56 acre, consists of manipulated pasture dominated by weeds. In the spring, non-native grasses grow interspersed with seedlings of warm-season weeds that become dominant by the end of summer. Preferential grazing of more desirable forage plants combined with disturbance of the pasture from trampling and over-grazing promotes increased populations of weedy species. The most commonly observed grasses in ruderal pasture habitat at Prado Park property are soft-chess brome (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum*), and Bermuda grass (*Cynodon dactylon*). By late summer, upland areas of the site are dominated by hayfield tarweed (*Hemizonia congesta* ssp. *luzulifolia*), bull thistle (*Cirsium vulgare*), yellow star thistle (*Centaurea solstitialis*), and black mustard (*Brassica nigra*).

3.4 Plant List

Floristic surveys conducted in March 29, 2007 and September 2008 identified 35 species of plants on the property (Table 3). Surveys were floristic in nature, identifying all species encountered, and were conducted at appropriate times of the year to locate potential special status species.

TABLE 3. PLANT LIST. The 35 species of plants identified on the property consist of 9 native species and 26 introduced species. One special status plant species, Congdon's tarplant, was observed on the property.

Scientific Name	Special Status	Origin	Common Name
Herbs - 25 Species			
Anthemis cotula	None	Introduced	Mayweed
Brassica nigra	None	Introduced	Black mustard
Carduus pycnocephalus	Noxious Weed (CA C-list)	Introduced	Italian thistle
Centaurea calcitrapa	Noxious Weed (CA A-list)	Introduced	Purple star thistle

Scientific Name	Special Status	Origin	Common Name
Centaurea solstitialis	Noxious Weed (CA C-list)	Introduced	Yellow star thistle
Centromadia parryi ssp. *congdonii*	CNPS List 1B.2	Native	Congdon's tarplant
Cichorium intybus	None	Introduced	Chicory
Cirsium vulgare	None	Introduced	Bull thistle
Eleocharis macrostachya	None	Native	Common spikerush
Erodium botrys	None	Introduced	Storksbill
Foeniculum vulgare	None	Introduced	Fennel
Heliotropium curassavicum	None	Native	Heliotrope
Hemizonia congesta ssp. *luzulifolia*	None	Native	Hayfield tarweed
Juncus mexicanus	None	Native	Curly rush
Juncus phaeocephalus	None	Native	Brown-headed rush
Lactuca serriola	None	Introduced	Prickly lettuce
Lotus corniculatus	None	Native	Birdfoot trefoil
Medicago polymorpha	None	Introduced	California burclover
Picris echioides	None	Introduced	Bristly ox-tongue
Plantago lanceolata	None	Introduced	English plantain
Polygonum arenastrum	None	Introduced	Common knotweed
Rumex crispus	None	Introduced	Curly dock
Trifolium fragiferum	None	Introduced	Strawberry clover
Xanthium spinosum	None	Introduced	Spiny cocklebur
Xanthium strumarium	None	Introduced	Cocklebur
Grasses - 10 Species			
Bromus hordeaceus	None	Introduced	Soft chess brome
Cynodon dactylon	None	Introduced	Bermuda grass
Festuca arundinacea	None	Introduced	Tall fescue
Hordeum brachyantherum	None	Native	Meadow barley
Hordeum marinum ssp. *gussoneanum*	None	Introduced	Mediterranean barley
Hordeum murinum	None	Introduced	Foxtail barley
Leymus triticoides	None	Native	Creeping wild rye
Poa annua	None	Introduced	Annual blue-grass
Polypogon monspeliensis	None	Introduced	Annual beard grass
Vulpia myuros	None	Introduced	Rat-tail fescue

3.5 Wildlife List

More than 61 animal species have the potential to occur on the property (Table 4). These include at least two amphibians, seven reptiles, 38 birds, and 14 mammals. Pasture on the Property provides some foraging habitat for raptors and predators, including American kestrel, fox, and coyote. Mule deer, raccoon, opossum, and striped skunk are likely to forage along the drainage and in adjoining residential neighborhoods. Chorus frog was observed in the drainage, and western toad is also likely to use seasonal aquatic habitat to breed. Gopher snake and garter snake are likely residents on site, and other common snake species may also occur. Several species of ground-nesting birds, including western meadowlark, California quail, and mourning dove, were observed on the property and could nest in upland areas. A flock of immature quail was flushed from beneath a tangle of thistles during a site visit on September 15, 2008. Several rodent species (e.g., California vole, harvest mouse) are expected to be residents on the property; however, no trapping was conducted as part of this study.

TABLE 4. WILDLIFE LIST. More than 61 animal species have the potential to occur on the property. The Special Status column indicates listing status of the organism under the Federal Endangered Species Act, the State Endangered Species Act, or by the CDFG (see Appendix A for status definitions). Species observed on the property during our surveys are designated by the check symbol (✓) in the fourth column.

Common Name	Scientific Name	Special Status	Found on the Property	Habitat Type
Amphibians - 2 species				
California (Western) Toad	*Bufo boreas halophilus*	None		Grassland, woodland
Pacific Chorus Frog	*Pseudacris regilla*	None	✓	Many habitats near water
Reptiles - 7 species				
Western Yellow-bellied Racer	*Coluber constrictor mormon*	None		Grasslands, open areas
California Alligator Lizard	*Elgaria multicarinata multicarinata*	None		Open grassland, woodland, chaparral
Pacific Gopher Snake	*Pituophis catenifer catenifer*	None		Woodland, grassland, rural
California Kingsnake	*Lampropeltis getula californiae*	None		Woodland, grassland, streams
Western Fence Lizard	*Sceloporus occidentalis*	None		Wide range
Coast Garter Snake	*Thamnophis elegans terrestris*	None		Many habitats near water
Valley Garter Snake	*Thamnophis sirtalis fitchii*	None		Many habitats near water
Birds - 38 species				

Common Name	Scientific Name	Special Status	Found on the Property	Habitat Type
Red-winged Blackbird	*Agelaius phoeniceus*	None		Marshes, fields
Grasshopper Sparrow	*Ammodramus savannarum*	PRBO 2nd Priority[1]		Grassland hillsides
American Pipit	*Anthus rubescens*	None		Fields, beaches, etc.
Western Scrub Jay	*Aphelocoma californica*	None		Oak, riparian woodlands
Great Egret	*Ardea alba*	None		Grasslands, wetlands, etc.
Great Blue Heron	*Ardea herodias*	None		Water habitats, grasslands
Great Horned Owl	*Bubo virginianus*	None		Woodland, grassland
Red-tailed Hawk	*Buteo jamaicensis*	None		Open, semi-open country
California Quail	*Callipepla californica*	None	✓	Shrubby habitats
Anna's Hummingbird	*Calypte anna*	None		Many habitats
American Goldfinch	*Carduelis tristis*	None		Weedy fields, woodlands
House Finch	*Carpodacus mexicanus*	None		Riparian, grasslands, chaparral, and woodlands
Turkey Vulture	*Cathartes aura*	None		Open country
Killdeer	*Charadrius vociferous*	None		Mud flats, stream banks
Northern Harrier	*Circus cyaneus*	SSC		Nest on ground in tall reeds or grasses
Rock Dove	*Columba livia*	None		Urban areas
American Crow	*Corvus brachyrhynchos*	None		Many habitats, esp. urban
Yellow-rumped Warbler	*Dendroica coronata*	None		Woodlands, brush, open country
California Horned Lark	*Eremophila alpestris actia*	SSC		Grassland, oak savanna
Brewer's Blackbird	*Euphagus cyanocephalus*	None	✓	Open habitats
Merlin	*Falco columbarius*	SSC		Open country with adjacent woodlands
American Kestrel	*Falco sparverius*	None		Open, semi-open country
Common Yellowthroat	*Geothlypis trichas*	None		Marshes, streamsides
Barn Swallow	*Hirundo rustica*	None		Riparian, grasslands, lakes
Loggerhead Shrike	*Lanius ludovicianus*	SSC		Nests in shrubs, trees near open areas

[1] PRBO 2nd Priority: Point Reyes Bird Observatory, Bird Species of Special Concern (BSSC) listing status.

Common Name	Scientific Name	Special Status	Found on the Property	Habitat Type
Northern Mockingbird	*Mimus polyglottos*	None		Riparian, chaparral and woodlands. Also urban
Brown-headed Cowbird	*Molothrus ater*	None	✓	Rural areas, ranches
House Sparrow	*Passer domesticus*	None		Urban
Savannah Sparrow	*Passerculus sandwichensis*	None		Open habitats, marshes, grasslands
Blue Grosbeak	*Passerina caerulea*	None		Woodland edges, streams
Black Phoebe	*Sayornis nigricans*	None		Near water
Say's Phoebe	*Sayornis saya*	None		Open country, grassland
Western Meadowlark	*Sturnella neglecta*	None	✓	Open habitats, grasslands
European Starling	*Sturnus vulgaris*	None	✓	Agricultural, livestock areas
Violet-green Swallow	*Tachycineta thalassina*	None		Oak, riparian woodlands, open areas near water
Western Kingbird	*Tyrannus verticalis*	None		Grasslands, savanna
Barn Owl	*Tyto alba*	None		Agricultural, woodlands
Mourning Dove	*Zenaida macroura*	None	✓	Open and semi-open habitats
Mammals - 14 species				
Coyote	*Canis latrans*	None		Open woodlands, brushy areas, wide ranging.
Opossum	*Didelphis marsupialis*	None		Woodlands, streams
Feral Cat	*Felis catus*	None	✓	Varied
Black-tailed Jackrabbit	*Lepus californicus*	None	✓	Grasslands
Striped Skunk	*Mephitis mephitis*	None		Mixed woods, brush, semi-open country
California Vole	*Microtus californicus*	None		Grassland meadows
Mule Deer	*Odocoileus hemionus*	None		Many habitats
Deer Mouse	*Peromyscus maniculatus*	None		All dry land habitats
Raccoon	*Procyon lotor*	None		Streams, lakes, rock cliffs, dens in trees
Western Harvest Mouse	*Reithrodontomys megalotis*	None		Grassland, dense vegetation near water
California Ground Squirrel	*Spermophilus beecheyi*	None	✓	Grasslands
Desert Cottontail	*Sylvilagus audubonii*	None		Brushy habitats

Common Name	Scientific Name	Special Status	Found on the Property	Habitat Type
Valley Pocket Gopher	*Thomomys bottae*	None		Variety of habitats
Red Fox	*Vulpes fulva*	None		Forest and open country

3.6 Special Status Plants and Animals

The CNDDB and the CNPS On-line Inventory of Rare and Endangered Plants of California contain records for 71 special status species and five sensitive natural communities within the designated search area. The search area included the Arroyo Grande NE, Lopez Mountain, Pismo Beach, and San Luis Obispo USGS 7.5 minute quadrangles (Table 5). Appropriate habitat and soil conditions are present for six special status plants and six special status animals. Figures 7 and 8 depict the current GIS data for special status species mapped in the vicinity of the project areas.

3.6.1 Introduction to CNPS Lists

Plant species are considered rare when their distribution is confined to localized areas, when there is a threat to their habitat, when they are declining in abundance, or are threatened in a portion of their range. The listing categories range from species with a low threat (List 4) to species that are presumed extinct (List 1A). The 1072 plants of List 1B (as of August 22, 2008) are rare throughout their range. All but a few species are endemic to California. All are judged to be vulnerable under present circumstances, or to have a high potential for becoming vulnerable. For an explanation of the CNPS listing scheme and CNDDB status codes, see Appendix A.

3.6.2 Introduction to CNDDB definitions

"Special Plants" is a broad term used to refer to all the plant taxa inventoried by the CNDDB, regardless of their legal or protection status (CDFG 2008a). Special plants include vascular plants and high priority bryophytes (mosses, liverworts, and hornworts).

"Special Animals" is a general term that refers to all of the animal taxa inventoried by the CNDDB, regardless of their legal or protection status (CDFG 2008b). These taxa may be listed or proposed for listing under the State and/or Federal Endangered Species Acts, but they may also be species deemed biologically rare, restricted in range, declining in abundance, or otherwise vulnerable.

Animals listed as California Species of Special Concern (SSC) are not listed under State or Federal Endangered Species Acts, but are considered rare or declining in abundance. The Special Concern designation is intended to provide the Department of Fish and Game, consulting biologists, land planners and managers with lists of species that require special consideration during the planning process in order to avert continued population declines and potential costly listing under federal and state endangered species laws. For many species of birds, the primary emphasis is on the breeding population in California. For some species which do not breed in California but winter here, emphasis is on

wintering range. The SSC designation thus may include a comment regarding the specific protection provided such as nesting or wintering.

Animals listed as Fully Protected are those species that are considered by CDFG as rare or faced with possible extinction. Most, but not all, have subsequently been listed under the California Endangered Species Act (CESA) or the Federal Endangered Species Act (FESA). Fully Protected species may not be taken or possessed at any time and no provision of the CDFG Code or any other law authorizes the issuance of permits or licenses to take any Fully Protected species.

For an explanation of the CNDDB status codes, refer to Appendix A.

3.6.3 Special status species list

Table 5 lists all seventy-one special status species and five sensitive natural communities known to occur in the vicinity of the project site. Federal and state status, global and state rank, CNPS listing status (plants), and CDFG designation (animals) for each species are given. Typical blooming period, habitat preference, potential habitat on site, whether or not the species was observed on the property and the effect of the proposed activity are also provided.

TABLE 5. SPECIAL STATUS SPECIES LIST. Seventy-one special status species and five sensitive natural communities were determined by our research to occur in the Arroyo Grande NE, Lopez Mountain, Pismo Beach, and San Luis Obispo quadrangles. Six special status plants and four special status animals could potentially occur on the property. Potential impacts are outlined in section 5.0, and mitigation recommendations are provided in section 6.0.

	Common and Scientific Names	Fed/State Status Global/State Rank CNPS List	Blooming Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
	Plants						
1.	**Hoover's Bent Grass** *Agrostis hooveri*	None/none G3/S2.2 List 1B.2	April - July	Sandy soil in oak woodland habitat; <600 m. Endemic to SLO & SB Counties.	No. Appropriate soil and habitat not present.	No	Not Significant
2.	**Arroyo de la Cruz Manzanita** *Arctostaphylos cruzensis*	None/none G2/S2.2 List 1B.2	December - March	Sandy bluffs; <150 m. c CCo (s Monterey, nw SLO Counties)	No. Occurs on buttes east of Morro Bay and northward.	No	Not Significant
3.	**Santa Lucia Manzanita** *Arctostaphylos luciana*	None/none G2/S2.2 List 1B.2	February - March	Shale outcrops, slopes, chaparral, 500-700 m. Cuesta Pass, SLO County.	No. Appropriate habitat is not present on Property.	No	Not Significant
4.	**Morro Manzanita** *Arctostaphylos morroensis*	Threatened/none G2/S2.2 List 1B.1	December - March	Sand dunes; <200 m. s CCo (Morro Bay, SLO County)	No. Property is outside known range of this species.	No	Not Significant
5.	**Pecho Manzanita** *Arctostaphylos pechoensis*	None/none G2/S2.2 List 1B.2	November - March	Shale outcrops, chaparral, coniferous forest; <850 m. s CCo (Pecho Hills, SLO)	No. Appropriate shale outcrops are not present on the property.	No	Not Significant
6.	**Santa Margarita Manzanita** *Arctostaphylos pilosula*	None/none G2/S2.2 List 1B.2	December - March	Shale outcrops, slopes, chaparral; 300-1100 m. s SCoRO Endemic to SLO County	No. Appropriate outcrops and plant communities do not occur on site.	No	Not Significant
7.	**Wells's Manzanita** *Arctostaphylos wellsii*	None/none G2/S2.1? List 1B.1	December - May	Sandstone outcrops in chaparral, oak woodland. <400 m. s CCo (hills se of San Luis Obispo)	No. Appropriate habitat and substrate do not occur on site.	No	Not Significant
8.	**Marsh Sandwort** *Arenaria paludicola*	Endangered/ Endangered G1/S1.1 List 1B.1	May - August	Boggy meadows, marshes <300 m. s CCo (Nipomo Mesa, SLO County, Santa Ana River, SCo)	No. Property is outside known range of species.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank CNPS List	Blooming Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
9.	**Miles' Milk-vetch** *Astragalus didymocarpus* var. *milesianus*	None/none G5T2/S2.2 List 1B.2	March - June	Clay or serpentine soils in coastal scrub, grassy areas near coast. 0-90 m. Endemic to SLO County	No. Appropriate soil is present but habitat is significantly degraded.	No	Not Significant
10.	**San Luis Obispo Mariposa-Lily** *Calochortus obispoensis*	None/none G2/S2.1 List 1B.2	May - July	Dry serpentine gen in chaparral; 100-500 m. SCoRO Endemic to SLO County	No. Appropriate soil and habitat type not present on site.	No	Not Significant
11.	**La Panza Mariposa-Lily** *Calochortus simulans*	None/none G2/S2.3 List 1B.3	April - May	Grassland, oak woodland & pine forest, on sand, granite, or serpentine; <1100 m. Endemic to SLO County	No. Appropriate habitat is not present on site.	No	Not Significant
12.	**Cambria Morning Glory** *Calystegia subacaulis* ssp. *episcopalis*	None/none G3T1/S1.2 List 1B.2	April - May	Dry, open scrub, woodland, or grassland; <500 m. c SCoRO; Endemic to SLO County	No. Appropriate habitat not present on site.	No	Not Significant
13.	**San Luis Obispo Sedge** *Carex obispoensis*	None/none G2/S2.2 List 1B.2	April - June	Serpentine springs, stream sides; <600 m. Endemic to SLO County	Yes. Appropriate moist habitat is present.	No	Not Significant
14.	**Obispo Indian Paintbrush** *Castilleja densiflora* ssp. *obispoensis*	None/none G5T2/S2.2 List 1B.2	April	Coastal grassland, <100 m. Endemic to SLO County.	Yes. Moderately appropriate habitat consists of ruderal pasture.	No	Not Significant
15.	**Congdon's Tarplant** *Centromadia parryi* ssp. *congdonii*	None/none G4?T1/S1.1 List 1B.2	May - November	Mesic grassland, open ground; <100 m. CW	Yes. Appropriate moist habitat is present.	Yes	Not Significant with Mitigation
16.	**Dwarf Soaproot** *Chlorogalum pomeridianum* var. *minus*	None/none G5T1/S1.2 List 1B.2	May - August	Serpentine outcrops in chaparral; gen <750 m. NCoRI, SnFrB, SCoRO	No. Appropriate habitat is not present.	No	Not Significant
17.	**Brewer's Spineflower** *Chorizanthe breweri*	None/none G2/S2.2 List 1B.3	May - August	Chaparral, foothill woodland on serpentine; <800 m. Endemic to SLO County	No. Appropriate habitat not present on site.	No	Not Significant
18.	**Straight-awned Spineflower** *Chorizanthe rectispina*	None/none G1/S1.2 List 1B.3	May - July	Chaparral, dry woodland in sandy soil; 200-600 m. SCoRO	No. Appropriate soil and habitat type not present on site.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank CNPS List	Blooming Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
19.	**Chorro Creek Bog Thistle** *Cirsium fontinale* var. *obispoense*	Endangered G2T1/S1.2 List 1B.2	February - July	Serpentine seeps and streams; <300 m. c SCoRO Endemic to SLO County	Yes. Appropriate moist habitat is present.	No	Not Significant
20.	**Surf Thistle** *Cirsium rhothophilum*	None/Threatened G2/S2.2 List 1B.2	April - June	Dunes, bluffs; <20 m. s CCo (s SLO, n SB Counties)	No. Appropriate dune or coastal bluff habitats not present on the property.	No	Not Significant
21.	**Pismo Clarkia** *Clarkia speciosa* ssp. *immaculata*	Endangered/Rare G4T1/S1.1 List 1B.1	May - July	Sandy hills near coast; <100 m. s CCo (±Pismo to Edna, SLO County)	No. Appropriate soil and habitat not present on the property.	No	Not Significant
22.	**Leafy Tarplant** *Deinandra increscens* ssp. *foliosa*	None/none G4G5T2/S2.2 List 1B.2	June - September	Sandy soils in valley and foothill grassland; 300-500 m. s SCoR	No. Appropriate soil and habitat not present on the property.	No	Not Significant
23.	**Dune Larkspur** *Delphinium parryi* ssp. *blochmaniae*	None/none G4T3/S2.2 List 1B.2	April - May	Coastal chaparral, sand. 0-200 m. s CCo	No. Appropriate soil and habitat not present on the property.	No	Not Significant
24.	**Beach Spectaclepod** *Dithyrea maritima*	None/Threatened G2/S2.1 List 1B.1	March - May	Sea shores, sandy soils on dunes near the shore; <50 m s CCo, SCo, Baja CA.	No. Appropriate habitat is not present on the property.	No	Not Significant
25.	**Betty's Dudleya** *Dudleya abramsii* ssp. *bettinae*	None/none G3T1/S1.2 List 1B.2	May - July	Rocky outcrops in serpentine grassland; <50-180 m. Endemic to SLO County	No. Appropriate habitat is not present on the property.	No	Not Significant
26.	**Mouse-Gray Dudleya** *Dudleya abramsii* ssp. *murina*	None/none G3T2/S2.3 List 1B.3	May - June	Serpentine outcrops; 120-300 m. Endemic to SLO County	No. Appropriate habitat is not present on the property.	No	Not Significant
27.	**Blochman's Dudleya** *Dudleya blochmaniae* ssp. *blochmaniae*	None/none G2T2/S2.1 List 1B.1	April - June	Open, rocky slopes, often serpentine or clay soils; <450 m. s CCo, SCo	No. Appropriate habitat is not present on the property.	No	Not Significant
28.	**Blochman's Leafy Daisy** *Erigeron blochmaniae*	None/none G2/S2.2 List 1B.2	July - August	Sand dunes and hills; <30 m. s CCo	No. Appropriate habitat is not present on the property.	No	Not Significant
29.	**Indian Knob Mountain Balm** *Eriodictyon altissimum*	Endangered/ Endangered G2Q/S2.2 List 1B.1	March - June	Sandstone ridges, chaparral; 250± m. Endemic to SLO County	No. Appropriate habitat is not present on the property.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank CNPS List	Blooming Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
30.	**Hoover's Button-celery** *Eryngium aristulatum* var. *hooveri*	None/none G5T2/S2.1 List 1B.1	July	Vernal pools, lagunas; 0-1000 m. s SnFrB, SCoR	Yes. Appropriate moist habitat is present.	No	Not Significant
31.	**San Benito Fritillary** *Fritillaria viridea*	None/none G3/S3.2 List 1B.2	March - May	Serpentine slopes; 200-1500 m. SCoR (San Benito, SLO Counties)	No. Appropriate habitat is not present on the property.	No	Not Significant
32.	**Mesa Horkelia** *Horkelia cuneata* ssp. *puberula*	None/none G4T2/S2.1 List 1B.1	February - September	Dry, sandy coastal chaparral; gen 70-700 m. SCoRO, SCo.	No. Appropriate soil and habitat type not present on the property.	No	Not Significant
33.	**Jones's Layia** *Layia jonesii*	None/none G1/S1.1 List 1B.2	March - May	Open serpentine or clay slopes; <400 m. Endemic to SLO County	No. Appropriate soil and habitat types are not present on site.	No	Not Significant
34.	**San Luis Obispo County Lupine** *Lupinus ludovicianus*	None/none G2/S2.2 List 1B.2	April - July	Open, grassy limestone in oak woodland; 50-500 m. Endemic to SLO County	No. Appropriate soil type is not present on site.	No	Not Significant
35.	**Palmer's Monardella** *Monardella palmeri*	None/none G2/S2.2 List 1B.2	June - August	Serpentine soils in chaparral, forest; 200-800 m. SCoRO	No. Appropriate soil and habitat type not found on site.	No	Not Significant
36.	**Adobe Sanicle** *Sanicula maritima*	None/Rare G2/S2.2 List 1B.1	February - May	Coastal, grassy, open wet meadows, ravines; ±150 m. CCo (SLO County)	Yes. Appropriate moist habitat is present.	No	Not Significant
37.	**Black-flowered Figwort** *Scrophularia atrata*	None/none G2/S2.2 List 1B.2	March - July	Closed-cone coniferous forest, riparian scrub, dune habitats; in sand, diatomaceous shales, calcareous and other soil types. 10-250 m. s SCoRO	No. Appropriate soil and habitat type not found on site.	No	Not Significant
38.	**Rayless Ragwort** *Senecio aphanactis*	None/none G3?/S1.2 List 2.2	January - April	Drying alkaline flats, chaparral, cismontane woodland, coastal scrub; <400 m. CW, SCo, Chi	No. Appropriate soil and habitat type not found on site.	No	Not Significant
39.	**Cuesta Pass Checkerbloom** *Sidalcea hickmanii* ssp. *anomala*	None/Rare G3T1/S1.2 List 1B.2	May - June	Closed-cone-conifer forest, gen serpentine; 600-800 m. Endemic to SLO County	No. Appropriate soil and habitat type not present on site.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank CNPS List	Blooming Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
40.	**Most-beautiful Jewel-flower** *Streptanthus albidus* ssp. *peramoenus*	None/none G2T2/S2.2 List 1B.2	April - June	Open, grassy or +/- barren slopes, often serpentine; +/- 150-800 m. c SCoRO	No. Appropriate substrate not present on site.	No	Not Significant
41.	**Saline Clover** *Trifolium depauperatum* var. *hydrophilum*	None/none G5T2?/S2.2? List 1B.2	April - June	Salt Marshes, open areas in alkaline soils; <300 m. ScV, CW.	No. Appropriate substrate not present on site.	No	Not Significant
42.	**Caper-fruited Tropidocarpum** *Tropidocarpum capparideum*	None/none G1/S1.1 List 1B.1	March - April	Alkaline clay soil in valley and foothill grassland; 1-455 m. SCoRO, nw SnJV	No. Appropriate habitat is not present on site.	No	Not Significant

Habitat characteristics are from the Jepson Manual and the CDNNB.
*not listed in the CNDDB or CNPS for the search area, but possible for the location.

Abbreviations used by CNPS and CNDDB:

CCo: Central Coast
SCo: South Coast
SCoR: South Coast Ranges
SCoRO: Outer South Coast Ranges
SCoRI: Inner South Coast Ranges

SnFrB: San Francisco Bay
TR: Transverse Ranges
WTR: Western Transverse Ranges
SnJV: San Joaquin Valley
SLO: San Luis Obispo

SN: Sierra Nevada
SnJt: San Jacinto Mtns
Teh: Tehachapi Mtn Area
CW: Central West
SW: South West

	Common and Scientific Names	Fed/State Status Global/State Rank DFG Rank	Nesting/ Breeding Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
Animals							
43.	**Southwestern Pond Turtle** *Actinemys marmorata pallida*	None/none G3G4T2T3Q/S2 SSC	April - August	Permanent or semi-permanent streams, ponds, lakes.	No. Appropriate aquatic habitat is not present.	No	Not Significant
44.	**Tricolored Blackbird** *Agelaius tricolor*	None/none G2G3/S2 SSC (Nesting)	March 15 through August 15	Requires open water, protected nesting substrate, & foraging area with insect prey near nesting colony.	No. Appropriate nesting habitat is not present on site.	No	Not Significant
45.	**California Tiger Salamander** *Ambystoma californiense*	Threatened/none G2G3/S2S3 SSC	Rainy season	Need underground refuges, ground squirrel burrows & vernal pools or other seasonal water for breeding.	Unlikely. Pools on site are within drainages. Records from the area are historic.	No	Not Significant
46.	**Silvery Legless Lizard** *Anniella pulchra pulchra*	None/none G3G4T3T4Q/S3 SSC	May - September	Sandy or loose loamy soils under coastal scrub or oak trees. Soil moisture essential.	No. Appropriate habitat is not present on site.	No	Not Significant
47.	**Pallid Bat** *Antrozous pallidus*	None/none G5/S3 SSC	Spring - Summer	Rock crevices, caves, tree hollows, mines, old buildings, and bridges.	No. Appropriate roosts for bats are not present.	No	Not Significant
48.	**Burrowing Owl** *Athene cunicularia*	None/none G4/S2 SSC (Burrow sites, some wintering sites)	March 15 through August 15	Burrows in squirrel holes in open habitats with low vegetation.	Yes. Moderately appropriate wintering and nesting habitat present on the property.	No	Not Significant With Mitigation
49.	**Vernal Pool Fairy Shrimp** *Branchinecta lynchi*	Threatened/none G3/S2S3 None	Rainy Season	Clear water sandstone depression pools, grassed swale, earth slump, or basalt flow depression pools.	Yes. Moderately appropriate pool habitat is present on the property, but protocol surveys were negative.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank DFG Rank	Nesting/ Breeding Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
50.	**Ferruginous Hawk*** *Buteo regalis*	None/none G4/S3S4 Special Animal (Wintering)	October - April (Wintering)	Winters locally in open grassland or savannah habitats. More common in interior SLO County than coast.	Unlikely. Foraging habitat is present. .	No	Not Significant
51.	**Western Snowy Plover** *Charadrius alexandrinus nivosus*	Threatened/none G4T3/S2 SSC	March 15 through August 15	Sandy beaches, salt pond levees, & shorelines of large alkali lakes. Needs friable soils for nesting.	No. Appropriate nesting habitat is not present on the property.	No	Not Significant
52.	**Sandy Beach Tiger Beetle** *Cicindela hirticollis gravida*	None/none G5T4/S1 Special Animal	n/a	Adjacent to non-brackish water near the coast from San Francisco to N. Mexico. Clean, dry, light-colored sand in the upper zone.	No. Appropriate habitat is not present on the property.	No	Not Significant
53.	**Western Yellow-billed Cuckoo** *Coccyzus americanus occidentalis*	Candidate/ Endangered G5T2Q/S1 Special Animal	March 15 through August 15	Nests in riparian jungles of willow, cottonwood, w/ blackberry, nettles, or wild grape understory. Typically found in larger river systems.	No. Appropriate nesting habitat is not present on the property.	No	Not Significant
54.	**Townsend's Big-eared Bat** *Corynorhinus townsendii*	None/none G4T3T4/S2S3 SSC	Spring - Summer	Caves, buildings, and mine tunnels. Cave like attics as day roosts. On coast roosts are normally within 100 m. of creeks.	No. Appropriate roosting habitat is not present on site.	No	Not Significant
55.	**Monarch Butterfly** *Danaus plexippus*	None/none G5/S3 Special Animal	September - March (aggregations)	Roosts located in wind-protected tree groves with nectar and water nearby.	No. Appropriate aggregation habitat is not present on the property.	No	Not Significant
56.	**White-tailed Kite** *Elanus leucurus*	None/none G5/S3 Fully Protected	March 15 through August 15	Nests in dense tree canopy near open foraging areas	No. Appropriate nesting habitat is not present on site.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank DFG Rank	Nesting/ Breeding Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
57.	**California Horned Lark** *Eremophila alpestris actia*	None/none G5T3/S3 SSC (Nesting)	March 15 through August 15	Nests on the ground in open habitats. More common in the interior.	Yes. Moderately appropriate habitat is present on site.	No	Not Significant
58.	**Tidewater Goby** *Eucyclogobius newberryi*	Endangered/none G3/S2S3 SSC	n/a	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	No. Appropriate habitat is not present on the property.	No	Not Significant
59.	**Western Mastiff Bat** *Eumops perotis californicus*	None/None G5T4/S3? SSC	Spring-Fall	Roosts in crevices in cliff faces, high buildings, trees, and tunnels. Inhabits conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral.	No. Appropriate roosts for bats are not present on the property. Bats could forage on site.	No	Not Significant
60.	**Merlin** *Falco columbarius*	None/none G5/S3 SSC (Wintering)	September - April (Wintering)	Winters on seacoasts, estuaries, woodlands, savannas, grassland edges, deserts.	No. Foraging habitat is present. Appropriate nesting habitat is not present on site.	No	Not Significant
61.	**Prairie Falcon** *Falco mexicanus*	None/none G5/S3 SSC (Nesting)	March 15 through August 15	Inhabits dry, open terrain. Nests on cliffs near open areas for hunting.	No. Foraging habitat is present. Appropriate nesting habitat is not present on site.	No	Not Significant
62.	**Loggerhead Shrike*** *Lanius ludovicianus*	None/none G4/S4 SSC	March 15 through August 15	Open areas with appropriate perches, near shrubby vegetation for nesting.	No Appropriate foraging habitat is present, but roosting habitat is not.	No	Not Significant
63.	**California Linderiella** *Linderiella occidentalis*	None/none G2G3/S2S3 Special Animal	Rainy season	Seasonal pools in unplowed grasslands with alluvial soils.	Yes. Moderately appropriate pool habitat is present on the property, but protocol surveys were negative.	No	Not Significant

	Common and Scientific Names	Fed/State Status Global/State Rank DFG Rank	Nesting/ Breeding Period	Habitat Preference	Potential Habitat?	Observed on Site?	Effect of Proposed Activity
64.	**Steelhead - South/Central California Coast ESU** *Oncorhynchus mykiss irideus*	Threatened/none G5T2Q/S2 Special Animal	February - April	Fed listing refers to runs in coastal basins from Pajaro River south to, but not including, the Santa Maria River.	No. Appropriate habitat is not present on the property.	No	Not Significant
65.	**Coast Horned Lizard** *Phrynosoma coronatum* (*frontale population*)	None/none G4G5/S3S4 SSC	May - September	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	No. Appropriate habitat and typical soils are not present on site.	No	Not Significant
66.	**Atascadero June Beetle** *Polyphylla nubila*	None/none G1/S1 None	n/a	Known only from sand dunes in Atascadero and San Luis Obispo, San Luis Obispo County.	No. Appropriate soil and habitat type not present on site.	No	Not Significant
67.	**Purple Martin** *Progne subis*	None/none G5/S3 SSC	March 15 through August 15	Inhabits woodlands, coniferous forests. Nests in woodpecker cavities on dead snags.	No. Appropriate nesting habitat for martins is not present.	No	Not Significant
68.	**San Luis Obispo Pyrg** *Pyrgulopsis taylori*	None/none G1/S1 Special Animal	n/a	Freshwater habitats in San Luis Obispo County.	No. Appropriate aquatic habitat is not present on the property.	No	Not Significant
69.	**California Red-legged Frog** *Rana* (*aurora*) *draytonii*	Threatened/none G4T2T3/S2S3 SSC	January - March	Lowlands and foothills in or near sources of deep water with dense, shrubby or emergent riparian vegetation.	No. Appropriate late-season aquatic habitat and appropriate vegetation is not present.	No	Not Significant
70.	**Coast Range Newt** *Taricha torosa torosa*	None/none G5T4/S4 SSC	December - May	Slow moving streams, ponds, and lakes with surrounding evergreen/oak forests along coast.	No. Pools are present, but surrounding habitat is not appropriate for newt.	No	Not Significant
71.	**American Badger** *Taxidea taxus*	None/none G5/S4 SSC	February – May	Needs friable soils in open ground with abundant food source such as California ground squirrels.	No. Soils on subject site are sticky clays that dry into hard, difficult-to-dig blocks.	No	Not Significant

Habitat characteristics are from the CDNNB.
*not listed in the CNDDB for the search area, but possible for the location.

	Common Name	Federal/State Status Global/State Rank	Potential Habitat?	Effect of Proposed Activity
Sensitive Natural Communities				
1.	**Central Foredunes**	None/none G1/S1.2	No. Dune habitat is not present on the property.	Not Significant
2.	**Central Maritime Chaparral**	None/none G2/S2.2	No. Chaparral habitat is not present on the property.	Not Significant
3.	**Coastal and Valley Freshwater Marsh**	None/none G3/S2.1	No. Marsh habitat is not found on site.	Not Significant
4.	**Northern Interior Cypress Forest**	None/none G2/S2.2	No. Cypress trees do not occur on site.	Not Significant
5.	**Serpentine Bunchgrass**	None/none G2/S2.2	No. Serpentine rock and or soil does not occur on site.	Not Significant

3.6.4 Special status plants that could or do occur on the property

This section provides an explanation of the potential for occurrence of six special status plant species thought to be compatible with conditions on the property. We discuss each species and describe habitat, range restrictions, known occurrences, and survey results for the property.

A. San Luis Obispo sedge, *Carex obispoensis*, is a CNPS list 1B species that grows at streamside and hillside seeps in serpentine soils. It is endemic to San Luis Obispo County. South Hill, just north of the subject property, is a serpentine ridge, and the drainage on site could potentially support San Luis Obispo sedge. Wetlands on site were searched for San Luis Obispo sedge. No sedge species were found.

B. Obispo Indian paintbrush (*Castilleja densiflora ssp. obispoensis*) is a CNPS List 1B.2 subspecies known only from San Luis Obispo County. It is an annual wildflower that occurs in coastal grasslands in sandy or clay soils. The closest reported occurrence is from South Hills Open Space, approximately 0.35 mile north of the subject property (Althouse and Meade, Inc., 2006; CNDDB #4). Moderately appropriate habitat on site consists of ruderal pasture. This species was not observed on the subject site during an appropriately timed site surveys conducted March 29, 2007.

C. Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) is a CNPS List 1B.2 subspecies. Congdon's tarplant ranges from Contra Costa County south to San Luis Obispo County. It has no state or federal status. Condon's tarplant is distributed in one to several highly restricted occurrences (or present in such small numbers that it is seldom reported), is endangered throughout its range, and is endemic to California. Numerous specimens at the Robert F. Hoover Herbarium at Cal Poly are from only three different localities in San Luis Obispo County. A literature search revealed a total of seven known localities for this rare subspecies in the County, all of which occur in the Los Osos Valley. This species has been observed on surrounding properties, including the Tank Farm, and also occurs on the subject site. On Prado Park property, this species occurs in wetlands at the south end of the property and east edge of the property. In 2008, individuals were scattered across suitable habitat, with highest densities occurring along the margins of the wetland. Exact locations of occurrence vary from year to year because this species is an annual, and its abundance varies with annual rain.

D. Chorro Creek Bog Thistle (*Cirsium fontinale* var. *obispoense*) is a federal and state endangered subspecies endemic to San Luis Obispo County. This species occurs in serpentine seeps and streams near the City of San Luis Obispo. Neil Havlik, Natural Resource Manager for the City of San Luis Obispo found a previously unknown locality for this thistle adjacent to the South Hills Open Space western property line in 2005. Wetland on the subject property is moderately appropriate habitat for Chorro Creek Bog Thistle; however this species was not observed on the subject site.

E. Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*) is a CNPS List 1B.1 subspecies known from vernal pool and vernal wetland habitats from Alameda

County to San Luis Obispo County. There are three localities documented in the CNDDB in San Luis Obispo County, two of which support extant populations. Laguna Lake was thought to hold the last known site in the County until a population was reported in 2003 in wetlands on private property along Tank Farm Road. Moderately appropriate wetland habitat is present on site, although the degraded conditions of wetlands on site are not conducive to persistence of this species. Hoover's button-celery was not found on the subject site during site surveys conducted in late summer 2008.

F. Adobe sanicle (*Sanicula maritima*) is a CNPS List 1B.1 species known from San Francisco to San Luis Obispo Counties. Half the known occurrences are from the vicinity of Arroyo de la Cruz (north coastal San Luis Obispo County). Records from the San Luis Obispo area are from wetlands in the Los Osos Valley, associated directly with the Morro Rock-Islay Hill outcrop complex. Adobe sanicle occurs in serpentine seeps at South Hills Open Space, just 0.4 mile north, and hydrologically connected to the Property (CNDDB #20). Moderately appropriate habitat for this species may be present in the wetlands on site. This species was not observed on site during an appropriately timed survey conducted on March 29, 2007.

3.6.5 Special Status animals that could occur on the property

This section provides an explanation of the potential for occurrence of four special status animal species thought to be compatible with conditions in the project areas. We discuss each species and describe habitat, range restrictions, known occurrences, and survey results for the property. .

A. Burrowing owl (*Athene cunicularia*) is a small, rare owl that nests in abandoned holes in the ground, most notably those of the California ground squirrel. It is listed as a California Species of Special Concern. Burrowing owls are a common resident in local areas of the interior, from the Bitterwater Valley to the Carizzo Plains and elsewhere. Less frequent reports are from coastal grasslands. Appropriate habitat is present, and transient owls could use the Property for wintering or nesting, but are unlikely to do so due to adjacent land use. No signs of burrowing owls were found on the Property during our surveys in the fall of 2008.

B. Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) is a federally listed threatened species known from the vicinity of the Property. It occurs in vernal pools and other ephemeral pools where water accumulates for more than three weeks during the rainy season. This species was found on the adjacent Tank Farm property. However, protocol surveys conducted by David Wolff Environmental in 2005 were negative for vernal pool fairy shrimp on the Property (report attached as Appendix C).

C. California Horned lark (*Eremophila alpestris actia*) is a California Special Concern species known from Sonoma County south to San Diego County, as well as east to the foothills of the Sierra Nevada Mountains. It breeds in open, flat habitats with short vegetation, including grasslands, alkali flats, fallow grain fields, and meadows. Horned larks are common in the interior areas of San Luis

Obispo County. They are known to make local movements through the seasons, and may not breed in all areas they are observed. This species was not observed on the subject property.

D. California linderiella (*Linderiella occidentalis*) is an uncommon but wide ranging species of fairy shrimp about an inch in length that inhabits small vernal pools and seasonal ponds in sporadic occurrences throughout much of central California. Moderately appropriate seasonal pools are present on site. However, protocol surveys conducted by David Wolff Environmental in 2005 were negative for California linderiella on the Property (report attached as Appendix C).

3.6.6 Special Status species not expected to occur on the property

The remaining 61 special status species known to occur in the Arroyo Grande NE, Lopez Mountain, Pismo Beach, and San Luis Obispo quadrangles are not expected to occur on the property due to the absence of required soil type, lack of appropriate habitat, or because the project site is substantially outside the known range of the species.

3.6.7 Sensitive natural communities

No habitats listed by the California Department of Fish and Game (CDFG) as sensitive natural communities occur on the property.

4.0 Discussion

4.1 General Discussion of Property Conditions

The Property is located near the east end of Los Osos Valley, a coastal valley with rich alluvial soils. Prado Park LLC sits at the toe of South Hills, a serpentine ridge with rock outcrops, seeps, and sticky clay soils. Soils on the subject site have been altered by human activity during and after use of the site as part of the old oil tank farm. Mixed rocks and surface soils in upland areas indicate placement of fill. The subject site also includes a managed channel that captures stormwater from Prado Road and adjacent neighborhoods and commercial development. Nuisance water from the adjacent developments keeps soil surfaces at the north end of the swale moist to the touch throughout the year. The lower (southern) portion of the swale dries up by late summer.

Ruderal pasture occupies approximately 17.56 of the 20.15 acre property. State and federal wetlands and other waters occupy the remaining 2.59 acre. Heavy grazing pressure and historic disturbance have reduced plant diversity in upland habitats, and wetland species observed on site are primarily herbaceous species that re-grow from rhizomes or seed each year. Riparian species such as willow and cottonwood are absent from the site. Ruderal pasture is in poor condition, dominated by non-native, weedy species such as star thistle and unpalatable late-season native wildflowers such as hayfield tarweed. In 2008, cattle trampled wetlands and cropped wetland plants down to the ground. By late summer, very little vegetation remained in wetlands on the Property. Rare species that thrive with periodic disturbance that reduces weed competition, such as Congdon's tarplant, are present on the Property.

The disturbed condition of the site and poor vegetative cover make it unlikely to support rare plants that require stable site conditions and less intense disturbance, such as Obispo Indian paintbrush or adobe sanicle. However, the site occurs downhill and downstream of South Hills Open Space, which is known to support several rare plant species. Therefore, all areas of the property, including severely manipulated areas, were investigated carefully for evidence of rare plants. On completion of proposed habitat enhancement and restoration work, some open space on the property may eventually recruit rare plants from the vicinity.

4.2 Regulatory Framework

The California Environmental Quality Act (CEQA) requires the lead agency (in this case, the City of San Luis Obispo) to determine potential environmental effects of the project. The lead agency must also identify other involved agencies that become responsible or trustee agencies.

All of the plants constituting CNPS List 1B meet the definitions of Sec. 1901, Chapter 10 of the California Native Plant Protection Act (CNPPA) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA (CEQA section 15065). Rare plants protected under the CNPPA must be fully considered under CEQA (CEQA sections 15380, 15386). Proposed impacts that affect more than 10 percent of a local breeding population generally require mitigation at a minimum 2:1 ratio. Congdon's tarplant, a CNPS List 1B.2 species, was observed on the Property.

Rare plants and animals listed under the Federal Endangered Species Act (FESA) are protected. The United States Fish and Wildlife Service is the agency that regulates activities affecting federally listed species. No federally listed plants or animals were observed on the Property.

Nesting birds are protected from disturbance by The Migratory Bird Treaty Act of 1918, (as regulated by the United States Fish and Wildlife Service) and by sections 3503, 3503.5, and 3800 of the California Department of Fish and Game code.

Drainages and wetlands on the property may be under the permitting jurisdiction of the U.S. Army Corps of Engineers (section 404), the California Department of Fish and Game (code 1603), and the Regional Water Quality Control Board (section 401). Areas affected would include placement of fill in non-wetland waters, state wetland, and federal wetland to support buildings and roads. The applicant should demonstrate to the lead agency that all applicable permits have been obtained for work affecting drainages and wetlands. All work that affects the bed or banks of the drainages, including culverts, bridges, or placement of fill, is likely to require USACE, RWQCB, and CDFG authorizations.

Construction activities that disturb more than one acre of ground require permits under the National Pollutant Discharge Elimination System (NPDES). A stormwater construction permit from the State Water Resources Control Board fulfills the NPDES requirement, and must be accompanied by a Storm Water Pollution Prevention Plan (SWPPP).

5.0 Potential Impacts

Construction of the proposed project could affect ruderal pasture, emergent wetland and common and special status wildlife and plant species. Maps used in our evaluation of potential impacts are included as Figures 9 and 10.

Sections 5.1 through 5.4 address potential impacts to biological resources from construction of the proposed project. We include in our analysis impacts to both common and special status species, as well as to habitats that are not sensitive. This consideration contributes to understanding cumulative impacts to the environment that may result from the loss of common species and habitat.

5.1 Habitat Impacts

5.1.1 Freshwater emergent wetland

Approximately 2.59 acre of the property consists of freshwater emergent wetland. This includes approximately 2.57 acre of federal and state jurisdictional wetland, as well as 0.02 acre of isolated wetland that is within state but not federal jurisdiction. Development on the property would permanently impact approximately 0.50 acre freshwater emergent wetland, including 0.01 acre isolated wetland. Impacts to wetlands typically require mitigation at a minimum 1-to-1 ratio for permanent fill of state wetlands, and 2-to-1 ratio for permanent fill of federal wetlands. The Regional Water Quality Control Board (RWQCB) and United States Army Corps of Engineers (USACE) can require higher ratios of wetland replacement to impact area, depending on the size, function, and value of wetlands affected by a proposed project.

The proposed stormwater basin and wetland mitigation/restoration project ("Prado Stormwater Basin") have been designed with sufficient capacity and wetland restoration area to address stormwater and wetland mitigation needs of the proposed Prado Park Commercial Center. Wetland impacts for creation of Prado Stormwater Basin, which is also located on the subject property, have been considered separately from the Prado Park Commercial Development, and are not included here.

5.1.2 Ruderal/pasture

Approximately 17.56 acre of ruderal pasture occurs on site. The proposed project would result in conversion of approximately 11.3 acre ruderal pasture to anthropogenic area. Buildings, parking lots, sidewalks, and landscape areas would cover approximately 11.8 acre when the project is complete. Impacts to ruderal pasture that do not affect rare plants are not significant and do not typically require mitigation under CEQA. Impacts to rare plants are addressed separately (see section 5.3).

5.2 Common Wildlife Impacts

5.2.1 Nesting habitat

Impacts to or take of nesting birds could occur if grading, mowing, or grubbing is conducted during nesting season (March 1 through August 31). Take of common nesting birds is prohibited by federal and state code. Impacts to or take of common nesting birds can be avoided (see section 6.3.1).

5.2.2 Reduction of wildlife movement corridors

Although numerous animal species may occasionally forage on the property, the site is not part of a significant wildlife movement corridor. Development on the property may alter common wildlife species' patterns of movement across the property.

5.2.3 Displacement and/or take

Common wildlife species currently living in the project site or using the site as transients would be permanently displaced from a portion of the property. Take of common species may occur.

5.3 Special Status Species Impacts

Appropriate habitat for up to six rare plants and four special status animals occurs on the property. One rare plant, Congdon's tarplant, was identified on the property in 2008.

5.3.1 Rare plants

Congdon's tarplant, a CNPS List 1B.2 species, occurs on the property. Moderately appropriate habitat for five additional species is also present, although these species were not observed on site.

A. Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) occurs within and immediately adjacent to emergent herbaceous wetlands on the subject property. Congdon's tarplant was observed in greatest numbers along perimeters of wetland outside low-flow channels. This rare subspecies also occurs in low spots within a "finger" of wetland that parallels the eastern border for approximately half its length and other locations that hold ponded water seasonally. Fill placed in wetlands and other seasonally ponded areas would impact up to 30 percent of on-site Congdon's tarplant. Regional mitigation efforts that attempted relocation of this subspecies by seed collection, creation of suitable habitat, and seed application have been successful. Thus, impacts to Congdon's tarplant can be mitigated to a less than significant level via relocation to appropriate habitat on the subject property, but outside the work area.

Appropriately timed floristic surveys in 2007 and 2008 were negative for other rare plant species on the property.

5.3.2 Special animals

Four special status animals have the potential to occur on the property although these species were not observed on site during biological surveys conducted in spring 2007 and late summer 2008 or during fairy shrimp surveys conducted in 2005. Appropriately timed and implemented pre-construction surveys for special status species would reduce the potential for impacts to special status animals to a less than significant level (refer to Section 6.4).

Potential impacts to special animals with potential to occur are listed by species below:

A. Burrowing owl (*Athene cunicularia*) and **California horned lark** (*Eremophila alpestris actia*) were not observed on the subject site, but could winter or nest on the subject site. Mowing and grading activities conducted during nesting season

could result in take of burrowing owl or California horned lark. Potential impacts can be mitigated (See Section 6.3).

B. Vernal pool fairy shrimp (*Branchinecta lynchi*) and **California linderiella** (*Linderiella occidentalis*) were not found during wet and dry season protocol surveys conducted by Wolff Environmental in 2005. Wet and dry season surveys were negative for both species (report attached as Appendix B). Therefore, this project would not result in take of either species, although moderately appropriate seasonally ponded areas would be filled.

6.0 Mitigation Recommendations

We recommend the following biological resource (BR) mitigation measures to reduce project impacts to a less than significant level.

6.1 General Project Considerations

The following general measures are recommended to ensure environmental compliance during all phases of construction.

6.1.1 Low impact development

BR-1. **Low impact development practices** shall be integrated into project plans where practicable. Some feasible examples include stormwater detention on site to reduce erosive flows and/or flooding during storm events. Lighting shall be minimized toward open space areas; shielded down-lighting is preferred. Fossil filters shall be incorporated into stormdrain inlets. Runoff shall be directed to landscape planters where feasible to reduce irrigation requirements and to allow biofiltration of parking lot pollutants during low storm events.

BR-2. **Where feasible, stormwater shall be conducted into bioswales or grassed waterways** that provide biofiltration and soil stabilization benefits in addition to conducting stormwater in a non-erosive manner. NRCS Practice 412 (attached as Appendix D) is one example of a grassed waterway. These features shall be vegetated with a mixture of appropriate native species, such as California brome (*Bromus carinatus*), California oat-grass (*Danthonia californica*), salt grass (*Distichlis spicata*), meadow barley (*Hordeum brachyantherum*) and creeping wildrye (*Leymus triticoides*).

6.1.2 Worker education meeting

BR-3. **Within 30 days prior to initiation of site disturbance and/or construction, all personnel associated with the project shall attend a worker education training program**, conducted by a qualified biologist, to avoid or reduce impacts on biological resources. At a minimum, the training shall include information on protection of wetlands and drainages adjacent to the project, all mitigation measures specified by the City, as well as any related biological report(s) prepared for the project. The applicant shall notify the City one week

prior to this meeting. A fact sheet shall also be developed prior to the training program, and distributed at the training program to all contractors, employers and other personnel involved with the construction of the project.

6.1.3 Biological monitor

BR-4. **Prior to issuance of land use permits, the applicant shall retain a City-approved biologist to monitor** grading/ground disturbing activities located within and directly adjacent to wetlands and rare plant habitats. During periodic site visits, the biological monitor will verify that mitigation measures and best-management practices are properly implemented. The biological monitor will actively communicate observations and information with the construction supervisor as necessary for maintenance of mitigation and best management practices. The construction supervisor will keep the biological monitor apprised of the project schedule. The biological monitor shall prepare a post construction report that documents completion of ground-disturbing activities adjacent to natural resources that are to be preserved on site, and progress of mitigation measures implemented. Reports shall be furnished to the construction supervisor and the City.

6.1.4 Equipment storage and materials management

BR-5. **Material and equipment storage locations shall be located at least 100 feet away from the drainage.** Appropriate leak and spill prevention and containment materials shall be used for equipment and materials stored on the Site.

BR-6. **Refueling shall be conducted at least 100 feet away** from wetlands and drainages. Portable toilet facilities shall be located at least 100 feet away from wetlands and drainage.

6.2 Habitat Mitigations

6.2.1 Emergent freshwater wetland

The proposed project would permanently impact up to 0.494 acre of low function and value federal wetland plus 0.01 acre of isolated state wetland. An additional 1.4 acre of wetland occurs on the site but outside the project area. To minimize impacts to existing wetland during project construction, the following measure shall be implemented:

BR-7. Temporary protective fencing shall be installed around wetlands in open space at the south end of the property, at the border of the work area, prior to ground disturbing activities. Fencing shall be highly visible in color, and staked in place with posts a maximum spacing of 8 feet on center. The biological monitor shall verify that fencing is correctly installed prior to start of ground disturbing activities.

Wetland Mitigation to Satisfy the USACE

At a 2-to-1 ratio for impacts to federal wetland Prado Park Commercial Center will require at least 0.988 acre of mitigation. Mitigation to satisfy the USACE will be as follows:

BR-8. Impacts to federal wetlands on the subject site shall be mitigated via wetland enhancement and creation onsite, and via participation in the approved Prado Stormwater Basin and Wetland Mitigation Project, which also occurs on the subject site on a separately owned easement. The Prado Stormwater Basin and Wetland Mitigation Project was designed to provide at least 1.0 acre mitigation credit for the Prado Park. The project owner shall contact Prado Basin LLC to arrange payment for 1.0 acre mitigation credit in the approved Basin. The project owner shall then demonstrate participation in the Basin via letter, bill of sale, or receipt to the satisfaction of the Lead Agency prior to issuance of grading and building permits.

Wetland Mitigation to Satisfy the State of California

The Regional Water Quality Control Board often requires higher ratios for mitigation of permanent impacts to federal wetlands. In addition, the State requires that projects result in no net loss of state wetland. To satisfy State requirements for wetland mitigation and ensure that adequate mitigation will be provided to satisfy the RWQCB, the following additional measures shall be implemented.

BR-9. Additional mitigation shall be performed through wetland protection, creation and enhancement onsite, but outside the Basin. Up to 0.5 acre of new state wetland shall be created adjacent to the stormwater basin via minor grading, weed abatement, and application of a seed mixture approved by the project biologist. This additional wetland shall be appropriate for growth of Congdon's tarplant, specifically, outside flow lines during normal storms, and shall be treated with Congdon's tarplant seed collected on the subject site (see also Section 6.4.1 regarding Congdon's tarplant).

BR-10. An open space easement shall be placed over the non-developed (southeastern) portion of the property to conserve in perpetuity approximately 1.4 acre of wetland and CNPS-listed rare plants that occur there. Existing wetland in this easement shall be enhanced via application of an appropriate native seed mix and weed abatement focused on reducing yellow star thistle infestation.

6.2.2 Ruderal/pasture

The proposed project would result in conversion of 11.3 acre ruderal pasture to anthropogenic area. Conversion of 11.3 acre low-quality pasture is not typically a significant impact, therefore no mitigation is recommended. Mitigation recommendations for impacts to rare plants are addressed separately (Section 6.2).

6.3 Common Wildlife Mitigations

6.3.1 Nesting habitat

Migratory non-game native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory non-game birds (as listed under the Federal MBTA).

BR-11. Within one week of ground disturbance or tree removal/trimming activities, if work occurs between March 15 and August 15, nesting bird surveys shall be conducted. To avoid impacts to nesting birds, grading and construction activities that affect trees and grasslands shall not be conducted during the breeding season from March 15 to August 15. If construction activities must be conducted during this period, nesting bird surveys shall take place within one week of habitat disturbance. If surveys do not locate nesting birds, construction activities may be conducted. If nesting birds are located, no construction activities shall occur within 100 feet of nests until chicks are fledged. Construction activities shall observe a 300-foot buffer for active raptor and special status species nests.

6.3.2 Reduction of wildlife movement corridors

Impacts to significant wildlife movement corridors are not anticipated from the proposed project; therefore no mitigation is recommended.

6.3.3 Displacement and/or take

Wildlife expected to occur on the property includes common species such as red fox, mule deer, coyote, striped skunk, and several species of rodents. Mitigations for impacts to common wildlife species are usually not required.

6.4 Mitigations for Special Status Species

6.4.1 Congdon's tarplant

Fill placed in seasonal wetlands and other seasonally ponded areas would remove up to 30 percent of on-site Congdon's tarplant. Impacts to Congdon's tarplant shall be reduced to a less than significant level as follows:

BR-12. A mitigation and monitoring plan for Congdon's tarplant shall be prepared and approved by the City prior to issuance of grading and building permits. At a minimum, this plan shall incorporate the following elements (BR-13 through BR- 17).

BR-13. The mitigation site shall be located within the newly created open space easement at the south end of the Prado Park LLC property, adjacent to existing, preserved wetlands. The site shall be a low-lying area of clay soil, outside stormwater facilities.

BR-14. Seed shall be collected from on-site Congdon's tarplant in the Fall. Seed should be collected from locations where the rare subspecies would be impacted by proposed development of Prado Park Commercial Center. Seed shall be dried and then stored in a dry, cool location.

BR-15. Shallow depressions approximately 20 by 30 feet in size and no more than 18 inches deep shall be formed by excavation or reshaping of existing topography.

BR-16. Stored seed shall be broadcast in the fall after the first rain over the created depression and gently raked in with a steel landscape rake to prevent seed from blowing away.

BR-17. The site shall be maintained and monitored for 3 to 5 years to determine success rate of Congdon's tarplant in the mitigation site. Maintenance activities shall include trash removal, supplemental seeding, and weeding as needed. Monitoring shall consist of sampling to estimate annual population of Congdon's tarplant in the mitigation area. When estimated annual population meets or exceeds 500 individuals, mitigation shall be deemed complete.

6.4.2 Special status animals

Burrowing owl (*Athene cunicularia*) and California horned lark (*Eremophila alpestris actia*) could nest in ground squirrel dens or upland areas, respectively. Although neither of these species has been observed on the property, it is possible that they could occur in proposed project areas. To reduce potential for take of special status birds, implement measure BR-3 prior to commencement of project activities. As noted above, if special status birds are found nesting on site, a no-work buffer of 300 feet from nests of special status birds shall be observed until young have fledged and left the nest.

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8.0 Figures

- **Figure 1. Vicinity Map**
- **Figure 2. USGS Topographic Map**
- **Figure 3. Aerial Photograph**
- **Figure 4. Biological Resource Map**
- **Figure 5. Wetland Map (2005 original)**
- **Figure 6. Wetland Map, Tentative Revision, September 2008**
- **Figure 7. CNDDB Animals GIS Map**
- **Figure 8. CNDDB Plants GIS Map**
- **Figure 9. Tentative Tract Map CO 06-0143 (Above Grade Engineering)**
- **Figure 10. Grading, Drainage, and Utility Plan (Above Grade Engineering)**

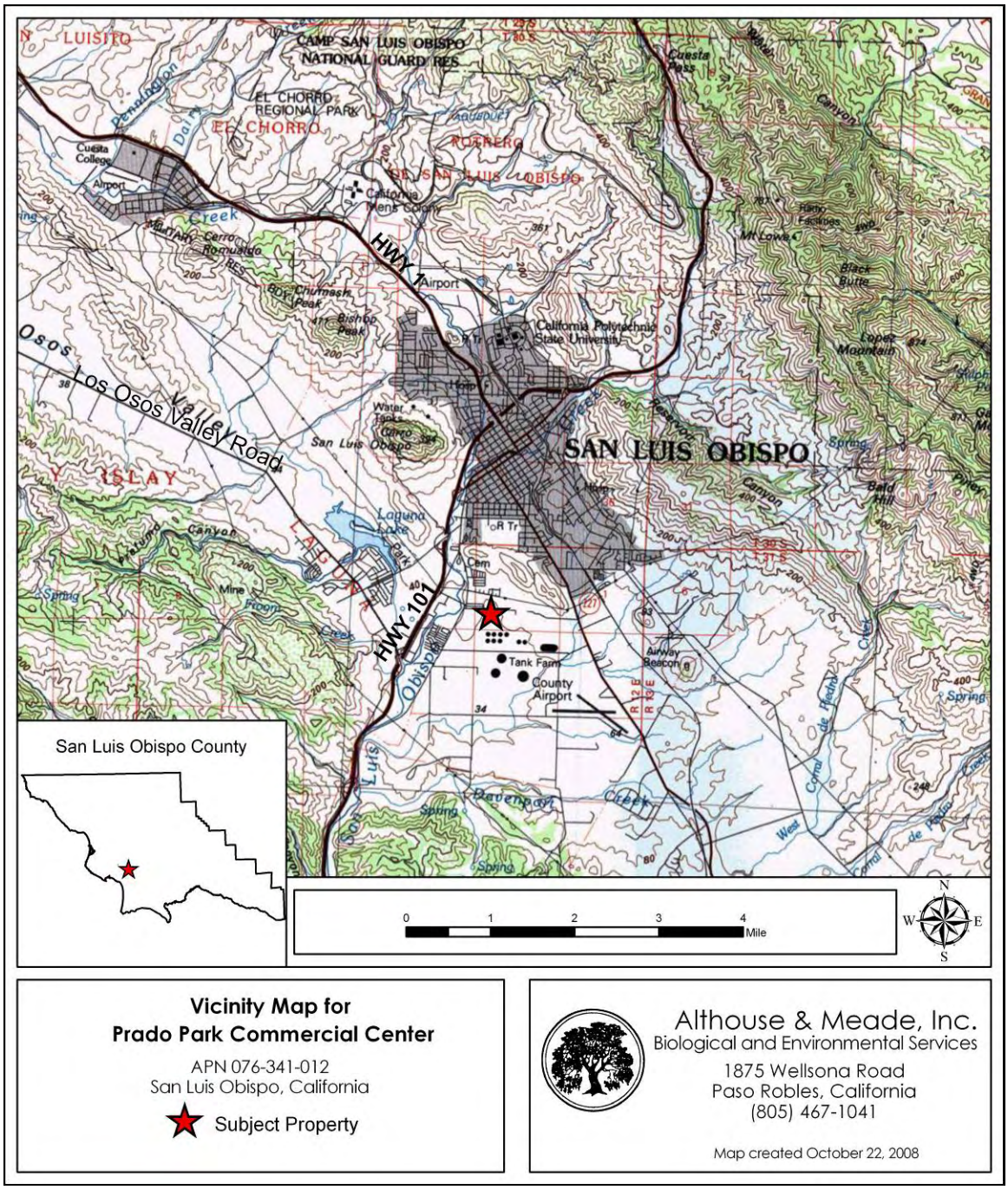


FIGURE 1. LOCATION MAP. The subject property (marked above) is located on Prado Road, approximately 0.25 mile east of South Higuera Street in San Luis Obispo. To reach the site, take Highway 101 south to Madonna Road Exit. Turn east on Madonna Road, and then turn south on South Higuera Street. Travel approximately 0.9 mile to Prado Road, turn east, and travel 0.25 mile. The subject property is located just east of Higuera Commercial Center.

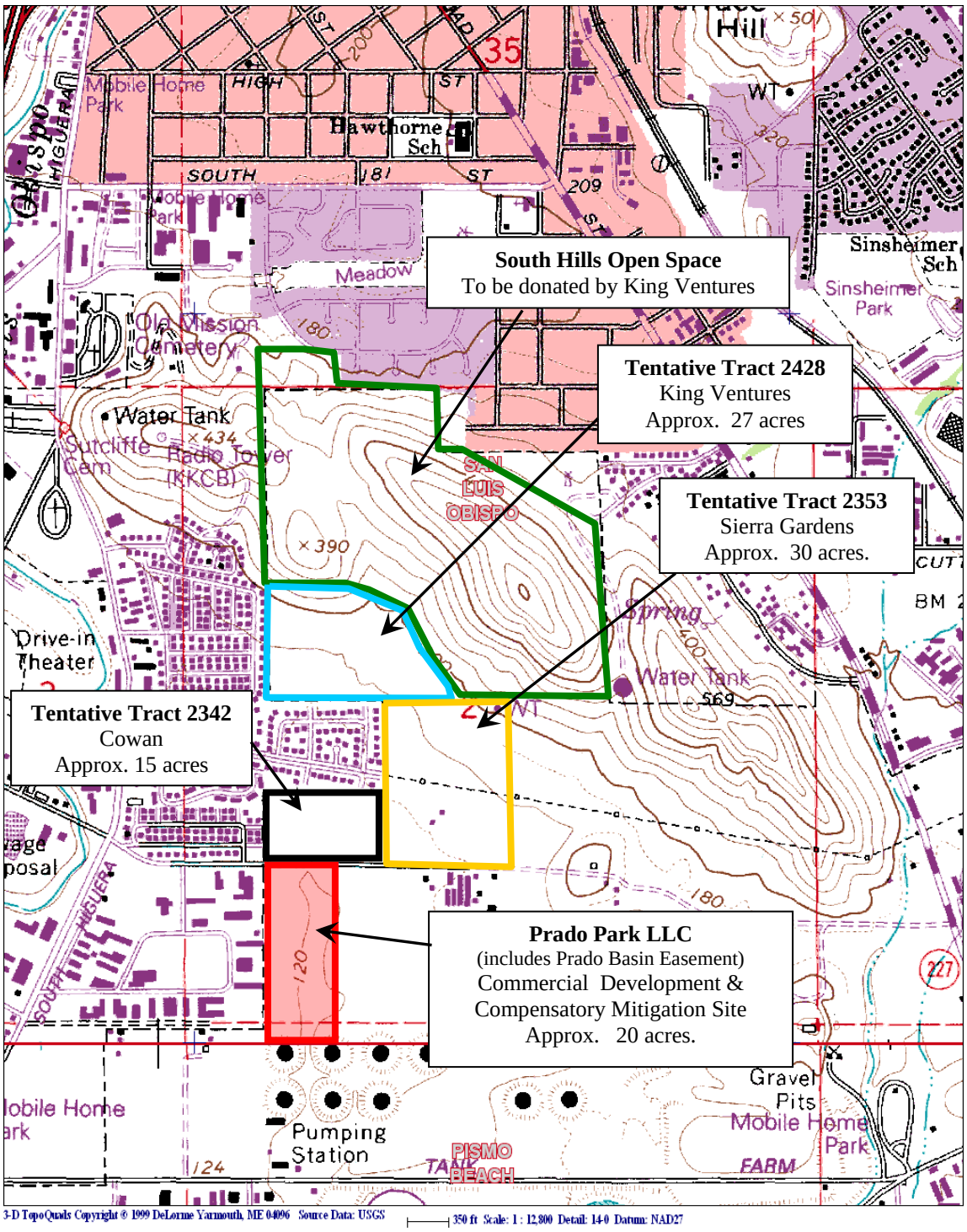


FIGURE 2. USGS TOPOGRAPHIC MAP. The ±20.15-acre property (Prado Park LLC) is located on the south side of Prado Road, east of South Higuera Street. The property is at the southeast corner of the City of San Luis Obispo limit. Locations of nearby projects that will participate in collaborative wetland mitigation in the Prado Basin (also on Prado Park LLC property) are marked above. The approximate property boundaries are marked on the San Luis Obispo U.S.G.S 7.5-minute topographic quad.

FIGURE 3. AERIAL PHOTOGRAPH. The subject property consists of emergent seasonal wetland and ruderal pasture. Prado Road is located along the northern property boundary. A commercial park borders the western property boundary.

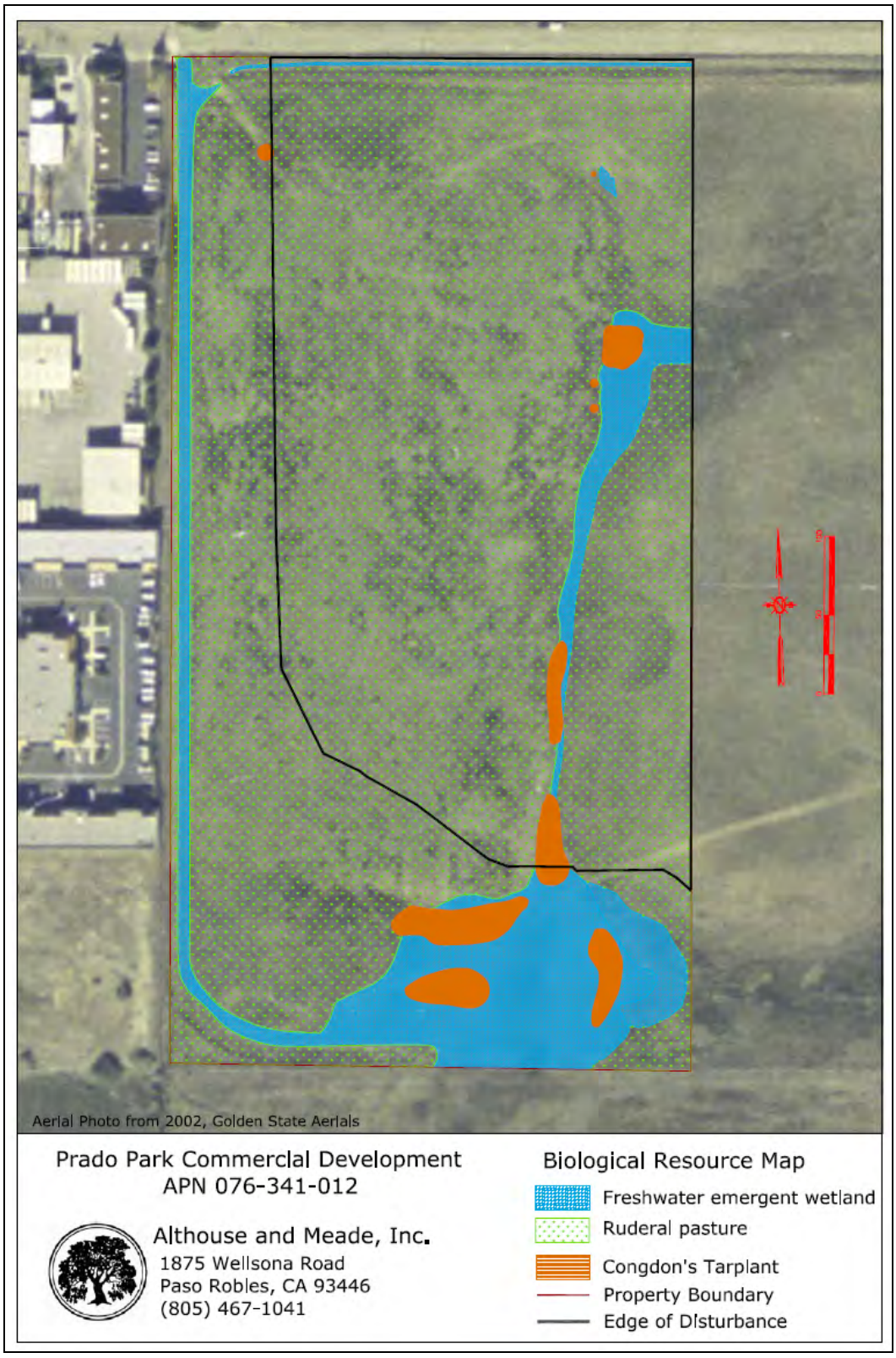


FIGURE 4. BIOLOGICAL RESOURCE MAP. The property consists of freshwater emergent wetland and ruderal pasture. One special status species, Congdon's tarplant, occurs on the property.

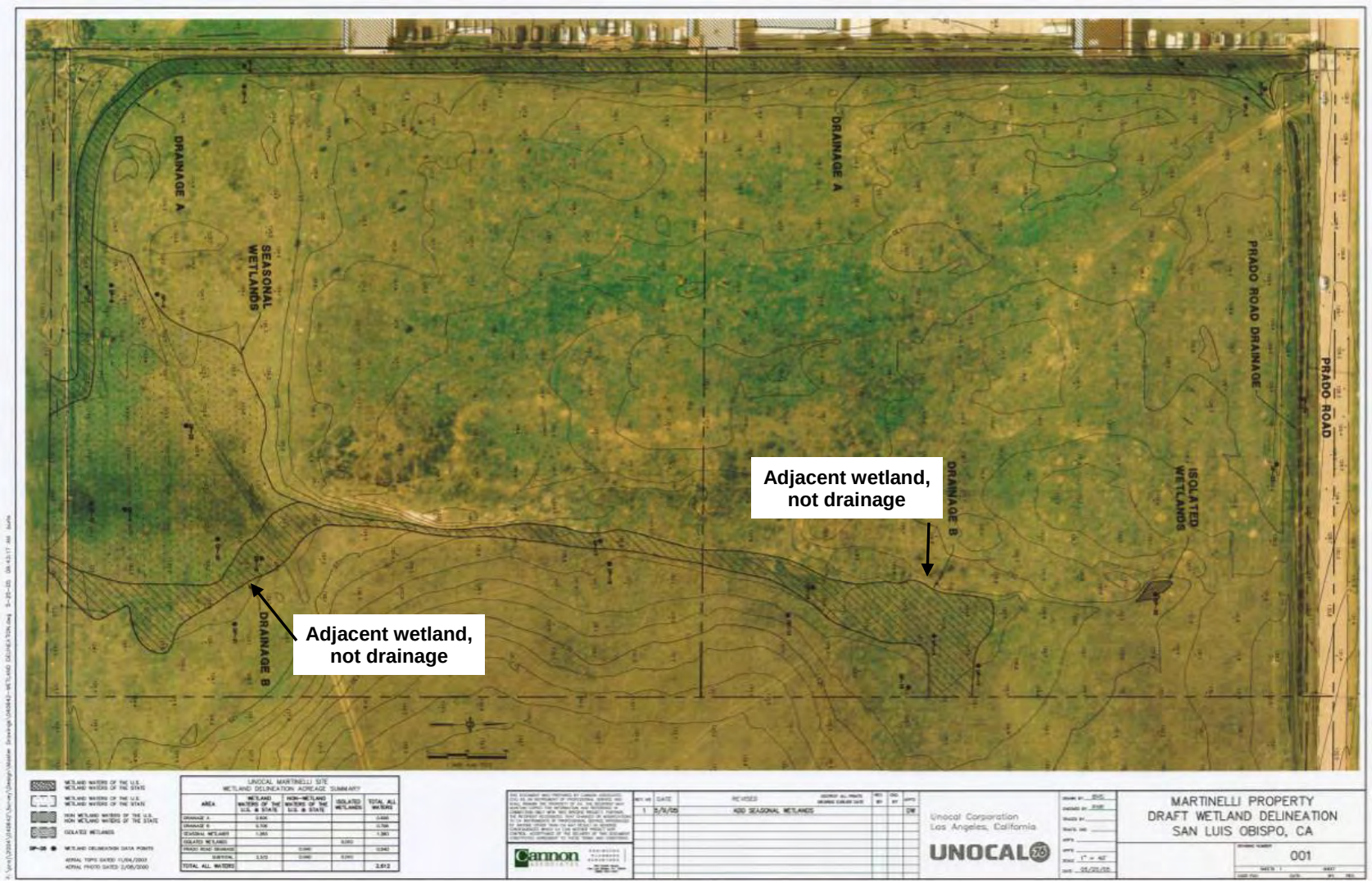


FIGURE 5. WETLAND DELINEATION MAP (ORIGINAL). The subject property consists of emergent seasonal wetland and ruderal pasture. Prado Road is located along the northern property boundary. A commercial park borders the western property boundary. Drainage "A" collects and transports stormwater from the road and adjacent developments. The area labeled as "Drainage B" is not actually a drainage, but rather a narrow finger of adjacent wetland. Bed and bank features are absent from this wetland, thus it is not a drainage.

FIGURE 6. REVISED WETLAND DELINEATION MAP (2008 REVISION). An additional 0.01 acre of state seasonal wetland near the southeastern corner of the property was added to the map based on field observation of facultative plants and root halos in soil (zig-zag hatched area on map).

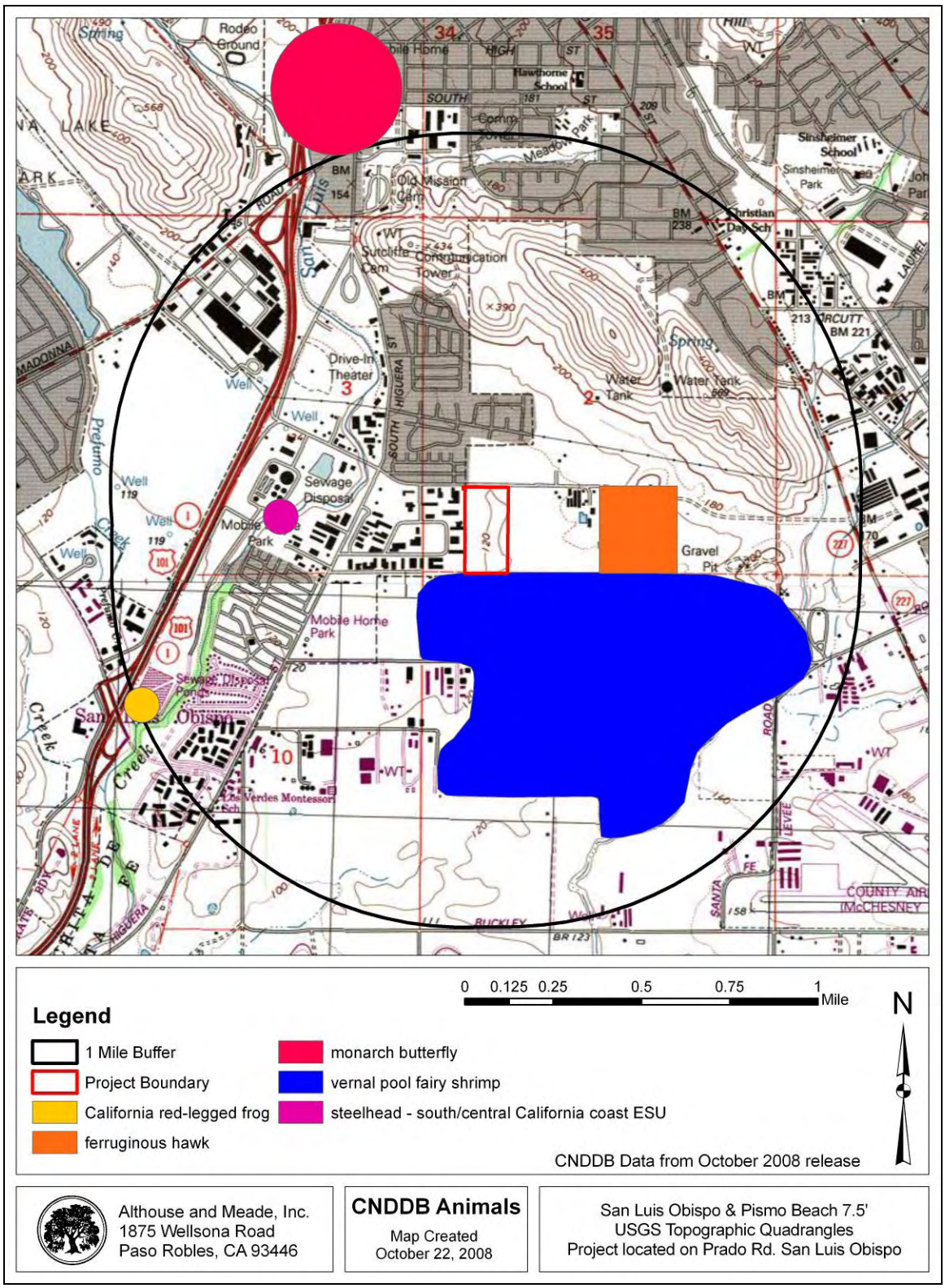


FIGURE 7. CNDDB ANIMALS GIS MAP. The Property has moderately appropriate habitat for six special status animal species. No special status animals have been observed on the property.

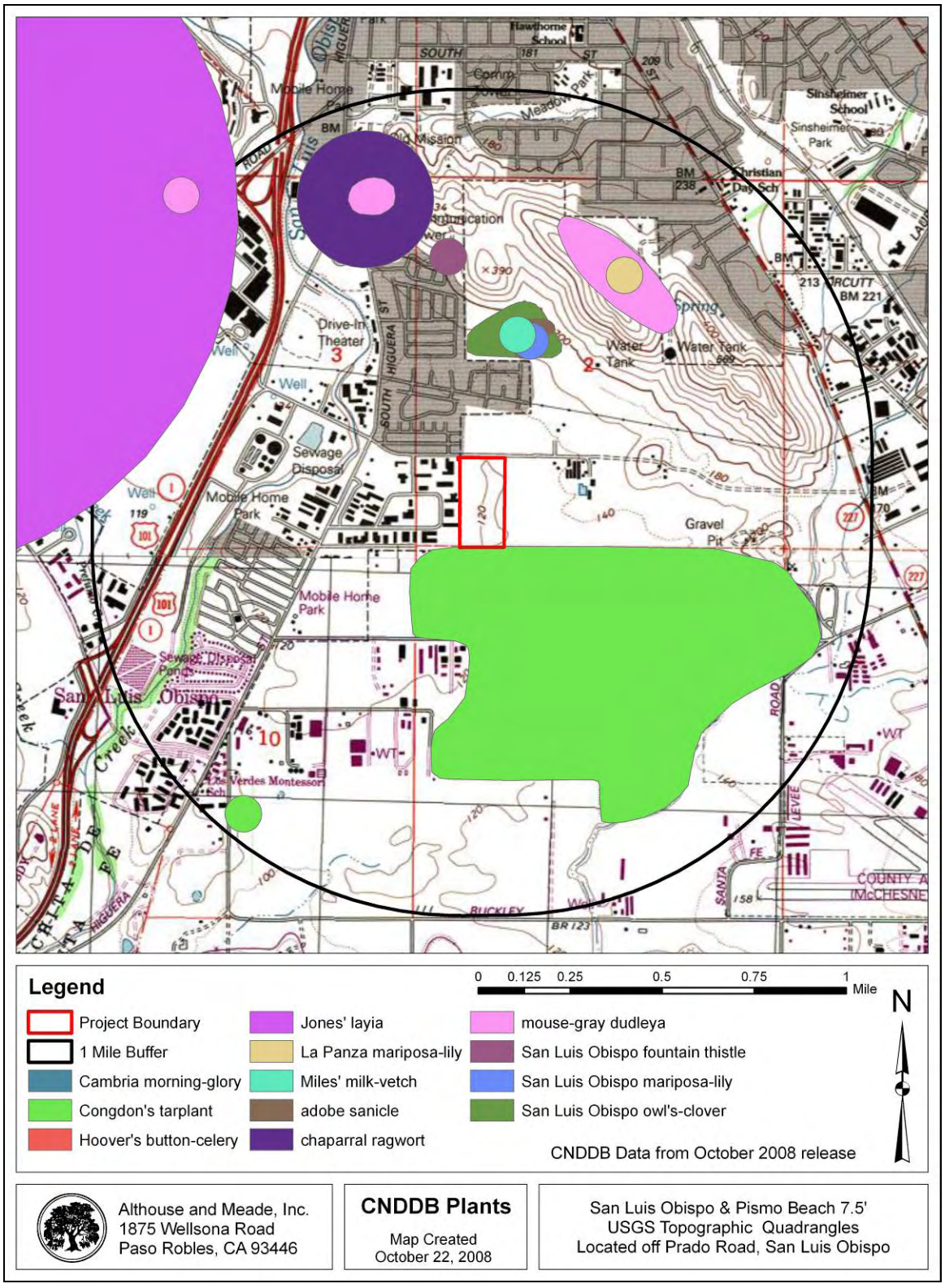
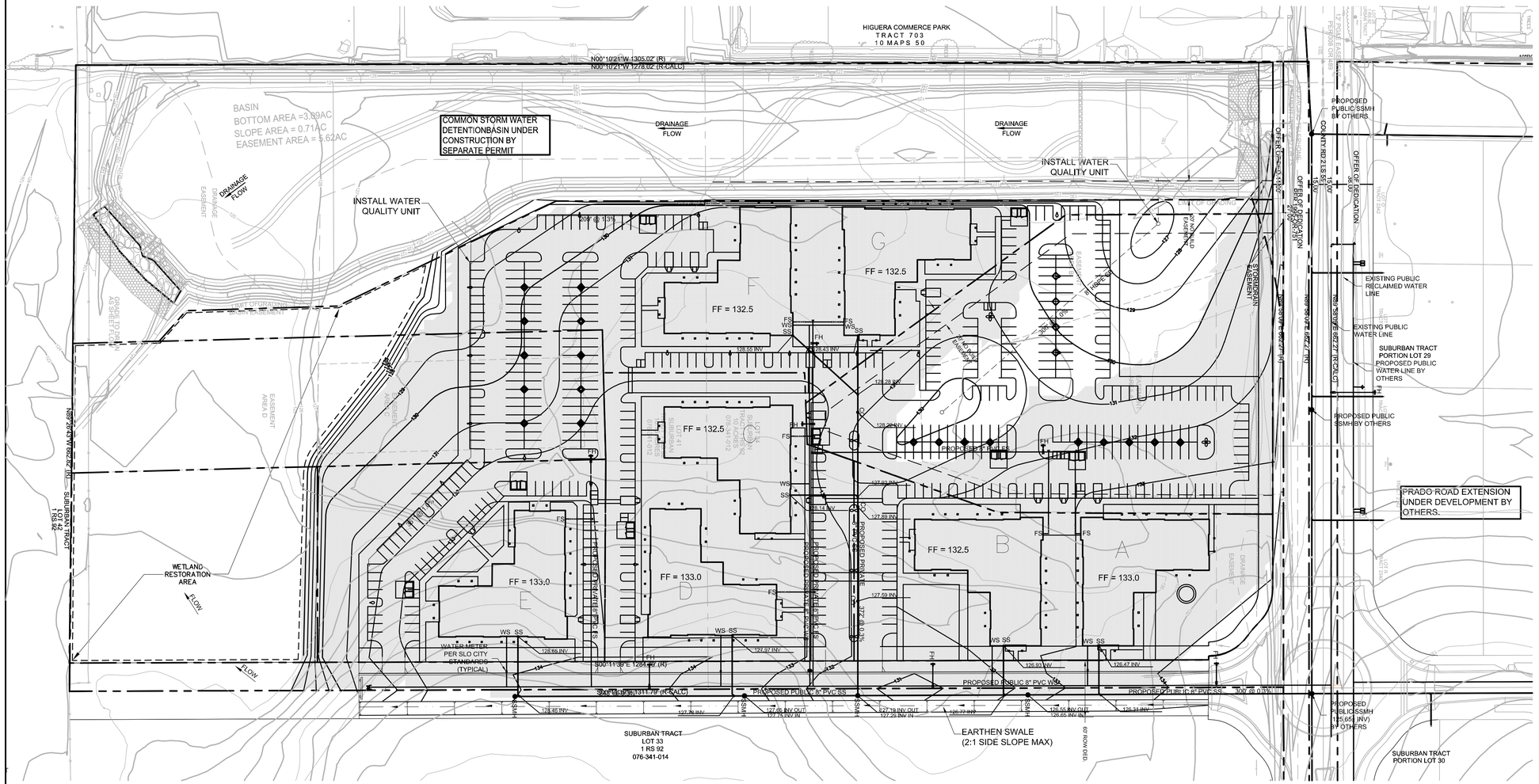


FIGURE 8. CNDDB PLANTS GIS MAP. The property has appropriate habitat for four special status plant species. One special status plant species, Congdon's tarplant, occurs on the property. Congdon's tarplant is mapped on the Biological Resource map (Figure 4).



Note (10-22-2008): Property was still part of County, not the City, when these plan sheets were originally drawn in 2006. Since that time, the property has been annexed into the City of San Luis Obispo. Tentative Tract Map number will likely change.

ABOVE GRADE ENGINEERING
778 Osos Street, Suite A
San Luis Obispo, CA 93401
phone: (805) 540-5115
fax: (805) 540-5116
A California Corporation
Scott Stokes PE # 58256

ENGINEER OF RECORD:

REGISTERED PROFESSIONAL ENGINEER SCOTT J. STOKES No. PE 58256 Exp. 6/30/10 CIVIL STATE OF CALIFORNIA

NOT FOR CONSTRUCTION

DATE:

PRADO RD COMMERCIAL

GRADING, DRAINAGE, & UTILITY PLAN

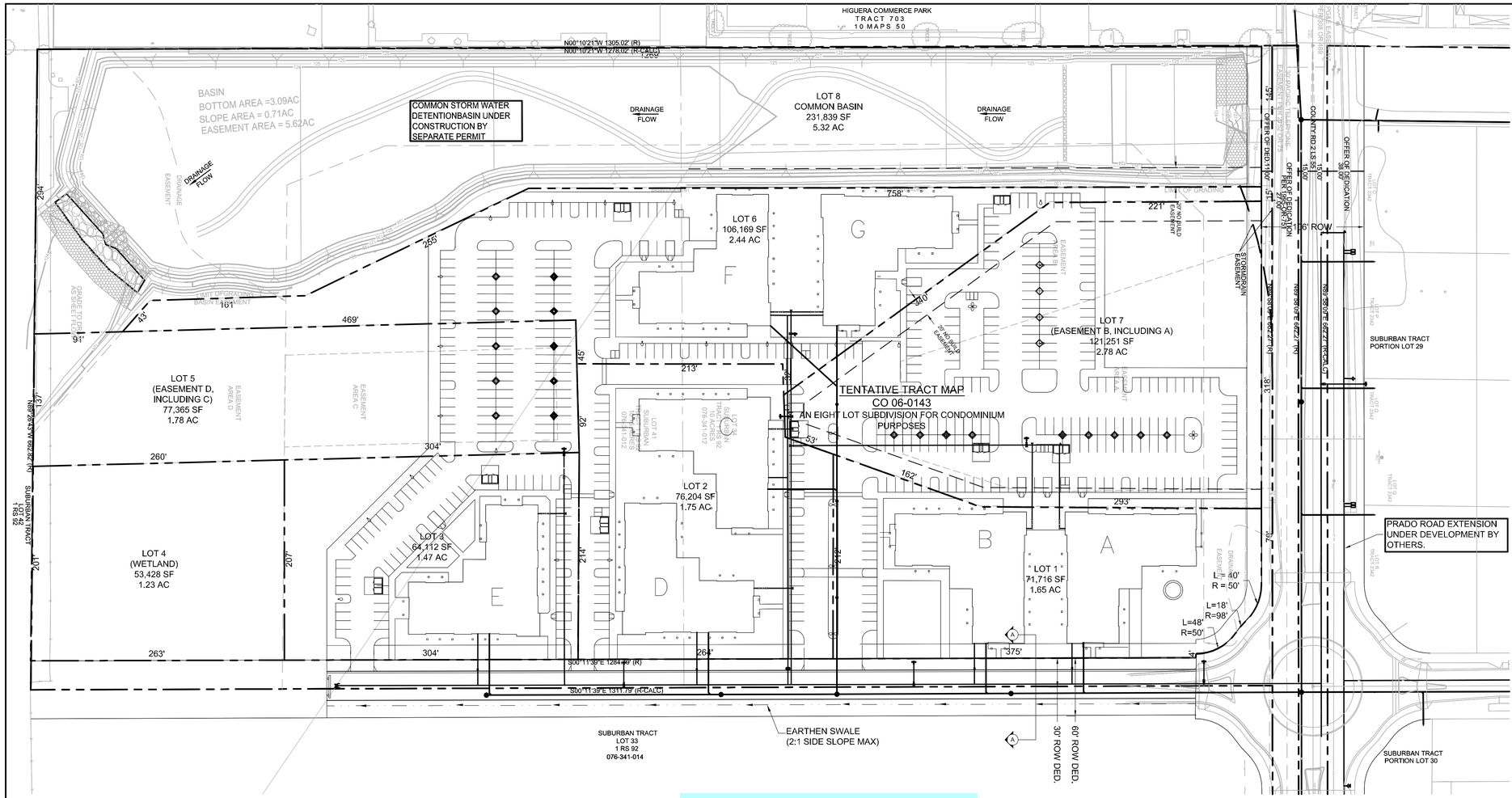
NO.	REVISION	DATE

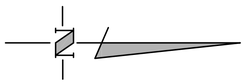
DESIGNED: DJS
DRAWN: DJS
JOB NUMBER: 06104

SHEET: C-2

DATE: AUGUST 18, 2008

PLOT BY: dspiegel PLOT DATE: Aug 18, 2008 - 9:57am Drawing name: N:\2006\06104-PradoCommercial\TTM\Sheetfiles-4\06104-C-2-GD.dwg





OWNER INFORMATION:

PRADO PARK LLC
PO BOX 1392
BAKERSFIELD, CA 93302

APN#: 076-341-012

PROJECT INFORMATION:

EXISTING LOT SIZES:	LOT 34 = 10.00 AC LOT 41 = 10.15 AC
	TOTAL = 20.15 AC
PROPOSED LOT SIZES:	LOT 1 = 1.65 AC LOT 2 = 1.75 AC LOT 3 = 1.47 AC LOT 4 = 1.23 AC LOT 5 = 1.78 AC LOT 6 = 2.44 AC LOT 7 = 2.78 AC LOT 8 = 5.32 AC ROAD DEDICATION = 1.73 AC
	TOTAL = 20.15 AC
MINIMUM LOT SIZE:	1.23 AC
MAXIMUM LOT SIZE:	5.32 AC
AVERAGE LOT SIZE:	2.30 AC
EXISTING ZONING:	COMMERCIAL
PROPOSED ZONING:	COMMERCIAL

SURVEY INFORMATION:

TOPOGRAPHIC SURVEY PERFORMED BY
WESTLAND ENGINEERING INC.
(805) 541-2394

BENCHMARK: THE BASIS OF ELEVATIONS USED FOR THIS SURVEY IS CITY OF SLO BENCHMARK NO. 47 BEING A USG&GS E-910 ELY END OF NORTH SIDE OF BRIDGE ABUTMENT OF S.L.O. CREEK ON PRADO ROAD WEST OF SOUTH HIGUERA, THAT ELEVATION BEING PUBLISHED AS 138.85'.

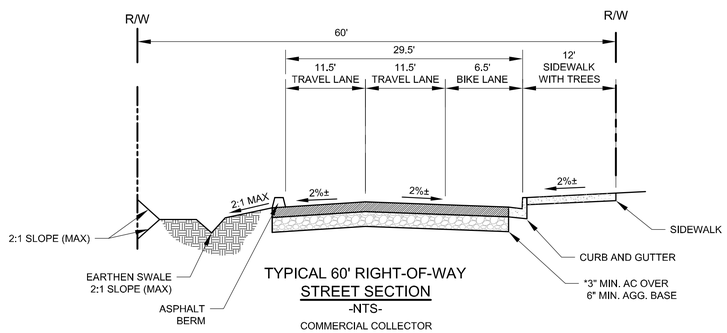
APPROXIMATE EARTHWORK INFORMATION:

CUT	3400 CY
FILL	41400 CY
NET	38000 CY FILL
MAX DEPTH OF CUT	1 FT
MAX DEPTH OF FILL	7 FT
AREA OF DISTURBANCE	11.8 AC

NOTE: THE EARTHWORK QUANTITIES SHOWN ARE FOR BONDING AND ESTIMATING PURPOSES ONLY AND ARE CALCULATED FROM PROPOSED FINISHED SURFACE TO EXISTING SURFACE. THE QUANTITIES DO NOT TAKE CERTAIN FACTORS INTO ACCOUNT, INCLUDING, BUT NOT LIMITED TO SUBGRADE, AREA OF OVEREXCAVATION AND RECOMPACTION, SHRINKAGE AND EXPANSION OF THE SOIL. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING EARTHWORK QUANTITIES FOR BIDDING AND CONSTRUCTION PURPOSES.

SHEET INDEX:

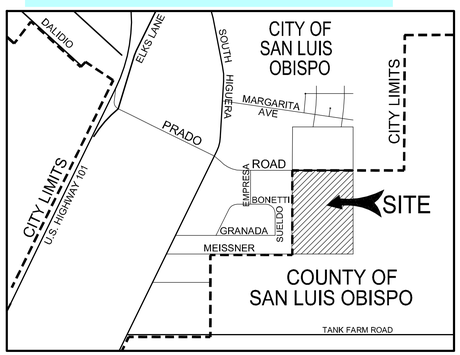
Note (10-22-2008): Property was still part of County, not the City, when these plan sheets were originally drawn in 2006. Since that time, the property has been annexed into the City of San Luis Obispo. Tentative Tract Map number will likely change.



TYPICAL 60' RIGHT-OF-WAY
STREET SECTION
-NTS-
COMMERCIAL COLLECTOR

*FINAL DETERMINATION OF THICKNESSES SHALL BE BASED UPON "R" VALUE FIELD TESTED ON ACTUAL SUBGRADE. TI=6.5, OR MINIMUM REQUIREMENTS (WHICHEVER IS GREATER).

SECTION A-A
NOT TO SCALE



Vicinity Map
Not to Scale

LEGEND:

(E)	EXISTING	SD	EXISTING STORM DRAIN
EG	EXISTING GROUND	W	EXISTING WATER LINE
EP	EDGE OF PAVEMENT	S	EXISTING SEWER LINE
FS	FINISH SURFACE	G	EXISTING GAS LINE
GB	GRADE BREAK	E	EXISTING ELECTRICAL CONDUIT
L	LENGTH	TEL	EXISTING FIBER OPTICAL CONDUIT
S	SLOPE		CATCH BASIN (CB)
2%	RATE & DIRECTION OF FLOW		AREA DRAIN (AD)
INV	INVERT	HDPE	HIGH DENSITY POLYETHYLENE
TG	TOP OF GRATE	SDMH	STORM DRAIN MANHOLE
347.20	ELEVATION	SD	STORM DRAIN
	GRADED SWALE	W	WATER LINE
	EXISTING FENCE	SS	SANITARY SEWER
345	EXISTING INDEX CONTOUR	E	ELECTRICAL CONDUIT
	EXISTING INTERMEDIATE CONTOUR	TEL	COMMUNICATION CONDUIT
345	PROPOSED INDEX CONTOUR	JT	JOINT TRENCH
	PROPOSED INTERMEDIATE CONTOUR		PROPERTY LINE

TENTATIVE TRACT MAP CO 06-0143

LEGAL DESCRIPTION:
LOT 34 AND 41 OF THE SAN LUIS OBISPO SUBURBAN TRACT, AS SHOWN ON THE MAP RECORDED IN BOOK 1 AT PAGE 92 OF RECORDS OF SURVEY IN THE CITY OF SAN LUIS OBISPO, COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA.

APN: 076-341-012

ABOVE GRADE ENGINEERING
778 Osos Street, Suite A
San Luis Obispo, CA 93401
phone: (805) 540-5115
fax: (805) 540-5116
A California Corporation
Scott Stokes PE # 58256

ENGINEER OF RECORD:
REGISTERED PROFESSIONAL ENGINEER SCOTT J. STOKES No. 58256 Exp. 6/30/10 CIVIL STATE OF CALIFORNIA
NOT FOR CONSTRUCTION
DATE:

PRADO RD COMMERCIAL

TENTATIVE TRACT MAP

NO.	REVISION	DATE

DESIGNED: DJS
DRAWN: DJS
JOB NUMBER: 06104

SHEET: C-1

DATE: AUGUST 18, 2008

Drawing name: N:\2006\06104-PradoCommercial\TTM\Sheetfiles-a\06104-C-1-TTM.dwg
PLOT DATE: Aug 18, 2008 - 9:58am
PLOT BY: dspiegel

9.0 Photographs

Photo 1. Prado Park property viewed facing north from the southeast corner. The site had been heavily grazed by cattle, and areas with desirable forage, such as wetlands in the foreground had little vegetation remaining on September 15, 2008. Upland areas dominated by less-palatable plants, such as yellow star thistle and may-weed, were still well-vegetated.

Photo 2. The south end of the property, much of which consists of herbaceous wetland, was grazed nearly bare by September 2008.

Photo 3. Wetlands at the south end of the property support Congdon's tarplant, a CNPS List 1B.2 species. In 2008, individuals were scattered throughout this wetland, with highest densities occurring along the margins of the wetland. Exact locations of occurrence vary from year to year because this species is an annual.

Photo 4. Congdon's tarplant occurs more densely along the interface between upland and southern wetland.

Photo 5. Upland areas are dominated by weeds, including yellow star thistle, Italian thistle, fennel, and field tarweed. Non-native grasses, including ripgut brome, soft-chess, and Bermuda grass, are also present. Photo taken facing southwest, September 14, 2008.

Photo 6. Late in the season, field tarweed dominates large patches of non-wetland habitats on site. Earlier in the year, black mustard, filaree, and non-native annual grasses are dominant (based on dried remains observed September 15, 2008).

Photo 7. Wetlands onsite include a long narrow "finger" of federal wetlands located between a natural hill to the east and artificial fill to the west. Wetlands are in federal jurisdiction under Section 404 of the Clean Water Act. Low spots within the channel support Congdon's tarplant (circled).

APPENDIX A – Status Codes

- **CNDDB Conservation Status Ranks** (CDFG Special Animals List, February 2008)
- **CNDDB Element Ranking for Plants** (CDFG Special Vascular Plants, Bryophytes, and Lichens List, January 2008)
- **CNPS Lists** (CDFG Special Vascular Plants, Bryophytes, and Lichens List, January 2008)

CNDDB CONSERVATION STATUS RANKS:

The CNDDB ranking codes are part of the "Heritage Methodology". It is a shorthand formula that provides information about the status of a taxon, both throughout its entire range and within California. We use the best information available to assign these ranks and they are changed and refined as new information becomes available. More detailed information about the conservation status ranking system can be found at: **http://www.natureserve.org/explorer/ranking.htm**

CALIFORNIA ENDANGERED SPECIES ACT (CESA) LISTING CODES: The listing status of each species is current as of the date of this list. The most current changes in listing status will be found in the list of "Endangered and Threatened Animals of California", which the CNDDB updates and issues quarterly (January, April, July, & October).

SE State-listed as Endangered
ST State-listed as Threatened
SCE State candidate for listing as Endangered
SCT State candidate for listing as Threatened
SCD State candidate for delisting

ENDANGERED SPECIES ACT (ESA) LISTING CODES: The listing status is current as of the date of this list. The most current changes in listing status will be found in the list of "Endangered and Threatened Animals of California", which the CNDDB updates and issues quarterly (January, April, July, & October). Federal listing actions are also available at: **http://www.epa.gov/fedrgstr/EPA-SPECIES/index.html**.
After careful consideration we have removed the USFWS Federal Species of Concern (FSC) designation from this list. The Federal Species of Concern list was not maintained on a statewide basis. The Sacramento field office, with jurisdiction over the central portion of California, maintained a list, but the Ventura, Carlsbad and Arcata offices did not. Therefore, species in the northern and southern parts of the state were not considered. Information on the list maintained by the Sacramento field office is available at: **http://sacramento.fws.gov/es/spp_concern.htm**

FE Federally listed as Endangered
FT Federally listed as Threatened
FPE Federally proposed for listing as Endangered
FPT Federally proposed for listing as Threatened
FPD Federally proposed for delisting
FC Federal candidate species (former Category 1 candidates)
SC Species of Concern – list established by National Marine Fisheries Service (NMFS) effective 15 April 2004

ELEMENT RANKING

GLOBAL RANKING

The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

SPECIES OR NATURAL COMMUNITY LEVEL

G1 = Less than 6 viable element occurrences (Eos) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 Eos OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

SUBSPECIES LEVEL

Subspecies receive a **T-rank** attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. For example: *Chorizanthe robusta* var. *hartwegii*. This plant is ranked G2T1. The G-rank refers to the whole species range i.e., *Chorizanthe robusta*. The T-rank refers only to the global condition of var. *hartwegii*.

STATE RANKING

The *state rank* (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 Eos OR less than 1,000 individuals OR less than 2,000 acres
- S1.1 = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

S2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

S3 = 21-80 Eos or 3,000-10,000 individuals OR 10,000-50,000 acres
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.

S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

Notes:

1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take a **bird's eye or aerial view** when ranking sensitive elements rather than simply counting element occurrences.

2. Uncertainty about the rank of an element is expressed in two major ways:

   By expressing the ranks as a **range** of values: e.g., S2S3 means the rank is somewhere between S2 and S3.

   By adding a ? to the rank: e.g., S2? This represents more certainty than S2S3, but less certainty than S2.

3. Other symbols:

   GH All sites are **historical**; the element has not been seen for at least 20 years, but suitable habitat still exists (SH = All California sites are historical).

   GX All sites are **extirpated**; this element is extinct in the wild (SX = All California sites are extirpated).

   GXC Extinct in the wild; exists in cultivation.

   G1Q The element is very rare, but there are **taxonomic questions** associated with it.

   T Rank applies to a subspecies or variety.

The California Native Plant Society's (CNPS) Lists

1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

List 1A: Plants Presumed Extinct in California

The plants of List 1A are presumed extinct because they have not been seen or collected in the wild in California for many years. Although most of them are restricted to California, a few are found in other states as well. In many cases, repeated attempts have been made to rediscover these plants by visiting known historical locations. Even after such diligent searching, we are constrained against saying that they are extinct, since for most of them rediscovery remains a distinct possibility. Note that care should be taken to distinguish between "extinct" and "extirpated." A plant is extirpated if it has been locally eliminated, but it may be doing well elsewhere in its range.

List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere.

The plants of List 1B are rare throughout their range. All but a few are endemic to California. All of them are judged to be vulnerable under present circumstances or to have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population (even though they may be wide ranging), or their limited number of populations. Most of the plants of List 1B have declined significantly over the last century.

List 2: Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere

Except for being common beyond the boundaries of California, the plants of List 2 would have appeared on List 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Until 1979, a similar policy was followed in California. However, after the passage of the Native Plant Protection Act, plants were considered for protection without regard to their distribution outside the state.

List 3: Plants About Which We Need More Information - A Review list

The plants that comprise List 3 are united by one common theme--we lack the necessary information to assign them to one of the other lists or to reject them. Nearly all of the plants remaining on List 3 are taxonomically problematic.

List 4: Plants of Limited Distribution - A Watch list

The plants in this category are of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time. While we cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, we will transfer it to a more appropriate list or deleted from consideration.

Threat ranks:

Recently, CNPS added a decimal threat rank to the List ranks to parallel that used by the CNDDB. This extension replaces the E (Endangerment) value from the R-E-D Code. CNPS ranks therefore read like this: 1B.1, 1B.2, etc.

New Threat Code extensions and their meanings:

.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2 – Fairly endangered in California (20-80% occurrences threatened)

.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

Note that all List 1A (presumed extinct in California) and some List 3 (need more information- a review list) plants lacking any threat information receive no threat code extension. Also, these Threat Code guidelines represent a starting point in the assessment of threat level. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are also considered in setting the Threat Code.

APPENDIX B – CNDDB Reports

- Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work: 9 (month (mm)) - 15 (date (dd)) - 2008 (year (yyyy))

Scientific Name: Centromadia parryi ssp. congdonii

Common Name: Congdon's Tarplant

Species Found? ☑ yes ☐ no _____ If not, why?

Total No. Individuals 1,000 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? 64 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Meg Perry
Address: Althouse and Meade, Inc.
1875 Wellsona Road Paso Robles, CA 93446

Email Address: meg@althouseandmeade.com
Phone: (805) 467-1041

Plant Information

Phenology: 0.00 % vegetative 50.00 % flowering 50.00 % fruiting

Animal Information

Age Structure: _____ # adults _____ # juveniles _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☑ other

Location ***(please also attach or draw map on back)***

400 Prado Road, San Luis Obispo, CA APN 076-341-012

County: San Luis Obispo Landowner / Mgr.: Private

Quad Name: San Luis Obispo Elevation: 100'

T _____ R _____ _____ 1/4 of _____ 1/4 of Section _____ T _____ R _____ _____ 1/4 of _____ 1/4 of Section _____

UTM: Zone: _____ (10, 11) Datum: NAD 1983 (NAD83, NAD27, WGS84, other)

Source: USGS 7.5' map (GPS, map & type, etc.) Point Accuracy: 20 Meters

UTM Coordinates [Latitude/Longitude]: 35.25225° N, 120.66372° W NAD 83.

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope)*

Margins of ruderal grassland and seasonal wetlands on property adjacent to the decommissioned tank farm. Congdon's tarplant is known from the vicinity of the subject property.

Other rare species? None observed during fall floristic survey.

Site Information Overall site quality: ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Current / surrounding land use: Pasture (north and east), decommissioned tank farm and open space (south) residential and commercial (west)

Visible disturbances / possible threats: Construction of a proposed commercial development will impact up to approximately 30% of the onsite Congdon's tarplant (~300 individuals)

Comments: Mitigation is proposed for impacts. Mitigation would occur onsite in open space.

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): _____
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Previous experience with the species.

Photographs: *(check one or more)*

	Slide	Print
Plant / animal	☐	☑
Habitat	☐	☑
Diagnostic feature	☐	☐

May we obtain duplicates at our expense? ☑ yes ☐ no

APPENDIX C – Fairy Shrimp Survey Results

- Unocal Martinelli Site 90-Day Comprehensive Wet and Dry Season Vernal Pool Branchiopod Survey Report (David Wolff Environmental, 2005).

UNOCAL MARTINELLI SITE

90-DAY COMPREHENSIVE WET AND DRY SEASON VERNAL POOL BRANCHIOPOD SURVEY REPORT

PREPARED FOR

Unocal, a Subsidiary of Chevron Corporation

PREPARED BY

David Wolff Environmental

OCTOBER 13, 2005

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

Survey Site/Name: Unocal Martinelli Site			County: San Luis Obispo				Vernal Pool #: Area 7 - Prado Rd ditch			
USGS 7.5 min Quad: San Luis Obispo	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: Roadside ditch					Max Area: Approx 0.02			Max Depth: 18"		
Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05	
Air Temperature		55°F	72°F	65°F	66°F	62°F	62°F	76°F	74°F	
Water Temperature		52°F	62°F	62°F	63°F	66°F	62°F	74°F		
Water Depth	Dry	12"	12"	3"-18"	5"-18	6"	3"	2"	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	Hyla						Tads	Tads	Tads	
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 1/2 - Flowing roadside drainage to W. drainage 1/18 - Flowing NO Ag. litter obs. 2/1 - Flowing w/ algal mats 2/18 Flowing, 2/21 Obs. Bank full Flows From Rains 3/30 Slight Flow

David Wolff Environmental
www.dkwenvironmental.com

UNOCAL MARTINELLI SITE

90-DAY COMPREHENSIVE WET AND DRY SEASON VERNAL POOL BRANCHIOPOD SURVEY REPORT

Table of Contents

APPENDICES

UNOCAL MARTINELLI SITE
90-DAY COMPREHENSIVE WET AND DRY SEASON
VERNAL POOL BRANCHIOPOD SURVEY REPORT

1.0 INTRODUCTION AND PURPOSE

On behalf of Unocal Corporation, David Wolff Environmental (DWE) completed the wet and dry season vernal pool branchiopod (fairy shrimp) surveys for the Unocal Martinelli site. The Unocal Martinelli site is an approximately 20-acre property directly south of Prado Road approximately one-half mile east of the intersection of Prado Road and South Higuera Street in San Luis Obispo County, California (Figure 1 in Appendix A). DWE has prepared this vernal pool branchiopod 90-day comprehensive wet and dry season survey report in accordance with terms and conditions of Recovery Permit TE-090849-0. This report provides the details from the surveys conducted in accordance with the United States Fish and Wildlife Service (USFWS) April 19, 1996 Interim Survey Guidelines (survey guidelines).

The purpose of the study was to complete the wet season and dry season survey protocols as detailed in the survey guidelines to determine presence or absence of listed fairy shrimp in the wetland habitats on site. This comprehensive report fulfills the 90-day reporting requirements for the 2004-2005 wet season and 2005 dry season surveys. In summary, the wet and dry season fairy shrimp surveys conducted for the Unocal Martinelli site during the 2004-2005 wet season and 2005 dry season did not result in any observations of listed vernal pool brachiopods.

2.0 METHODS

The wet season fairy shrimp survey request was submitted by DWE on November 17, 2004 and authorized by Steve Kirkland of the USFWS via e-mail on December 13, 2004. Copies of the wet season survey approval requests and authorizations are included in Appendix B. David Wolff, DWE Principal Ecologist, conducted the wet season survey protocol under Recovery Permit TE-090849-0 From December 14, 2004 to April 14, 2005. The fairy shrimp wet season survey was conducted in three drainage features and four isolated wetland features on the Unocal Martinelli site (see Figure 2 in Appendix A). Surveys were conducted by wading through the ponded drainage and wetland feature with a pool skimmer net that covers 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.

The dry season survey request was submitted by DWE letter dated July 5, 2005 and authorized by Julie Vanderwier of the USFWS via e-mail dated July 14, 2005. An amendment to the dry season authorization was submitted to the USFWS by DWE letter dated September 1, 2005 to have Mitch Dallas process and analyze the soil samples under David Wolff's permit until his permit was issued. Julie Vanderwier was notified via e-mail dated September 16, 2005 that Mr. Dallas had received his Recovery Permit TE102310-0 and authorized him to complete the soil processing and analysis via e-mail dated September 20, 2005. Copies of the dry season survey approval requests and authorizations are included in Appendix C.

The dry season soil collection was conducted by David Wolff on August 16, 2005 under permit TE090849-0 in five of the seven wetland features that were not subject to regular flowing water throughout the 2004-2005 wet season. Two areas, "Drainage A" and "Prado Road drainage" were not sampled for dry season analysis as they were observed with bank full flowing water following rainfall events. Water was observed flowing in these two features throughout the wet season rendering them unsuitable for listed vernal pool branchiopods. Soil samples were processed and analyzed for listed vernal pool branchiopods by Mitch Dallas, Dallas Branchiopod Laboratories, Recovery Permit TE102310-0.

3.0 RESULTS

Seven wetland areas were identified for surveying during the 2004-2005 wet season based on observations of ponded water. Figure 2, and Figures 3A and 3B, in Appendix A are a map showing survey area locations and representative photographs respectively. Areas 1 and 2 are small isolated ponded features. Areas 3 and 4 are small ponded features within "Drainage B" that receives runoff from the east that turns to the south on the site where it follows a berm narrowing down substantially until fanning out in Area 5 before exiting the site. Area 5 is a shallow flooded area that is also subject to the overland flooding from Area 6, Drainage A, as a result of a debris dam along the southern property boundary fence line that causes shallow overland flooding of Area 5. Area 6 (Drainage A) flows from north to south until the point it curves to the east for a short reach before exiting the site to the south. Drainage A is fed primarily from the north of Prado Road by a concrete channel conveying runoff along the mobile home park and a culvert carrying surface runoff. Drainage A also receives runoff from the Prado Road Drainage that runs east to west along the south side of Prado Road. Area 7, the Prado Road drainage, receives surface runoff from north of Prado Road via a culvert under Prado Road approximately ½ mile east of the site.

No listed vernal pool branchiopods were observed during the 2004-2005 wet season protocol fairy shrimp survey conducted on the Unocal Martinelli site. As discussed above, two of the areas (Areas 6 and 7) were observed with flowing water of various levels in response to rainfall events throughout the wet season. Drainage A and Prado Road drainage contained flowing water even after weeks without rainfall rendering them unsuitable for fairy shrimp. The wet season survey data sheets completed during this survey are included behind the survey approval correspondences in Appendix B. The data sheets show the dates surveyed, species observed, air temperature, water temperature, and water depth recorded on each survey date.

The dry season soil collection and analysis was conducted in five seasonally ponded areas (Areas 1-5) on the Unocal Martinelli site. Although broad overland flooding in Area 5 was observed during the wet season, the flow was minimal enough to warrant the dry season analysis. No listed vernal pool branchiopods were discovered during the 2005 dry season soil analysis. Interestingly, one *Artemia* sp. cyst was discovered in Area 1 soils. Dry season survey data sheets completed during this survey are included behind the survey approval correspondences in Appendix C. The data sheets show the date surveyed and approximate location of the 10 soil samples collected in each feature.

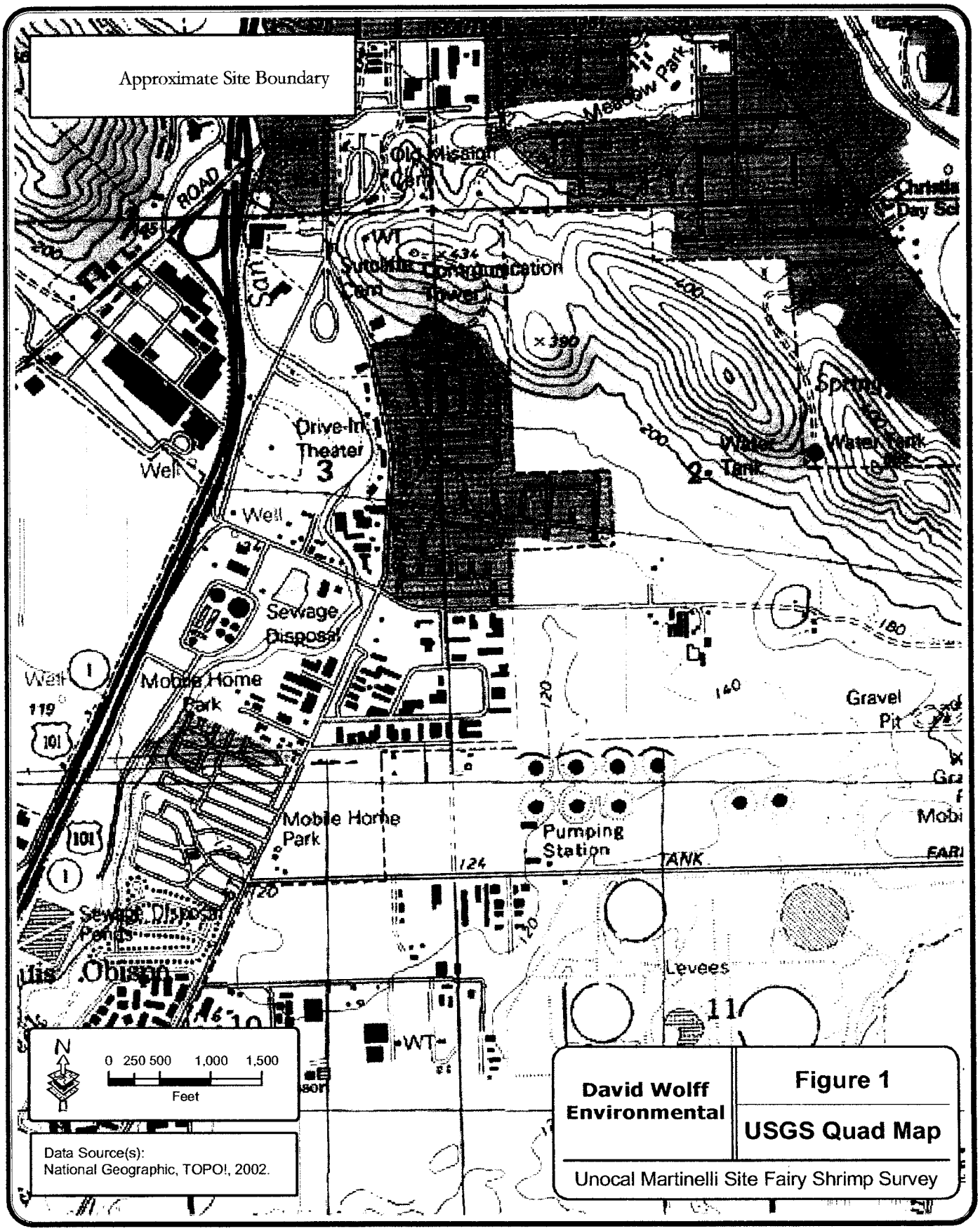
APPENDIX A

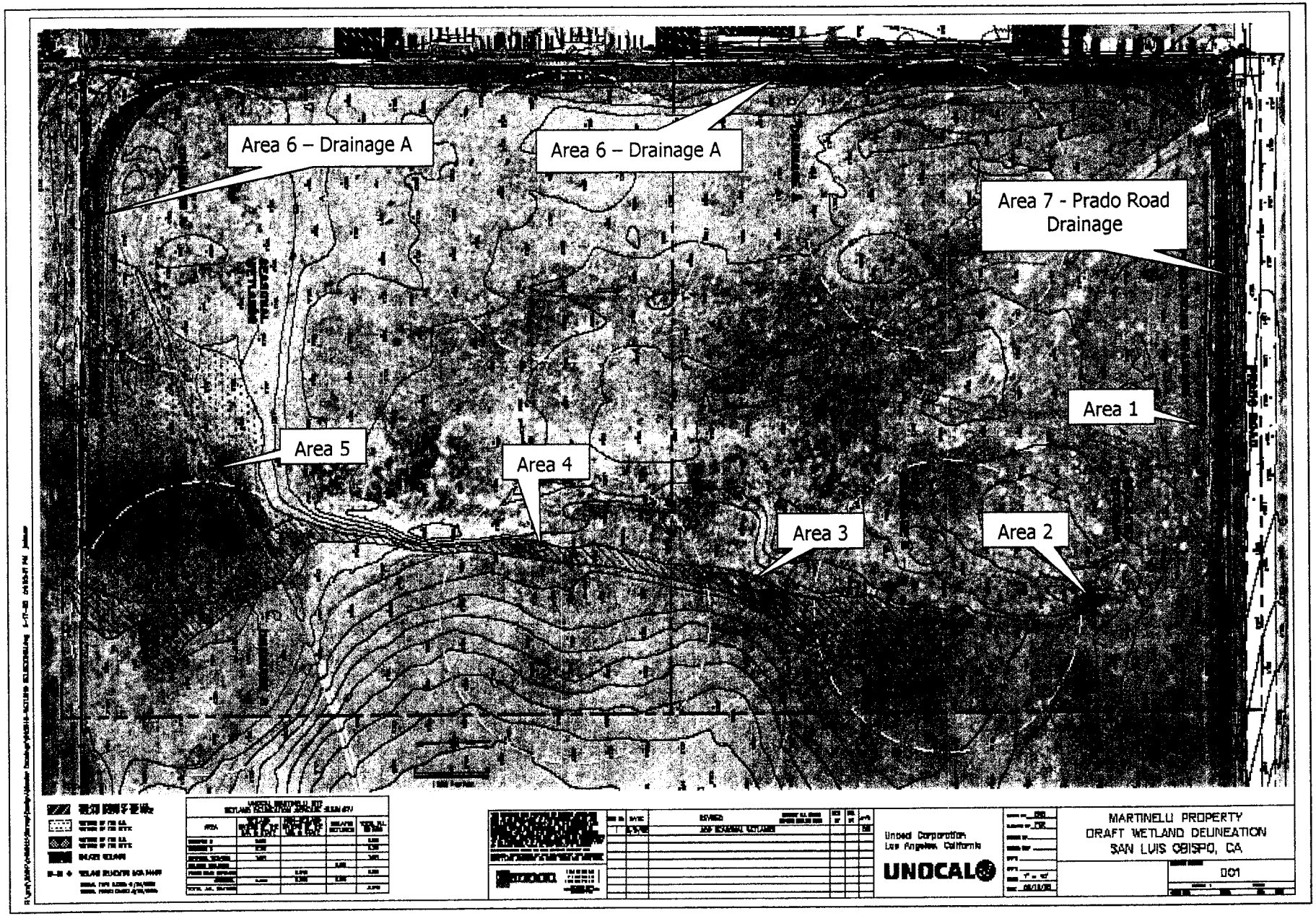
FIGURES

Figure 1 – Location Map

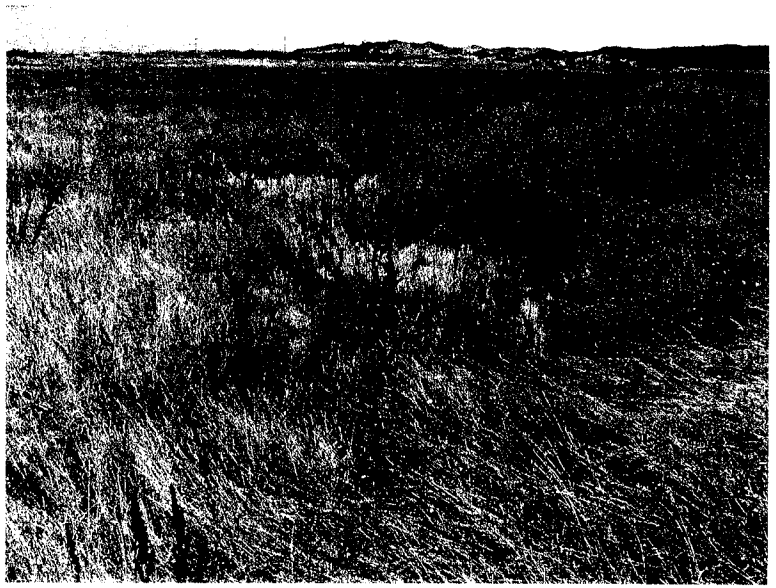
Figure 2 – Survey Area Map

Figures 3A & 3B – Representative Photographs


Approximate Site Boundary
Old Mission
Drive-In Theater
Well
Sewage Disposal
Mobile Home Park
Gravel Pit
Pumping Station
TANK
Levees
Sewage Disposal Ponds
Obispo
N
0 250 500 1,000 1,500
Feet
Data Source(s):
National Geographic, TOPO!, 2002.
David Wolff Environmental
Figure 1
USGS Quad Map
Unocal Martinelli Site Fairy Shrimp Survey


Area 6 – Drainage A
Area 6 – Drainage A
Area 7 - Prado Road Drainage
Area 1
Area 5
Area 4
Area 3
Area 2
MARTINELLI PROPERTY
DRAFT WETLAND DELINEATION
SAN LUIS OBISPO, CA
Unocal Corporation
Los Angeles, California
UNOCAL

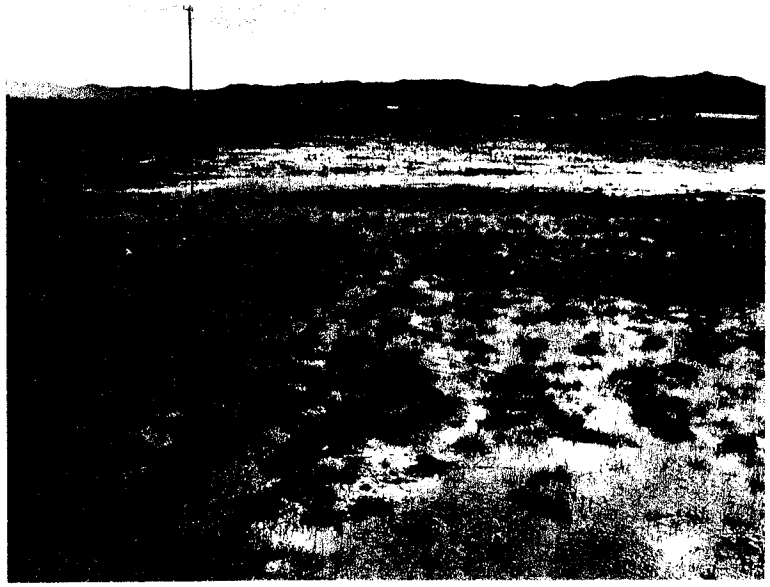
Area 1 - Looking west, August 16, 2005.



Area 2 - Looking south, August 16, 2005.

Area 3 - Looking south, August 16, 2005.

Area 4 - Looking south, August 16, 2005.



Area 5 - Looking south, January 2, 2005.

Area 5 - Looking west, August 16, 2005.

Area 6 - Drainage A looking south, January 2, 2005.

Area 7 - Prado Road drainage looking east, August 16, 2005.

APPENDIX B

Wet Season Survey Approval Correspondences and Data Forms

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 Martinelli Site 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 Martinelli site in San Luis Obispo, California. The study area includes the approximately 20-acre area located south of Prado Road approximately ½ mile east of South Higuera Street. A map is attached showing the location of the study area on the southern edge of USFWS San Luis Obispo 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. No dry season protocol surveys have been completed on this site. Dry season surveys would be conducted next summer depending on the outcome of this proposed wet season survey.

The wetland habitats to be surveyed include two low gradient seasonal wetland drainage features that cross the site draining to the south onto the Unocal Former San Luis Obispo Tank Farm site. 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

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

2. AUTHORITY-STATUTES
16 USC 1539(a)
16 USC 1533(d)

REGULATIONS *(Attached)*
50 CFR 17.22
50 CFR 17.32

50 CFR 13

1. PERMITTEE

DAVID K. WOLFF
1637 9TH STREET
LOS OSOS, CA 93402
U.S.A.

3. NUMBER
TE090849-0

4. RENEWABLE	5. MAY COPY
☒ YES	☒ YES
☐ NO	☐ NO

6. EFFECTIVE	7. EXPIRES
11/05/2004	11/04/2008

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*

9. TYPE OF PERMIT
THREATENED AND ENDANGERED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Further conditions of authorization are contained in the attached Special Terms and Conditions.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
ANNUAL REPORTS DUE: 1/31
See permit conditions for further reporting requirements.

ISSUED BY	TITLE	DATE
Sarah B. Hall	for CHIEF - ENDANGERED SPECIES	11/05/2004

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE. 11th Avenue
Portland, Oregon 97232-4181

IN REPLY REFER TO:

LIST OF AUTHORIZED INDIVIDUALS
TE-090849-0

1. Individual authorized to independently conduct activities pursuant to this permit:

   David K. Wolff.

   Supervised individuals may conduct activities pursuant to this permit only under the direct, on-site supervision of Mr. Wolff.

11/5/04
Date

for Chief, Endangered Species

This List is only valid if it is dated on or after the permit issuance date.

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

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

Survey Site/Name: Unocal Martinelli Site			County: San Luis Obispo				Vernal Pool #: Area 1			
USGS 7.5 min Quad: San Luis Obispo	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: 70'x4'			Max Depth: 46"		
Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05	
Air Temperature		55°F	70°F	65°F	70°F	62°F	62°F	78°	74°F	
Water Temperature		58°F	66°F	64°F	70°F	68°F	[redacted]			
Water Depth	Dry	46"	1"-2"	41"	2"	42"	[redacted]	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: 1/2 - Ponding After 5"+ rainfall 120 Ag. Life obs. 1/18 - NO Ag. life 2/1 - NO Ag life 2/18 - NO Ag. life

David Wolff Environmental
www.dkwenvironmental.com

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

Survey Site/Name: Unocal Martinelli Site			County: San Luis Obispo				Vernal Pool #: Area 2			
USGS 7.5 min Quad: San Luis Obispo	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: 30x25' oval			Max Depth: 6"		
Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05	
Air Temperature		55°F	72°F	65°F	70°F	62°F	62°F	78°F	74°F	
Water Temperature		58°F	66°F	64°F	78°F	66°F	68°F	74°F		
Water Depth	43"	46"	3"	43"	4"	6"	23"	2"	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: 1/2 ND Ag. life Obs

David Wolff Environmental
www.dkwenvironmental.com

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

Survey Site/Name: Unocal Martinelli Site			County: San Luis Obispo				Vernal Pool #: Area 3			
USGS 7.5 min Quad: San Luis Obispo		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: 135'x25'			Max Depth: 14"		
	Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05
	Air Temperature		55°F	72°F	65°F	70°F	62°F	62°F	78°F	74°F
	Water Temperature		56°F	62°F	62°F	70°F	64°	62°F	69°F	70°F
	Water Depth	L 3"	6"-10"	14"	L 12"	L 10"	6"-10"	4"-10"	4"-10"	L 5"
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					Tad ✓			Tads	tads
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 Martinelli Site			County: San Luis Obispo				Vernal Pool #: Area 4			
USGS 7.5 min Quad: San Luis Obispo	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: 50x25'			Max Depth: 4"		
Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05	
Air Temperature		58°F	72°F		70°F	62°F	62°F	78°F	DRY	
Water Temperature		[illegible]	62°F	62°F	70°F	64°F	64°F	78°F		
Water Depth	DRY	DRY	3"	2.3"	2.4"	2.4"	2.2"	2.2"		
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		
Fish										
Salamanders										
Water Fowl										
Other Species										

Voucher Specimens:

Notes: 2/1 Algal mats

David Wolff Environmental
www.dkwenvironmental.com

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

Survey Site/Name: Unocal Martinelli Site			County: San Luis Obispo				Vernal Pool #: Area 5			
USGS 7.5 min Quad: San Luis Obispo	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: Approx 1.2 acre			Max Depth: 10"		
Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05	
Air Temperature		55°F	70°F	65°F	70°F	62°F	62°F	78°F	74°F	
Water Temperature		58°F	62°F	64°F	70°F	66°F	62°F	76°F	70°F	
Water Depth	<4"	6"-10"	6"-10"	<3"	2-4"	2"-8"	2"-4"	2-4"	<2"	
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: 1/2/05 - Lots of ponding from channel flooding from debris build up on fence. 1/18 - observed flow as Area 5 drains. 2/1 - still overflow flooding from drainage. 2/18 - flowing overflow from W. drainage. 3/30 - still flowing. 4/14 - no flow water ponding reduced to one small area @ fence.

David Wolff Environmental
www.dkwenvironmental.com

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

Survey Site/Name: Unocal Martinelli Site		County: San Luis Obispo	Vernal Pool #: Area 6 - W Drainage
USGS 7.5 min Quad: San Luis Obispo	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: Approx 0.6 acre	Max Depth: 18"

	Survey Date:	12/14/04	1/2/05	1/18/05	2/1/05	2/18/05	3/3/05	3/17/05	3/31/05	4/14/05	
	Air Temperature		55°F	72°F	65°F	70	62°F	62°F	76°F	72°F	
	Water Temperature		58°F	66°F	60°F	68°F	66°F	62°F	74°F	70°F	
	Water Depth	<12"	12"-18"	12"-18"	12"-18"	12"-18"	8"-18"	4"-6"	4"-10"	<8"	
Species Observed											
Branchinecta lynchi	vernal pool fairy sh.										
Linderiella occidentalis	linderiella										
Notostraca	tadpole shrimp										
Platyhelminthes	flatworms										
Erpobdellidae	leeches			✓	✓		✓			[illegible] ✓	
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	tads	tads	
Fish										Stickle?	
Salamanders											
Water Fowl											
Other Species											

Voucher Specimens:

Notes: 12/14 - W. drainage shallow ponding 1/2 to south turn; 1/2 Flowing water thru' drainage; 1/18 - Flowing; 2/1 - Still flowing w/ Algae + emerg veg

David Wolff Environmental
www.dkwenvironmental.com

2/18/05 - Drainage flow [illegible] thick 2/21 - obs Bank full flows [illegible] , obs Bank full flow last storm

3/17 - water level lower still slight flow emergent veg taking over channel

3/30 still flowing algae & emergent veg covering drainage

4/14 - substantial draw down algae covered slight flow

APPENDIX C

Dry Season Survey Approval Correspondences and Data Forms

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

July 5, 2005

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 branchiopod (fairy shrimp) dry season surveys for the Unocal Martinelli Site 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 a dry season fairy shrimp survey for the Unocal Martinelli site. The study area includes the approximately 20-acre area located south of Prado Road approximately ½ mile east of South Higuera Street. The attached Figure 1 shows the location of the study area on the southern edge of USFWS San Luis Obispo 7.5 minute quadrangle map. The study area includes the same drainage and wetland features approved for conducting the wet season survey on December 13, 2004 by Steve Kirkland of your office. David Wolff, DWE Principal Ecologist, will conduct the study under Recovery Permit TE-090849-0 during the month of July 2005. I have attached my permit cover sheet and authorized individuals sheet for your reference. Following soil collection, I will be working with Debbie Martin of Biota Biological Consulting for conducting the soil processing and analysis under her Recovery Permit TE795931-3. All conditions of the permits and guidelines will be implemented.

The purpose of the study is to complete the dry season survey protocol as detailed in the currently accepted April 19, 1996 Interim Survey Guidelines to determine presence or absence of listed fairy shrimp along the project site seasonal wetland and drainage features. No vernal pool branchiopods were observed during the 2005 wet season protocol survey completed for this project site. The required 90-day report from the wet season survey is forthcoming.

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:

Figure 1 – Location Map
David Wolff and Biota Permits

C: Julie Vanderwier, USFWS Ventura Field Office
Rick Rittenberg, Unocal Corporation

David Wolff Environmental

From: Julie_Vanderwier@fws.gov
Sent: Thursday, July 14, 2005 11:31 AM
To: david@dkwenvironmental.com
Cc: Steve_Henry@r1.fws.gov
Subject: dry season sampling for vernal pool branchiopods [use this one!]

the ventura fish and wildlife office (vfwo) is in receipt of three requests for approval to conduct dry season surveys for listed vernal pool
branchiopods: tract 2342 of the santa margarita specific plan area, city of san luis obispo (received vfwo 5 july 2005); unocal martinelli site, san luis obispo county (received vfwo 6 july 2005); and the nacimiento water pipeline project, san luis obispo county (received 29 june 2005). we are also in receipt of your 90-day wet season survey report for tract 2342 of the santa margarita specific plan area. season sampling of based on your facsimile transmission dated 7 july 2005, it is our understanding that you are no longer requesting approval for the nacimiento water pipeline project.

i have reviewed the requests for tract 2342, santa margarita specific plan, and unocal martinelli and find that they are complete. as such, this email serves as your approval, pursuant to the conditions of recovery permit te-090849-0, to go forward with dry season sampling at these two sites.
if you have any questions, please feel free to contact me via phone or email at the addresses provided below.

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

September 1, 2005

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

SUBJECT: Request for amendment to approval to conduct listed vernal pool branchiopod (fairy shrimp) dry season surveys for the Unocal Martinelli Site under Recovery Permit TE-090849-0.

Dear Ms. Noda:

On behalf of Unocal Corporation, David Wolff Environmental (DWE) is submitting this request for an amendment to the July 14, 2005 e-mail approval by Julie Vanderwier to conduct a dry season fairy shrimp survey for the Unocal Martinelli site. The original request and approval anticipated that Debbie Martin of Biota Biological Consulting would conduct the laboratory processing and analysis the soil samples. Given schedule constraints, I would like to request the amendment for the approval to have the laboratory processing and analysis of the soil samples by Mitch Dallas under my permit TE090849-0. Mr. Dallas experienced in the process, is currently listed under a Caltrans permit, and expects to receive a permit in his own name soon. I will forward his permit information when it is received. In the interim, I will be working closely with Mr. Dallas under my permit for the timely processing of the samples.

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

C: Julie Vanderwier, USFWS Ventura Field Office
Rick Rittenberg, Unocal Corporation

David Wolff Environmental

From: David Wolff Environmental [david@dkwenvironmental.com]
Sent: Friday, September 16, 2005 2:06 PM
To: Julie Vanderwier (julie_vanderwier@fws.gov)
Subject: Dry Season Amendments

Greetings Julie,
Mitch Dallas has been issued and has received his fairy shrimp permit TE102310-0. He is poised to do the soil analysis for Tract 2342 and Unocal Martinelli Site upon USFWS approval. We are standing by anxiously. Thanks very much for you help.

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

David Wolff Environmental

From: Julie_Vanderwier@fws.gov
Sent: Tuesday, September 20, 2005 9:34 AM
To: david@dkwenvironmental.com
Subject: Re: Dry Season Amendments

as mitch has been authorized to perform cyst identification pursuant to permit number te-102310 (issued august 24, 2005), he is approved to conduct such for tract 2342 of the margarita specific plan to complete the dry season survey portion of the survey protocol for listed branchiopods. he is also approved to conduct cyst identification for the unocal martinelli 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>
09/16/2005 02:06 PM
Please respond to david

To: "Julie Vanderwier" <julie_vanderwier@fws.gov>
cc:
Subject: Dry Season Amendments

Greetings Julie,
Mitch Dallas has been issued and has received his fairy shrimp permit TE102310-0. He is poised to do the soil analysis for Tract 2342 and Unocal Martinelli Site upon USFWS approval. We are standing by anxiously.
Thanks very much for you help.

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david@DKWEnvironmental.com
www.dkwenvironmental.com

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 X yes

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

Date: 8/16/05 Time: 1:40PM County: SLO Quad: San Luis Obispo

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

Site/Project Name: Unocal Martinelli Pool #: 1

Township: 31S Range: 12E Section: _____ 30°15' lat. 120°40' long.

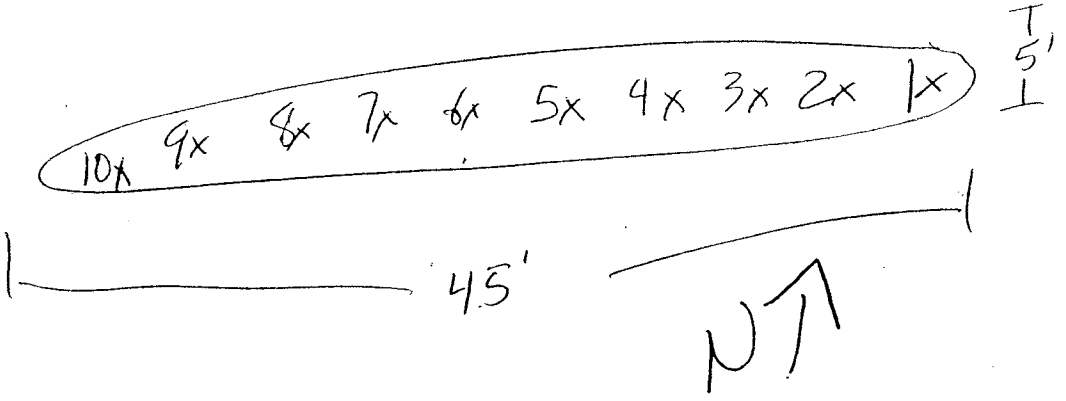
Habitat Condition: (circle where appropriate)

- 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 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

Area 1

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

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None) N=None	Cyst Density (#/100ml)
UM1-1	100		None	
UM1-2	100		N	
UM1-3	100		N	
UM1-4	100		N	
UM1-5	100		N	
UM1-6	100	Artimia sp. Not listed	1	1/100mL
UM1-7	100		N	
UM1-8	100		N	
UM1-9	100		N	
UM1-10	100		N	

Mitch C. Dallas TB102310-0

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 __X__ yes

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

Date: 8/16/05 Time: 1:15pm County: SLO Quad: San Luis Obispo

Collector(s): David Wolff Permit #: TE-090849-0

Site/Project Name: Unocal Martinelli Pool #: 2

Township: 31S Range: 12E Section: _____ 35°15' lat. 120°40' long.

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

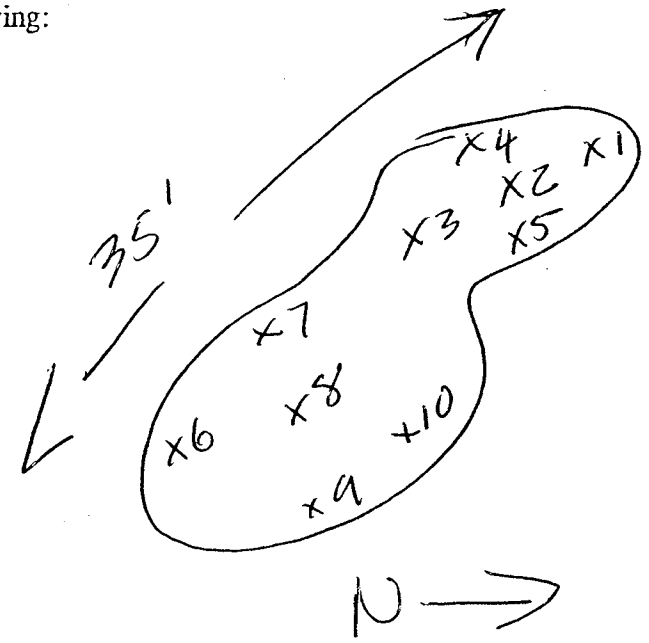
- ungrazed (grazed:) cattle horses sheep other_____
(light) moderate heavy

- land use of habitat: Grazing Annual Grassland

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



Area 2

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) N=None	Cyst Density (#/100ml)
VMZ-1	100		N	
VMZ-2	100		N	
VMZ-3	100		N	
VMZ-4	100		N	
VMZ-5	100		N	
VMZ-6	100		N	
VMZ-7	100		N	
VMZ-8	100		N	
VMZ-9	100		N	
VMZ-10	100		N	

Mitch C. Dallas TE 10230-0

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 __X__ yes

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

Date: 8/16/05 Time: 12:35 County: SLO Quad: San Luis Obispo

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

Site/Project Name: Unocal / Martinelli Pool #: 3

Township: 31S. Range: 12E. Section: _____ 30'15 lat. 120°40' long.

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

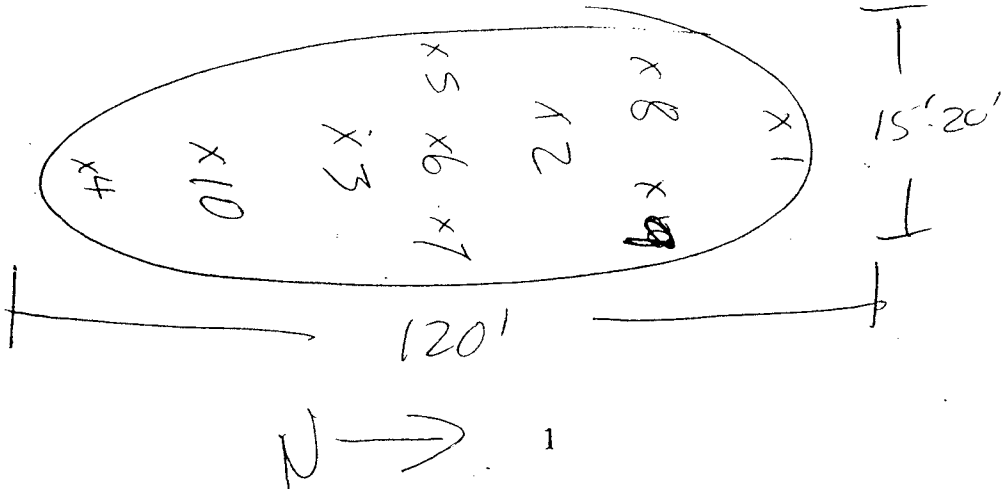
- ungrazed (grazed:) ~~cattle~~ horses sheep other_____
(light) moderate heavy

- land use of habitat: Grazing Annual Grassland

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

Area 3

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

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None) N=None	Cyst Density (#/100ml)
UM3-1	100		N	
UM3-2	100		N	
UM3-3	100		N	
UM3-4	100		N	
UM3-5	100		N	
UM3-6	100		N	
UM3-7	100		N	
UM3-8	100		N	
UM3-9	100		N	
UM3-10	100		N	

Mitch C. Dallas TE 102310-0

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 __X__ yes

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

Date: 8/16/05 Time: 12:02 PM County: SLO Quad: San Luis Obispo

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

Site/Project Name: Unocal Martinelli Pool #: 4

Township: 31S Range: 12E Section: _____ 30°15' lat. 120°40' long.

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

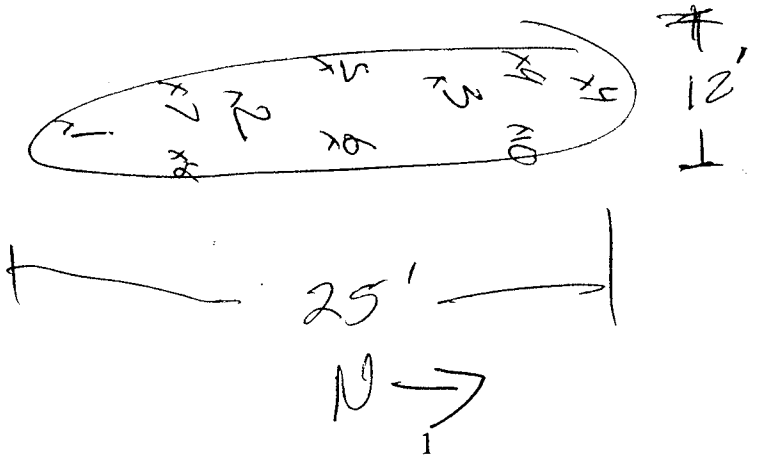
- ungrazed (grazed:) cattle horses sheep other_____
(light) moderate heavy

- land use of habitat: Grazing Annual Grassland

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

Area 4

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

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None) N=None	Cyst Density (#/100ml)
UM 4-1	100		N	
UM 4-2	100		N	
UM 4-3	100		N	
UM4-4	100		N	
UM 4-5	100		N	
UM4-6	100		N	
UM4-7	100		N	
UM4-8	100		N	
UM4-9	100		N	
UM4-10	100		N	

Mitch C. Dallas TE 102310-0

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 __X__ yes

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

Date: 8/16/05 Time: 11:11 am County: SLO Quad: San Luis Obispo

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

Site/Project Name: Unocal Martinelli Pool #: Area 5

Township: 31S Range: 12E Section: _____ 30°15' lat. 120°40' long.

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

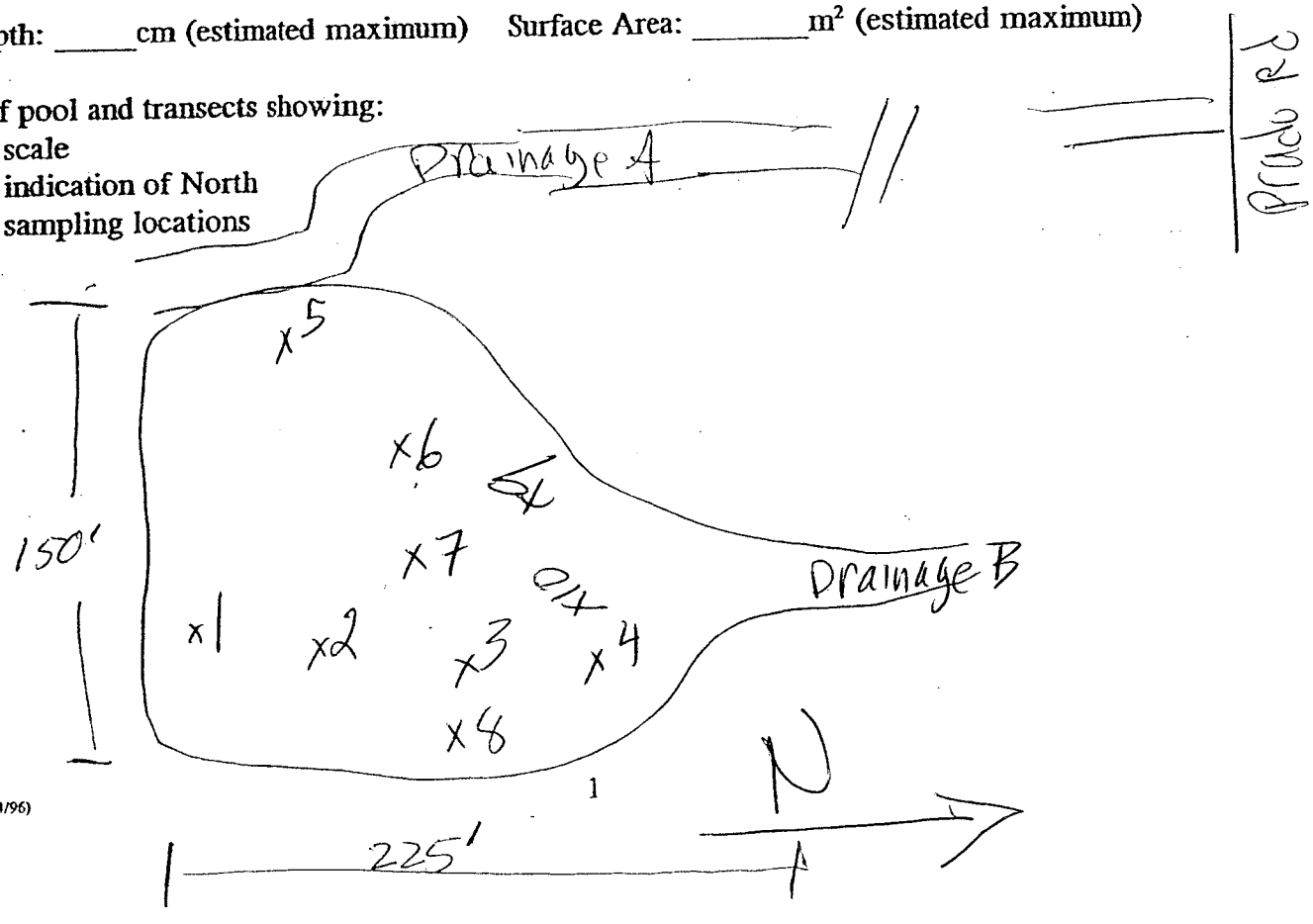
- ungrazed (grazed:) (cattle) horses sheep other_____
(light) moderate heavy

- land use of habitat: Grazing Annual Grassland

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

Area 5

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

Sample ID	Sample Volume(ml)	Genus (/species)	# Cysts (or None) N=None	Cyst Density (#/100ml)
VM5-1	100		N	
VM5-2	100		N	
VM5-3	100		N	
VM5-4	100		N	
VM5-5	100		N	
VM5-6	100		N	
VM5-7	100		N	
VM5-8	100		N	
VM5-9	100		N	
VM5-10	100		N	

Mitch C. Dallas TE 102310-0

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 D – NRCS Practice #412

- Grassed Waterways (NRCS Practice #412)

GRASSED WATERWAY

PRACTICE INTRODUCTION

USDA, Natural Resources Conservation Service - practice code 412

GRASSED WATERWAY
A grassed waterway is a natural or constructed channel established to suitable vegetation for safe water disposal.

PRACTICE INFORMATION
Waterways are constructed to convey runoff from terraces, diversions, or other concentrated flow areas where erosion control is needed.
The most critical time for successful installation of a grassed waterway is immediately following construction when the channel is bare and unprotected from runoff. Waterways are generally planted to perennial grass. It is critical during the vegetative establishment period to restrict outside water from flowing through the channel. Therefore, it may be necessary delay construction of terraces and/or diversions until the waterway is well established. Another critical consideration is the outlet at the lower end. If water quality or protection of riparian vegetation (streambank) is an issue, the outlet end may need to widen significantly or another buffer or filtering type practice may be necessary. In addition, the waterway installation must assure that the runoff from the waterway does not cause gullies and/or overfalls to develop.
Grassed waterways are multipurpose and provide one or more of the following benefits:

1. Safe disposal of runoff water
2. Erosion control is concentrated flow areas of a field
3. Improved water quality
4. Improved wildlife habitat
5. Reduced sediment damage
6. Improved landscape aesthetics

Additional information including standards and specifications are on file in the local NRCS Field Office Technical Guides

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

GRASSED WATERWAY

(Ac.)

CODE 412

DEFINITION

A shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet.

PURPOSE

- To convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding.
- To reduce gully erosion.
- To protect/improve water quality.

CONDITIONS WHERE PRACTICE APPLIES

In areas where added water conveyance capacity and vegetative protection are needed to control erosion resulting from concentrated runoff.

CRITERIA

General Criteria Applicable to All Purposes

Plan, design, and construct grassed waterways to comply with all Federal, State, and local laws and regulations.

Capacity. The minimum capacity shall convey the peak runoff expected from the 10-year frequency, 24-hour duration storm. Capacity shall be increased as needed to account for potential volume of sediment expected to accumulate in the waterway between planned maintenance activities. When the waterway slope is less than 1 percent, out-of-bank flow may be permitted if such flow will not cause excessive erosion. At a minimum, the design capacity shall remove the water before crops are damaged.

Stability. Determine the minimum depth and width requirements for stability of the grassed waterway using the procedures in the NRCS National Engineering Handbook, Part 650, Engineering Field Handbook, Chapter 7, Grassed Waterways; Agricultural Research Service (ARS) Agriculture Handbook 667, Stability Design of Grass-Lined Open Channels; or other equivalent method.

Width. Keep the bottom width of trapezoidal waterways less than 100 feet unless multiple or divided waterways or other means are provided to control meandering of low flows.

Side slopes. Keep the side slopes flatter than a ratio of two horizontal to one vertical. Accommodate the equipment anticipated to be used for maintenance and tillage/harvesting equipment that will cross the waterway in the designed width.

Depth. The capacity of the waterway must be large enough so that the water surface of the waterway is below the water surface of the tributary channel, terrace, or diversion that flows into the waterway at design flow.

Provide freeboard above the designed depth when flow must be contained to prevent damage. Provide freeboard above the designed depth when the vegetation has the maximum expected retardance.

Drainage. When needed to help or keep vegetation established on sites having prolonged flows, high water tables, or seepage problems, include Subsurface Drains (606), Underground Outlets (620), stone center waterways or other suitable measures in waterway designs.

NRCS, NHCP

September 2008

Outlets. Provide a stable outlet with adequate capacity. The outlet can be another vegetated channel, an earthen ditch, a grade-stabilization structure, filter strip or other suitable outlet.

Vegetative Establishment. Grassed waterways shall be vegetated according to NRCS Conservation Practice Standard Critical Area Planting (342). Species selected shall be suited to the current site conditions and intended uses. Selected species will have the capacity to achieve adequate density, height, and vigor within an appropriate time frame to stabilize the waterway.

Establish vegetation as soon as conditions permit. Use mulch anchoring, nurse crop, rock, straw or hay bale dikes, fabric checks, filter fences, or runoff diversion to protect the vegetation until it is established. Planting of a close growing crop, e.g. small grains or millet, on the contributing watershed prior to construction of the grassed waterway can also significantly reduce the flow through the waterway during establishment.

CONSIDERATIONS

Establish an appropriate width of vegetation on one or both sides of the waterway or add other sediment control measures above the waterway such as residue management to improve water quality and reduce sediment deposition in the waterway. Consider increasing the channel depth and/or designing areas of increased width or decreased slope to trap and store sediment to reduce the amount of sediment that leaves a field. Be sure to provide for regular cleaning out the waterway when trapping sediment in this manner.

Avoid areas where unsuitable subsurface, subsoil, substratum material that limits plant growth such as salts, acidity, root restrictions, etc., may be exposed during implementation of the practice. Where areas can not be avoided, seek recommendations from a soil scientist for ameliorating the condition or, if not feasible consider over-cutting the waterway and add topsoil over the cut area to facilitate vegetative establishment.

Avoid or protect if possible important wildlife habitat, such as woody cover or wetlands when determining the location of the grassed waterway. If trees and shrubs are incorporated, they should be retained or planted in the periphery of grassed waterways so they do not interfere with hydraulic functions. Medium or tall bunch grasses and perennial forbs may also be planted along waterway margins to improve wildlife habitat. Waterways with these wildlife features are more beneficial when connecting other habitat types; e.g., riparian areas, wooded tracts and wetlands. When possible, select species of vegetation that can serve multiple purposes, such as benefiting wildlife, while still meeting the basic criteria needed for providing a stable conveyance for runoff.

Water-tolerant vegetation may be an alternative to subsurface drains or stone center waterways on some wet sites.

Use irrigation in dry regions or supplemental irrigation as necessary to promote germination and vegetation establishment.

Provide livestock and vehicular crossings as necessary to prevent damage to the waterway and its vegetation.

Add width of appropriate vegetation to the sides of the waterway for wildlife habitat.

Consider including diverse legumes or other forbs that provide pollen and nectar for native bees. In dry regions, these sites may be able to support flowering forbs with higher water requirements and thus provide bloom later in the summer

The construction of a grassed waterway can disturb large areas and potentially affect cultural resources. Be sure to follow state cultural resource protection policies before construction begins.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for grassed waterways that describe the requirements for applying the practice according to this standard. As a minimum the plans and specifications shall include:

- A plan view of the layout of the grassed waterway.
- Typical cross sections of the grassed waterway(s).

- Profile(s) of the grassed waterway(s).
- Disposal requirements for excess soil material.
- Site specific construction specifications that describe in writing the installation of the grassed waterway. Include specification for control of concentrated flow during construction and vegetative establishment.
- Vegetative establishment requirements.

OPERATION AND MAINTENANCE

Provide an operation and maintenance plan to review with the landowner. Include the following items and others as appropriate in the plan.

- Establish a maintenance program to maintain waterway capacity, vegetative cover, and outlet stability. Vegetation damaged by machinery, herbicides, or erosion must be repaired promptly.
- Protect waterway from concentrated flow by using diversion of runoff or mechanical means of stabilization such as silt fences, mulching, haybale barriers and etc. to stabilize grade during vegetation establishment.
- Minimize damage to vegetation by excluding livestock whenever possible, especially during wet periods. Permit grazing in the waterway only when a controlled grazing system is being implemented.
- Inspect grassed waterways regularly, especially following heavy rains. Fill, compact, and reseed damaged areas immediately. Remove sediment deposits to maintain capacity of grassed waterway.
- Avoid use of herbicides that would be harmful to the vegetation in and adjacent to the waterway area.
- Avoid using waterways as turn-rows during tillage and cultivation operations.
- Mow or periodically graze vegetation to maintain capacity and reduce sediment deposition. Mowing may be appropriate to enhance wildlife values, but must be conducted to avoid peak nesting seasons and reduced winter cover.
- Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the waterway.
- Control noxious weeds.
- Do not use waterways as a field road. Avoid crossing with heavy equipment when wet.

REFERENCES

USDA, ARS. 1987. Stability design of grass-lined open channels. Agriculture Handbook 667.

USDA, NRCS. 2007. National Engineering Handbook, Part 650, Engineering Field Handbook, Chap. 7, Grassed waterways.