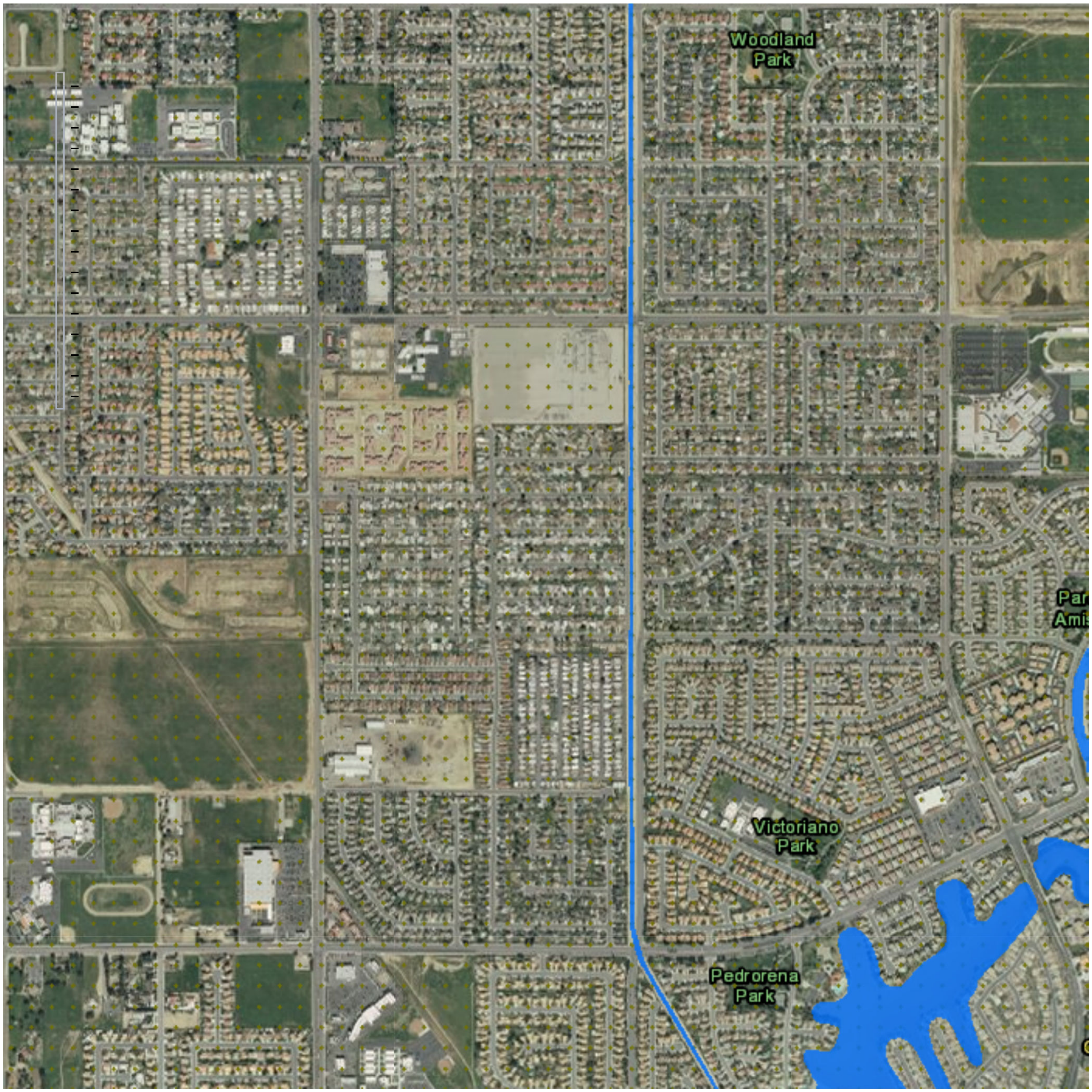
Print

Notes:

MyPlan Report



Historic Fault	
Displacement in the last 200 years	
Holocene Fault	
Displacement in the last 11,700 years	
Late Quaternary Fault	
Displacement in the last 700,000 years	

Quaternary Fault	
Dispalcement undifferentiated	
Earthquake Fault Zone of Required Investigation	
Earthquake Fault Zone Area	
Earthquake Fault Zone of Required Investigation	
Earthquake Fault Zone Area (out of scale range)	

Landslide Zone of Required Investigation	
Landslide Zone Area	
Landslide Zone of Required Investigation	
Landslide Zone Area (margin uncertain)	
Landslide and Liquefaction Zone Overlap Areas	
Overlap Areas	
Unevaluated Areas	
Unmapped Areas	

Liquefaction Zone of Required Investigation	
Liquefaction Zone Area	
Liquefaction Zone of Required Investigation	
Liquefaction Zone Area (margin uncertain)	
Liquefaction And Landslide Overlap Areas	
Overlap Areas	
Unevaluated Areas	
Unmapped Areas	

100-Year Floodplains	
100-Year Flood Zones	
100-Year plus	
100-Year with Storm Surge	
500-Year Floodplains	
500 - Year Zones	

Ambystoma californiense

Element Code: AAAAA01180

California tiger salamander

Listing Status:	**Federal:**	Threatened	**CNDDB Element Ranks:**	**Global:** G2G3
	State:	Threatened		**State:** S2S3
	Other:	DFG_SSC-Species of Special Concern, IUCN_VU-Vulnerable		
Habitat:	**General:**	CENTRAL VALLEY DPS FEDERALLY LISTED AS THREATENED. SANTA BARBARA & SONOMA COUNTIES DPS FEDERALLY LISTED AS ENDANGERED.		
	Micro:	NEED UNDERGROUND REFUGES, ESPECIALLY GROUND SQUIRREL BURROWS & VERNAL POOLS OR OTHER SEASONAL WATER SOURCES FOR BREEDING		

Occurrence No.	2 **Map Index:** 37896	**EO Index:**	32903	**Element Last Seen:**	1892-XX-XX
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1892-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-01-13

Quad Summary: Hemet (3311668), Lake Fulmor (3311677), San Jacinto (3311678), Winchester (3311761), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.78387 / -116.95881	**Accuracy:**	5 miles
UTM:	Zone-11 N3738193 E503813	**Elevation (ft):**	1540
PLSS:	T04S, R01W, Sec. 35 (S)	**Acres:**	0.0

Location: SAN JACINTO.

Detailed Location: HISTORIC RECORD, EXACT LOCATION UNKNOWN.

Ecological: GENERAL HABITAT TYPE FOR TIGER SALAMANDER IS FOOTHILL AND VALLEY GRASSLAND.

General: MUSEUM SPECIMEN SU #695.

Owner/Manager: UNKNOWN

Spea hammondii

Element Code: AAABF02020

western spadefoot

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G3
	State:	None		**State:** S3
	Other:	BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_NT-Near Threatened		
Habitat:	**General:**	OCCURS PRIMARILY IN GRASSLAND HABITATS, BUT CAN BE FOUND IN VALLEY-FOOTHILL HARDWOOD WOODLANDS.		
	Micro:	VERNAL POOLS ARE ESSENTIAL FOR BREEDING AND EGG-LAYING.		

Occurrence No.	5	**Map Index:**	20474	**EO Index:**	9408	**Element Last Seen:**	1991-06-01
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-06-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-10-20

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.82459 / -117.14745	**Accuracy:**	80 meters
UTM:	Zone-11 N3742716 E486355	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 13 (S)	**Acres:**	0.0

Location: JUST EAST OF THE SAN JACINTO RIVER, APPROXIMATELY 150 FEET NORTH OF THE END OF 11TH STREET, 1 MI NORTH OF NUEVO.

Detailed Location: TOADS INHABIT A SERIES OF SHALLOW, MAN-MADE PONDS.

Ecological: HABITAT SURROUNDING PONDS CONSISTS OF ALKALINE SINK SCRUB, VEGETATED BY SUAEDA TORREYA, SPERGULARIA MARINA, FRANKENIA GRANDIFOLIA, RUMEX CRISPUS, HORDEUM DEPRESSUM, POLYGONUM AVICIULARE, LASTHENIA CALIFORNICA, AMARANTHUS ALBUS, AND OTHERS.

General: APPROXIMATELY 700 "TOADLETS" (JUVENILES) OBSERVED. POTENTIAL FAIRY SHRIMP HABITAT. AREA SURROUNDING THIS SITE RECENTLY ZONED FOR RESIDENTIAL DEVELOPMENT.

Owner/Manager: UNKNOWN

Occurrence No.	33	**Map Index:**	24632	**EO Index:**	20817	**Element Last Seen:**	1993-06-08
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1993-06-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1993-11-02

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90468 / -117.29379	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3751625 E472838	**Elevation (ft):**	1580
PLSS:	T03S, R04W, Sec. 15 (S)	**Acres:**	0.0

Location: 0.25 MILE SW OF THE INTERSECTION OF CACTUS ROAD AND PLUMMER ROAD, MARCH AIR FORCE BASE.

Detailed Location: A TOTAL OF 4 INDIVIDUALS WAS CAPTURED DURING A 1-WEEK SURVEY UTILIZING PITFALL TRAPS; NO ANIMALS WERE MARKED, IT IS UNKNOWN IF ANY WERE RECAPTURES.

Ecological: HABITAT CONSISTS OF GRASSLAND, DOMINATED BY BROMUS, BRASSICA, AND SALSOLA.

General: SITE IS PART OF A 1000-ACRE RESERVE ESTABLISHED FOR STEPHENS' K-RAT. USE OF CONTROLLED BURNS TO ENHANCE K-RAT HABITAT MAY HAVE UNKNOWN EFFECTS.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	68 **Map Index:** 32335	**EO Index:**	2679	**Element Last Seen:**	1978-04-11
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1978-04-11
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1995-06-21

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.91970 / -117.28488	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3753289 E473667	**Elevation (ft):**	1510
PLSS:	T03S, R04W, Sec. 10 (S)	**Acres:**	0.0

Location: EDGEMONT; BETWEEN U.S. ROUTE 395 AND ATCHISON TOPEKA AND SANTA FE RAILROAD NORTH OF ALESSANDRO BLVD.

Detailed Location:

Ecological: IN A PUDDLE BETWEEN HIGHWAY AND RAILROAD TRACKS.

General: A FEW TADPOLES OBSERVED; CONSULTED SEVERAL MAPS AND HIGHWAYS 15E, 215 AND 395 SEEM TO CORRESPOND TO THE SAME HIGHWAY.

Owner/Manager: UNKNOWN

Occurrence No.	226 **Map Index:** 48074	**EO Index:**	48074	**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2002-06-10

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.88659 / -117.13490	**Accuracy:**	80 meters
UTM:	Zone-11 N3749589 E487525	**Elevation (ft):**	1700
PLSS:	T03S, R02W, Sec. 30 (S)	**Acres:**	0.0

Location: 1.4 MILES NORTHEAST OF PERRIS RESERVOIR. 1.3 MILES SOUTHEAST OF MT. RUSSELL. 0.3 MILE WEST OF DAVIS ROAD.

Detailed Location: PIT-FALL TRAP ARRAYS 12 & 13.

Ecological: OVERALL THE LAKE PERRIS SITE IS A VERY LARGE STUDY AREA DOMINATED BY BRITTLE BUSH, WITH LARGE AREAS OF GRASSLAND & BOULDER FIELDS. MOST ARRAYS ON SOUTH FACING SLOPES, ALTHOUGH SOME ARE FLAT. THIS SITE INCLUDED IN STEPHENS K-RAT HCP.

General: THREE TOADS CAPTURED. 24 SAMPLE PERIODS BETWEEN 11 JULY 1995 & 6 OCT 1999 FOR ALL OF THE LAKE PERRIS ARRAYS, NOT KNOWN EXACTLY WHICH DATES APPLY TO THESE TWO ARRAYS.

Owner/Manager: DFG, DPR

Occurrence No.	227	**Map Index:** 48075	**EO Index:**	48075	**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-06-10

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87623 / -117.12311	**Accuracy:**	80 meters
UTM:	Zone-11 N3748439 E488614	**Elevation (ft):**	1600
PLSS:	T03S, R02W, Sec. 30 (S)	**Acres:**	0.0

Location: 1.75 MILES ENE OF PERRIS RESEROIR. JUST EAST OF DAVIS ROAD.

Detailed Location: PIT-FALL TRAP ARRAY 17.

Ecological: OVERALL THE LAKE PERRIS SITE IS A VERY LARGE STUDY AREA DOMINATED BY BRITTLE BUSH, WITH LARGE AREAS OF GRASSLAND & BOULDER FIELDS. MOST ARRAYS ON SOUTH FACING SLOPES, ALTHOUGH SOME ARE FLAT. THIS SITE INCLUDED IN STEPHENS K-RAT HCP.

General: THREE TOADS CAPTURED. 24 SAMPLE PERIODS BETWEEN 11 JULY 1995 & 6 OCT 1999 FOR ALL OF THE LAKE PERRIS ARRAYS, NOT KNOWN EXACTLY WHICH DATES APPLY TO THIS ARRAY.

Owner/Manager: DFG, DPR

Occurrence No.	228	**Map Index:** 48077	**EO Index:**	48077	**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-06-10

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84562 / -117.14635	**Accuracy:**	80 meters
UTM:	Zone-11 N3745048 E486460	**Elevation (ft):**	1550
PLSS:	T04S, R03W, Sec. 01 (S)	**Acres:**	0.0

Location: ABOUT 1.1 MILES EAST OF PERRIS RESERVOIR, EAST OF BERNASCONI HILLS. 0.3 MI NORTH OF MARTIN ST.

Detailed Location: PIT-FALL TRAP ARRAY 15.

Ecological: OVERALL THE LAKE PERRIS SITE IS A VERY LARGE STUDY AREA DOMINATED BY BRITTLE BUSH, WITH LARGE AREAS OF GRASSLAND & BOULDER FIELDS. MOST ARRAYS ON SOUTH FACING SLOPES, ALTHOUGH SOME ARE FLAT. THIS SITE INCLUDED IN STEPHENS K-RAT HCP.

General: ONE TOAD CAPTURED. 24 SAMPLE PERIODS BETWEEN 11 JULY 1995 & 6 OCT 1999 FOR ALL OF THE LAKE PERRIS ARRAYS, NOT KNOWN EXACTLY WHICH DATES APPLY TO THIS ARRAY.

Owner/Manager: DFG, DPR

Occurrence No.	230	**Map Index:** 48080	**EO Index:**	48080		**Element Last Seen:**	2003-03-08
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-03-08
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-08-29

Quad Summary: Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80844 / -117.25624	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740946 E476283	**Elevation (ft):**	1900
PLSS:	T04S, R04W, Sec. 24 (S)	**Acres:**	167.6

Location: MOTTE RIMROCK RESERVE. 1 MILE SOUTHWEST OF MAYER FARMS AT HIGHWAY 395 (I-15E), NORTH OF PERRIS.

Detailed Location: PIT-FALL TRAP ARRAYS 1, & 3-10. TOADS FOUND IN ALL BUT ONE OF THE ARRAYS.

Ecological: MOTTE RESERVE IS MODERATE SIZED FRAGMENT DOMINATED BY COASTAL SAGE SCRUB WITH PATCHES OF GRASSLAND. SITE IS RELATIVELY FLAT, SURROUNDED BY LOW DENSITY HOUSES. SITE IS PART OF THE STEPHENS K-RAT HCP.

General: 23 TOADS CAPTURED. 22 SAMPLE PERIODS BETWEEN 11 JUL 1995 & 6 OCT 1999 FOR ALL OF THE MOTTE RESERVE ARRAYS. 100'S OF TADPOLES OBSERVED ON 8 MAR 2003 IN AN AREA THAT WAS FORMERLY PART OF MOTTE RIMROCK RESERVE.

Owner/Manager: UCNR-MOTTE RIMROCK RESERVE

Occurrence No.	259	**Map Index:** 51783	**EO Index:**	51783		**Element Last Seen:**	2003-05-16
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-05-16
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-07-16

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.95168 / -117.24643	**Accuracy:**	80 meters
UTM:	Zone-11 N3756826 E477228	**Elevation (ft):**	1680
PLSS:	T02S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: DOWNSTREAM OF THE POORMAN RESERVOIR DAM, MORENO VALLEY

Detailed Location: SITE IS LOCATED WITHIN THE LOWER FLOOD CATCHMENT BASIN (130 ACRES), WHICH IS SURROUNDED BY RESIDENTIAL DEVELOPMENT.

Ecological: HABITAT CONSISTS OF A 4.2-ACRE VERNAL MARSH, VEGETATED BY RUMEX CRISPUS, ELEOCHARIS SPP, CAREX SPP, AND XANTHIUM STRUMARIUM.

General: 20 TADPOLES IN MID-METAMORPHOSIS OBSERVED ON 16 MAY 2003.

Owner/Manager: CITY OF MORENO VALLEY

Occurrence No.	310	**Map Index:** 60449	**EO Index:** 60485	**Element Last Seen:**	2005-03-08
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	2005-03-08
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2005-03-09

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.96272 / -117.15989	**Accuracy:**	80 meters
UTM:	Zone-11 N3758034 E485227	**Elevation (ft):**	2050
PLSS:	T02S, R03W, Sec. 26 (S)	**Acres:**	0.0

Location: JUST WEST OF REDLANDS BOULEVARD, 0.4 MILE NORTH OF LOCUST AVENUE, 3.25 MILES WSW OF EL CASCO LAKE

Detailed Location:

Ecological: HABITAT CONSISTS OF SMALL, PUDDLED AREAS ON A DIRT ROAD; SURROUNDED BY RIVERSIDEAN SAGE SCRUB TO THE NW AND ACTIVE AGRICULTURE THE THE SE. DOMINANT PLANTS IN THE CSS ARE ENCELIA FARINOSA, ARTEMISIA CALIFORNICA, AND LESSINGIA FILAGINIFOLIA.

General: 100 LARVAE OBSERVED ON 8 MAR 2005, WITHIN SMALL PUDDLES ON A DIRT ROAD; PUDDLES MAY DRY UP BEFORE THE LARVAE CAN METAMORPHOSE.

Owner/Manager: UNKNOWN

Occurrence No.	393	**Map Index:** 69833	**EO Index:** 70652	**Element Last Seen:**	2005-04-07
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	2005-04-07
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2007-08-31

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.93555 / -117.00702	**Accuracy:**	80 meters
UTM:	Zone-11 N3755010 E499350	**Elevation (ft):**	2525
PLSS:	T03S, R01W, Sec. 05 (S)	**Acres:**	0.0

Location: 0.1 MILE NORTH OF HIGHWAY 60 AND 0.8 MILE WEST OF I-10, BEAUMONT.

Detailed Location:

Ecological: HABITAT CONSISTS OF SEVERAL POOLS FORMED AS ROAD RUTS FROM EXTENSIVE ORV ACTIVITY AND IN ONE CATTLE POND; SURROUNDED BY SPARSE ANNUAL GRASSLAND IMPACTED BY ORV USE.

General: 100 LARVAE OBSERVED ON 7 APR 2005.

Owner/Manager: PVT

Rana muscosa **Element Code:** AAABH01330

Sierra Madre yellow-legged frog

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:** G1
	State:	Candidate Endangered		**State:** S1
	Other:	DFG_SSC-Species of Special Concern, IUCN_EN-Endangered, USFS_S-Sensitive		
Habitat:	**General:**	FEDERAL LISTING REFERS TO POPULATIONS IN THE SAN GABRIEL, SAN JACINTO & SAN BERNARDINO MOUNTAINS ONLY.		
	Micro:	ALWAYS ENCOUNTERED WITHIN A FEW FEET OF WATER. TADPOLES MAY REQUIRE 2 - 4 YRS TO COMPLETE THEIR AQUATIC DEVELOPMENT.		

Occurrence No.	26 **Map Index:** 42447	**EO Index:**	42447	**Element Last Seen:**	1905-04-12
Occ. Rank:	None	**Presence:**	Extirpated	**Site Last Seen:**	1905-04-12
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2010-04-22

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10478 / -117.10855	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3773779 E489987	**Elevation (ft):**	1800
PLSS:	T01S, R02W, Sec. 08 (S)	**Acres:**	938.0

Location: MOUTH OF THE CANYONS OF THE UPPER SANTA ANA RIVER WASH.

Detailed Location:

Ecological:

General: INFORMATION TAKEN FROM: FOOTHILL YELLOW-LEGGED FROG, THE SEASONAL & ASSOCIATIONAL DISTRIBUTION OF THE FAUNA OF THE UPPER SANTA ANA RIVER WASH, JOURNAL OF ENTOMOLOGY AND ZOOLOGY, 21(1,2) 1-96, 1929.

Owner/Manager: UNKNOWN

Plegadis chihi

white-faced ibis

Element Code: ABNGE02020

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5
	State:	None		**State:** S1
	Other:	DFG_WL-Watch List, IUCN_LC-Least Concern		
Habitat:	**General:**	SHALLOW FRESH-WATER MARSH.		
	Micro:	DENSE TULE THICKETS FOR NESTING INTERSPERSED WITH AREAS OF SHALLOW WATER FOR FORAGING.		

Occurrence No.	16 **Map Index:** 24635	**EO Index:**	48048	**Element Last Seen:**	1993-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1993-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2002-06-04

Quad Summary: Lakeview (3311771), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.88790 / -117.09815	**Accurracy:**	1 mile
UTM:	Zone-11 N3749731 E490923	**Elevation (ft):**	1425
PLSS:	T03S, R02W (S)	**Acres:**	0.0

Location: SAN JACINTO LAKE & NEAR MYSTIC LAKE.

Detailed Location:

Ecological:

General: SAN JACINTO LAKE: 200 NESTS IN 1911; DRAINED IN 1917 (GRINNELL & MILLER, 1944; WILLETT & JAY, 1911). INDIVIDUALS NESTING SINCE 1993 NEAR MYSTIC LAKE (T. PAULEK, 1997).

Owner/Manager: UNKNOWN

Occurrence No.	29 **Map Index:** 75837	**EO Index:**	76868	**Element Last Seen:**	2006-XX-XX
Occ. Rank:	Excellent	**Presence:**	Presumed Extant	**Site Last Seen:**	2006-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-07-13

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.79745 / -117.02375	**Accurracy:**	80 meters
UTM:	Zone-11 N3739698 E497801	**Elevation (ft):**	1492
PLSS:	T04S, R01W, Sec. 30 (S)	**Acres:**	0.0

Location: 0.4 MILES NORTH OF CANAL AND 0.6 MILES EAST OF N. WARREN RD, MIDWAY BETWEEN LAKEVIEW MOUNTAINS & SAN JACINTO RESERVOIR.

Detailed Location: 40 METERS EAST OF ODEL AVENUE, NORTH OF DEEGAN STREET.

Ecological: RIPARIAN AREA WITH CATTAILS AND WILLOWS IN AN OPEN WETLAND ASSOCIATED WITH A WATER TREATMENT FACILITY.

General: ROOKERY OBSERVED IN THE SPRING OF 2005 & 2006. APPROXIMATELY 50 TO 75 YOUNG.

Owner/Manager: UNKNOWN

Elanus leucurus — **Element Code:** ABNKC06010

white-tailed kite

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5
	State:	None		**State:** S3
	Other:	BLM_S-Sensitive, DFG_FP-Fully Protected, IUCN_LC-Least Concern		
Habitat:	**General:**	ROLLING FOOTHILLS AND VALLEY MARGINS WITH SCATTERED OAKS & RIVER BOTTOMLANDS OR MARSHES NEXT TO DECIDUOUS WOODLAND.		
	Micro:	OPEN GRASSLANDS, MEADOWS, OR MARSHES FOR FORAGING CLOSE TO ISOLATED, DENSE-TOPPED TREES FOR NESTING AND PERCHING.		

Occurrence No.	61	**Map Index:**	47815	**EO Index:**	47815	**Element Last Seen:**	1983-07-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1983-07-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-30

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.79821 / -117.35220	**Accuracy:**	80 meters
UTM:	Zone-11 N3739838 E467398	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 25 (S)	**Acres:**	0.0

Location: 5.5 MILES WEST OF PERRIS AND 1.4 MILES ESE OF GAVILAN PEAK.

Detailed Location:

Ecological: HABITAT CONSISTS OF GRASSLAND, SCRUB AND WOODLAND.

General: NEST LOCATED DURING MONTHS OF JUNE/JULY 1983. PARCELS 1 AND 2 HAVE "HIGH-VALUE RAPTOR NESTING HABITAT"; IT IS RECOMMENDED THAT PARCELS 1-4 REMAIN CONTINOUS.

Owner/Manager: PVT

Occurrence No.	147	**Map Index:**	78435	**EO Index:**	79357	**Element Last Seen:**	2006-06-23
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-03-25

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.01347 / -117.01810	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3763650 E498328	**Elevation (ft):**	2760
PLSS:	T02S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: ABOUT 0.2 MI SE OF WILDWOOD CYN RD AT HOLMES ST, SOUTH SIDE OF YUCAIPA CRK, YUCAIPA.

Detailed Location: MAPPED TO DESCRIBED HABITAT IN 2005 NAIP AERIAL IN THE VICINITY OF PROVIDED COORDINATE (UTM COORDINATE FROM TOPOZONE FALLS NORTH OF CREEK & ABSENT OF OAK TREES).

Ecological: "STRIP OF OAK WOODLAND SOUTH OF YUCAIPA CREEK BED." OTHER SPECIES OBSERVED WERE COSTA'S HUMMINGBIRD, RUFOUS-CROWNED SPARROW, YELLOW WARBLE (MIGRANT), LAWRENCE'S GOLDFINCH, & OLIVE-SIDED FLYCATCHER (MIGRANT).

General: A PAIR OF ADULTS WAS OBSERVED AT A NEST ON 19 MAY AND 23 JUN, 2006.

Owner/Manager: CITY OF YUCAIPA

Haliaeetus leucocephalus

Element Code: ABNKC10010

bald eagle

Listing Status:	**Federal:**	Delisted	**CNDDB Element Ranks:**	**Global:**	G5
	State:	Endangered		**State:**	S2
	Other:	BLM_S-Sensitive, CDF_S-Sensitive, DFG_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern			
Habitat:	**General:**	OCEAN SHORE, LAKE MARGINS, & RIVERS FOR BOTH NESTING & WINTERING. MOST NESTS WITHIN 1 MI OF WATER.			
	Micro:	NESTS IN LARGE, OLD-GROWTH, OR DOMINANT LIVE TREE W/OPEN BRANCHES, ESPECIALLY PONDEROSA PINE. ROOSTS COMMUNALLY IN WINTER.			

Occurrence No.	1 **Map Index:** 03288	**EO Index:**	27012	**Element Last Seen:**	1975-03-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1975-03-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1989-08-10

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.83889 / -117.39311	**Accurracy:**	1 mile
UTM:	Zone-11 N3744362 E463628	**Elevation (ft):**	1400
PLSS:	T04S, R05W, Sec. 10 (S)	**Acres:**	0.0

Location: NORTH SHORE OF LAKE MATHEWS.

Detailed Location:

Ecological: SITE CONSISTS OF SEVERAL WINDROWS OF GUM TREES (EUCALYPTUS SP). WATERFOWL IMPORTANT IN DIET OF THESE WINTERING RAPTORS.

General: WINTER ROOST SITE.

Owner/Manager: UNKNOWN

Accipiter cooperii

Element Code: ABNKC12040

Cooper's hawk

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5
	State:	None		**State:**	S3
	Other:	DFG_WL-Watch List, IUCN_LC-Least Concern			
Habitat:	**General:**	WOODLAND, CHIEFLY OF OPEN, INTERRUPTED OR MARGINAL TYPE.			
	Micro:	NEST SITES MAINLY IN RIPARIAN GROWTHS OF DECIDUOUS TREES, AS IN CANYON BOTTOMS ON RIVER FLOOD-PLAINS; ALSO, LIVE OAKS.			

Occurrence No.	44	**Map Index:**	03389	**EO Index:**	479	**Element Last Seen:**	1983-07-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1983-07-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-04-09

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80500 / -117.34032	**Accuracy:**	1 mile
UTM:	Zone-11 N3740587 E468500	**Elevation (ft):**	2000
PLSS:	T04S, R04W, Sec. 19 (S)	**Acres:**	0.0

Location: GAVILAN HILLS, IN HARFORD SPRINGS COUNTY PARK AND ON IDA LEONA ESTATES EAST OF PARK.

Detailed Location:

Ecological: SUITABLE NESTING AND FORAGING HABITAT IS PRESENT IN THE RIPARIAN WOODLAND, SCRUB OAK WOODLAND, AND JUNIPER WOODLAND.

General: SIGHTINGS MADE IN HARFORD SPRING COUNTY PARK AND ON IDA LEONA ESTATES; NO NEST OBSERVED.

Owner/Manager: PVT, RIV COUNTY

Occurrence No.	72	**Map Index:**	45576	**EO Index:**	45576	**Element Last Seen:**	2001-06-26
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-06-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2001-08-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.95568 / -117.24658	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3757269 E477216	**Elevation (ft):**	1680
PLSS:	T02S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: SE END OF POORMAN RESERVOIR, 0.3 MILE SOUTH OF MANZANITA AVENUE, MORENO VALLEY

Detailed Location:

Ecological: HABITAT CONSISTS OF COTTONWOOD/WILLOW RIPARIAN, SUPPORTED BY LAWN IRRIGATION AND STORMWATER RUN-OFF; SURROUNDED BY DISTURBED ANNUAL GRASSLAND. SITE IS OPERATED AS A FLOOD CONTROL RESERVOIR.

General: 2 ADULTS FIRST OBSERVED NESTING ON 9 MAY 2001; SUBSEQUENTLY OBSERVED ON 30 MAY, 15 JUN, AND 26 JUN 2001. 2 JUVENILES OBSERVED, AS WELL.

Owner/Manager: CITY OF MORENO VALLEY

Occurrence No.	91 **Map Index:** 54557	**EO Index:**	54559	**Element Last Seen:**	1999-07-31
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1999-07-31
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-03-04

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.01058 / -117.17160	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3763343 E484154	**Elevation (ft):**	1460
PLSS:	T02S, R03W, Sec. 11 (S)	**Acres:**	33.1

Location: SAN TIMOTEO CANYON, JUST NORTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE, DIRECTLY SOUTH OF REDLANDS.

Detailed Location: 1.2 KM STRETCH ALONG CREEK.

Ecological: HABITAT CONSISTS OF DENSE LINEAR STANDS OF RIPARIAN. DOMINANT SPECIES INCLUDE SALIX LASIOLEPIS, SALIX HINDSIANA, POPULUS FREMONTII AND BACHARIS GLUTINOSA. YELLOW-BILLED CUCKOO OBSERVED IN AREA.

General: 4 OBSERVED DURING SURVEYS WHICH OCCURRED ONCE A WEEK BETWEEN 1 APR AND 31 JUL 1999. NESTING WAS CONFIRMED.

Owner/Manager: UNKNOWN

Occurrence No.	110 **Map Index:** 66241	**EO Index:**	66323	**Element Last Seen:**	2004-07-15
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2004-07-15
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-09-18

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92671 / -117.00860	**Accuracy:**	80 meters
UTM:	Zone-11 N3754030 E499204	**Elevation (ft):**	790
PLSS:	T03S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: WSW OF BEAUMONT, ABOUT 1.8 MI WEST OF HWY 79 AND 0.45 MI SOUTH OF HWY 60.

Detailed Location:

Ecological: DOMINANT PLANT SPECIES INCLUDE ARROYO WILLOW, COTTONWOOD AND NETTLE. CANOPY HEIGHT IS 11M. SURFACE WATER OR SATURATED SOIL IS PRESENT.

General: NEST SITE WITH 1 ADULT PRESENT OBSERVED BETWEEN 26 MAY & 15 JUL 2004.

Owner/Manager: UNKNOWN

Buteo regalis

Element Code: ABNKC19120

ferruginous hawk

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4
	State:	None		**State:**	S3S4
	Other:	DFG_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern			
Habitat:	**General:**	OPEN GRASSLANDS, SAGEBRUSH FLATS, DESERT SCRUB, LOW FOOTHILLS & FRINGES OF PINYON-JUNIPER HABITATS.			
	Micro:	EATS MOSTLY LAGOMORPHS, GROUND SQUIRRELS, AND MICE. POPULATION TRENDS MAY FOLLOW LAGOMORPH POPULATION CYCLES.			

Occurrence No.	1	**Map Index:**	47739	**EO Index:**	47739	**Element Last Seen:**	1989-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-19

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.76045 / -117.09723	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3735599 E490996	**Elevation (ft):**	2200
PLSS:	T05S, R02W, Sec. 04 (S)	**Acres:**	198.7

Location: 1.0 TO 1.6 MILES NORTH OF HOMELAND; LOCATED BETWEEN JUNIPER FLAT ROAD AND JUNIPER SPRINGS ROAD.

Detailed Location:

Ecological: HABITAT CONSISTS OF UNDISTURBED COASTAL SAGE SCRUB VEGETATED BY ERIOGONUM FASCICULATUM, ARTEMISIA CALIFORNICA, RHUS OVATA, SALVIA APIANA AND SALVIA MELLIFERA.

General: 1 ADULT OBSERVED

Owner/Manager: PVT

Occurrence No.	2	**Map Index:**	47740	**EO Index:**	47740	**Element Last Seen:**	1991-12-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-12-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-19

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.81368 / -117.00056	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3741497 E499948	**Elevation (ft):**	1470
PLSS:	T04S, R01W, Sec. 20 (S)	**Acres:**	0.0

Location: APPROXIMATELY 3.1 MILES NW OF SAN JACINTO. 0.4 MILES SOUTH OF JUNCTION OF RAMONA BLVD AND COLORADO RIVER AQUEDUCT.

Detailed Location:

Ecological: HABITAT CONSISTS OF DRY AND IRRIGATED CROPLANDS.

General: 6 NOV AND DEC 13 1991: AT LEAST 1 INDIVIDUAL SEEN ON EACH DAY.

Owner/Manager: UNKNOWN

Occurrence No.	11	**Map Index:**	65991	**EO Index:**	66070	**Element Last Seen:**	2005-12-01
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-12-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-08-23

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.95064 / -117.16638	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3756695 E484626	**Elevation (ft):**	1936
PLSS:	T02S, R03W, Sec. 35 (S)	**Acres:**	38.0

Location: ABOUT 2.3 MI NNW OF MORENO, 1 MI NW OF INTERSECTION OF REDLANDS BLVD AND HWY 60.

Detailed Location: MAPPED ACCORDING TO ATTACHED MAP IN SOURCE.

Ecological: GENTLY SLOPING ALLUVIAL FAN. RUDERAL HABITAT, BRASSICA NEGRA, BROMUS SPP., SCHISMUS BARBATUS, DATURA METELOIDES, HELIANTHUS ANNUUS, HETEROTHECA GRANDIFLORA, EREMOCARPUS SETIGERUS & ASTRALAGUS SPP.

General: WINTERING SITE. 2 INDIVIDUALS OBSERVED ON 1 DEC 2005.

Owner/Manager: PVT

Coccyzus americanus occidentalis

Element Code: ABNRB02022

western yellow-billed cuckoo

Listing Status:	**Federal:**	Candidate	**CNDDB Element Ranks:**	**Global:**	G5T3Q
	State:	Endangered		**State:**	S1
	Other:	BLM_S-Sensitive, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern			
Habitat:	**General:**	RIPARIAN FOREST NESTER, ALONG THE BROAD, LOWER FLOOD-BOTTOMS OF LARGER RIVER SYSTEMS.			
	Micro:	NESTS IN RIPARIAN JUNGLES OF WILLOW, OFTEN MIXED WITH COTTONWOODS, W/ LOWER STORY OF BLACKBERRY, NETTLES, OR WILD GRAPE.			

Occurrence No.	79	**Map Index:**	25607	**EO Index:**	5431	**Element Last Seen:**	1930-XX-XX
Occ. Rank:	None			**Presence:**	Possibly Extirpated	**Site Last Seen:**	1930-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1994-06-09

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.07072 / -117.28292	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3770033 E473894	**Elevation (ft):**	1000
PLSS:	T01S, R04W (S)	**Acres:**	1216.7

Location: SANTA ANA RIVER AND WARM CREEK, FROM 3 MILES EAST OF SAN BERNARDINO TO RIVERSIDE COUNTY LINE.

Detailed Location: IN 1930'S SPECIES DESCRIBED AS COMMON AND NESTING IN THIS AREA.

Ecological: ALL NESTS FOUND IN WILLOW TREES, IN WILLOW AND WILLOW-COTTONWOOD THICKETS WITH HEAVY UNDERBRUSH OF NETTLES, WILD GRAPE VINES & CATTAILS.

General: EGG SETS: 6/24/16-NEAR COLTON, 6/30/19-3 MI NE COLTON, 6/6/20-URBITA SWAMP 3 MI NE COLTON, 6/10/20-3 MI SW COLTON, 6/19/22-WARM CR 2 MI E SAN BERNARDINO, 5/29/23-3 MI SW COLTON. ALSO COLLECTED MAY-JULY 1930'S IN THIS AREA BY VARIOUS MUSEUMS

Owner/Manager: UNKNOWN

Occurrence No.	168	**Map Index:**	45571	**EO Index:**	45571	**Element Last Seen:**	2001-06-26
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-06-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2001-08-14

Quad Summary: Sunnymead (3311782), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95734 / -117.25189	**Accurracy:**	1/10 mile
UTM:	Zone-11 N3757454 E476726	**Elevation (ft):**	1690
PLSS:	T02S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: POORMAN RESERVOIR, 0.25 MILE SOUTH OF MANZANITA AVENUE, MORENO VALLEY.

Detailed Location:

Ecological: HABITAT CONSISTS OF COTTONWOOD/ WILLOW RIPARIAN, WHICH IS SUPPORTED BY LAWN IRRIGATION AND STORMWATER RUNOFF; SURROUNDED BY DISTURBED ANNUAL GRASSLAND. SITE IS OPERATED AS A FLOOD CONTROL RESERVOIR.

General: 1 ADULT OBSERVED ON 26 JUN 2001.

Owner/Manager: CITY OF MORENO VALLEY

Athene cunicularia

Element Code: ABNSB10010

burrowing owl

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4
	State:	None		**State:**	S2
	Other:	BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern			

Habitat:	**General:**	OPEN, DRY ANNUAL OR PERENIAL GRASSLANDS, DESERTS & SCRUBLANDS CHARACTERIZED BY LOW-GROWING VEGETATION.
	Micro:	SUBTERRANEAN NESTER, DEPENDENT UPON BURROWING MAMMALS, MOST NOTABLY, THE CALIFORNIA GROUND SQUIRREL.

Occurrence No.	65	**Map Index:**	03755	**EO Index:**	25455	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1989-08-10

Quad Summary: Perris (3311772), Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.86913 / -117.18566	**Accuracy:**	1 mile
UTM:	Zone-11 N3747661 E482828	**Elevation (ft):**	1700
PLSS:	T03S, R03W, Sec. 34 (S)	**Acres:**	0.0

Location: LAKE PERRIS STATE RECREATION AREA, BETWEEN DAM AND PARKING LOT.
Detailed Location:
Ecological:
General: COLONY OF MANY OWLS OBSERVED IN 1980 BY J. SPEAKS.
Owner/Manager: DPR-LAKE PERRIS SRA

Occurrence No.	79	**Map Index:**	03967	**EO Index:**	25445	**Element Last Seen:**	1982-07-03
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1982-07-03
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1995-11-15

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86612 / -117.12197	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3747318 E488718	**Elevation (ft):**	1425
PLSS:	T03S, R02W, Sec. 31 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA, 2 MILES NORTH OF LAKEVIEW.
Detailed Location:
Ecological:
General: ACTIVE BURROW WITH 2 ADULTS AND 5 FLEDGED YOUNG.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	80 **Map Index:** 04009	**EO Index:**	25438	**Element Last Seen:**	1982-05-26
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1982-05-26
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1995-11-03

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.85859 / -117.11156	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3746482 E489680	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA, 1.5 MILES NNE OF LAKEVIEW.
Detailed Location:
Ecological:
General: ACTIVE BURROW WITH 2 BIRDS PRESENT.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	81 **Map Index:** 03996	**EO Index:**	25439	**Element Last Seen:**	1982-05-28
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1982-05-28
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1995-11-03

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.84567 / -117.11581	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3745050 E489286	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA, 0.5 MILE NORTH OF LAKEVIEW.
Detailed Location:
Ecological:
General: TWO BIRDS PRESENT AT THIS LOCATION ON BOTH 26 AND 28 MAY 1982; NO SEARCH MADE FOR BURROW.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	82 **Map Index:** 03974	**EO Index:**	25441	**Element Last Seen:**	1982-07-15
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1982-07-15
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1995-11-03

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.87147 / -117.12056	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3747911 E488849	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 32 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA, APPROX 2-4 MILES NORTH OF LAKEVIEW.
Detailed Location:
Ecological:
General: TWO ADULTS AND FOUR FLEDGED YOUNG OBSERVED.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	83	**Map Index:** 03995	**EO Index:** 25440	**Element Last Seen:**	1982-XX-XX
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1982-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1995-11-03

Quad Summary: Lakeview (3311771), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87572 / -117.11513	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3748382 E489352	**Elevation (ft):**	1440
PLSS:	T03S, R02W, Sec. 29 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA, 2.6 MILES NORTH OF LAKEVIEW.

Detailed Location:

Ecological:

General: ACTIVE BURROW WITH 1-2 BIRDS FROM SEPTEMBER THROUGH EARLY OCTOBER OF 1982.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	84	**Map Index:** 03971	**EO Index:** 25436	**Element Last Seen:**	1982-07-XX
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1982-07-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1995-11-03

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87837 / -117.12029	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3748676 E488875	**Elevation (ft):**	1480
PLSS:	T03S, R02W, Sec. 29 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA, 2.8 MILES NORTH OF LAKEVIEW.

Detailed Location:

Ecological:

General: UP TO FOUR BIRDS IN THIS AREA DURING JULY OF 1982.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	99	**Map Index:** 17249	**EO Index:** 12257	**Element Last Seen:**	1989-10-07
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1989-10-07
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1990-12-13

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.75952 / -117.16496	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3735505 E484723	**Elevation (ft):**	1475
PLSS:	T05S, R03W, Sec. 02 (S)	**Acres:**	0.0

Location: 0.5 NE OF ROMOLAND, ADJACENT TO MAPES ROAD AND TRADEWIND DRIVE.

Detailed Location: TWO BURROWS AND TWO OWLS LOCATED, BOTH NEAR LOW ROCK OUTCROPS.

Ecological: BURROWS SURROUNDED BY LAND HISTORICALLY PLANTED IN POTATOES; PRESENTLY, VEGETATION CONSISTS OF DISTURBED ANNUALS INCLUDING BRASSICA GENICULATA, AMSINCKIA INTERMEDIA, SALSOLA IBERICA, BROMUS RUBENS, BROMUS DIANDRUS, CHENOPODIUM ALBUS, ETC.

General: IT IS UNKNOWN IF THE OWLS ARE ACTUALLY BREEDING AT THIS HEAVILY-DISTURBED SITE.

Owner/Manager: PVT

Occurrence No.	130	**Map Index:** 20703	**EO Index:**	9507		**Element Last Seen:**	1992-XX-XX
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-03-16

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.81293 / -117.10467	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3741419 E490313	**Elevation (ft):**	1600
PLSS:	T04S, R02W, Sec. 20 (S)	**Acres:**	0.0

Location: 0.6 MI ENE OF THE JUNCTION OF JUNIPER FLAT ROAD AND HANSEN AVENUE, APPROXIMATELY 2 MI SE OF LAKEVIEW.

Detailed Location:

Ecological: HABITAT IS RUDERAL GRASSLAND WITH ONE SMALL PATCH OF COASTAL SAGE SCRUB, IN THE VICINITY OF AGRICULTURAL FIELDS.

General: TWO ADULTS AND TWO ACTIVE BURROWS OBSERVED.

Owner/Manager: UNKNOWN

Occurrence No.	247	**Map Index:** 36172	**EO Index:**	31169		**Element Last Seen:**	1997-05-XX
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	1997-05-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1997-07-21

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77729 / -117.19574	**Accuracy:**	80 meters
UTM:	Zone-11 N3737480 E481876	**Elevation (ft):**	1410
PLSS:	T04S, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: EAST SIDE OF PERRIS VALLEY DRAIN, 0.4 MILE NE OF POINT WHERE I-15E CROSSES THE DRAIN, 1 MILE EAST OF PERRIS.

Detailed Location: ONE OF FOUR BURROW SITES LOCATED WITHIN A 2-MILE STRETCH.

Ecological: HABITAT SURROUNDING THE BURROW SITE CONSISTS OF AGRICULTURE, FALLOW FIELDS, AND THE RUDERAL FLOODPLAIN OF THE SAN JACINTO RIVER.

General: 2 BURROWS BEING USED BY 2 ADULTS AND AT LEAST 1 JUVENILE DURING 19-27 MAY 1997 SURVEY.

Owner/Manager: RIV COUNTY FLOOD CONTROL

Occurrence No.	248 **Map Index:** 36173	**EO Index:**	31170	**Element Last Seen:**	1997-05-XX
Occ. Rank:	Excellent	**Presence:**	Presumed Extant	**Site Last Seen:**	1997-05-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1997-07-21

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.78911 / -117.20549	**Accuracy:**	80 meters
UTM:	Zone-11 N3738792 E480976	**Elevation (ft):**	1410
PLSS:	T04S, R03W, Sec. 28 (S)	**Acres:**	0.0

Location: WEST SIDE OF PERRIS VALLEY DRAIN, 0.5 MILE ENE OF THE INTERSECTION OF WILSON AVENUE& SAN JACINTO AVENUE, EAST OF PERRIS.

Detailed Location: ONE OF FOUR BURROW SITES LOCATED ALONG A 2-MILE STRETCH OF THE DRAIN.

Ecological: HABITAT SURROUNDING THE BURROW SITES INCLUDES AGRICULTURE, FALLOW FIELDS, AND THE RUDERAL FLOODPLAIN FLOODPLAIN OF THE SAN JACINTO RIVER.

General: TWO ADULTS OBSERVED AT THE BURROW SITE DURING A 19-27 MAY 1997 SURVEY.

Owner/Manager: RIV COUNTY FLOOD CONTROL

Occurrence No.	249 **Map Index:** 36174	**EO Index:**	31171	**Element Last Seen:**	2008-06-15
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2008-06-15
Occ. Type:	Natural/Native occurrence	**Trend:**	Stable	**Record Last Updated:**	2011-04-11

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.80259 / -117.20689	**Accuracy:**	specific area
UTM:	Zone-11 N3740287 E480849	**Elevation (ft):**	1410
PLSS:	T04S, R03W, Sec. 21 (S)	**Acres:**	14.0

Location: WEST SIDE OF PERRIS VALLEY DRAIN, 0.3 MILE NE OF THE INTERSECTION OF MURRIETA ROAD AND NUEVO ROAD, NE OF PERRIS.

Detailed Location: 1997 BURROWS ARE THE NORTHMOST OF FOUR BURROW SITES LOCATED ALONG A 2-MILE STRETCH OF THE DRAIN.

Ecological: HABITAT SURROUNDING THE BURROW SITE CONSISTS OF AGRICULTURE, FALLOW FIELDS, AND THE RUDERAL FLOODPLAIN OF THE SAN JACINTO RIVER. NO GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION IN 2007.

General: 2 ADULTS AND AT LEAST 1 YOUNG OBSERVED AT 1 BURROW AND 2 ADULTS AND AT LEAST 4 YOUNG AT THE SECOND BURROW IN MAY 1997. 2 ADULTS AND 2 JUVENILES OBSERVED 19 JUN 2007. 2 ADULTS AND 3 JUVENILES OBSERVED AT 3 BURROW SITES ON 15 JUN 2008.

Owner/Manager: RIV COUNTY FLOOD CONTROL

Occurrence No.	314	**Map Index:**	40533	**EO Index:**	35540	**Element Last Seen:**	1983-XX-XX
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1983-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1999-01-07

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.10196 / -117.21459	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3773482 E480206	**Elevation (ft):**	1170
PLSS:	T01S, R03W, Sec. 08 (S)	**Acres:**	0.0

Location: EAST END OF THE MAIN RUNWAY, NORTON AIR FORCE BASE.
Detailed Location: BURROWS WERE LOCATED EAST OF THE ROAD THAT SKIRTS THE RUNWAY.
Ecological: HABITAT CONSISTS OF AN OPEN, SANDY FIELD.
General: AN UNDETERMINED NUMBER OF OWLS UTILIZED THIS BURROW SITE IN 1983.
Owner/Manager: DOD-USAF

Occurrence No.	439	**Map Index:**	47369	**EO Index:**	47369	**Element Last Seen:**	2007-07-14
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-07-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Stable	**Record Last Updated:**	2011-04-11

Quad Summary: Sunnymead (3311782), Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.90605 / -117.24800	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3751767 E477072	**Elevation (ft):**	1530
PLSS:	T03S, R04W, Sec. 13 (S)	**Acres:**	160.4

Location: MARCH AIR FORCE BASE, SOUTH OF SUNNYMEAD; BETWEEN CATUS AVE & ESCHSCHOLTZIA AVE, & WEST OF HEACOCK ST.
Detailed Location: 1991: BURROW SITES LOCATED BETWEEN BUILDINGS AND ADJACENT TO RUNWAYS (EXACT LOCATIONS UNKNOWN). OBSERVED AT BLOCK CODE 3750-475 LOCATION CODE "A" AND "B" WITHIN MAPPED FEATURE IN 2007.
Ecological: HABITAT CONSISTS OF OPEN GRASSLAND DOMINATED BY BROMUS, ERODIUM AND EREMOCARPUS SETIGERUS. AREAS ARE REGULARLY MOWED FOR FIRE CONTROL. CALIFORNIA GROUND SQUIRRELS DETECTED IN AREA.
General: 25 OCT 1991: 14 ADULTS OBSERVED AT 6 BURROW LOCATIONS THROUGHOUT THE BASE. 1999: 6 OBS AT BURROWS. 2002: 11 OWLS OBS BY BURROWS. 2003: 14 ADULTS, 20 JUVENILES AND 15 UNK NEAR BURROWS OBS. 14 JUL 2007: 6 ADULTS AND 2 JUVENILES OBS.
Owner/Manager: DOD-MARCH AFB

Occurrence No.	520	**Map Index:** 49101	**EO Index:**	49101		**Element Last Seen:**	1989-04-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-04-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2002-10-24

Quad Summary: Twelve Gauge Lake (3411783), Lockhart (3511713)
County Summary: San Bernardino

Lat/Long:	34.99887 / -117.31467	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3872963 E471285	**Elevation (ft):**	2100
PLSS:	T11N, R04W, Sec. 32 (S)	**Acres:**	0.0

Location: SOUTH OF HARPER LAKE
Detailed Location:
Ecological: HABITAT CONSISTS OF DESERT SCRUB.
General: OWLS OBSERVED NESTING DURING 11-14 APR 1989 TRANSECT SURVEYS.
Owner/Manager: PVT

Occurrence No.	628	**Map Index:** 52149	**EO Index:**	52149		**Element Last Seen:**	2009-09-02
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2009-09-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-02-23

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.85932 / -117.24185	**Accuracy:**	80 meters
UTM:	Zone-11 N3746584 E477628	**Elevation (ft):**	1475
PLSS:	T03S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: ALONG OLEANDER STORM DRAIN, JUST EAST OF THE HEACOCK STREET (WEBSTER AVENUE) CROSSING, SE OF THE MARCH AFB RUNWAY.
Detailed Location: MAPPED TO 2001 COORDINATES. 2009 LOCATION DESCRIBED AS THE ENTIRE CANAL BETWEEN HEACOCK ST AND PERRIS BLVD.
Ecological: HABITAT CONSISTS OF A BERM SURROUNDING A FALLOW AGRICULTURAL FIELD.
General: OWLS WERE OBSERVED FLYING BETWEEN 8 BURROWS ON 12 JUL 2001; WHITEWASH, FEATHERS, AND PREY PARTS PRESENT. 5 OWLS WERE OBSERVED WITHIN A MAINTAINED EARTHEN TRAPEZOIDAL FLOOD CONTROL CHANNEL ON 2 SEP 2009.
Owner/Manager: PVT

Occurrence No.	838	**Map Index:** 65895	**EO Index:**	65974		**Element Last Seen:**	2002-07-20
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-07-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2006-08-18

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.79838 / -117.33261	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3739851 E469211	**Elevation (ft):**	2190
PLSS:	T04S, R04W, Sec. 30 (S)	**Acres:**	38.4

Location: ~0.7 MILE NORTH OF SANTA ROSA ROAD, 6 MILES WEST OF PERRIS.
Detailed Location: BURROW SITE WAS LOCATED WITHIN A FENCED "YARD" IN NE1/4 OF NE1/4 SEC 30.
Ecological: HABITAT CONSISTS OF SOMEWHAT DISTURBED NON-NATIVE GRASSLAND.
General: 2 ADULTS AND 4 JUVENILES OBSERVED AT THE BURROW ON 20 JUL 2002.
Owner/Manager: PVT

Occurrence No.	871	**Map Index:**	66809	**EO Index:**	66966	**Element Last Seen:**	2006-05-15
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-05-15
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-10-26

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.99857 / -117.29598	**Accuracy:**	80 meters
UTM:	Zone-11 N3872925 E472990	**Elevation (ft):**	2084
PLSS:	T11N, R04W, Sec. 33 (S)	**Acres:**	0.0

Location: 0.2 MILE NORTH OF UTILITY ROAD AND 1 MILE EAST OF EDIE ROAD, 20 MILES EAST OF BORON.
Detailed Location:
Ecological: HABITAT SURROUNDING BURROW CONSISTS OF A FALLOW AGRICULTURAL (ALFALFA) FIELD, CURRENTLY DOMINATED BY DESCURAINIA SOPHIA. MOJAVE CREOSOTE BUSH SCRUB FOUND TOWARD THE SOUTH, ON AN ALLUVIAL PLAIN. SOILS: SILT/SAND. NE ASPECT; SLOPE 0-1%.
General: 2 ADULTS OBSERVED AT A BURROW SITE ON 15 MAY 2006.
Owner/Manager: PVT

Occurrence No.	882	**Map Index:**	67910	**EO Index:**	68057	**Element Last Seen:**	2006-06-28
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-28
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-01-29

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.84182 / -117.31320	**Accuracy:**	specific area
UTM:	Zone-11 N3744661 E471022	**Elevation (ft):**	1660
PLSS:	T04S, R04W, Sec. 09 (S)	**Acres:**	140.0

Location: MEAD VALLEY, NW OF THE INTERSECTION OF ALEXANDER STREET AND CAJALCO ROAD, SE OF RIVERSIDE.
Detailed Location: SITE IS DEVELOPED ON THREE SIDES, WITH A SMALL EASEMENT ON THE EAST.
Ecological: VEGETATION SURROUNDING BURROW IS DOMINATED BY ERIOGONUM SP. AND BRASSICA SP.
General: 14 ADULTS AND 3+ JUVENILES OBSERVED ON 28 JUN 2006.
Owner/Manager: UNKNOWN

Occurrence No.	929	**Map Index:**	69282	**EO Index:**	70066	**Element Last Seen:**	2006-10-25
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-10-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-05-24

Quad Summary: Steele Peak (3311773), Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.87591 / -117.32890	**Accuracy:**	specific area
UTM:	Zone-11 N3748446 E469582	**Elevation (ft):**	1640
PLSS:	T03S, R04W, Sec. 29 (S)	**Acres:**	26.0

Location: ALONG LURIN AVENUE, EAST OF WOOD ROAD, 1.5 MILES ESE OF WOODCREST.
Detailed Location:
Ecological: HABITAT CONSISTS OF NON-NATIVE GRASSLAND IN A HISTORIC AGRICULTURAL AREA. NUMEROUS GROUND SQUIRREL BURROWS FOUND IN THE VICINTIY, WHICH HAS THE POTENTIAL TO SUPPORT MULTIPLE OWL PAIRS.
General: 5 BURROWS AND 2 POTENTIAL BURROWS OBSERVED ON 17 JAN 2006. 1 ADULT OBSERVED AT A BURROW SITE NORTH OF LURIN AVENUE ON 25 OCT 2006.
Owner/Manager: UNKNOWN

Occurrence No.	1069	**Map Index:**	71396	**EO Index:**	72294	**Element Last Seen:**	2006-05-25
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-05-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-05-29

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.85672 / -117.26713	**Accuracy:**	80 meters
UTM:	Zone-11 N3746301 E475289	**Elevation (ft):**	1570
PLSS:	T04S, R04W, Sec. 02 (S)	**Acres:**	0.0

Location: 0.22 MI SE OF THE CORNER OF OLEANDER AVE & DECKER RD, SOUTH OF MARCH AFB.
Detailed Location: THE PROPERTY IS COMPRISED OF NON-NATIVE GRASSLAND, SEVERAL ROCK OUTCROPS, DISCED AREAS AND A LARGE GRAVEL PAD.
Ecological: HABITAT DOMINATED BY DEINANDRA PANICULATA, BRASSICA SP., CROTON SETIGERUS AND TRICHOSTEMA LANCEOLATUM. NO NATIVE VEGETATION COMMUNITIES PRESENT ON-SITE.
General: 3 ADULTS OBSERVED BREEDING ON 25 MAY 2006.
Owner/Manager: PVT

Occurrence No.	1070	**Map Index:**	71397	**EO Index:**	72295	**Element Last Seen:**	2006-06-06
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-05-29

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.86172 / -117.27200	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3746858 E474839	**Elevation (ft):**	1700
PLSS:	T03S, R04W, Sec. 35 (S)	**Acres:**	78.0

Location: NW OF THE CORNER OF OLEANDER AVE & DECKER RD, SOUTH OF MARCH AFB.
Detailed Location:
Ecological: HABITAT COMPOSED OF VERY LOW GROWING GRASSLAND.
General: 8 TERRITORIES (15 ADULTS AND 23 JUVENILES) OBSERVED ON 6 JUN 2006, 6 BURROWS IDENTIFIED AS "NATAL" BURROWS AND 2 IDENTIFIED AS "OCCUPIED" BURROWS.
Owner/Manager: PVT

Occurrence No.	1074	**Map Index:**	71405	**EO Index:**	72303	**Element Last Seen:**	2004-XX-XX
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	2005-04-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-05-30

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.91205 / -117.37367	**Accuracy:**	80 meters
UTM:	Zone-11 N3752468 E465455	**Elevation (ft):**	1500
PLSS:	T03S, R05W, Sec. 14 (S)	**Acres:**	0.0

Location: 0.14 MI BELOW PRENDA DAM, PRENDA.
Detailed Location: OWL HAS OCCUPIED A GROUND SQUIRREL BURROW ON A ROCKY GENTLE SLOPE.
Ecological: HABITAT DOMINATED BY GRASSLAND AND SAGE SCRUB, IMMEDIATELY UPSLOPE OF THE BURROW ENTRANCE ARE TALL MUSTARD PLANTS.
General: PAIR CONFIRMED BREEDING IN THIS LOCATION IN 2004. OWLS NOW EXTRIPATED FROM THIS LOCATION.
Owner/Manager: PVT

*** SENSITIVE ***

Occurrence No.	1079	**Map Index:** 71412	**EO Index:**	72309		**Element Last Seen:**	2006-07-12
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-07-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-05-30

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:		**Accurracy:**	80 meters
UTM:		**Elevation (ft):**	1495
PLSS:		**Acres:**	0.0

Location: *SENSITIVE* LOCATION INFORMATION SUPPRESSED.

Detailed Location: PLEASE CONTACT THE CALIFORNIA NATURAL DIVERSITY DATABASE, CALIFORNIA DEPARTMENT OF FISH AND GAME, FOR MORE INFORMATION: (916) 322-2493

Ecological: HABITAT WITHIN THE TERRITORY CONSISTS OF AGRICULTURE (DAIRIES, CROPPED FIELDS, TURF GRASS), GRAZED FIELDS, RUDERAL VEGETATION, AND TREATMENT WETLANDS.

General:

Owner/Manager:

*** SENSITIVE ***

Occurrence No.	1096	**Map Index:** 71438	**EO Index:**	72336		**Element Last Seen:**	2005-06-20
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2005-06-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-06-05

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:		**Accurracy:**	80 meters
UTM:		**Elevation (ft):**	1515
PLSS:		**Acres:**	0.0

Location: *SENSITIVE* LOCATION INFORMATION SUPPRESSED.

Detailed Location: PLEASE CONTACT THE CALIFORNIA NATURAL DIVERSITY DATABASE, CALIFORNIA DEPARTMENT OF FISH AND GAME, FOR MORE INFORMATION: (916) 322-2493

Ecological: HABITAT WITHIN THIS TERRITORY CONSISTS OF OPEN RUDERAL FIELDS AND AGRICULTURE (CROPPED FIELDS),

General:

Owner/Manager:

Occurrence No.	1283	**Map Index:** 79601	**EO Index:**	80589		**Element Last Seen:**	2009-07-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2009-07-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-08-19

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.90312 / -117.31515	**Accuracy:**	80 meters
UTM:	Zone-11 N3751459 E470863	**Elevation (ft):**	1680
PLSS:	T03S, R04W, Sec. 17 (S)	**Acres:**	0.0

Location: ABOUT 0.7 MI E OF TRAUTWEIN RD AND 0.6 MI N OF ORANGE TERRACE PARKWAY, NW OF MARCH AFB, RIVERSIDE.

Detailed Location: MARCH AFB SKR PRESERVE. MAPPED TO PROVIDED COORDINATES.

Ecological: RIPARIAN AREA SURROUNDED BY NON-NATIVE GRASSLAND INTERMIXED W/ RIVERSIDEAN SAGE SCRUB. SMALL TO MEDIUM SIZED TREES (INCLUDING COTTONWOODS), WILLOWS, AND MULEFAT ALONG RIPARIAN. AREA SURROUNDING PRESERVE IS RESIDENTIAL.

General: A PAIR WAS OBSERVED WITH A CHICK ON 29 JUL 2009. OWLS WERE FIRST SEEN IN THIS AREA ON 2 JAN 2009. OWLS WERE SEEN IN AREA THROUGHOUT SPRING.

Owner/Manager: MARCH JPA, CNLM

Occurrence No.	1284	**Map Index:** 79603	**EO Index:**	80590		**Element Last Seen:**	2009-01-02
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2009-01-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-08-19

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.90651 / -117.31744	**Accuracy:**	80 meters
UTM:	Zone-11 N3751835 E470652	**Elevation (ft):**	1670
PLSS:	T03S, R04W, Sec. 17 (S)	**Acres:**	0.0

Location: ABOUT 0.6 MI E OF TRAUTWEIN RD AND 0.8 MI N OF ORANGE TERRACE PARKWAY, NW OF MARCH AFB, RIVERSIDE.

Detailed Location: MARCH AFB SKR PRESERVE. MAPPED TO PROVIDED COORDINATES.

Ecological: RIPARIAN AREA SURROUNDED BY NON-NATIVE GRASSLAND INTERMIXED W/ RIVERSIDEAN SAGE SCRUB. SMALL TO MEDIUM SIZED TREES (INCLUDING COTTONWOODS), WILLOWS, AND MULEFAT ALONG RIPARIAN. AREA SURROUNDING PRESERVE IS RESIDENTIAL.

General: A PAIR WAS FREQUENTLY SEEN AT BURROW ON UNKNOWN DATES. OWLS WERE FIRST SEEN IN THIS AREA ON 2 JAN 2009. OWLS WERE SEEN IN AREA THROUGHOUT SPRING.

Owner/Manager: MARCH JPA, CNLM

Occurrence No.	1575	**Map Index:**	80909	**EO Index:**	81896	**Element Last Seen:**	2007-03-20
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-03-20
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-30

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.92118 / -117.26864	**Accuracy:**	80 meters
UTM:	Zone-11 N3864336 E475462	**Elevation (ft):**	2250
PLSS:	T10N, R04W, Sec. 35 (S)	**Acres:**	0.0

Location: SOUTH SIDE OF SR 58, 1 MI W OF WAGNER RD, 4.5 MI WSW HINKLEY PO.

Detailed Location: MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT CONSISTS OF CREOSOTE BUSH SCRUB, WITH LARREA TRIDENTATA AS THE DOMINANT SPECIES. MANY TORTOISE BURROWS NEARBY. VISIBLE DISTURBANCES INCLUDE OHV ACTIVITY & DUMPING.

General: 1 ADULT OBSERVED AND FLUSHED FROM OLD TORTOISE BURROW ON 20 MAR 2007; SITE VISITED 5 DAYS PER MONTH BETWEEN MARCH - JULY DURING MOHAVE GROUND SQUIRREL TRAPPING BUT OWL NOT SEEN AGAIN.

Owner/Manager: UNKNOWN

Occurrence No.	1576	**Map Index:**	80914	**EO Index:**	81905	**Element Last Seen:**	2007-05-18
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-05-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-30

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.92919 / -117.26336	**Accuracy:**	80 meters
UTM:	Zone-11 N3865222 E475946	**Elevation (ft):**	2230
PLSS:	T10N, R04W, Sec. 26 (S)	**Acres:**	0.0

Location: 0.9 MI NW SR 58 AT WAGNER RD, 4.2 MI W OF HINKLEY PO.

Detailed Location: MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT CONSISTS OF ATRIPLEX SCRUB, WITH LYCIUM COOPERI, KRASCHENINNIKOVIA LANATA, TETRADYMIA SP. AND EPHEDRA SP. AS ASSOCIATES. VISUAL DISTURBANCES INCLUDE OCCASIONAL OHV TRAFFIC.

General: BURROWING OWL BURROW WITH RECENT SIGN (PELLETS, WHITEWASH AND FEATHERS) OBSERVED ON 18 MAY 2007.

Owner/Manager: UNKNOWN

Occurrence No.	1577	**Map Index:**	80916	**EO Index:**	81907	**Element Last Seen:**	2007-05-22
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-05-22
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-30

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.91982 / -117.25613	**Accuracy:**	80 meters
UTM:	Zone-11 N3864182 E476604	**Elevation (ft):**	2260
PLSS:	T10N, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: 0.4 MI WSW OF SR 58 AT WAGNER RD, 3.9 MI WSW OF HINKLEY PO.
Detailed Location: MAPPED TO PROVIDED COORDINATES.
Ecological: HABITAT CONSISTS OF ATRIPLEX SCRUB, WITH LYCIUM COOPERI, KRASCHENINNIKOVIA LANATA, TETRADYMIA SP. AND EPHEDRA SP. AS ASSOCIATES. VISUAL DISTURBANCES INCLUDE OCCASIONAL OHV TRAFFIC.
General: BURROWING OWL BURROW WITH RECENT SIGN (PELLETS AND BONES AT 8.5 INCH BURROW OPENING) OBSERVED ON 22 MAY 2007.
Owner/Manager: UNKNOWN

Occurrence No.	1578	**Map Index:**	80919	**EO Index:**	81911	**Element Last Seen:**	2006-06-06
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-30

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.99904 / -117.32383	**Accuracy:**	80 meters
UTM:	Zone-11 N3872985 E470449	**Elevation (ft):**	2100
PLSS:	T11N, R04W, Sec. 32 (S)	**Acres:**	0.0

Location: 0.5 MI SE HARPER LAKE RD AT ROY RD, ABOUT 9 MI NW OF HINKLEY PO.
Detailed Location: BLOCK CODE 3870-470 - LOCATION CODE A. MAPPED TO PROVIDED COORDINATES.
Ecological: HABITAT CONSISTS OF GRAIN OR HAYFIELD AGRICULTURE. LOWLAND ELEVATION SUBREGION. GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION.
General: 1 ADULT OBSERVED AND 1 BREEDING PAIR ESTIMATED TO OCCUR IN AREA ON 6 JUN 2006.
Owner/Manager: PVT

Occurrence No.	1763	**Map Index:**	81851	**EO Index:**	82826	**Element Last Seen:**	2007-08-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-08-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-02-23

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.79996 / -117.01145	**Accuracy:**	80 meters
UTM:	Zone-11 N3739976 E498940	**Elevation (ft):**	1500
PLSS:	T04S, R01W, Sec. 29 (S)	**Acres:**	0.0

Location: 0.4 MI NE SCOTT ST AT CAWSTON AVE, ABOUT 0.5 MI W OF SAN JACINTO RESERVOIR, SAN JACINTO.
Detailed Location: BLOCK CODE 3735-495 - LOCATION CODE A. MAPPED TO PROVIDED COORDINATES.
Ecological: UPLAND ELEVATION SUBREGION.
General: 2 ADULTS OBSERVED AND 1 BREEDING PAIR ESTIMATED TO OCCUR IN AREA ON 23 AUG 2007.
Owner/Manager: PVT

Occurrence No.	1764	**Map Index:** 81852	**EO Index:**	82827		**Element Last Seen:**	2006-06-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-06-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-02-23

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.75154 / -117.01781	**Accuracy:**	specific area
UTM:	Zone-11 N3734608 E498349	**Elevation (ft):**	1510
PLSS:	T05S, R01W, Sec. 07 (S)	**Acres:**	10.0

Location: JUST NW OF N CAWSTON AVE AT W DEVONSHIRE AVE, HEMET.

Detailed Location: BLOCK CODE 3730-495 - LOCATION CODES U (EAST) AND V (WEST). MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT DESCRIBED AS NATURAL GRASSLAND. UPLAND ELEVATION SUBREGION. GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATIONS.

General: 2 ADULTS OBSERVED AT U; 2 ADULTS AND 4 JUVENILES OBSERVED AT V; 1 BREEDING PAIR ESTIMATED TO OCCUR AT EACH LOCATION ON 29 JUN 2006.

Owner/Manager: PVT

Occurrence No.	1765	**Map Index:** 81853	**EO Index:**	82828		**Element Last Seen:**	2007-06-20
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-02-23

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84779 / -117.12205	**Accuracy:**	80 meters
UTM:	Zone-11 N3745286 E488708	**Elevation (ft):**	1425
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	0.0

Location: WEST SIDE OF DAVIS RD, ABOUT 0.7 MI N OF RESERVOIR AVE, LAKEVIEW.

Detailed Location: BLOCK CODE 3745-485 - LOCATION CODE A. MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT DESCRIBED AS NATURAL GRASSLAND. UPLAND ELEVATION SUBREGION. NO GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION.

General: 2 ADULTS OBSERVED AND 1 BREEDING PAIR ESTIMATED TO OCCUR IN AREA ON 20 JUN 2007.

Owner/Manager: UNKNOWN

Occurrence No.	1766	**Map Index:**	81854	**EO Index:**	82829	**Element Last Seen:**	2006-06-01
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-02-23

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.87011 / -117.09179	**Accuracy:**	specific area
UTM:	Zone-11 N3747758 E491510	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 33 (S)	**Acres:**	13.0

Location: 1.75 MI SW OF GILMAN SPRINGS RD AT OLIVE AVE, ABOUT 3 MI NE LAKEVIEW, SAN JACINTO WILDLIFE AREA.

Detailed Location: BLOCK CODE 3745-490 - LOCATION CODES A, E, F, G, AND H. MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT DESCRIBED AS ALKALI FLOOD PLAIN BERM. UPLAND ELEVATION SUBREGION. NO GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATIONS.

General: 2 ADULTS & 2 JUVENILES OBSERVED AT A, 2 AD & 3 JUV OBS AT E, 2 AD & 4 JUV OBS AT F, 2 AD & 5 JUV OBS AT G AS WELL AS H; 1 BREEDING PAIR OBSERVED AT EACH LOCATION ON 1 JUN 2006.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	1767	**Map Index:**	81855	**EO Index:**	82831	**Element Last Seen:**	2007-06-25
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-06-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-02-23

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78158 / -117.19965	**Accuracy:**	80 meters
UTM:	Zone-11 N3737956 E481515	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: ALONG PERRIS VALLEY STORM DRAIN, ABOUT 1.7 MI NE OF PERRIS VALLEY AIRPORT.

Detailed Location: BLOCK CODE 3735-480 - LOCATION CODE A. MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT DESCRIBED AS IDLE OR FALLOW FIELD. UPLAND ELEVATION SUBREGION. GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION.

General: 3 ADULTS OBSERVED AND 1 BREEDING PAIR ESTIMATED TO OCCUR IN AREA ON 25 JUN 2007.

Owner/Manager: PVT

Occurrence No.	1768	**Map Index:**	81856	**EO Index:**	82832	**Element Last Seen:**	2007-06-19
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-06-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-02-23

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.81160 / -117.20565	**Accuracy:**	80 meters
UTM:	Zone-11 N3741286 E480966	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: ALONG PERRIS VALLEY STORM DRAIN, 0.3 MI SSE MURRIETA RD AT ORANGE AVE, PERRIS.

Detailed Location: BLOCK CODE 3740-480 - LOCATION CODE A. MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT DESCRIBED AS STORM DRAIN BANK SURROUNDED BY HOUSING CONSTRUCTION. UPLAND ELEVATION SUBREGION. NO GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION.

General: 1 ADULT OBSERVED AND 1 BREEDING PAIR ESTIMATED TO OCCUR IN AREA ON 19 JUN 2007.

Owner/Manager: PVT

Occurrence No.	1769	**Map Index:**	81857	**EO Index:**	82833	**Element Last Seen:**	2007-06-19
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-06-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-02-23

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.82441 / -117.20846	**Accuracy:**	80 meters
UTM:	Zone-11 N3742706 E480708	**Elevation (ft):**	1430
PLSS:	T04S, R03W, Sec. 16 (S)	**Acres:**	0.0

Location: ALONG MURRIETA RD JUST N OF PLACENTIA AVE, PERRIS.

Detailed Location: IN EMPTY DIRT LOT WEST OF PERRIS VALLEY STORM DRAIN. BLOCK CODE 3740-480 - LOCATION CODE C. MAPPED TO PROVIDED COORDINATES.

Ecological: UPLAND ELEVATION SUBREGION. GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION.

General: 1 ADULT AND 3 JUVENILES OBSERVED; 1 BREEDING PAIR ESTIMATED TO OCCUR IN AREA ON 19 JUN 2007.

Owner/Manager: UNKNOWN

Occurrence No.	1770	**Map Index:**	81859	**EO Index:**	82834	**Element Last Seen:**	2006-06-01
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-02-23

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87690 / -117.09191	**Accuracy:**	specific area
UTM:	Zone-11 N3748510 E491499	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 28 (S)	**Acres:**	15.0

Location: ALONG S CONTOUR RD, 1.5 MI SW OF GILMAN SPRINGS RD AT OLIVE AVE, SAN JACINTO WILDLIFE AREA.

Detailed Location: BLOCK CODE 3745-490 - LOCATION CODES B, C AND D. MAPPED TO PROVIDED COORDINATES.

Ecological: HABITAT DESCRIBED AS ALKALI FLOOD PLAINS ON BERMS CONTAINING WATER. UPLAND ELEVATION SUBREGION. NO GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATIONS. CHICKS WERE FLYING WELL AND WERE DIFFICULT TO COUNT.

General: 2 ADULTS AND 4 JUVENILES OBSERVED AT B; 2 ADULTS AND 5 JUVENILES OBSERVED AT C; 2 ADULTS AND 5 JUVENILES OBSERVED AT D; 1 BREEDING PAIR ESTIMATED TO OCCUR AT EACH LOCATION ON 1 JUN 2006.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	1784	**Map Index:** 81883	**EO Index:**	82856		**Element Last Seen:**	2006-05-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-05-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-02-28

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10655 / -117.24148	**Accurracy:**	80 meters
UTM:	Zone-11 N3773996 E477727	**Elevation (ft):**	1110
PLSS:	T01S, R03W, Sec. 06 (S)	**Acres:**	0.0

Location: JUST E OF STERLING AVE AT E 3RD ST, N EDGE OF SAN BERNARDINO INTERNATIONAL AIRPORT.

Detailed Location: ALONG CITY CREEK. BLOCK CODE 3770-475 - LOCATION CODE A. MAPPED TO PROVIDED COORDINATES.

Ecological: UPLAND ELEVATION SUBREGION. GROUND SQUIRRELS DETECTED WITHIN 100 M OF BREEDING LOCATION.

General: 6 ADULTS AND 3 JUVENILES DETECTED ON 26 MAY 2006; THE 3 PAIRS WERE LOCATED WITHIN 1/4 MI OF EACH OTHER AT THIS LOCATION.

Owner/Manager: UNKNOWN

Asio otus **Element Code:** ABNSB13010

long-eared owl

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G5
	State:	None	**State:**	S3
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern		
Habitat:	**General:**	RIPARIAN BOTTOMLANDS GROWN TO TALL WILLOWS & COTTONWOODS; ALSO, BELTS OF LIVE OAK PARALLELING STREAM COURSES.		
	Micro:	REQUIRE ADJACENT OPEN LAND PRODUCTIVE OF MICE AND THE PRESENCE OF OLD NESTS OF CROWS, HAWKS, OR MAGPIES FOR BREEDING.		

Occurrence No.	35 **Map Index:** 03381	**EO Index:**	25544	**Element Last Seen:**	1983-07-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1983-07-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-11-07

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80463 / -117.34428	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3740548 E468133	**Elevation (ft):**	2015
PLSS:	T04S, R04W, Sec. 19 (S)	**Acres:**	0.0

Location: IDA LEONA ESTATES, 0.5 MI WNW OF GAVILAN MINE, 4 MILES SOUTHEAST OF LAKE MATHEWS.

Detailed Location: PARCEL 6. ROOST AND NEST SITE.

Ecological: HABITAT CONSISTS OF JUNIPER WOODLAND. IDA LEONA ESTATES PROVIDES EXCELLENT NESTING AND FORAGING HABITAT.

General: 1 NEST OBSERVED DURING 1983. THE OWLS ARE SENSITIVE TO DISTURBANCE DUE TO SEMI-COLONIAL NESTING HABITS. THERE ARE FEW POSSIBLE NESTING AREAS FOR RELOCATION IN THE WESTERN COUNTY; THIS IS A CRITICAL SITE FOR THESE OWLS.

Owner/Manager: PVT

Occurrence No.	36 **Map Index:** 03366	**EO Index:**	13007	**Element Last Seen:**	1983-07-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1983-07-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-11-07

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.79936 / -117.34758	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3739965 E467826	**Elevation (ft):**	2030
PLSS:	T04S, R05W, Sec. 25 (S)	**Acres:**	0.0

Location: IDA LEONA ESTATES, 0.7 MI WSW OF GAVILAN MINE, 4 MILES SOUTHEAST OF LAKE MATHEWS.

Detailed Location: PARCEL 3. ROOST AND NEST SITE.

Ecological: HABITAT CONSISTS OF SCRUB OAK WOODLAND. IDA LEONA ESTATES PROVIDES EXCELLENT NESTING AND FORAGING HABITAT.

General: 1 NEST OBSERVED DURING 1983. OWLS ARE SENSITIVE TO DISTURBANCE DUE TO SEMI-COLONIAL NESTING HABITS. THERE ARE FEW POSSIBLE NESTING AREAS FOR RELOCATION IN THE WESTERN COUNTY; THIS IS A CRITICAL SITE FOR THESE OWLS.

Owner/Manager: PVT

Empidonax traillii extimus **Element Code:** ABPAE33043

southwestern willow flycatcher

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:** **Global:**	G5T1T2
	State:	Endangered	**State:**	S1
	Other:	ABC_WLBCC-Watch List of Birds of Conservation Concern		

Habitat:	**General:**	RIPARIAN WOODLANDS IN SOUTHERN CALIFORNIA.
	Micro:	

Occurrence No.	4	**Map Index:** 37946	**EO Index:**	32953	**Element Last Seen:**	1997-06-30
Occ. Rank:	Excellent		**Presence:**	Presumed Extant	**Site Last Seen:**	1997-06-30
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1998-01-21

Quad Summary: Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long:	34.10353 / -117.01246	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3773635 E498850	**Elevation (ft):**	3400
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: VICINITY OF THURMAN FLATS PICNIC AREA, IN MILL CREEK CANYON, SAN BERNARDINO NATIONAL FOREST
Detailed Location:
Ecological: HABITAT CONSISTS OF RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB, DOMINATED BY A TALL WILLOW AND ALDER OVERSTORY, WITH A DENSE UNDERSTORY OF BLACKBERRY AND OTHER HERBS.
General: 2 PAIRS NESTED SUCCESSFULLY IN 1997; 2 FLEDGLINGS FROM ONE NEST WERE BANDED.
Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	29	**Map Index:** 54561	**EO Index:**	54561	**Element Last Seen:**	1999-07-17
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1999-07-31
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-03-04

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.01174 / -117.17320	**Accuracy:**	specific area
UTM:	Zone-11 N3763471 E484007	**Elevation (ft):**	1460
PLSS:	T02S, R03W, Sec. 11 (S)	**Acres:**	39.8

Location: SAN TIMOTEO CANYON, 0.4-0.9 MI NORTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE, DIRECTLY SOUTH OF REDLANDS.
Detailed Location: THE FIRST 2 BIRDS WERE DETECTED (100 METERS APART) IN THE NORTH PORTION OF OCCURRENCE. THESE BIRDS WERE UTILIZING A WILLOW THICKET AND WILLOW/MULEFAT THICKET. THE THIRD BIRD WAS DETECTED IN SOUTH PORTION OF OCCURRENCE.
Ecological: HABITAT CONSISTS OF DENSE LINEAR STANDS OF RIPARIAN. DOMINANT SPECIES INCLUDE SALIX LASIOLEPIS, SALIX HINDSIANA, POPULUS FREMONTII AND BACHARIS GLUTINOSA. YELLOW-BILLED CUCKOO OBSERVED IN AREA.
General: 1 OBS 24 MAY, 10 & 12 JUN & 1 & 17 JUL 1999. 2ND BIRD HEARD WHITTING 10 JUN, 100M UPSTREAM OF FIRST OBS. 3RD BIRD FLYCATCHING FROM SALT CEDAR 12 JUN 1999. NESTING NOT CONFIRMED BUT BIRDS OBS AFTER 10 JUN CONSIDERED TO BE ON TERRITORY.
Owner/Manager: UNKNOWN

Occurrence No.	46 **Map Index:** 66229	**EO Index:**	66309	**Element Last Seen:**	2004-07-15
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2004-07-15
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-09-15

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92729 / -117.01615	**Accuracy:**	80 meters
UTM:	Zone-11 N3754094 E498506	**Elevation (ft):**	790
PLSS:	T03S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: ABOUT 2.35 MI WSW OF BEAUMONT, 0.4 MI SOUTH OF HWY 60.
Detailed Location:
Ecological: DOMINANT SPECIES INCLUDE ARROYO WILLOW, COTTONWOOD, NETTLE. CANOPY HEIGHT IS 11M. SURFACE WATER OR SATURATED SOIL IS PRESENT.
General: 1 ADULT OBSERVED BETWEEN 26 MAY AND 15 JUL 2004; POSSIBLY TERRITORIAL.
Owner/Manager: UNKNOWN

Occurrence No.	47 **Map Index:** 66230	**EO Index:**	66311	**Element Last Seen:**	2004-07-XX
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2004-07-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-11-02

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92987 / -117.02351	**Accuracy:**	80 meters
UTM:	Zone-11 N3754381 E497827	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: ABOUT 2.7 MI WEST OF BEAUMONT, 0.2 MI SOUTH OF HWY 60, COOPER'S CREEK.
Detailed Location:
Ecological: DOMINANT SPECIES INCLUDE ARROYO WILLOW, BLACK WILLOW AND MULEFAT.
General: 1 INDIVIDUAL OBSERVED ON 2 SURVEY DAYES BETWEEN MAY AND JUL 2004; POSSIBLY TERRITORIAL.
Owner/Manager: PVT

Eremophila alpestris actia

Element Code: ABPAT02011

California horned lark

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T3Q
	State:	None		**State:**	S3
	Other:	DFG_WL-Watch List, IUCN_LC-Least Concern			
Habitat:	**General:**	COASTAL REGIONS, CHIEFLY FROM SONOMA CO. TO SAN DIEGO CO. ALSO MAIN PART OF SAN JOAQUIN VALLEY & EAST TO FOOTHILLS.			
	Micro:	SHORT-GRASS PRAIRIE, "BALD" HILLS, MOUNTAIN MEADOWS, OPEN COASTAL PLAINS, FALLOW GRAIN FIELDS, ALKALI FLATS.			

Occurrence No.	37	**Map Index:**	47733	**EO Index:**	47733	**Element Last Seen:**	1997-05-27
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	1997-05-27
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-18

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.80735 / -117.20437	**Accuracy:**	80 meters
UTM:	Zone-11 N3740814 E481084	**Elevation (ft):**	1410
PLSS:	T04S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: 2 MILES NE OF PERRIS; SOUTH OF CITRUS AVE BETWEEN MURRIETA RD AND EVANS RD.

Detailed Location:

Ecological: HABITAT CONSISTS OF AGRICULTURAL/RUDERAL LAND AND FALLOW FIELDS. SURROUNDING LAND USED FOR AGRICULTURE AND RESIDENTIAL PURPOSES.

General: 19 & 27 MAY 1997: ONE JUVENILE & FIVE ADULTS OBSERVED.

Owner/Manager: RIV COUNTY FLOOD CONTROL

Occurrence No.	48	**Map Index:**	55837	**EO Index:**	55853	**Element Last Seen:**	2003-XX-XX
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-06-17

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.93061 / -117.01466	**Accuracy:**	specific area
UTM:	Zone-11 N3754462 E498644	**Elevation (ft):**	2430
PLSS:	T03S, R01W, Sec. 08 (S)	**Acres:**	21.0

Location: JUST SOUTH OF HWY 60, 2 MILES WEST OF BEAUMONT.

Detailed Location:

Ecological: HABITAT ON SITE CONSISTS OF DISTURBED NON-NATIVE ANNUAL GRASSLANDS AND BARE AREAS. SURROUNDING AREA IS UNDISTURBED OPEN SPACE.

General: 10 ADULTS (BREEDING) OBSERVED DURING 2003.

Owner/Manager: PVT

Occurrence No.	61	**Map Index:**	38668	**EO Index:**	55893	**Element Last Seen:**	1992-11-24
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-11-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-08-17

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.86915 / -117.30816	**Accuracy:**	specific area
UTM:	Zone-11 N3747690 E471498	**Elevation (ft):**	1700
PLSS:	T03S, R04W, Sec. 33 (S)	**Acres:**	25.4

Location: MARCH AIR FORCE BASE, 0.25 MILE NNE OF INTERSECTION OF BARTON ST & NANDIN AVE, 0.4 MILE SW OF BARTON ST & MARIPOSA AVE.

Detailed Location: SITE 1 TRANSECT. WINTERING.

Ecological: HABITAT CONSISTS OF DISTURBED GRASSLAND. TOPOGRAPHY IS LEVEL TO GENTLY SLOPING.

General: 70 OBSERVED DURING SURVEYS. SITE VISITED ON 3 DIFFERENT DAYS BETWEEN 21 OCTOBER AND 24 NOVEMBER 1992.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	62	**Map Index:**	38572	**EO Index:**	55895	**Element Last Seen:**	1992-11-24
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-11-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-01-28

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.89242 / -117.29071	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3750266 E473119	**Elevation (ft):**	1640
PLSS:	T03S, R04W, Sec. 22 (S)	**Acres:**	26.0

Location: WEST MARCH AIR FORCE BASE, ABOUT 0.5 MILE WEST OF ARNOLD HEIGHTS AND ABOUT 2 MILES SSW OF EDGEMONT.

Detailed Location: SITE 5 TRANSECT. WINTERING.

Ecological: HABITAT CONSISTS OF DISTURBED GRASSLAND. TOPOGRAPHY IS LEVEL TO GENTLY SLOPING.

General: 110 OBSERVED DURING SURVEYS. SITE VISITED ON 3 DIFFERENT DAYS BETWEEN 21 OCTOBER AND 24 NOVEMBER 1992.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	63	**Map Index:**	55922	**EO Index:**	55938	**Element Last Seen:**	2001-10-12
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-10-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-06-25

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08228 / -117.24081	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3771305 E477782	**Elevation (ft):**	1100
PLSS:	T01S, R03W, Sec. 18 (S)	**Acres:**	0.0

Location: JUST SOUTH OF THE SANTA ANA RIVER & NORTH OF I-10, SE OF SAN BERNARDINO.

Detailed Location: AG FIELD NORTH OF MOUNTAIN VIEW POWERPLANT.

Ecological: HABITAT CONSISTS OF RIPARIAN WOODLAND. CURRENT/SURROUNDING LAND USE: AG LAND, DISTURBED, COMMERICAL AND DEVELOPED LAND. LOGGERHEAD SHRIKE AND COOPER'S HAWK LOCATED IN VICINITY.

General: 50 ADULTS AND 25 JUVENILES OBSERVED FEEDING IN PLOWED AGRICULTURAL FIELD ON 12 OCT 2001.

Owner/Manager: UNKNOWN

Campylorhynchus brunneicapillus sandiegensis **Element Code:** ABPBG02095

coastal cactus wren

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G5T3Q
	State:	None	**State:**	S3
	Other:	DFG_SSC-Species of Special Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern		
Habitat:	**General:**	SOUTHERN CALIFORNIA COASTAL SAGE SCRUB.		
	Micro:	WRENS REQUIRE TALL OPUNTIA CACTUS FOR NESTING AND ROOSTING.		

Occurrence No.	168 **Map Index:** 52665	**EO Index:**	53524	**Element Last Seen:**	2001-12-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2001-12-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2003-12-18

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86783 / -117.02750	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3747502 E497455	**Elevation (ft):**	1640
PLSS:	T03S, R01W, Sec. 31 (S)	**Acres:**	0.0

Location: NW OF LABORDE CANYON, NE OF GILMAN SPRINGS ROAD, 5.6 MILES NE OF LAKEVIEW.

Detailed Location:

Ecological: HABITAT DOMINATED BY BRITTLEBUSH, INTERIOR FLAT-TOPPED BUCKWHEAT, CALIFORNIA SAGE & VALLEY CHOLLA W/LARGE PATCH OF COASTAL PRICLKLY PEAR CACTUS. BADLAND HILLS AREA BURNED (2000) & MAY NO LONGER HAVE SUITABLE HABITAT;AREA IS RECOVERING

General: 2-3 PAIRS OBSERVED IN PATCH OF COASTAL PRICKLY PEAR CACTUS. OBSERVATION OCCURRED DURING THE SAN JACINTO CHRISTMAS BIRD COUNT CONDUCTED EACH YEAR IN DEC, 1995-2001.

Owner/Manager: UNKNOWN

Polioptila californica californica **Element Code:** ABPBJ08081

coastal California gnatcatcher

Listing Status:	**Federal:**	Threatened	**CNDDB Element Ranks:** **Global:**	G3T2
	State:	None	**State:**	S2
	Other:	ABC_WLBCC-Watch List of Birds of Conservation Concern, DFG_SSC-Species of Special Concern		
Habitat:	**General:**	OBLIGATE, PERMANENT RESIDENT OF COASTAL SAGE SCRUB BELOW 2500 FT IN SOUTHERN CALIFORNIA.		
	Micro:	LOW, COASTAL SAGE SCRUB IN ARID WASHES, ON MESAS & SLOPES. NOT ALL AREAS CLASSIFIED AS COASTAL SAGE SCRUB ARE OCCUPIED.		

Occurrence No.	39	**Map Index:** 03346	**EO Index:**	25109		**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1989-08-10

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81279 / -117.35838	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3741456 E466831	**Elevation (ft):**	1900
PLSS:	T04S, R05W (S)	**Acres:**	0.0

Location: HARFORD SPRINGS, EAST OF GAVILAN PEAK, VICINITY LAKE MATTHEWS.

Detailed Location:

Ecological: HABITAT IS COASTAL SAGE SCRUB, DOMINATED BY ARTEMISIA CALIFORNICA, ERIOGONUM FASCICULATUM, AND SALVIA MELLIFERA.

General: 5-10 PAIRS ESTIMATED.

Owner/Manager: UNKNOWN

Occurrence No.	136	**Map Index:** 03531	**EO Index:**	25023		**Element Last Seen:**	1988-06-27
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1988-06-27
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1989-08-10

Quad Summary: Sunnymead (3311782), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.97946 / -117.25254	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3759907 E476672	**Elevation (ft):**	1900
PLSS:	T02S, R04W, Sec. 24 (S)	**Acres:**	0.0

Location: LAWLESS RANCH, 2.3 MI N OF SUNNYMEAD, E OF RIVERSIDE.

Detailed Location:

Ecological: HABITAT IS ECOTONE BETWEEN RIPARIAN SYCAMORE WOODLAND AND COASTAL SAGE SCRUB; MODERATE TO STEEPLY SW SLOPING ASPECT, ADJOINING DISTURBED HABITAT.

General: 4 ADULTS OBSERVED.

Owner/Manager: PVT

Occurrence No.	151	**Map Index:** 17454	**EO Index:**	11913		**Element Last Seen:**	1989-09-19
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-09-19
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1991-02-20

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95496 / -117.28852	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3757199 E473341	**Elevation (ft):**	1700
PLSS:	T02S, R04W, Sec. 34 (S)	**Acres:**	0.0

Location: AT THE INTERSECTION OF CLARK STREET AND FRESH SKY RD, MORENO VALLEY.

Detailed Location: ONE PAIR FOUND AT THE BASE OF A STEEP, WEST-FACING SLOPE.

Ecological: HABITAT IS RIVERSIDIAN SAGE SCRUB DOMINATED BY ENCELIA FARINOSA (80%); OTHER SHRUBS PRESENT INCLUDE ARTEMISIA CALIFORNICA, ERIOGONUM FASCICULATUM, AND SALVIA APIANA.

General:

Owner/Manager: PVT

Occurrence No.	152	**Map Index:** 17455	**EO Index:**	11912		**Element Last Seen:**	1989-12-22
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-12-22
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1991-02-20

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.98271 / -117.25653	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3760268 E476305	**Elevation (ft):**	2000
PLSS:	T02S, R04W, Sec. 24 (S)	**Acres:**	0.0

Location: 0.25 MI EAST OF THE INTERSECTION OF PIGEON PASS RD AND LAWLESS RANCH RD, MORENO VALLEY.

Detailed Location: TWO PAIRS OBSERVED DURING A FIELD SURVEY OF THIS 20 ACRE PARCEL.

Ecological: HABITAT IS SPARSE TO DENSE RIVERSIDIAN SAGE SCRUB DOMINATED BY ENCELIA FARINOSA (70%); OTHER SHRUBS PRESENT INCLUDE ARTEMISIA CALIFORNICA, SALVIA APIANA, SALVIA MELLIFERA, AND ERIOGONUM FASCICULATUM.

General: IT IS LIKELY THAT PORTIONS OF THESE BIRDS' TERRITORIES OCCUR ON ADJOINING PARCELS.

Owner/Manager: PVT

Occurrence No.	153	**Map Index:** 17457	**EO Index:**	11910		**Element Last Seen:**	1989-10-14
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-10-14
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1991-02-20

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81926 / -117.36857	**Accuracy:**	80 meters
UTM:	Zone-11 N3742177 E465891	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 14 (S)	**Acres:**	0.0

Location: JUST NORTH OF MULTIVIEW DRIVE, 0.6 MI WEST OF GAVILAN RD, ONE MI NNE OF GAVILAN PEAK.

Detailed Location: ONE PAIR OBSERVED.

Ecological: HABITAT IS APPROXIMATELY 20 ACRES OF UNDISTURBED COASTAL SAGE SCRUB CONTAINING SCRUB OAK, ERIOGONUM FASCICULATUM, SALVIA APIANA, SALVIA MELLIFERA, SAMBUCUS MEXICANA, ENCELIA FARINOSA, ETC.

General:

Owner/Manager: PVT

Occurrence No.	337	**Map Index:** 21727	**EO Index:**	21407	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1996-01-04

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.82089 / -117.34307	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3742349 E468251	**Elevation (ft):**	1850
PLSS:	T04S, R04W (S)	**Acres:**	0.0

Location: ONE MILE NORTHEAST OF HARFORD SPRING, NORTHEAST OF GAVILAN PK. SITE APPROX 0.25 MILE NW OF DIRT ROAD NEAR BIRD BENCHMARK

Detailed Location:

Ecological: RIVERSIDIAN SAGE SCRUB HABITAT; DOMINANTS: SALVIA MELLIFERA, ERIOGONUM FASICULATUM, AND ARTEMISIA CALIFORNICA. STEEP, SOUTH-FACING SLOPE.

General: ONE NESTING PAIR DETECTED DURING 1990 SURVEY. SITE IS PART OF HARFORD SPRINGS MITIGATION STUDY SITE FOR METROPOLITAN WATER DISTRICT.

Owner/Manager: MWD

Occurrence No.	338	**Map Index:** 21728	**EO Index:**	14542	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1996-01-04

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81398 / -117.34020	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3741582 E468514	**Elevation (ft):**	2200
PLSS:	T04S, R04W (S)	**Acres:**	0.0

Location: ONE MILE EAST OF HARFORD SPRING, EAST OF GAVILAN PEAK.

Detailed Location:

Ecological: RIVERSIDIAN SAGE SCRUB HABITAT; DOMINANTS: SALVIA MELLIFERA, ERIOGONUM FASICULATUM, AND ARTEMISIA CALIFORNICA. SITE IS NORTHWEST-FACING SUMMIT OF 2200 FOOT HILL.

General: ONE PAIR DETECTED DURING 1990 SURVEY. SITE IS PART OF HARFORD SPRINGS MITIGATION STUDY SITE FOR METROPOLITAN WATER DISTRICT.

Owner/Manager: MWD

Occurrence No.	339 **Map Index:** 21729	**EO Index:**	14541	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-01-04

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81563 / -117.26200	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3741744 E475752	**Elevation (ft):**	1800
PLSS:	T04S, R04W, Sec. 14 (S)	**Acres:**	0.0

Location: 1.25 MILES WEST MAYER FARMS AT HIGHWAY 395, ABOUT 2 MILES NNE OF JUCTION OF SAN JACINTO AVE & OLD ELSINOR ROAD.

Detailed Location:

Ecological: RIVERSIDIAN SAGE SCRUB HABITAT; PLANT SPECIES NOT GIVEN IN REPORT.

General: ONE INDIVIDUAL DETECTED DURING 1990 SURVEY ALONG UNNAMED STREAM. SITE IS PART OF MOTTE RESERVE MITIGATION SITE FOR METROPOLITAN WATER DISTRICT.

Owner/Manager: MWD

Occurrence No.	340 **Map Index:** 21730	**EO Index:**	8394	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-01-04

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81327 / -117.25480	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3741481 E476418	**Elevation (ft):**	1800
PLSS:	T04S, R04W, Sec. 24 (S)	**Acres:**	0.0

Location: ONE MILE WEST-SOUTHWEST OF MAYER FARMS AT HIGHWAY 395, ABOUT 2 MILES NE OF JUNCTION OF OLD ELSINOR RD & SAN JACINTO AVE.

Detailed Location:

Ecological: RIVERSIDIAN SAGE SCRUB HABITAT; PLANT SPECIES NOT GIVEN. SITE IS ACROSS ROAD FROM UNNAMED SOUTHWEST-FLOWING STREAM, IN STEEP-SLOPED CANYON.

General: ONE INDIVIDUAL DETECTED DURING 1990 SURVEY. SITE IS PART OF MOTTE RESERVE MITIGATION SITE.

Owner/Manager: MWD

Occurrence No.	454 **Map Index:** 24993	**EO Index:**	6368	**Element Last Seen:**	1928-04-10
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1928-04-10
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2003-10-31

Quad Summary: Sunnymead (3311782), Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.01874 / -117.27110	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3764267 E474969	**Elevation (ft):**	1600
PLSS:	T02S, R04W (S)	**Acres:**	2755.2

Location: RECHE CANYON, SE OF COLTON.

Detailed Location: 1923-1928: 4 NESTS 4-7 MILES SE COLTON, 3 OF THE 4 NESTS WERE BUILT IN BLACK SAGE, 3-3.5 FEET FROM THE GROUND. 2002: 0.65 MILES S OF WASHINGTON ST/BARTON RD, WEST SIDE OF RECHE CANYON.

Ecological: 190 OF 210 ACRES ON BLUE MOUNTAIN PROJECT SITE CONSISTS OF RIVERSIDIAN SAGE SCRUB AND NON-SAGE SCRUB HABITAT. HABITAT CONSIDERED TO BE OF GOOD TO MODERATE QUALITY DUE TO STEEP TOPOGRAPHY, DISTURBED HABITAT AND NON-NATIVE GRASSES.

General: 4 HISTORICAL EGG SET COLLECTIONS. IN ALL 4 CASES, BOTH MEMBERS OF PAIR WERE PRESENT & 4 EGGS WERE COLLECTED (HANNA, SETS #1915, 2941, 4650, AND 7605 SAN BERNARDINO COUNTY MUSEUM). 1 FEMALE OBS 14 MAY 2002, BUT NOT OBS ON FOLLOWING SURVEYS.

Owner/Manager: UNKNOWN

Occurrence No.	494 **Map Index:** 28537	**EO Index:**	29846	**Element Last Seen:**	1995-06-28
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1995-06-28
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-11-27

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09540 / -117.17234	**Accuracy:**	1 mile
UTM:	Zone-11 N3772747 E484102	**Elevation (ft):**	1340
PLSS:	T01S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: SANTA ANA WASH AT EAST HIGHLANDS.

Detailed Location:

Ecological: SOBOBA STONY LOAMY SAND SOIL. 2% TO 9% SLOPE. DOMINANT PLANT SPECIES INCLUDE SALVIA APIANA, ERIOGONIUM FASCICULATUM, LOTUS SCOPARIUS, & ERIODICTYON TRICHOCALYX.

General: ONE JUVENILE BIRD OBSERVED 28 JUNE 1995.

Owner/Manager: UNKNOWN

Occurrence No.	525	**Map Index:** 40517	**EO Index:**	35524		**Element Last Seen:**	1997-05-06
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1997-05-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1999-01-06

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.84833 / -117.34877	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3745394 E467734	**Elevation (ft):**	1630
PLSS:	T04S, R05W, Sec. 01 (S)	**Acres:**	0.0

Location: 1 MILE NNE OF THE INTERSECTION OF HARLEY JOHN ROAD AND CAJALCO ROAD, 6 MILES NW OF PERRIS
Detailed Location: LOCATED AT A WATER TANK SITE.
Ecological: HABITAT CONSISTS OF XERIC RIVERSIDEAN SAGE SCRUB, DOMINATED BY BRITTLEBUSH, CALIFORNIA SAGEBRUSH, AND CALIFORNIA BUCKWHEAT.
General: 5 INDIVIDUALS (2 ADULTS, 3 JUVENILES) OBSERVED BETWEEN 4 APR-6 MAY 1997.
Owner/Manager: MWD

Occurrence No.	526	**Map Index:** 40518	**EO Index:**	35525		**Element Last Seen:**	1997-06-25
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1997-06-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1999-01-06

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.89873 / -117.35853	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3750985 E466851	**Elevation (ft):**	1400
PLSS:	T03S, R05W, Sec. 24 (S)	**Acres:**	0.0

Location: 2.5 MILES WNW OF THE INTERSECTION OF TRAUTWEIN ROAD AND VAN BUREN ROAD, WOODCREST.
Detailed Location:
Ecological: HABITAT CONSISTS OF RIVERSIDEAN SAGE SCRUB, DOMINATED BY BRITTLEBUSH, COASTAL SAGEBRUSH, CUDWEED ASTER, AND SEVERAL ANNUAL GRASSES, AND ANNUAL GRASSLAND, DOMINATED BY SLENDER OAT, SPANISH BROME, RIPGUT BROME, AND RANCHER'S FIDDLENECK.
General: 2 ADULTS AND 2 JUVENILES OBSERVED ON 21 MAY 1997.
Owner/Manager: PVT

Occurrence No.	536	**Map Index:** 42495	**EO Index:**	42495		**Element Last Seen:**	1999-04-02
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-04-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2000-03-06

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86702 / -117.04264	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3747412 E496056	**Elevation (ft):**	1500
PLSS:	T03S, R02W, Sec. 36 (S)	**Acres:**	0.0

Location: 0.2 MILE SE OF JCT OF BRIDGE ST & HIGHWAY 79, ~1 MILE NW OF LABORDE CANYON, ~5 MILES NE OF LAKEVIEW, SAN JACINTO VALLEY.
Detailed Location: MAPPED TO COORDINATES (LAT 33 52 00; LONG 117 02 30) GIVEN, AND ALSO TO COVER ELEVATION GIVEN.
Ecological: RIVERSIDIAN SAGE SCRUB DOMINATED BY ENCELIA FARINOSA, ARTEMISIA CALIFORNICA, ERIOGONUM FASCICULATUM.
General: 2 OBSERVED FORAGING, 1999.
Owner/Manager: UNKNOWN

Occurrence No.	537	**Map Index:** 42500	**EO Index:**	42500	**Element Last Seen:**	1999-06-17
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	1999-06-17
Occ. Type:	Natural/Native occurrence		**Trend:**	Stable	**Record Last Updated:**	2003-10-03

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84179 / -117.36513	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744674 E466218	**Elevation (ft):**	1512
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	77.5

Location: HARLEY JOHN ROAD EXTENDING SW TO EL SOBRANTE RD, 0.4 TO 0.8 MILE NORTH OF CAJALCO ROAD; EAST LAKE MATHEWS.

Detailed Location: 1999 OBSERVATION MAPPED TO COORDINATES (LAT 33 50 44, LONG 117 21 45) AND ELEVATION GIVEN.

Ecological: HABITAT CONSISTS OF RIVERSIDIAN SAGE SCRUB. NE AREA DOMINATED BY ENCELIA FARINOSA, ARTEMISIA CALIFORNICA, ERIOGONUM, FASCICULATUM, SALVIA MELLIFERA. LAND SURROUNDING LAKE MATHEWS IS A COMBINATION OF ECOLOGICAL RESERVE AND BUFFER LANDS.

General: 3 PAIRS OBS IN 1992. 2 PAIRS OBS IN 1993. 2 ADULTS (W/ 1JUV) NESTING IN 1999. EREMOPHILA ALPESTRIS ACTIA, AIMOPHILA RUFICEPS CANESCENS, CAMPYLORHYNCHUS BRUNNEICAPILLUS COUESI, AMPHISPIZA BELLI BELLI, LANIUS LUDVICIANUS OBS VIC LAKE MATHEWS

Owner/Manager: MWD, WESTERN MWD

Occurrence No.	712	**Map Index:** 52018	**EO Index:**	52018	**Element Last Seen:**	2002-01-24
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-01-24
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2003-08-05

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.75595 / -117.02635	**Accuracy:**	80 meters
UTM:	Zone-11 N3735097 E497558	**Elevation (ft):**	1633
PLSS:	T05S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: JUST NW OF THE INTERSECTION OF ROSE ROAD AND MYERS ROAD, TRES CERRITOS, APPROXIMATELY 3 MILES WEST OF HEMET

Detailed Location: LOCATION MAPPED USING UTM COORDINATES (NAD 27).

Ecological: HABITAT ON PROJECT SITE CONSISTS OF RSS COMPRISED OF ENCELIA FARINOSA (DOM MOST AREAS), ERIOGONUM FASCICULATUM, ARTEMISIA CALIFORNICA, BEBBIA JUNCEA, BRICKELLIA CALIFORNICA, OPUNTIA PARRYI, SALVIA MELLIFERA, LOTUS SCOPARIUS, SALVIA APIANA.

General: 1 PAIR OBSERVED ON 29 NOV 2001 AND 24 JAN 2002.

Owner/Manager: PVT

Occurrence No.	757	**Map Index:** 52665	**EO Index:**	52665		**Element Last Seen:**	2000-12-19
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2001-12-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-09-25

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86783 / -117.02750	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3747502 E497455	**Elevation (ft):**	1640
PLSS:	T03S, R01W, Sec. 31 (S)	**Acres:**	0.0

Location: NW OF LABORDE CANYON, NE OF GILMAN SPRINGS ROAD, 5.6 MILES NE OF LAKEVIEW.

Detailed Location:

Ecological: HABITAT DOMINATED BY BRITTLEBUSH, INTERIOR FLAT-TOPPED BUCKWHEAT, CALIFORNIA SAGE & VALLEY CHOLLA W/LARGE PATCH OF COASTAL PRICLKLY PEAR CACTUS. BADLAND HILLS AREA BURNED (2000) & MAY NO LONGER HAVE SUITABLE CAGN HABITAT;AREA IS RECOVERING

General: 2 MATED PAIRS OBSERVED 19 DEC 1995. 3 INDIVIDUALS OBSERVED 31 DEC 1996, 30 DEC 1997 AND 22 DEC 1998. NONE OBSERVED DEC 1999. 1 MATED PAIR OBSERVED 19 DEC 2000. NONE OBSERVED DEC 2001. ALL OBSERVATIONS FROM CHRISTMAS BIRD COUNTS.

Owner/Manager: UNKNOWN

Occurrence No.	758	**Map Index:** 52666	**EO Index:**	52666		**Element Last Seen:**	1998-11-20
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1998-11-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-09-26

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.80326 / -117.24807	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3740370 E477038	**Elevation (ft):**	1680
PLSS:	T04S, R04W, Sec. 24 (S)	**Acres:**	0.0

Location: 0.8 MILE WEST OF INTERSTATE 215 AND 1.4 MILES NW OF PERRIS.

Detailed Location: END OF POOLEY DRIVE, WEST OF THE INTERSECTION WITH WEBSTER STREET

Ecological: HABITAT CONSISTS OF COASTAL SAGE SCRUB.

General: 2 ADULTS OBSERVED FORAGING IN VEGETATION ON 20 NOV 1998.

Owner/Manager: PVT

Occurrence No.	761	**Map Index:** 52674	**EO Index:**	52674	**Element Last Seen:**	1999-06-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1999-06-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2003-09-29

Quad Summary: Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.77288 / -117.25010	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3737002 E476842	**Elevation (ft):**	1600
PLSS:	T04S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: JUST NE OF THE INTERSECTION OF STATE ROUTE 74 AND ELLIS AVE, APPROXIMATELY 1 MILE WSW OF PERRIS.

Detailed Location: NORTH OF SR-74 (WITHIN 50 FT OF PAVEMENT) AND EAST OF ELLIS AVE

Ecological: HABITAT CONSISTS OF RIVERSIDIAN SAGE SCRUB

General: 1 PAIR OBSERVED DURING FOCUSED SURVEYS CONDUCTED IN APR, MAY AND JUN 1999. OBSERVATION OCCURRED WITHIN PROJECY BOUNDARY.

Owner/Manager: UNKNOWN

Occurrence No.	762	**Map Index:** 52677	**EO Index:**	52677	**Element Last Seen:**	2000-04-01
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2000-04-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2003-09-29

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.82418 / -117.32248	**Accuracy:**	specific area
UTM:	Zone-11 N3742709 E470157	**Elevation (ft):**	1800
PLSS:	T04S, R04W, Sec. 17 (S)	**Acres:**	49.2

Location: 1 MILE SOUTH OF CAJALCO ROAD AND 3.2 MILES NE OF GAVILAN PEAK, 4.5 MILES NW OF PERRIS

Detailed Location:

Ecological: HABITAT CONSISTS OF RIVERSIDIAN SAGE SCRUB DOMINATED BY CALIFORNIA SAGEBRUSH, CALIFORNIA BUCKWHEAT & BLACK SAGE. OPEN AREAS BETWEEN SHRUBS DOMINATED BY NON-NATIVE GRASSLAND SPECIES SUCH AS RIPGUT GRASS, FIDDLENECK, BLACK MUSTARD & OTHERS

General: 1 PAIR OBSERVED ON 1 APR 2000. 2 MOLOTHRUS ATER OBSERVED NW OF GNATCATCHER OBSERVATION. PROJECT SITE IS SURROUNDED BY RURAL RESIDENTIAL, ORCHARDS AND OPEN SPACE.

Owner/Manager: UNKNOWN

Occurrence No.	773	**Map Index:** 52790	**EO Index:**	52790		**Element Last Seen:**	1992-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-10-03

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.83735 / -117.37480	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3744185 E465321	**Elevation (ft):**	1440
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	0.0

Location: APPROXIMATELY 0.5 MILE WEST OF EL SOBRANTE RD, JUST N OF THE COLORADO RIVER AQUEDUCT; EAST LAKE MATHEWS.

Detailed Location:

Ecological: SURVEYS CONDUCTED WITHIN ALL SAGE SCRUB HABITATS W/ SHRUB COVER EXCEEDING 15%. EREMOPHILA ALPESTRIS ACTIA, AIMOPHILA RUFICEPS CANESCENS, CAMPYLORHYNCHUS BRUNNEICAPILLUS COUESI, AMPHISPIZA BELLI BELLI, LANIUS LUDVICIANUS OBS VIC LAKE MATHEWS

General: 1 MALE OBSERVED DURING FOCUSED SURVEYS CONDUCTED IN 1992. LAND SURROUNDING LAKE MATHEWS IS A COMBINATION OF ECOLOGICAL RESERVE AND BUFFER LANDS.

Owner/Manager: MWD

Occurrence No.	800	**Map Index:** 53052	**EO Index:**	53052		**Element Last Seen:**	2002-04-03
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-04-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-10-24

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.96158 / -117.22227	**Accuracy:**	specific area
UTM:	Zone-11 N3757918 E479464	**Elevation (ft):**	2120
PLSS:	T02S, R03W, Sec. 29 (S)	**Acres:**	29.4

Location: 0.5 - 1 MILE EAST OF THE INTERSECTION OF INDIAN STREET AND MANZANITA AVE, NNE SUNNYMEAD

Detailed Location: 1 PR LIKELY NESTING IN CSS ON PROMINENT HILL IN W PORTION OF POLYGON. 1 UNPAIRED ADULT DETECTED IN E PORTION OF POLYGON. LOCATED WITHIN DESIGNATED CRITICAL HABITAT. CSS IS OF INTERMEDIATE-HIGH POTENTIAL VALUE FOR LONG TERM CONSERVATION.

Ecological: UPLAND RIVERSIDIAN SAGE SCRUB. INCLUDES BRITTLEBUSH DROUGHT DECIDUOUS SCRUB (DOM BY ENCELIA FARINOSA W/BEBBIA JUNCIA, SALVIA MELLIFERA, OTHERS) & CALIFORNIA SAGEBRUSH SCRUB (DOM BY ARTEMISIA CALIFORNICA W/SALVIA APIANA, S.MELLIFERA, OTHERS)

General: GNATCATCHERS OBS OR HEARD DURING ALL 9 SURVEYS CONDUCTED BETWEEN 27 DEC 2001 & 3 APR 2002. AREA WHERE GNATCATCHERS DETECTED PROPOSED TO REMAIN AS OPEN SPACE. RANCH TO N, TRACT HOMES TO S & SW, FORMER FARMLAND TO NW; VACANT AREAS TO N, S, E

Owner/Manager: UNKNOWN

Occurrence No.	801	**Map Index:**	53053	**EO Index:**	53053	**Element Last Seen:**	2002-02-06
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2002-02-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-10-24

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.97283 / -117.22705	**Accuracy:**	specific area
UTM:	Zone-11 N3759167 E479025	**Elevation (ft):**	2180
PLSS:	T02S, R03W, Sec. 30 (S)	**Acres:**	15.8

Location: 0.9 MILE NE OF THE INTERSECTION OF MANZANITA AVE AND NECTAR AVE, NORTH SUNNYMEAD

Detailed Location: DETECTIONS OCCURRED WITHIN CALIFORNIA SAGEBRUSH SCRUB AND BRITTLEBUSH DROUGHT DECIDUOUS SCRUB, 0.3 MILE NORTH OF NECTAR AVE.

Ecological: UPLAND RIVERSIDIAN SAGE SCRUB. INC BRITTLEBUSH DROUGHT DECIDUOUS SCRUB (DOM BY ENCELIA FARINOSA W/ SALVIA MELLIFERA, ERIOGONUM FASCICULATUM, OTHERS) & CA SAGEBRUSH SCRUB (DOM BY ARTEMISIA CALIFORNICA W/SALVIA MELLIFERA, BRITTLEBUSH,OTHERS)

General: 1 ADULT OBS 26 DEC 2001. SINGLE CAGN HEARD 6 FEB 2002. AREA USED BY CAGN FOR FORAGING,BUT NOT KNOWN IF BREEDING OCCURS IN AREA. CONSERVATION EASEMENT MAY BE PLACED ON PROPOSED OPEN SPACE (21 ACRES). RESIDENTIAL TO N, S, W; UNDEVELOPED TO E

Owner/Manager: UNKNOWN

Occurrence No.	813	**Map Index:**	53213	**EO Index:**	53213	**Element Last Seen:**	2002-04-09
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2002-04-09
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-11-19

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.76412 / -117.30166	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3736044 E472064	**Elevation (ft):**	2100
PLSS:	T05S, R04W, Sec. 04 (S)	**Acres:**	657.6

Location: NORTH OF STEELE PEAK AND EAST OF STEELE VALLEY, SOUTHWEST OF ELLIS AVE, 3.3 MILES SW OF PERRIS.

Detailed Location: SECTION 4

Ecological: HABITAT CONSISTS OF RIVERSIDEAN SAGE SCRUB. SLOPES: 20 - 40%. CURRENT/SURROUNDING LAND USE: HOMES, OPEN SPACE.

General: 1 ADULT OBSERVED FORAGING ON 9 APR 2002.

Owner/Manager: UNKNOWN

Occurrence No.	916	**Map Index:** 72099	**EO Index:**	73033		**Element Last Seen:**	2008-08-21
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2008-08-21
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-08-28

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.08994 / -117.12974	**Accuracy:**	80 meters
UTM:	Zone-11 N3772136 E488031	**Elevation (ft):**	1620
PLSS:	T01S, R02W, Sec. 18 (S)	**Acres:**	0.0

Location: SOUTH SIDE OF SANTA ANA WASH APPROXIMATELY 0.2 MILES EAST OF OPAL AVE & 0.5 MILES NE OF BENCH MARK 1594, MENTONE.
Detailed Location: MAPPED TO PROVIDED COORDINATES.
Ecological: HABITAT WAS DESCRIBED AS ALLUVIAL FAN SAGE SCRUB WITH SURROUNDING LAND USES AS MINING, FLOOD CONTROL, & OPEN SPACE.
General: 2 ADULTS OBSERVED AND HEARD SINGING ON 21 AUG 2008.
Owner/Manager: UNKNOWN

Occurrence No.	917	**Map Index:** 72100	**EO Index:**	73037		**Element Last Seen:**	2006-09-20
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-09-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-08-28

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09459 / -117.13522	**Accuracy:**	80 meters
UTM:	Zone-11 N3772652 E487525	**Elevation (ft):**	1583
PLSS:	T01S, R02W, Sec. 07 (S)	**Acres:**	0.0

Location: 0.6 MILES N OF BENCH MARK 1594 & WEST OF CONE CAMP RD, ALONG THE NORTH SIDE OF SANTA ANA WASH, HILAND.
Detailed Location: MAPPED TO USFWS CARLSBAD FIELD OFFICE 80M POLYGON OF SPECIFIC UTM COORDINATE.
Ecological: HABITAT APPEARS TO BE SAGE SCRUB IN 2008 AERIAL IMAGES.
General: 2 BIRDS DETECTED ON 6 JUN 2006, AND 4 BIRDS DETECTED ON 20 SEP 2006 BY A. DAVENPORT.
Owner/Manager: UNKNOWN

Lanius ludovicianus

Element Code: ABPBR01030

loggerhead shrike

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G4
	State:	None	**State:**	S4
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern		
Habitat:	**General:**	BROKEN WOODLANDS, SAVANNAH, PINYON-JUNIPER, JOSHUA TREE, & RIPARIAN WOODLANDS, DESERT OASES, SCRUB & WASHES.		
	Micro:	PREFERS OPEN COUNTRY FOR HUNTING, WITH PERCHES FOR SCANNING, AND FAIRLY DENSE SHRUBS AND BRUSH FOR NESTING.		

Occurrence No.	2	**Map Index:**	47441	**EO Index:**	47441	**Element Last Seen:**	1994-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1994-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-03-19

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90447 / -117.30649	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3751606 E471664	**Elevation (ft):**	1700
PLSS:	T03S, R04W, Sec. 16 (S)	**Acres:**	1184.7

Location: MARCH AFB; NW AREA BETWEEN TRAUTWEIN ROAD AND HWY 395.

Detailed Location: NESTS FOUND (1-2 METERS FROM GROUND) IN THE FOLLOWING SHRUB TYPES: SALIX SP., BACCHARIS PILULARIS, JUNIPERUS OCCIDENTALIS AND BACCHARIS SILICIFOLIA.

Ecological: HABITAT CONSISTS OF ANNUAL GRASSLAND WITH WILLOW RIPARIAN AND RIVERSIDIAN SAGE SCRUB.

General: 1994: 7 NESTS LOCATED. IT IS ESTIMATED THAT 10 -15 PAIRS OCCUPY AREA.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	5	**Map Index:**	54557	**EO Index:**	54560	**Element Last Seen:**	1999-07-31
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-07-31
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-03-04

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.01058 / -117.17160	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3763343 E484154	**Elevation (ft):**	1460
PLSS:	T02S, R03W, Sec. 11 (S)	**Acres:**	33.1

Location: SAN TIMOTEO CANYON, JUST NORTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE, DIRECTLY SOUTH OF REDLANDS.

Detailed Location: 1.2 KM STRETCH ALONG CREEK.

Ecological: HABITAT CONSISTS OF DENSE LINEAR STANDS OF RIPARIAN. DOMINANT SPECIES INCLUDE SALIX LASIOLEPIS, SALIX HINDSIANA, POPULUS FREMONTII AND BACHARIS GLUTINOSA. YELLOW-BILLED CUCKOO OBSERVED IN AREA.

General: 2 OBSERVED DURING SURVEYS WHICH OCCURRED ONCE A WEEK BETWEEN 1 APR AND 31 JUL 1999. NESTING WAS CONFIRMED.

Owner/Manager: UNKNOWN

Occurrence No.	20	**Map Index:**	75788	**EO Index:**	76800	**Element Last Seen:**	2005-XX-XX
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-07-08

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.79860 / -117.02216	**Accurracy:**	80 meters
UTM:	Zone-11 N3739825 E497948	**Elevation (ft):**	1492
PLSS:	T04S, R01W, Sec. 30 (S)	**Acres:**	0.0

Location: EAST OF LAKEVIEW MOUNTAINS, 1.2 MILES WEST OF SAN JACINTO RESERVOIR, SAN JACINTO VALLEY.

Detailed Location: LOCATED BETWEEN N WARREN RD AND N SANDERSON AVE IN HEMET/SAN JACINTO.

Ecological: NEST LOCATED IN A BLACK WILLOW NEAR WETLANDS ASSOCIATED WITH A WATER TREATMENT FACILITY; WILLOW RIPARIAN, OPEN WATER HABITAT.

General: 1 ADULT AND 3-4 FLEDGLINGS OBSERVED DURING THE SPRING OF 2005.

Owner/Manager: UNKNOWN

Occurrence No.	52	**Map Index:**	80990	**EO Index:**	81979	**Element Last Seen:**	2003-06-XX
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-06-20

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.90944 / -117.00176	**Accurracy:**	80 meters
UTM:	Zone-11 N3752115 E499837	**Elevation (ft):**	2596
PLSS:	T03S, R01W, Sec. 17 (S)	**Acres:**	0.0

Location: 0.3 MI WNW OF MT. DAVIS, 1.8 MI SW OF I-10 & HWY 79 JUNCTION, 2.9 MI NE OF MT. EDEN, BEAUMONT.

Detailed Location: AMONG THE DIRT ROADS TO THE WEST OF MT. DAVIS, ABOUT 0.3 MI S OF RADIO FACILITY. MAPPED TO COORDINATES PROVIDED.

Ecological: UNDEVELOPED LANDS CONSISTING OF GRASSLANDS & MIXED CHAPARRAL. VISIBLE DISTURBANCES: OHV USE.

General: ONE ADULT OBSERVED DISPLAYING TERRITORIAL BEHAVIOR IN BUSHES ON FOUR OCCASIONS BETWEEN APR-JUN 2003.

Owner/Manager: PVT

Occurrence No.	87	**Map Index:** 81093	**EO Index:**	82074		**Element Last Seen:**	2006-03-29
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-03-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-12-14

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.99545 / -117.30886	**Accuracy:**	80 meters
UTM:	Zone-11 N3872582 E471813	**Elevation (ft):**	2098
PLSS:	T10N, R04W, Sec. 04 (S)	**Acres:**	0.0

Location: HARPER LAKE AREA, 1.9 MI SE FROM THE TOWN OF LOCKHART, HINKLEY ZIP CODE.

Detailed Location: JUST SOUTH OF ROY STREET/UTILITY ROAD, 1.2 MI EAST OF HARPER LAKE ROAD. MAPPED ACCORDING TO COORDINATES PROVIDED.

Ecological: DESERT SALTBUSH SCRUB DOMINATED BY ATRIPLEX POLYCARPA. ADJACENT TO MOJAVE CROESOTE BUSH SCRUB. ALLUVIAL PLAIN. SOILS: SILT, SAND. NE ASPECT W/SLOPE OF 0-1%. SURROUNDING LAND: OPEN DESERT ALONG TRANSMISSION LINE CORRIDOR. AG FIELDS TO N.

General: 2 ADULTS SEEN NESTING IN LARGE ATRIPLEX POLYCARPA ON 29 MARCH 2006.

Owner/Manager: BLM

Vireo bellii pusillus

Element Code: ABPBW01114

least Bell's vireo

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:** **Global:**	G5T2
	State:	Endangered	**State:**	S2
	Other:	ABC_WLBCC-Watch List of Birds of Conservation Concern, IUCN_NT-Near Threatened		
Habitat:	**General:**	SUMMER RESIDENT OF SOUTHERN CALIFORNIA IN LOW RIPARIAN IN VICINITY OF WATER OR IN DRY RIVER BOTTOMS; BELOW 2000 FT.		
	Micro:	NESTS PLACED ALONG MARGINS OF BUSHES OR ON TWIGS PROJECTING INTO PATHWAYS, USUALLY WILLOW, BACCHARIS, MESQUITE.		

Occurrence No.	11	**Map Index:** 04033	**EO Index:**	25002		**Element Last Seen:**	1978-07-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1978-07-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1989-08-10

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.97306 / -117.10169	**Accuracy:**	1 mile
UTM:	Zone-11 N3759173 E490605	**Elevation (ft):**	2000
PLSS:	T02S, R02W, Sec. 28 (S)	**Acres:**	0.0

Location: SAN TIMOTEO CANYON; ACROSS FROM FISHERMANS RETREAT RESORT.

Detailed Location:

Ecological: CONTIGUOUS RIPARIAN HABITAT EXTENDS FOR APPROXIMATELY 6 MILES, FROM ABOUT 3 MILES WEST OF I-10 TO REDLANDS BLVD.

General: ONE TERRITORIAL MALE OBSERVED DURING SUMMER OF 1978.

Owner/Manager: UNKNOWN

Occurrence No.	268	**Map Index:**	54556	**EO Index:**	54556	**Element Last Seen:**	2001-05-15
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-07-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-07-12

Quad Summary: Redlands (3411712)

County Summary: Riverside, San Bernardino

Lat/Long:	34.00630 / -117.16852	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3762867 E484438	**Elevation (ft):**	1460
PLSS:	T02S, R03W, Sec. 11 (S)	**Acres:**	57.9

Location: SAN TIMOTEO CANYON, JUST NORTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE, DIRECTLY SOUTH OF REDLANDS.

Detailed Location: FROM COUNTY LINE TO 0.4 MILE NORTH OF COUNTY LINE.

Ecological: DENSE LINEAR STANDS OF RIPARIAN. DOMINANT SPECIES INCLUDE POPULUS FREEMONTII, SALIX LASIOLEPIS, SALIX HINDSIANA & BACHARIS GLUTINOSA. WILLOW THICKET = 8M HIGH. YELLOW-BILLED CUCKOO OBS IN AREA. SCATTERED HOMES, RANCHES IN AREA.

General: 1 DETECTED 24 MAY, 2ND WEEK OF JUNE & 8 JUL 1999. VIREO OBSERVED CHASING OTHER SPECIES AWAY FROM PRESUMED TERRITORY ON 24 MAY 1999. ANOTHER VIREO HEARD TO N OF SITE ON 20 JUL 1999. 2 MALES, 1 PAIR DETECTED MAY '01. NESTING NOT CONFIRMED

Owner/Manager: UNKNOWN

Occurrence No.	270	**Map Index:**	54848	**EO Index:**	54848	**Element Last Seen:**	2001-08-07
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-08-07
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-03-25

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.86082 / -117.14973	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3746734 E486150	**Elevation (ft):**	1700
PLSS:	T03S, R03W, Sec. 36 (S)	**Acres:**	40.3

Location: EAST SHORE OF PERRIS RESERVOIR, 1.5 MILES NORTH OF BERNASCONI PASS, LAKE PERRIS STATE RECREATIONAL AREA.

Detailed Location: TOWNSHIP 3S RANGE 3S SE 1/4 OF SW 1/4 SECTION 36.

Ecological: HABITAT CONSISTS OF WILLOW RIPARIAN WITH SOME EXOTIC TAMARISK ALONG THE LAKE SHORE. RIVERSIDIAN COASTAL SAGE SCRUB AND ANNUAL GRASSLAND ADJACENT TO THE WILLOW RIPARIAN. AREA IS A STATE RECREATIONAL PARK.

General: 1 PAIR AND 1 ADULT OBSERVED DURING PRESENCE SURVEYS FOR LEAST BELL'S VIREO.

Owner/Manager: DPR-LAKE PERRIS SRA

Occurrence No.	301	**Map Index:** 67534	**EO Index:**	67695		**Element Last Seen:**	2006-06-28
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-06-28
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-01-04

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.96036 / -117.25562	**Accuracy:**	80 meters
UTM:	Zone-11 N3757790 E476382	**Elevation (ft):**	1700
PLSS:	T02S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: NORTHWEST AREA OF POORMAN RESERVOIR, 1 MILE NORTHWEST OF SUNNYMEAD.

Detailed Location: JUST SOUTH OF MANZANITA AVE. LOCATION MAPPED ACCORDING TO UTM COORDINATES.

Ecological: FLAT WILLOW RIPARIAN AREA. VEGETATION DOMINATED BY SALIX GOODDINGII, S. LASIOLEPIS, EUCALYPTUS WITH SALIX EXIGUA. UNDERSTORY: BACCHARIS SALICIFOLIA, FOENICULUM VULGARE, XANTHIUM STRUMARIUM, POLYPOGON MONSPELIENSIS, BRASSICA TOURNEIFORTII.

General: 1 MALE OBSERVED SINGING ON 28 JUNE, 26 JULY, AND 12 AUGUST OF 2006. 1 COOPER'S HAWK PAIR NESTING AND 1 YELLOW-BREATSED CHAT SINGING IN VICINITY. 1 WILLOW FLYCATCHER HEARD SINGING. SURROUNDING LAND USE: RESIDENTIAL, SCHOOL, URBAN.

Owner/Manager: RIV COUNTY FLOOD CONTROL

Dendroica petechia brewsteri

Element Code: ABPBX03018

yellow warbler

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T3?
	State:	None		**State:**	S2
	Other:	DFG_SSC-Species of Special Concern, USFWS_BCC-Birds of Conservation Concern			
Habitat:	**General:**	RIPARIAN PLANT ASSOCIATIONS. PREFERS WILLOWS, COTTONWOODS, ASPENS, SYCAMORES, & ALDERS FOR NESTING & FORAGING.			
	Micro:	ALSO NESTS IN MONTANE SHRUBBERY IN OPEN CONIFER FORESTS.			

Occurrence No.	86	**Map Index:** 54557	**EO Index:**	54557		**Element Last Seen:**	1999-07-31
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-07-31
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-03-04

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.01058 / -117.17160	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3763343 E484154	**Elevation (ft):**	1460
PLSS:	T02S, R03W, Sec. 11 (S)	**Acres:**	33.1

Location: SAN TIMOTEO CANYON, JUST NORTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE, DIRECTLY SOUTH OF REDLANDS.

Detailed Location: 1.2 KM STRETCH ALONG CREEK.

Ecological: HABITAT CONSISTS OF DENSE LINEAR STANDS OF RIPARIAN. DOMINANT SPECIES INCLUDE SALIX LASIOLEPIS, SALIX HINDSIANA, POPULUS FREMONTII AND BACHARIS GLUTINOSA. YELLOW-BILLED CUCKOO OBSERVED IN AREA.

General: 11 OBSERVED DURING SURVEYS WHICH OCCURRED ONCE A WEEK BETWEEN 1 APR AND 31 JUL 1999. NESTING WAS CONFIRMED.

Owner/Manager: UNKNOWN

Icteria virens **Element Code:** ABPBX24010

yellow-breasted chat

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5
	State:	None		**State:** S3
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern		
Habitat:	**General:**	SUMMER RESIDENT; INHABITS RIPARIAN THICKETS OF WILLOW & OTHER BRUSHY TANGLES NEAR WATERCOURSES.		
	Micro:	NESTS IN LOW, DENSE RIPARIAN, CONSISTING OF WILLOW, BLACKBERRY, WILD GRAPE; FORAGES AND NESTS WITHIN 10 FT OF GROUND.		

Occurrence No.	96 **Map Index:** 45571	**EO Index:**	54056	**Element Last Seen:**	2001-05-09
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2001-05-09
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-01-23

Quad Summary: Sunnymead (3311782), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95734 / -117.25189	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3757454 E476726	**Elevation (ft):**	1690
PLSS:	T02S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: POORMAN RESERVOIR, 0.25 MILE SOUTH OF MANZANITA AVENUE, MORENO VALLEY.

Detailed Location:

Ecological: HABITAT CONSISTS OF COTTONWOOD-WILLOW RIPARIAN. THIS AREA SERVES AS A FLOOD CONTROL RESERVOIR AND IS SUPPORTED BY LAWN IRRIGATION AND STORMWATER RUNOFF. AREA IS SURROUNED ON ALL SIDES BY DEVELOPMENT.

General: 1 OBSERVED UTILIZING AREA FOR BREEDING ON 9 MAY 2001.

Owner/Manager: CITY OF MORENO VALLEY

Occurrence No.	99 **Map Index:** 54557	**EO Index:**	54558	**Element Last Seen:**	1999-07-31
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1999-07-31
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-03-04

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.01058 / -117.17160	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3763343 E484154	**Elevation (ft):**	1460
PLSS:	T02S, R03W, Sec. 11 (S)	**Acres:**	33.1

Location: SAN TIMOTEO CANYON, JUST NORTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE, DIRECTLY SOUTH OF REDLANDS.

Detailed Location: 1.2 KM STRETCH ALONG CREEK.

Ecological: HABITAT CONSISTS OF DENSE LINEAR STANDS OF RIPARIAN. DOMINANT SPECIES INCLUDE SALIX LASIOLEPIS, SALIX HINDSIANA, POPULUS FREMONTII AND BACHARIS GLUTINOSA. YELLOW-BILLED CUCKOO OBSERVED IN AREA.

General: 6 OBSERVED DURING SURVEYS WHICH OCCURRED ONCE A WEEK BETWEEN 1 APR AND 31 JUL 1999. NESTING WAS CONFIRMED.

Owner/Manager: UNKNOWN

Aimophila ruficeps canescens **Element Code:** ABPBX91091

southern California rufous-crowned sparrow

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5T2T4
	State:	None		**State:** S2S3
	Other:	DFG_WL-Watch List		

Habitat:	**General:**	RESIDENT IN SOUTHERN CALIFORNIA COASTAL SAGE SCRUB AND SPARSE MIXED CHAPARRAL.
	Micro:	FREQUENTS RELATIVELY STEEP, OFTEN ROCKY HILLSIDES WITH GRASS & FORB PATCHES.

Occurrence No.	94	**Map Index:**	52023	**EO Index:**	52023	**Element Last Seen:**	2002-04-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2002-04-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-08-05

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.75616 / -117.02644	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3735120 E497550	**Elevation (ft):**	1540
PLSS:	T05S, R01W, Sec. 07 (S)	**Acres:**	324.7

Location: NORTH OF ROSE ROAD EXTENDING INTO TRES CERRITOS, EAST OF WARREN ROAD & WEST OF CAWSTON AVE, ABOUT 3 MILES WEST OF HEMET

Detailed Location: LOCATION MAPPED IS PROJECT BOUNDARY

Ecological: HABITAT ON PROJECT SITE CONSISTS OF RSS (ENCELIA FARINOSA, ERIOGONUM FASCICULATUM, ARTEMISIA CALIFORNICA, BEBBIA JUNCEA, BRICKELLIA CALIFORNICA, OPUNTIA PARRYI, OTHERS) & NON-NATIVE ANNUAL GRASSLAND(RED BROME,BLACK MUSTARD,WILD OATS,OTHERS)

General: UNKNOWN OBSERVED DURING CALIFORNIA GNATCATCHER SURVEYS CONDUCTED BETWEEN 14 NOV 2001 AND 23 APR 2002.

Owner/Manager: PVT

Occurrence No.	119	**Map Index:**	52683	**EO Index:**	52684	**Element Last Seen:**	2000-05-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-09-29

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.82640 / -117.32229	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3742955 E470176	**Elevation (ft):**	1800
PLSS:	T04S, R04W, Sec. 17 (S)	**Acres:**	74.3

Location: 0.6 TO 1 MILE SOUTH OF CAJALCO ROAD AND 3.4 MILES NW OF GAVILAN HILLS, 4.5 MILES NW OF PERRIS

Detailed Location:

Ecological: HABITAT ON PROJECT SITE CONSISTS OF RIVERSIDIAN SAGE SCRUB.

General: UNKNOWN NUMBER OBSERVED AT 1 TO 2 LOCATIONS DURING CALIFORNIA GNATCATHER SURVEYS CONDUCTED BETWEEN 22 MAR AND 22 MAY 2000. PROJECT SITE IS SURROUNDED BY RURAL RESIDENTIAL, ORCHARDS AND OPEN SPACE.

Owner/Manager: UNKNOWN

Occurrence No.	123 **Map Index:** 53058	**EO Index:**	53058	**Element Last Seen:**	2002-04-03
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2002-04-03
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2003-10-24

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.96552 / -117.22332	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3758356 E479368	**Elevation (ft):**	2120
PLSS:	T02S, R03W, Sec. 29 (S)	**Acres:**	212.1

Location: 0.3 TO 1 MILE EAST OF INDIAN STREET AND 1-2 MILES NORTH OF IRONWOOD AVE, NNE SUNNYMEAD
Detailed Location: EAST PORTION OF SECTION 30 AND THE SW 1/4 SECTION 29
Ecological: UPLAND RIVERSIDIAN SAGE SCRUB. BRITTLEBUSH DROUGHT DECIDUOUS SCRUB FOUND ON STEEP SLOPES/HIGHER ELEVATIONS OF RIDGE, WHILE CALIFORNIA SAGEBRUSH SCRUB FOUND ON LOWER ELEVATION RIDGES/VALLEYS AT BASE OF FOOTHILLS.
General: UNKNOWN NUMBER OBSERVED DURING CALIFORNIA GNATCATCHER SURVEYS BETWEEN 17 OCT 2001 AND 3 APR 2002. CONSERVATION EASEMENT MAY BE PLACED ON NORTH 1/3 OF E PORTION OF SECTION 30. MAJORITY OF SW 1/4 SECTION 29 TO REMAIN AS OPEN SPACE.
Owner/Manager: UNKNOWN

Occurrence No.	135 **Map Index:** 54744	**EO Index:**	54744	**Element Last Seen:**	2003-04-09
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-09
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-03-18

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.90140 / -117.01596	**Accuracy:**	80 meters
UTM:	Zone-11 N3751224 E498523	**Elevation (ft):**	2166
PLSS:	T03S, R01W, Sec. 20 (S)	**Acres:**	0.0

Location: 2.2 MILES SOUTH OF STATE ROUTE 60 AND 0.7 MI EAST OF LABORDE CANYON, 2.7 MILES SW OF BEAUMONT
Detailed Location: MAPPED ACCORDING TO GPS COORDINATES.
Ecological: HABITAT CONSISTS OF A RECENTLY BURNED AREA COMPRISED OF CHAMISE CHAPARRAL.
General: 1 ADULT DETECTED ON 9 APR 2003.
Owner/Manager: PVT

Occurrence No.	136	**Map Index:**	54745	**EO Index:**	54745	**Element Last Seen:**	2003-04-08
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-03-18

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.90887 / -117.01281	**Accuracy:**	80 meters
UTM:	Zone-11 N3752052 E498815	**Elevation (ft):**	2261
PLSS:	T03S, R01W, Sec. 17 (S)	**Acres:**	0.0

Location: 1.7 MILES SOUTH OF STATE ROUTE 60 AND 0.9 MI EAST OF LABORDE CANYON, 2.2 MILES SW OF BEAUMONT

Detailed Location: MAPPED ACCORDING TO GPS COORDINATES.

Ecological: HABITAT CONSISTS OF CHAPARRAL DOMINATED BY BLACK SAGE AND CHAMISE WITH AN UNDERSTORY OF NON-NATIVE GRASSES. THE AREA HAS RECENTLY BEEN BURNED. SURROUNDING AREA CONSISTS OF WILDERNESS.

General: 2 BREEDING ADULTS DETECTED ON 8 APR 2003.

Owner/Manager: PVT

Occurrence No.	138	**Map Index:**	54747	**EO Index:**	54747	**Element Last Seen:**	2003-04-XX
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-03-19

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.03842 / -117.09118	**Accuracy:**	specific area
UTM:	Zone-11 N3766419 E491582	**Elevation (ft):**	2200
PLSS:	T01S, R02W, Sec. 33 (S)	**Acres:**	9.0

Location: 0.3 MILES NORTH OF WEST YUCAIPA BLVD, WEST OF YUCAIPA.

Detailed Location: DRAINAGE JUST WEST OF THE YUCAIPA INTERMEDIATE SCHOOL.

Ecological: HABITAT CONSISTS OF NON-NATIVE GRASSLAND WITH SMALL AMOUNT OF RIVERSIDEAN SAGE SCRUB. CHAPARRAL HABITAT, ALONG W/ COAST LIVE OAKS & A STAND OF EUCALYPTUS ALSO LOCATED ON SITE. COOPER'S HAWK, ORANGE-THROATED WHIPTAIL, VERNAL POOLS IN AREA

General: 2 BREEDING ADULTS DETECTED DURING APRIL 2003. NEST/TERRITORIES NOT CONFIRMED FOR ADULTS OBSERVED, BUT INDIVIDUALS PRESUMED TO BE NESTING IN RIVERSIDEAN SAGE SCRUB/CHAPARRAL HABITAT. SURROUNDING LAND: RESIDENTIAL DEVELOPMENT, HIGH SCHOOL.

Owner/Manager: PVT

Occurrence No.	142	**Map Index:** 54754	**EO Index:**	54754	**Element Last Seen:**	2002-07-25
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-07-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-03-22

Quad Summary: El Casco (3311781), Yucaipa (3411711)

County Summary: Riverside

Lat/Long:	33.98268 / -117.07161	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3760238 E493385	**Elevation (ft):**	2200
PLSS:	T02S, R02W, Sec. 22 (S)	**Acres:**	3941.5

Location: OAK VALLEY PROPERTY, BETWEEN I-10 AND SAN TIMOTEO CANYON, SOUTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE.

Detailed Location:

Ecological: HABITAT CONSISTS OF A GRASSLAND AND COASTAL SAGE SCRUB ECOTONE. CHAETODIPUS FALLAX FALLAX IN VICINITY.

General: 3 ADULTS CAPTURED BETWEEN 11 MAY AND 25 JUL 2002.

Owner/Manager: PVT

Occurrence No.	154	**Map Index:** 55795	**EO Index:**	55811	**Element Last Seen:**	1998-05-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1998-05-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-06-10

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.79998 / -117.05210	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3739980 E495177	**Elevation (ft):**	2340
PLSS:	T04S, R02W, Sec. 26 (S)	**Acres:**	0.0

Location: 2.2 MILES DIRECTLY EAST THE INTERSECT OF JUNIPER FLAT ROAD & STAGECOACH RD, 3 MI DIRECTLY WEST OF SAN JACINTO RESERVOIR.

Detailed Location: WITHIN PARCEL NO. 162-261.

Ecological: HABITAT CONSISTS PRIMARILY OF CHAMISE CHAPARRAL WITH NON-NATIVE GRASSLANDS AND POCKETS OF RIVERSIDEAN SAGE SCRUB. TOPOGRAPHY CONSISTS OF STEEP HILLS AND ROCKY OUTCROPS. DISTURBANCES INCLUDE ORV ACTIVITY, ILLEGAL DUMPING AND SHOOTING.

General: OBS AT 1 LOCATION IN PARCEL ON 29 MAY 1998 DURING SURVEYS BY USFWS. SITE MAY BE IMPORTANT AS MOVEMENT AREA BETWEEN EASTSIDE RESERVOIR PROJECT, BADLANDS AREA & SAN JACINTO WILDLIFE AREA. ORANGE-THROATED WHIPTAIL OBS IN AREA IN 1989.

Owner/Manager: BLM

Amphispiza belli belli

Element Code: ABPBX97021

Bell's sage sparrow

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G5T2T4
	State:	None	**State:**	S2?
	Other:	ABC_WLBCC-Watch List of Birds of Conservation Concern, DFG_WL-Watch List, USFWS_BCC-Birds of Conservation Concern		
Habitat:	**General:**	NESTS IN CHAPARRAL DOMINATED BY FAIRLY DENSE STANDS OF CHAMISE. FOUND IN COASTAL SAGE SCRUB IN SOUTH OF RANGE.		
	Micro:	NEST LOCATED ON THE GROUND BENEATH A SHRUB OR IN A SHRUB 6-18 INCHES ABOVE GROUND. TERRITORIES ABOUT 50 YDS APART.		

Occurrence No.	33	**Map Index:** 52687	**EO Index:**	52687		**Element Last Seen:**	2000-05-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2000-05-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-09-29

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.82453 / -117.32069	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3742747 E470323	**Elevation (ft):**	1800
PLSS:	T04S, R04W, Sec. 17 (S)	**Acres:**	55.6

Location: 0.25 TO 0.4 MILE SOUTH OF CAJALCO ROAD AND 3.5 MILES NE GAVILAN PEAK, 4.2 MILES NW OF PERRIS

Detailed Location:

Ecological: HABITAT ON PROJECT CONSISTS OF RIVERSIDIAN SAGE SCRUB.

General: UNKNOWN NUMBER OBSERVED AT 1 TO 2 LOCATIONS DURING CALIFORNIA GNATCATHER SURVEYS CONDUCTED BETWEEN 22 MAR AND 22 MAY 2000. PROJECT SITE IS SURROUNDED BY RURAL RESIDENTIAL, ORCHARDS AND OPEN SPACE.

Owner/Manager: UNKNOWN

Occurrence No.	35	**Map Index:** 53058	**EO Index:**	53059		**Element Last Seen:**	2002-04-03
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-04-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-10-24

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.96552 / -117.22332	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3758356 E479368	**Elevation (ft):**	2120
PLSS:	T02S, R03W, Sec. 29 (S)	**Acres:**	212.1

Location: 0.3 TO 1 MILE EAST OF INDIAN STREET AND 1-2 MILES NORTH OF IRONWOOD AVE, NNE SUNNYMEAD

Detailed Location: EAST PORTION OF SECTION 30 AND THE SW 1/4 SECTION 29

Ecological: UPLAND RIVERSIDIAN SAGE SCRUB. BRITTLEBUSH DROUGHT DECIDUOUS SCRUB FOUND ON STEEP SLOPES/HIGHER ELEVATIONS OF RIDGE, WHILE CALIFORNIA SAGEBRUSH SCRUB FOUND ON LOWER ELEVATION RIDGES/VALLEYS AT BASE OF FOOTHILLS.

General: UNKNOWN NUMBER OBSERVED DURING CALIFORNIA GNATCATCHER SURVEYS BETWEEN 17 OCT 2001 AND 3 APR 2002. CONSERVATION EASEMENT MAY BE PLACED ON NORTH 1/3 OF E PORTION OF SECTION 30. MAJORITY OF SW 1/4 SECTION 29 TO REMAIN AS OPEN SPACE.

Owner/Manager: UNKNOWN

Occurrence No.	50	**Map Index:** 55794	**EO Index:**	55810	**Element Last Seen:**	1998-05-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1998-05-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-06-10

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.79538 / -117.05349	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3739470 E495048	**Elevation (ft):**	2380
PLSS:	T04S, R02W, Sec. 26 (S)	**Acres:**	0.0

Location: 2.2 MILES EAST OF THE INTERSECTION OF JUNIPER FLAT ROAD & STAGECOACH RD, 3 MI WEST OF SAN JACINTO RESERVOIR.

Detailed Location: PARCEL NUMBER 162-261.

Ecological: HABITAT CONSISTS PRIMARILY OF CHAMISE CHAPARRAL WITH NON-NATIVE GRASSLANDS AND POCKETS OF RIVERSIDEAN SAGE SCRUB. TOPOGRAPHY CONSISTS OF STEEP HILLS AND ROCKY OUTCROPS. DISTURBANCES INCLUDE ORV ACTIVITY, ILLEGAL DUMPING AND SHOOTING.

General: OBSERVED AT 1 LOCATION ON 29 MAY 1998 DURING SURVEYS BY USFWS. SITE MAY BE IMPORTANT AS MOVEMENT AREA BETWEEN EASTSIDE RESERVOIR PROJECT, THE BADLANDS AREA & SAN JACINTO WILDLIFE AREA. ORANGE-THROATED WHIPTAIL OBSERVED IN VIC DURING 1989.

Owner/Manager: BLM

Agelaius tricolor

Element Code: ABPBXB0020

tricolored blackbird

Listing Status: **Federal:** None — **CNDDB Element Ranks:** **Global:** G2G3

State: None — **State:** S2

Other: ABC_WLBCC-Watch List of Birds of Conservation Concern, BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_EN-Endangered, USFWS_BCC-Birds of Conservation Concern

Habitat: **General:** HIGHLY COLONIAL SPECIES, MOST NUMBEROUS IN CENTRAL VALLEY & VICINITY. LARGELY ENDEMIC TO CALIFORNIA.

Micro: REQUIRES OPEN WATER, PROTECTED NESTING SUBSTRATE, & FORAGING AREA WITH INSECT PREY WITHIN A FEW KM OF THE COLONY.

Occurrence No.	217	**Map Index:** 21605	**EO Index:**	17015	**Element Last Seen:**	1992-06-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-06-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1992-07-14

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.94351 / -117.32348	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3755939 E470107	**Elevation (ft):**	1100
PLSS:	T02S, R04W, Sec. 05 (S)	**Acres:**	0.0

Location: SYCAMORE CANYON, 1.8 MI EAST OF THE JUNCTION OF ALESSANDRO BLVD AND ARLINGTON AVENUE, SE EDGE OF RIVERSIDE.

Detailed Location:

Ecological: NESTING SUBSTRATE IS THISTLES.

General: 250 ADULTS OBSERVED NESTING.

Owner/Manager: UNKNOWN

Occurrence No.	219	**Map Index:**	21597	**EO Index:**	14212	**Element Last Seen:**	1997-04-26
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	1997-04-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-05-21

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.88038 / -117.11173	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3748899 E489666	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 29 (S)	**Acres:**	40.8

Location: SAN JACINTO WILDLIFE AREA, APPROXIMATELY 2 MILES NORTH OF LAKEVIEW.

Detailed Location: LOCATIONS GIVEN AS MARSH A, POND 1 AND MARSH B. BIRDS ARE SPREAD AROUND IN SEVERAL DISTINCT COLONIES NEAR THE ENTRANCE TO THE WILDLIFE AREA. SIZE OF COLONY APPROXIMATELY 3-4 ACRES.

Ecological: NESTING SUBSTRATE IS TYPHA AND WILLOWS. SURROUNDING LAND USE IS AGRICULTURE.

General: 1988: NESTING OBS. 25 MAR - 7 JUN 1989: 3,000 PRS, 100'S OF YOUNG OBS. 1992: ABOUT 5000 OBS IN 3 AREAS. 400 OBS NESTING 23 APR 1994. ABOUT 2000 OBS ON 22 APR 1995, GONE BY 22 MAY 1995. 1996: 500 - 25000 OBS IN 3 AREAS. 1997: 350 OBS.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	363	**Map Index:**	47605	**EO Index:**	47605	**Element Last Seen:**	1986-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1986-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-05

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.97534 / -117.09892	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3759426 E490862	**Elevation (ft):**	1960
PLSS:	T02S, R02W, Sec. 28 (S)	**Acres:**	0.0

Location: FISHERMAN'S RETREAT MEMBERSHIP TRAILER PARK; 0.5 MILES DIRECTLY EAST OF EL CASCO LAKE ALONG SAN TIMOTEO CANYON ROAD.

Detailed Location: COLONY SIZE ABOUT 0.5 ACRE.

Ecological: HABITAT CONSISTS OF FRESHWATER MARSH WITH BULRUSH AND CATTAILS.

General: 1983-1986: 20 PAIRS HAVE OCCUPIED AREA & SUCCESSFULLY FLEDGED YOUNG.

Owner/Manager: PVT

Occurrence No.	366	**Map Index:**	47619	**EO Index:**	47619	**Element Last Seen:**	1995-05-27
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1995-05-27
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-05-07

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.93454 / -117.14344	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3754908 E486743	**Elevation (ft):**	1800
PLSS:	T03S, R03W, Sec. 01 (S)	**Acres:**	0.0

Location: VICINITY OF THEODORE STREET AND HIGHWAY 60. ABOUT 1.5 MILES NE OF MORENO.

Detailed Location: 3 REPORTS OF TCBB IN THIS AREA FROM 22 APR & 19 & 27 MAY 1995. IT IS UNCLEAR, BUT LIKELY, THAT ALL 3 REPORTS REFER TO THE SAME COLONY.

Ecological: BIRDS NESTING IN WINTER WHEAT FIELD WITH MUCH MUSTARD WEED.

General: POPULATION ESTIMATED TO BE BETWEEN 1,200 & 2000 INDIVIDUALS. NESTING OBSERVED BY CHILDS & PAULEK.

Owner/Manager: UNKNOWN

Occurrence No.	371	**Map Index:**	52321	**EO Index:**	52321	**Element Last Seen:**	2001-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Fluctuating	**Record Last Updated:**	2003-09-04

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.79743 / -117.02007	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3739696 E498141	**Elevation (ft):**	1490
PLSS:	T04S, R01W, Sec. 30 (S)	**Acres:**	0.0

Location: HEMET SEWAGE PONDS. ABOUT 1 MILES WEST OF SAN JACINTO RESERVOIR.

Detailed Location:

Ecological: ABOUT A 50 ACRE MAN-MADE BULRISH WETLAND PLANTED IN 1993. SITE BURNED BETWEEN 1997-1999 & BULRUSHES REMOVED. FORAGING HABITAT IS ALFALFA. SITE MANAGED AS A RESEARCH FACILITY (UC RIVERSIDE) IN THE USE OF MARSHES FOR FILTERING WASTE WATER.

General: COLONY OF 35K IN 1994, THE LARGEST COLONY IN SOUTHERN CALIF. 4K IN 1999; 10K IN 2000 BUT UNSUCCESSFUL DUE TO PREDATION BY BLACK-CROWNED NIGHT HERONS & GREAT-TAILED GRACKLES. 30 BIRDS IN 2001.

Owner/Manager: EASTERN MWD

Spinus lawrencei **Element Code:** ABPBY06100

Lawrence's goldfinch

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3G4
	State:	None		**State:**	S3
	Other:	ABC_WLBCC-Watch List of Birds of Conservation Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern			
Habitat:	**General:**	NESTS IN OPEN OAK OR OTHER ARID WOODLAND & CHAPARRAL, NEAR WATER. NEARBY HERBACEOUS HABITATS USED FOR FEEDING.			
	Micro:	CLOSELY ASSOCIATED WITH OAKS.			

Occurrence No.	3 **Map Index:** 45571	**EO Index:**	61573	**Element Last Seen:**	2001-05-30
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2001-05-30
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-06-08

Quad Summary: Sunnymead (3311782), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95734 / -117.25189	**Accurracy:**	1/10 mile
UTM:	Zone-11 N3757454 E476726	**Elevation (ft):**	1690
PLSS:	T02S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: POORMAN RESERVOIR, 0.25 MILE SOUTH OF MANZANITA AVENUE, MORENO VALLEY.

Detailed Location: NW1/4 OF NE1/4 SECTION 36. MAPPED ACCORDING TO LOCATION SHOWN ON MAP.

Ecological: HABITAT CONSISTS OF COTTONWOOD-WILLOW RIPARIAN. THIS AREA IS A FLOOD CONTROL RESERVOIR AND IS SUPPORTED BY LAWN IRRIGATION AND STORMWATER RUNOFF. AREA IS SURROUNDED ON ALL SIDES BY DEVELOPMENT. ADJACENT GRASSLAND PERIODICALLY DISCED.

General: 6 ADULTS OBSERVED AND NOTED AS NESTING ON 30 MAY 2001.

Owner/Manager: CITY OF MORENO VALLEY

Rhinichthys osculus ssp. 3			**Element Code:** AFCJB3705K
Santa Ana speckled dace			
Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:** G5T1
	State:	None	**State:** S1
	Other:	AFS_TH-Threatened, DFG_SSC-Species of Special Concern, USFS_S-Sensitive	
Habitat:	**General:**	HEADWATERS OF THE SANTA ANA AND SAN GABRIEL RIVERS. MAY BE EXTIRPATED FROM THE LOS ANGELES RIVER SYSTEM.	
	Micro:	REQUIRES PERMANENT FLOWING STREAMS WITH SUMMER WATER TEMPS OF 17-20 C. USUALLY INHABITS SHALLOW COBBLE AND GRAVEL RIFFLES.	

Occurrence No.	6	**Map Index:**	03870	**EO Index:**	41477	**Element Last Seen:**	1995-08-04
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1995-08-04
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1999-08-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.12036 / -117.13997	**Accuracy:**	specific area
UTM:	Zone-11 N3775510 E487092	**Elevation (ft):**	1600
PLSS:	T01S, R03W, Sec. 37 (S)	**Acres:**	41.2

Location: PLUNGE CREEK, UPSTREAM OF JCT WITH NORTH FORK CANAL, 5 MILES NNE OF REDLANDS, 3 MILES E OF JCT OF BASE LINE RD & HWY 30.

Detailed Location: MAPPED IN SOUTHERN SYCAMORE ALDER RIPARIAN WOODLAND COMMUNITY.

Ecological: AQUATIC VEGETATION MOSTLY MOSS & ALGAE. SUBSTRATE 50% BOULDERS, 30% COBBLES, 10% GRAVEL, 8% SAND, 2% SILT. 80% RUN & 20% POOLS. LIGHT SHADE CANOPY.

General: 388 DACE OBSERVED AUGUST, 1995.

Owner/Manager: USFS-SAN BERNARDINO NF, PVT

Occurrence No.	9	**Map Index:**	42030	**EO Index:**	42030	**Element Last Seen:**	1999-05-05
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-05-05
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2000-04-25

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07690 / -117.09465	**Accuracy:**	specific area
UTM:	Zone-11 N3770686 E491267	**Elevation (ft):**	2080
PLSS:	T01S, R02W, Sec. 21 (S)	**Acres:**	7.4

Location: MILL CREEK, 0.4 MILES SE OF NEWPORT AVE AND GARNET ST, EAST OF REDLANDS.

Detailed Location: AREA IS WITHIN THE ACTIVE FLOOD CONTROL CHANNELS AND GRAVEL MINING ZONES. STREAM APROXIMATIONS: 2-3 METERS WIDE; AVERAGE 20 CM DEEP; 64 DEGREES F; 10 CFS

Ecological: RIPARIAN AREA CONSISTING OF ALDERS (UP TO 15 METERS HIGH, 24 CM DBH) AND WILOWS (UP TO 3 METERS). SUBSTRATE: 10-20% BOULDERS, 60-70% COBBLE, 10% GRAVEL AND SAND, 10% FINES. COBBLES WERE EMBEDDED ~50-60%.

General: 7 ADULTS OBSERVED, 1999; OCCASIONAL FLOODING HAS REMOVED FISH FROM THE AREA IN THE RECENT PAST, HOWEVER THEY HAVE RECOVERED. FISH PRESENT 1970 TO 1993.

Owner/Manager: SBT COUNTY-FLOOD CONTROL DIST

Lasiurus xanthinus			**Element Code:** AMACC05070
western yellow bat			
Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:** G5
	State:	None	**State:** S3
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_H-High Priority	

Habitat:	**General:**	FOUND IN VALLEY FOOTHILL RIPARIAN, DESERT RIPARIAN, DESERT WASH, AND PALM OASIS HABITATS.
	Micro:	ROOSTS IN TREES, PARTICULARLY PALMS. FORAGES OVER WATER AND AMONG TREES.

Occurrence No.	18	**Map Index:** 47547	**EO Index:**	58918		**Element Last Seen:**	1987-08-19
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1987-08-19
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-12-21

Quad Summary: Winchester (3311761), Romoland (3311762), Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.74770 / -117.11110	**Accuracy:**	1 mile
UTM:	Zone-11 N3734187 E489710	**Elevation (ft):**	1660
PLSS:	T05S, R02W, Sec. 08 (S)	**Acres:**	0.0

Location: HOMELAND.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED IN THE VICINTY OF HOMELAND.

Ecological:

General: ONE FEMALE SPECIMEN COLLECTED 19 AUG 1987 BY W. RAINEY AT "HOMELAND." DEPOSITED AT MVZ #182503.

Owner/Manager: UNKNOWN

Occurrence No.	31	**Map Index:** 58903	**EO Index:**	58939		**Element Last Seen:**	1981-08-17
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1981-08-17
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-12-21

Quad Summary: Sunnymead (3311782), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.94213 / -117.23986	**Accuracy:**	1 mile
UTM:	Zone-11 N3755766 E477833	**Elevation (ft):**	1650
PLSS:	T03S, R03W, Sec. 06 (S)	**Acres:**	0.0

Location: SUNNYMEAD, RIVERSIDE COUNTY.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED IN THE VICINTY OF SUNNYMEAD.

Ecological:

General: 2 FEMALE & 1 MALE SPECIMENS COLLECTED 19 SEP & 13 OCT 1980 & 17 AUG 1981 BY D. CONSTANTINE AT "SUNNYMEAD." DEPOSITED AT MVZ #181921-181923.

Owner/Manager: UNKNOWN

Occurrence No.	36 **Map Index:** 58908	**EO Index:**	58944	**Element Last Seen:**	1998-09-14
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1998-09-14
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-12-21

Quad Summary: Redlands (3411712), Harrison Mtn. (3411722)

County Summary: San Bernardino

Lat/Long:	34.12971 / -117.20520	**Accuracy:**	1 mile
UTM:	Zone-11 N3776557 E481078	**Elevation (ft):**	1350
PLSS:	T01N, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: HIGHLAND.

Detailed Location: EXACT LOCATION NOT GIVEN. MAPPED IN THE GENERAL VICINTY OF HIGHLAND.

Ecological:

General: 1 MALE & 1 FEMALE SPECIMENS COLLECTED 14 JUN 1984 & 14 SEP 1998 BY D. CONSTANTINE & SAN BERNARDINO HEALTH LABORATORY AT "HIGHLAND." DEPOSITED AT MVZ #181928 & 200035.

Owner/Manager: UNKNOWN

Occurrence No.	38 **Map Index:** 58911	**EO Index:**	58947	**Element Last Seen:**	1998-06-16
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1998-06-16
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-12-21

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.05602 / -117.18288	**Accuracy:**	1 mile
UTM:	Zone-11 N3768382 E483122	**Elevation (ft):**	1400
PLSS:	T01S, R03W, Sec. 27 (S)	**Acres:**	0.0

Location: REDLANDS.

Detailed Location: EXACT LOCATION NOT KNOWN. MAPPED IN THE GENERAL VICINTY OF REDLANDS.

Ecological:

General: 9 TOTAL SPECIMENS COLLECTED, ALL AT MVZ. 1 MALE OCT 1978, 1 MALE MAY 1979, 1 FEMALE APR 1984, 1 MALE JUN 1996, 1 MALE JUL 1996, 1 FEMALE AUG 1996, 1 MALE JUN 1997, 1 MALE JUL 1997 & 1 MALE JUN 1998.

Owner/Manager: UNKNOWN

Occurrence No.	41 **Map Index:** 58915	**EO Index:**	58951	**Element Last Seen:**	1991-10-29
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1991-10-29
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-12-21

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.03383 / -117.04297	**Accuracy:**	1 mile
UTM:	Zone-11 N3765908 E496032	**Elevation (ft):**	2600
PLSS:	T02S, R02W, Sec. 01 (S)	**Acres:**	0.0

Location: YUCAIPA.

Detailed Location: EXACT LOCATION NOT KNOWN. MAPPED ACCORING TO LAT/LONG COORDINATES PROVIDED BY MANIS. LOCATION UNCERTAINTY GIVEN AS 1.75 MILES.

Ecological:

General: 2 MALE SPECIMENS COLLECTED 9 AUG 1981 (MVZ # 181945) AND 29 OCT 1991 (LACM # 94007) BY D. CONSTANTINE AT "YUCAIPA."

Owner/Manager: UNKNOWN

Occurrence No.	53	**Map Index:** 53796	**EO Index:**	59072	**Element Last Seen:**	1992-08-31
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-08-31
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-12-30

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.89740 / -117.20117	**Accuracy:**	1 mile
UTM:	Zone-11 N3750799 E481399	**Elevation (ft):**	1500
PLSS:	T03S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: MORENO VALLEY.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED IN THE VICINITY OF MORENO VALLEY AND THE LAT-LONG COORDINATES PROVIDED BY MANIS.
Ecological:
General: 1 FEMALE COLLECTED 22 AUG 1991 (LACM # 94000) & 1 MALE COLLECTED 31AUG 1992 (MVZ #186307).
Owner/Manager: UNKNOWN

Antrozous pallidus

Element Code: AMACC10010

pallid bat

Listing Status: **Federal:** None — **CNDDB Element Ranks:** **Global:** G5
State: None — **State:** S3
Other: BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority
Habitat: **General:** DESERTS, GRASSLANDS, SHRUBLANDS, WOODLANDS & FORESTS. MOST COMMON IN OPEN, DRY HABITATS WITH ROCKY AREAS FOR ROOSTING.
Micro: ROOSTS MUST PROTECT BATS FROM HIGH TEMPERATURES. VERY SENSITIVE TO DISTURBANCE OF ROOSTING SITES.

Occurrence No.	244	**Map Index:** 58911	**EO Index:**	66710	**Element Last Seen:**	1929-05-19
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1929-05-19
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2007-04-03

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.05602 / -117.18288	**Accuracy:**	1 mile
UTM:	Zone-11 N3768382 E483122	**Elevation (ft):**	1360
PLSS:	T01S, R03W, Sec. 27 (S)	**Acres:**	0.0

Location: REDLANDS.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED IN THE GENERAL VICINITY OF REDLANDS.
Ecological:
General: 1 FEMALE AND 2 MALES COLLECTED ON 2 MAY 1928, MVZ #77029-77031, 1 MALE AND 1 FEMALE COLLECTED ON 19 MAY 1929, MVZ #77032-77033, BY ROBERT D. MOORE.
Owner/Manager: UNKNOWN

Eumops perotis californicus

Element Code: AMACD02011

western mastiff bat

Listing Status: **Federal:** None — **CNDDB Element Ranks:** **Global:** G5T4
State: None — **State:** S3?
Other: BLM_S-Sensitive, DFG_SSC-Species of Special Concern, WBWG_H-High Priority
Habitat: **General:**

	MANY OPEN, SEMI-ARID TO ARID HABITATS, INCLUDING CONIFER & DECIDUOUS WOODLANDS, COASTAL SCRUB, GRASSLANDS, CHAPARRAL ETC
Micro:	ROOSTS IN CREVICES IN CLIFF FACES, HIGH BUILDINGS, TREES & TUNNELS.

Occurrence No.	10 **Map Index:** 33084	**EO Index:**	3637	**Element Last Seen:**	1992-09-01
Occ. Rank:	Poor	**Presence:**	Presumed Extant	**Site Last Seen:**	1992-09-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1995-03-27

Quad Summary: Redlands (3411712), Harrison Mtn. (3411722)

County Summary: San Bernardino

Lat/Long:	34.12964 / -117.20506	**Accurracy:**	2/5 mile
UTM:	Zone-11 N3776549 E481091	**Elevation (ft):**	1380
PLSS:	T01N, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: HIGHLAND, CHURCH OF THE LIVING GOD. SAN BERNARDINO MOUNTAINS.

Detailed Location:

Ecological:

General: 40-50 OBSERVED AT THIS SITE IN 1969 BY D. CONSTANTINE; IN 1992; ONLY 3 WERE DETECTED ACCOUSTICALLY AND OBSERVED LEAVING THE BUILDING.

Owner/Manager: PVT

Occurrence No.	78 **Map Index:** 21200	**EO Index:**	66410	**Element Last Seen:**	1957-08-28
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1957-08-28
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-11-02

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.81375 / -117.17861	**Accurracy:**	4/5 mile
UTM:	Zone-11 N3741519 E483469	**Elevation (ft):**	1570
PLSS:	T04S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: 4 MILES SW OF LAKEVIEW.

Detailed Location: NON-SPECIFIC LOCATION. LAT/LONG COORDINATES GIVEN WERE AT 4 MILES NW OF LAKEVIEW, SO MAPPED ACCORDING TO LOCALITY DESCRIPTION.

Ecological:

General: 2 MALE & 1 FEMALE SPECIMENS COLLECTED ON 14 JUL, 1 MALE SPECIMEN COLLECTED ON 1 AUG 1954, 1 MALE SPECIMEN COLLECTED ON 28 AUG 1957 BY T.A. VAUGHN, KU #73128, 73213, 76578-76580.

Owner/Manager: UNKNOWN

Occurrence No.	80	**Map Index:** 53796	**EO Index:**	66412	**Element Last Seen:**	1990-09-06
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1990-09-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2006-09-21

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.89740 / -117.20117	**Accuracy:**	1 mile
UTM:	Zone-11 N3750799 E481399	**Elevation (ft):**	
PLSS:	T03S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: MORENO VALLEY.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED IN THE VICINITY OF MORENO VALLEY.
Ecological:
General: 1 FEMALE SPECIMEN COLLECTED BY D.G. CONSTANTINE, ANOTHER FEMALE SPECIMEN COLLECTED BY CA DEPT. OF HEALTH SERVICES ON 6 SEP 1990, LACM #94015 AND 95890, RESPECTIVELY.
Owner/Manager: UNKNOWN

Occurrence No.	128	**Map Index:** 66378	**EO Index:**	66475	**Element Last Seen:**	1992-05-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-05-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2006-09-25

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.84913 / -117.18928	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3745444 E482488	**Elevation (ft):**	1570
PLSS:	T04S, R03W, Sec. 03 (S)	**Acres:**	0.0

Location: LAKE PERRIS.
Detailed Location: MAPPED ACCORDING TO LAT/LONG COORDINATES GIVEN.
Ecological:
General: SPECIMEN COLLECTED 13 JUL 1954. MULTIPLE INDIVIDUALS DETECTED MAY 1992.
Owner/Manager: UNKNOWN

Occurrence No.	175	**Map Index:** 66436	**EO Index:**	66535	**Element Last Seen:**	1991-07-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1991-07-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2006-09-26

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09156 / -117.22723	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3772332 E479038	**Elevation (ft):**	
PLSS:	T01S, R03W, Sec. 18 (S)	**Acres:**	0.0

Location: SANTA ANA WASH.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED ACCORDING TO LAT/LONG COORDINATES GIVEN BY PIERSON AND RAINEY. THIS PUTS THE SITE IN THE WASH, SOUTH OF NORTON AFB.
Ecological:
General: SPECIMEN COLLECTED JUL 1991 BY B. MCKERNON.
Owner/Manager: UNKNOWN

Nyctinomops femorosaccus

Element Code: AMACD04010

pocketed free-tailed bat

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G4
	State:	None	**State:**	S2S3
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_M-Medium Priority		
Habitat:	**General:**	VARIETY OF ARID AREAS IN SOUTHERN CALIFORNIA; PINE-JUNIPER WOODLANDS, DESERT SCRUB, PALM OASIS, DESERT WASH, DESERT RIPARIAN, ETC.		
	Micro:	ROCKY AREAS WITH HIGH CLIFFS.		

Occurrence No.	20 **Map Index:** 68463	**EO Index:**	68721	**Element Last Seen:**	1985-02-05
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-05
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2007-03-14

Quad Summary: Steele Peak (3311773), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.88574 / -117.28002	**Accurracy:**	1 mile
UTM:	Zone-11 N3749522 E474105	**Elevation (ft):**	1600
PLSS:	T03S, R04W, Sec. 27 (S)	**Acres:**	0.0

Location: MARCH AIR FORCE BASE.

Detailed Location: MAPPED ACCORDING TO LAT/LONG COORDINATES PROVIDED BY MANIS, WITH UNCERTAINTY OF 1609.344M (1 MILE).

Ecological:

General: 1 MALE SPECIMEN (MVZ #181962) COLLECTED AT "MARCH AIR FORCE BASE" BY DENNY G. CONSTANTINE ON 5 FEB 1985.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	23 **Map Index:** 68464	**EO Index:**	68724	**Element Last Seen:**	1985-11-15
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1985-11-15
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2007-03-14

Quad Summary: Redlands (3411712), San Bernardino South (3411713), Fontana (3411714), Harrison Mtn. (3411722), San Bernardino North (3411723), Devore (3411724)

County Summary: San Bernardino

Lat/Long:	34.11843 / -117.29904	**Accurracy:**	5 miles
UTM:	Zone-11 N3775328 E472422	**Elevation (ft):**	1200
PLSS:	T01S, R04W, Sec. 04 (S)	**Acres:**	0.0

Location: SAN BERNARDINO.

Detailed Location: MAPPED ACCORDING TO LAT/LONG COORDINATES PROVIDED BY MANIS, WITH UNCERTAINTY OF 14,858M (9.2 MILES).

Ecological:

General: 1 FEMALE SPECIMEN (MVZ #181965) COLLECTED AT "SAN BERNARDINO" BY DENNY G. CONSTANTINE ON 15 NOV 1985.

Owner/Manager: UNKNOWN

Lepus californicus bennettii

Element Code: AMAEB03051

San Diego black-tailed jackrabbit

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G5T3?
	State:	None	**State:**	S3?
	Other:	DFG_SSC-Species of Special Concern		
Habitat:	**General:**	INTERMEDIATE CANOPY STAGES OF SHRUB HABITATS & OPEN SHRUB / HERBACEOUS & TREE / HERBACEOUS EDGES.		
	Micro:	COASTAL SAGE SCRUB HABITATS IN SOUTHERN CALIFORNIA.		

Occurrence No.	39	**Map Index:**	53927	**EO Index:**	53927	**Element Last Seen:**	2003-04-09
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-09
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-01-13

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.90309 / -117.01398	**Accuracy:**	80 meters
UTM:	Zone-11 N3751411 E498706	**Elevation (ft):**	2280
PLSS:	T03S, R01W, Sec. 20 (S)	**Acres:**	0.0

Location: 2.7 MILES SW OF BEAUMONT
Detailed Location:
Ecological: HABITAT CONSISTS OF DISTURBED GRASSLAND AND RECENTLY-BURNED CHAPARRAL.
General: 1 ADULT OBSERVED ON 9 APR 2003.
Owner/Manager: PVT

Occurrence No.	49	**Map Index:**	57338	**EO Index:**	57354	**Element Last Seen:**	2004-01-29
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-01-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-10-12

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92067 / -117.01787	**Accuracy:**	80 meters
UTM:	Zone-11 N3753360 E498347	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: ABOUT 2.5 MILES SOUTHWEST OF BEAUMONT AND 0.9 MILES SOUTH OF CALIFORNIA STATE HIGHWAY 60.
Detailed Location:
Ecological: HABITAT CONSISTS OF UNDEVELOPED CHAMISE CHAPARRAL.
General: ONE ADULT OBSERVED. MAPPED USING UTM COORDINATES GIVEN: ZONE 11 498427E X 3753153N DATUM: NAD 27.
Owner/Manager: PVT

Occurrence No.	64	**Map Index:**	59981	**EO Index:**	60017	**Element Last Seen:**	2004-06-23
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-06-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-02-14

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92783 / -117.02372	**Accuracy:**	80 meters
UTM:	Zone-11 N3754155 E497806	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: 0.3 MILE SOUTH OF HIGHWAY 60, 2.5 MILES WEST OF BEAUMONT
Detailed Location:
Ecological: HABITAT CONSISTS OF CHAPARRAL AND NON-NATIVE GRASSLAND.
General: 1 ADULT OBSERVED ON 23 JUN 2004.
Owner/Manager: PVT

Occurrence No.	70	**Map Index:**	65698	**EO Index:**	65777	**Element Last Seen:**	2005-05-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-05-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-08-08

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.82611 / -117.03992	**Accuracy:**	80 meters
UTM:	Zone-11 N3742876 E496305	**Elevation (ft):**	1470
PLSS:	T04S, R02W, Sec. 13 (S)	**Acres:**	0.0

Location: SAN JACINTO VALLEY; ON PICO ROAD, 0.4 MILE NW OF JUNCTION WITH GRANT BDY ROAD.

Detailed Location:

Ecological: HABITAT CONSISTS OF A FLAT AREA WITH VERY LITTLE TOPOGRAPHIC RELIEF; VEGETATION INCLUDES NON-NATIVE GRASSLANDS AND RUDERAL HABITAT.

General: 3-5 INDIVIDUALS OBSERVED ON 5-23-2005.

Owner/Manager: CITY OF SAN JACINTO

Occurrence No.	92	**Map Index:**	79660	**EO Index:**	80651	**Element Last Seen:**	2005-05-23
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-05-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-08-19

Quad Summary: Steele Peak (3311773), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.87569 / -117.32864	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3748422 E469606	**Elevation (ft):**	1665
PLSS:	T03S, R04W, Sec. 29 (S)	**Acres:**	14.0

Location: JUST SE OF WOOD RD AT LURIN AVE, 1.7 MILES ESE OF WOODCREST, SE CITY OF RIVERSIDE.

Detailed Location: MAPPED FROM PROVIDED MAP.

Ecological: HABITAT CONSISTED OF ANNUAL GRASSLANDS SURROUNDED BY URBAN AREAS. LOT APPEARS DISKED IN AERIAL IMAGES FROM 2009.

General: 1 ADULT OBSERVED ON 23 MAY 2005.

Owner/Manager: UNKNOWN

Occurrence No.	93	**Map Index:** 79666	**EO Index:**	80654		**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-09-07

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.98932 / -117.19696	**Accuracy:**	specific area
UTM:	Zone-11 N3760990 E481808	**Elevation (ft):**	2400
PLSS:	T02S, R03W, Sec. 21 (S)	**Acres:**	15.0

Location: ABOUT 3.4 MILES N OF HWY 60 AT NASSON ST, E OF RECHE CYN AND W OF THE BADLANDS, NORTH OF MORENO VALLEY

Detailed Location: AREA WNW JUNCTION OF SMILY BLVD (JORDAN DR) AND JEFFERY DR. MAPPED FROM PROVIDED COORDINATES AND MAP.

Ecological: HABITAT CONSISTS OF DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB ON MODERATE TO STEEP ROLLING HILLS.

General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED ON 1 JUN 2007. DESCRIBED AS NUMEROUS THROUGHOUT THE SITE.

Owner/Manager: PVT

Occurrence No.	94	**Map Index:** 79667	**EO Index:**	80657		**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-10-28

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.97878 / -117.17962	**Accuracy:**	specific area
UTM:	Zone-11 N3759818 E483408	**Elevation (ft):**	2310
PLSS:	T02S, R03W, Sec. 22 (S)	**Acres:**	10.0

Location: AREA 1 MI SE OF SMILY BLVD AT JEFFERY DR, 2.7 MI NNE OF FWY 60 AT NASON ST, NORTH OF MORENO VALLEY.

Detailed Location: MAPPED FROM PROVIDED COORDINATES AND MAP.

Ecological: HABITAT CONSISTED OF DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB ON MODERATE TO STEEP ROLLING HILLS.

General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED ON 1 JUN 2007. DESCRIBED AS NUMEROUS THROUGHOUT THE SITE.

Owner/Manager: PVT

Occurrence No.	95	**Map Index:** 79668	**EO Index:**	80658		**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-08-19

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.97934 / -117.19849	**Accuracy:**	80 meters
UTM:	Zone-11 N3759883 E481664	**Elevation (ft):**	2675
PLSS:	T02S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: ABOUT 2.8 MILES N OF HWY 60 AT NASON ST, E OF RECHE CYN AND W OF THE BADLANDS, NORTH OF MORENO VALLEY.
Detailed Location: 0.7 MI SW OF SMILY BLVD AT JEFFERY DR. MAPPED FROM PROVIDED COORDINATES.
Ecological: HABITAT CONSISTED OF DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB ON MODERATE TO STEEP ROLLING HILLS.
General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED ON 1 JUN 2007. DESCRIBED AS NUMEROUS THROUGHOUT THE SITE.
Owner/Manager: PVT

Occurrence No.	96	**Map Index:** 79669	**EO Index:**	80659		**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-08-19

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.98437 / -117.18524	**Accuracy:**	80 meters
UTM:	Zone-11 N3760439 E482890	**Elevation (ft):**	2440
PLSS:	T02S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: 3.1 MI N OF HWY 60 AT NASON ST, E OF RECHE CYN AND W OF THE BADLANDS, NORTH OF MORENO VALLEY.
Detailed Location: 0.4 MI ESE OF SMILY BLVD AT JEFFERY DR. MAPPED FROM PROVIDED COORDINATES.
Ecological: HABITAT CONSISTED OF DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB ON MODERATE TO STEEP ROLLING HILLS.
General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED ON 1 JUN 2007. DESCRIBED AS NUMEROUS THROUGHOUT THE SITE.
Owner/Manager: PVT

Occurrence No.	97	**Map Index:** 79670	**EO Index:**	80660		**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-08-19

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.97726 / -117.18406	**Accuracy:**	80 meters
UTM:	Zone-11 N3759649 E482997	**Elevation (ft):**	2530
PLSS:	T02S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: 2.6 MI N OF HWY 60 AT NASON ST, E OF RECHE CYN AND W OF THE BADLANDS, NORTH OF MORENO VALLEY.
Detailed Location: 0.8 MI SE OF SMILY BLVD AT JEFFERY DR. MAPPED FROM PROVIDED COORDINATES.
Ecological: HABITAT CONSISTED OF DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB ON MODERATE TO STEEP ROLLING HILLS.
General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED ON 1 JUN 2007. DESCRIBED AS NUMEROUS THROUGHOUT THE SITE.
Owner/Manager: PVT

Occurrence No.	98 **Map Index:** 79671	**EO Index:**	80661	**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2010-08-19

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.98456 / -117.19746	**Accuracy:**	80 meters
UTM:	Zone-11 N3760461 E481760	**Elevation (ft):**	2745
PLSS:	T02S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: 3.2 MI N OF HWY 60 AT NASON ST, E OF RECHE CYN AND W OF THE BADLANDS, NORTH OF MORENO VALLEY.

Detailed Location: 0.4 MI WSW OF SMILY BLVD AT JEFFERY DR. MAPPED FROM PROVIDED MAP.

Ecological: HABITAT CONSISTED OF DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB ON MODERATE TO STEEP ROLLING HILLS.

General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED ON 1 JUN 2007. DESCRIBED AS NUMEROUS THROUGHOUT THE SITE.

Owner/Manager: PVT

Xerospermophilus mohavensis

Element Code: AMAFB05150

Mohave ground squirrel

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G2G3
	State:	Threatened		**State:**	S2S3
	Other:	BLM_S-Sensitive, IUCN_VU-Vulnerable			
Habitat:	**General:**	OPEN DESERT SCRUB, ALKALI SCRUB & JOSHUA TREE WOODLAND. ALSO FEEDS IN ANNUAL GRASSLANDS. RESTRICTED TO MOJAVE DESERT.			
	Micro:	PREFERS SANDY TO GRAVELLY SOILS, AVOIDS ROCKY AREAS. USES BURROWS AT BASE OF SHRUBS FOR COVER. NESTS ARE IN BURROWS.			

Occurrence No.	40	**Map Index:**	22617	**EO Index:**	7896	**Element Last Seen:**	2007-05-04
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-05-04
Occ. Type:	Natural/Native occurrence			**Trend:**	Stable	**Record Last Updated:**	2011-06-13

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.92704 / -117.28090	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3864988 E474343	**Elevation (ft):**	2250
PLSS:	T10N, R04W, Sec. 27 (S)	**Acres:**	818.0

Location: THE GENERAL AREA 1.5-3.3 MI E OF TWELVE GAUGE LAKE, CENTERED ABOUT 4.5 MI WSW HINKLEY.

Detailed Location: MAPPED TO GENERAL LOCATIONS STATED AS: "15 MI W BARSTOW" (1938), & "ALONG HWY 58, AT MILEPOST 22, E OF KRAMER JCT (HWY 395), 25 M IN FROM ROADWAY (SOUTH SIDE)" (1988). CLARK 1992 DOCUMENT IS A COMPILATION & SUMMARY OF OTHER SOURCES.

Ecological: SALTBUSH SCRUB, DOMINATED BY KRASCHNENINNIKOVIA LANATA, HYMENOCLEA SALSOLA, LYCIUM SP, ATRIPLEX SP, & PSOROTHAMNUS SP. 2007: AREA WAS AN ACTIVE CONTACT ZONE BETWEEN MOHAVE & ROUND-TAILED GROUND SQUIRRELS, BUT NO HYBRIDIZATION FOUND.

General: 1 FEMALE COLLECTED 11 JUN 1938 (MVZ #81813, DC #112). 1 DETECTED 21 JUN 1988 BY M. RECHT (DC #32). 1 BURROW OBS & 1 ADULT FEMALE TRAPPED/RELEASED/RECAP 4 MAY 2007; GENETICALLY DISTINCT ROUND-TAILED GROUND SQUIRREL CAPTURED <70 M SAME DAY.

Owner/Manager: UNKNOWN, BLM

Occurrence No.	156	**Map Index:**	22618	**EO Index:**	18534	**Element Last Seen:**	1988-05-24
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-05-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1993-02-02

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.99399 / -117.34338	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3872430 E468663	**Elevation (ft):**	2150
PLSS:	T10N, R04W, Sec. 06 (S)	**Acres:**	0.0

Location: 1.5 MILES SOUTH OF LOCKHART, 0.75 MILES WEST OF HARPER LAKE ROAD-SANTA FE AVENUE INTERSECTION.

Detailed Location:

Ecological: HABITAT IS SALTBUSH SCRUB; DOMINANTS: ATRIPLEX SPINOSA, ERODIUM CICUTARIUM, AND SCHISMUS ARABICUS. SANDY, FRIABLE SOIL. LOW ROLLING HILLS.

General: ONE ADULT SQUIRREL DETECTED ON 24 MAY 1988 BY C. UPTAIN. D. CLARK #S: DC29.

Owner/Manager: UNKNOWN

Perognathus longimembris brevinasus

Element Code: AMAFD01041

Los Angeles pocket mouse

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T1T2
	State:	None		**State:**	S1S2

	Other:	DFG_SSC-Species of Special Concern, USFS_S-Sensitive
Habitat:	**General:**	LOWER ELEVATION GRASSLANDS & COASTAL SAGE COMMUNITIES IN AND AROUND THE LOS ANGELES BASIN.
	Micro:	OPEN GROUND WITH FINE SANDY SOILS. MAY NOT DIG EXTENSIVE BURROWS, HIDING UNDER WEEDS & DEAD LEAVES INSTEAD.

Occurrence No.	11	**Map Index:** 15995	**EO Index:**	23960	**Element Last Seen:**	1940-03-21
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1940-03-21
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2007-08-10

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89537 / -117.05503	**Accurracy:**	1 mile
UTM:	Zone-11 N3750556 E494911	**Elevation (ft):**	
PLSS:	T03S, R02W (S)	**Acres:**	0.0

Location: EDEN HOT SPRINGS.

Detailed Location:

Ecological:

General: MVZ #90713 COLLECTED 21 MAR 1940 BY FLOYD DURHAM.

Owner/Manager: UNKNOWN

Occurrence No.	12	**Map Index:** 24993	**EO Index:**	23958	**Element Last Seen:**	1916-10-31
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1916-10-31
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1998-10-01

Quad Summary: Sunnymead (3311782), Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.01874 / -117.27110	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3764267 E474969	**Elevation (ft):**	1300
PLSS:	T02S, R04W (S)	**Acres:**	2755.2

Location: RECHE CANYON. SOUTHEAST OF COLTON, SOUTH OF THE SANTA ANA RIVER.

Detailed Location: COLLECTED FROM THE MOUTH OF THE CANYON AND THE INTERIOR OF THE CANYON.

Ecological:

General: MVZ #2656 COLLECTED BY C.H. RICHARDSON FROM THE MOUTH OF RECHE CANYON ON 27 JUL 1908. MVZ #24496 COLLECTED BY GRINNELL FROM RECHE CANYON ABOUT 4 MILES SOUTHEAST OF COLTON ON 31 OCT 1916.

Owner/Manager: UNKNOWN

Occurrence No.	19	**Map Index:** 38572	**EO Index:**	33579	**Element Last Seen:**	1992-10-15
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-10-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2011-01-28

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.89242 / -117.29071	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3750266 E473119	**Elevation (ft):**	1640
PLSS:	T03S, R04W, Sec. 22 (S)	**Acres:**	26.0

Location: WEST MARCH AIR FORCE BASE, ABOUT 0.5 MILE WEST OF ARNOLD HEIGHTS AND ABOUT 2 MILES SSW OF EDGEMONT.

Detailed Location:

Ecological: DISTURBED GRASSLAND, LIMITED SAGE SCRUB, SMALL ROCK OUTCROP.

General: 1 ADULT CAPTURED 15 OCT 1992 ON TRAPLINE #5.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	27	**Map Index:** 47388	**EO Index:**	47388	**Element Last Seen:**	1994-09-16
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1994-09-16
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-03-08

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84335 / -117.00275	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744787 E499745	**Elevation (ft):**	1490
PLSS:	T04S, R01W, Sec. 08 (S)	**Acres:**	21.7

Location: 0.9 MILE NW OF GILMAN HOT SPRINGS; APPROXIMATELY 300 FEET EAST OF SANDERSON AVENUE.

Detailed Location: TRAP 1: LOCATED AT EDGE OF SAN JACINTO RIVER WASH. TRAP 2: LOCATED APPROXIMATELY 0.2 MILE NORTH OF TRAP 1.

Ecological: HABITAT (AT TRAP 1) CONSISTS OF SPARSE VEGETATION DOMINATED BY AMBROSIA PSILOSTACHYA, CROTON CALIFORNICUS, NICOTIANA GLAUCA, HETEROTHECA GRANDIFLORA WITH SOME ERIOGONUM FASCICULATUM AND BRASSICA GENICULATA.

General: TRAP 1: 26-28 JUL 1994, 4 ADULTS & 5 SUBADULTS CAPTURED. 15,16 SEP 1994: 18 ADULTS CAPTURED. SUBSTANTIAL POPULATION EXISTS AT SITE. TRAP 12: 2 INDIVIDUALS (LIKELY TO BE TRANSIENTS) CAPTURED. HABITAT UNLIKELY TO SUPPORT POPULATION.

Owner/Manager: RIV COUNTY-HWY COMMISSION

Occurrence No.	28	**Map Index:** 47422	**EO Index:** 47422	**Element Last Seen:**	1999-01-XX
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1999-01-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2002-03-14

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.93873 / -117.22892	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3755386 E478844	**Elevation (ft):**	1650
PLSS:	T03S, R03W, Sec. 06 (S)	**Acres:**	87.0

Location: NW OF PERRIS RESERVOIR, LOCATED WITHIN TOWN OF SUNNYMEAD.
Detailed Location: MAPPED THE AREA SOUTH OF HWY 60 & NORTH OF URBAN AREA OF SUNNYMEAD.
Ecological: HABITAT CONSISTS OF DISTURBED ANNUAL GRASSLAND, SAGE SCRUB AND CULTIVATED FIELDS.
General: DEC 1997 - JAN 1999: 1 INDIVIDUAL OBSERVED WITHIN THIS AREA.
Owner/Manager: UNKNOWN

Occurrence No.	29	**Map Index:** 47423	**EO Index:** 47423	**Element Last Seen:**	1999-01-XX
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1999-01-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2002-03-14

Quad Summary: Perris (3311772), Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.88866 / -117.23461	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3749835 E478305	**Elevation (ft):**	1500
PLSS:	T03S, R03W, Sec. 19 (S)	**Acres:**	1277.4

Location: MORENO VALLEY, NW OF PERRIS RESERVOIR AND SOUTH OF SUNNYMEAD.
Detailed Location:
Ecological: HABITAT CONSISTS OF DISTURBED ANNUAL GRASSLAND, SAGE SCRUB AND CULTIVATED FIELDS.
General: DEC 1997 - JAN 1999: 1 INDIVIDUAL OBSERVED WITHIN THIS AREA.
Owner/Manager: UNKNOWN

Occurrence No.	30	**Map Index:** 47424	**EO Index:** 47424	**Element Last Seen:**	1991-07-24
Occ. Rank:	Good		**Presence:** Presumed Extant	**Site Last Seen:**	1991-07-24
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2002-03-14

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.86539 / -117.13445	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3747239 E487564	**Elevation (ft):**	1480
PLSS:	T03S, R02W, Sec. 31 (S)	**Acres:**	64.9

Location: SAN JACINTO WA. 1.4 MILES EAST OF PERRIS RESERVOIR, LOCATED 0.25 MILES NE OF THE BERNASCONI HILLS.
Detailed Location:
Ecological: HABITAT CONSISTS OF DISTURBED GRASSLAND.
General: 9-14 JUL 1990: 21 CAPTURED (APPROX. 6 INDIVIDUALS) DURING 1000 TRAP NIGHTS. 23-28 JUL 1990: 22 CAPTURED (APPROX. 10 INDIVIDUALS) DURING 1210 TRAP NIGHTS. 11-24 JUL 1991: 53 INDIVIDUALS CAPTURED (NOTED AS BEING "NOTICEABLY ABUNDANT")
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	38	**Map Index:** 58068	**EO Index:**	58104		**Element Last Seen:**	2000-10-31
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2000-10-31
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-11-15

Quad Summary: Perris (3311772), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.87791 / -117.14090	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3748628 E486969	**Elevation (ft):**	1600
PLSS:	T03S, R03W, Sec. 25 (S)	**Acres:**	925.9

Location: ON THE EAST END OF LAKE PERRIS WITHIN THE LAKE PERRIS STATE RECREATION AREA.

Detailed Location: T3S R2W: W 1/2 SEC 30, T3S R3W: S 1/2 SEC 25, AND NE 1/4 SEC 36.

Ecological: HABITAT IS NON-NATIVE GRASSLAND AND ACTIVELY MONITORED AND MANAGED FOR DIPODOMYS STEPHENSI.

General: ONE ADULT OBSERVED.

Owner/Manager: DPR-LAKE PERRIS SRA

Occurrence No.	39	**Map Index:** 68227	**EO Index:**	58105		**Element Last Seen:**	2006-02-11
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-02-11
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-02-23

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09838 / -117.21693	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3773085 E479990	**Elevation (ft):**	1100
PLSS:	T01S, R03W, Sec. 08 (S)	**Acres:**	647.0

Location: LOCATED ON EASTERN END OF NORTON AIR FORCE BASE.

Detailed Location: 2002: SECTION 8. 2006: LOCATED IN THE FAR SOUTHEAST PORTION OF MAPPED AREA ALONG ALABAMA ROAD.

Ecological: RELATIVELY UNDISTURBED ALLUVIAL SCRUB VEGETATION. SOME AREAS OF DEEP SANDY SOIL. DOMINANTS INCLUDE: BRASSICA, BROMUS, CROTON, & ERIASTRUM. THREE OF THE FOUR SITES SURVEYED OF EXCELLENT QUALITY, ONE OF THE FOUR SITES SURVEYED OF POOR QUALITY

General: ONE INDIVIDUAL OBSERVED 12 NOV 2002. 2 ADULTS TRAPPED ON 11 FEB 2006 - TRAPPED MICE RELOCATED JUST OUTSIDE FENCED AREA. MOST SITES WHERE MICE WERE CAPTURED ARE CONSIDERED EXCELLENT QUALITY, ONLY ONE SITE CONSIDERED POOR QUALITY.

Owner/Manager: DOD-NORTON AFB

Occurrence No.	41	**Map Index:** 58094	**EO Index:**	58130		**Element Last Seen:**	1993-05-10
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1993-05-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-11-16

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.88391 / -117.28320	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3749321 E473810	**Elevation (ft):**	1600
PLSS:	T03S, R04W, Sec. 27 (S)	**Acres:**	182.0

Location: LOCATED ON MARCH AIR FORCE BASE, ABOUT 0.15 MILES SOUTH OF ARNOLD HEIGHTS.

Detailed Location:

Ecological:

General: 1 FEMALE CAPTURED/RELEASED DURING A 1-10 MAY 1993 SURVEY.

Owner/Manager: DOD-MARCH AFB

Dipodomys stephensi

Stephens' kangaroo rat

Element Code: AMAFD03100

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:**	G2
	State:	Threatened		**State:**	S2
	Other:	IUCN_EN-Endangered			
Habitat:	**General:**	PRIMARILY ANNUAL & PERENNIAL GRASSLANDS, BUT ALSO OCCURS IN COASTAL SCRUB & SAGEBRUSH WITH SPARSE CANOPY COVER.			
	Micro:	PREFERS BUCKWHEAT, CHAMISE, BROME GRASS & FILAREE. WILL BURROW INTO FIRM SOIL.			

Occurrence No.	3	**Map Index:** 03895	**EO Index:**	9356	**Element Last Seen:**	2000-10-31
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-13
Occ. Type:	Natural/Native occurrence		**Trend:**	Stable	**Record Last Updated:**	2010-01-14

Quad Summary: Lakeview (3311771), Perris (3311772), El Casco (3311781), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.87091 / -117.17247	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3747856 E484048	**Elevation (ft):**	1750
PLSS:	T03S, R03W, Sec. 24 (S)	**Acres:**	6992.9

Location: SURROUNDING LAKE PERRIS; MOST OF THE HABITAT IS LOCATED TO THE NORTHWEST, NORTH & EAST OF LAKE.

Detailed Location: LARGE PORTION OF SITE IS WITHIN LAKE PERRIS SRA & SAN JACINTO WA. W PORTIONS UNDER STUDY FOR HABITAT ENHANCEMENT. THE EXTREME SE PORTION HAS AN OBSERVATION WHICH RECORDS PRESENCE OF 239 INDV'S. 9-13 APR 2003: NO SKR SIGN IN T3S,R3W SEC 33.

Ecological: HABITAT CONSISTS OF PREVIOUSLY-CULTIVATED ANNUAL GRASSLAND SURROUNDED BY RIVERSIDIAN SAGE SCRUB. SOIL:CIENEBA, EXETER, GORGONIO, GREENFIELD, HANFORD, MONSERATE, PACHAPPA, PLACENTIA, RAMONA, VISTA. SLOPE: 0-15%. POST CONSTR SURVEY SHOWS SKR.

General: 10 INDV'S IN 1988, S OF DUCK PONDS. DEC '97-JAN '99: 32 ADULTS & 2 JUV. RELOC PROJECT ON E SIDE: MAR-NOV '98 119 INDV'S, MAY '99: 305 INDV & 7 INDV AUG '99 CAPT & RELOCATED. JUN '99; 1 ADULT. 90 ADULTS 4-9 NOV '99. 28 ADULTS 26-31 OCT 2000.

Owner/Manager: DPR, DFG, PVT

Occurrence No.	4	**Map Index:** 03461	**EO Index:**	9442	**Element Last Seen:**	2004-08-10
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	2004-08-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2011-08-18

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.88949 / -117.28759	**Accuracy:**	specific area
UTM:	Zone-11 N3749940 E473406	**Elevation (ft):**	1650
PLSS:	T03S, R04W, Sec. 22 (S)	**Acres:**	547.2

Location: NORTH & SOUTH OF VAN BUREN BLVD., 0.5 MILES WEST OF ARNOLD HEIGHTS, MARCH STEPHENS KANGAROO RAT PRESERVE.

Detailed Location: OCCURRENCE EXTENDS FROM JUST N OF GOLF COURSE TO N OF KENNEDY DRIVE, BOUNDED BY RESIDENTIAL HOUSING TO E & W. CAPTURE RATE LOW; BEAUCHAMP (1984) SAID FROM ALL INDICATIONS POP. HAS BEEN EXTIRPATED. 1992: SITES 2A, 2B, 5.

Ecological: VEGETATION COMPRISED OF ERIOGONUM FASCICULATURM & ARTEMISIA CALIFORNICA. SITE 5: DISTURBED GRASSLAND, SMALL ROCK OUTCROP. 2004: WAS WILDLIFE PRESERVE AT TIME OF STUDY, SURROUNDED BY URBANIZATION; WILL BE DEVELOPED AS LIGHT INDUSTRIAL.

General: O'FARRELL ('88) FOUND LOW DENSITY POPULATION SURROUNDING, 380 ACRES. 30 ADULTS/2 JUV'S CAPTURED OCT '92. 17 MALES/9 FEMALES CAPTURED/RELEASED MAY '93. 13 ADULTS & 6 JUV'S CAPTURED MAR-APR 2004. 20 ADULTS CAPTURED 5-10 AUG 2004.

Owner/Manager: CENTER FOR NATURAL LANDS MGMT

Occurrence No.	11	**Map Index:**	03218	**EO Index:**	9283	**Element Last Seen:**	2003-06-19
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-01-06

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.82229 / -117.43179	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3742536 E460041	**Elevation (ft):**	1400
PLSS:	T04S, R05W, Sec. 17 (S)	**Acres:**	3327.0

Location: DIRECTLY SOUTH OF LAKE MATHEWS.

Detailed Location: THE DISTRIBUTION VARIES OVER ABOUT 4000 ACRES, FROM TRACE ABUNDANCE TO LARGE PATCHES OF MEDIUM AND HIGH DENSITY. BAX SOURCES SHOW LOCATIONS OF PERMANENT TRAPPING GRIDS.

Ecological: HABITAT CONSISTS OF NON-NATIVE GRASSLAND PLATEAUS SURROUNDED BY RIVERSIDIAN SAGE SCRUB. SOILS: ARLINGTON, BUREN, CAJALCO, CIENEBA, FALLBROOK, GORGONIO, HANFORD, HONCUT, LAS POSAS, MONSERATE, TEMESCAL, YOKOHL. SLOPE: 0-20%

General: 1 ADULT 4 NOV 1998. NEG DATA AT GRIDS #9,13 & 15 NOV-DEC '98. 9 CAPTURED ON 9 DEC '98 AT GRIDS 11&12. NEG DATA AT GRID #'S16-19 MAR-APR '99. 4 TRAPPED 21 APR '99 AT GRID 20. 2 SKR SIGNS OBS 18 OCT 2002 AND ON 18-19 JUN '03 (NO TRAPPING).

Owner/Manager: DFG, BLM, RIV COUNTY, MWD

Occurrence No.	13	**Map Index:**	03265	**EO Index:**	9282	**Element Last Seen:**	2001-11-10
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-11-10
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-12-07

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.84870 / -117.40187	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3745453 E462822	**Elevation (ft):**	1480
PLSS:	T04S, R05W, Sec. 04 (S)	**Acres:**	1486.1

Location: LAKE MATHEWS ECOLOGICAL RESERVE, DIRECTLY NORTHEAST OF LAKE MATTHEWS.

Detailed Location: 1988: PATCHES OF MEDIUM TO HIGH DENSITY WITH LARGE STRETCHES OF TRACE. MAPPED ACCORDING TO MAP & COORDINATES PROVIDED. BAX SOURCES SHOW LOCATIONS OF PERMANENT TRAPPING GRIDS.

Ecological: NON-NATIVE GRASSLAND PLATEAUS SURROUNDED BY RIVERSIDIAN SAGE SCRUB. SOILS: ARLINGTON, BUREN, CAJALCO, CIENEBA, FALLBROOK, GORGIANO, HANFORD, HONCUT, LAS POSAS, MONSERAE, TEMESCAL, YOKOHL. SLOPE: 0-20%.

General: 33 ADULTS CAPTURED DURING OCT 1998 @ GRID #'S 2,4,5,7, & 8. NEGATIVE DATA RECORDED DURING OCT '98 @ GRIDS #1, 3, & 6. 24-28 MAR 2001: 11 NEW CAPTURES & 23 RECAPS @ GRID 5. 6-10 NOV 2001: 9 NEW CAPTURES & 22 RECAPS @ GRID P1.

Owner/Manager: DFG-LAKE MATHEWS ER

Occurrence No.	23	**Map Index:**	03326	**EO Index:**	13605	**Element Last Seen:**	1988-08-12
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1991-06-21

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84918 / -117.36643	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3745493 E466101	**Elevation (ft):**	1460
PLSS:	T04S, R05W, Sec. 02 (S)	**Acres:**	0.0

Location: 15.3 KM NW PERRIS.

Detailed Location: IN 1988, O'FARRELL FOUND AREA OF OCCUPATION TO BE ONLY 1 ACRE. CITRUS GROVES NEARBY. POPULATION CONCENTRATED NEAR CENTER, ALONG A DIRT ROAD.

Ecological: NON-NATIVE GRASSLAND.

General: IN 1988, O'FARRELL FOUND A LOW ABUNDANCE HERE.

Owner/Manager: UNKNOWN

Occurrence No.	27	**Map Index:**	33878	**EO Index:**	23999	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-15
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-04-12

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.96823 / -117.30066	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3758674 E472224	**Elevation (ft):**	2200
PLSS:	T02S, R04W, Sec. 28 (S)	**Acres:**	321.8

Location: BOX SPRINGS RESERVE; NEAR UC RIVERSIDE CAMPUS.

Detailed Location: TOWNSHIP 2S, RANGE 4W, EAST HALF OF SECTION 28. SITE IS AN IN-HOLDING IN A COUNTY PARK.

Ecological:

General:

Owner/Manager: UCNR-BOX SPRINGS RESERVE

Occurrence No.	30	**Map Index:**	03634	**EO Index:**	23997	**Element Last Seen:**	1923-09-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1923-09-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1989-08-10

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78085 / -117.22794	**Accuracy:**	1 mile
UTM:	Zone-11 N3737880 E478896	**Elevation (ft):**	1450
PLSS:	T04S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: PERRIS.

Detailed Location:

Ecological:

General: MVZ #33562.

Owner/Manager: UNKNOWN

Occurrence No.	31	**Map Index:** 04212	**EO Index:**	9361		**Element Last Seen:**	1991-08-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1991-08-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Decreasing		**Record Last Updated:**	1995-10-27

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.90629 / -117.07688	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3751768 E492892	**Elevation (ft):**	1800
PLSS:	T03S, R02W, Sec. 22 (S)	**Acres:**	2875.5

Location: ABOUT 4-5 MILES NORTHEAST OF PERRIS RESERVOIR. ON THE WESTERN SLOPES OF THE MORENO BADLANDS.

Detailed Location: PATCHY BETWEEN LOW AND TRACE DISTRIBUTION. POPULATIONS ARE BEING ISOLATED AND EXTIRPATED BY DEVELOPMENT.

Ecological: NON-NATIVE GRASSLAND; GRAZED GRAIN FIELDS; GOLF COURSE; BORDERS OF RIVERSIDIAN SAGE SCRUB. SOILS: METZ, SAN EMIGDIO.

General: SAMPLE TAKEN IN 1938: MVZ #88407. SOME HABITATS NEAR THE BADLANDS COULD BE PRESERVED AS A BUFFER FOR STUDY AREA TO THE NORTH.

Owner/Manager: PVT

Occurrence No.	45	**Map Index:** 04090	**EO Index:**	9367		**Element Last Seen:**	1980-03-XX
Occ. Rank:	None		**Presence:**	Extirpated		**Site Last Seen:**	1988-09-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1996-01-11

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.80561 / -117.09418	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3740606 E491283	**Elevation (ft):**	1700
PLSS:	T04S, R02W, Sec. 21 (S)	**Acres:**	0.0

Location: ABOUT 2.0 MI SE LAKEVIEW. SW OF JUNIPER FLAT RD.

Detailed Location: 1 TRAPPED IN 1980 BY PEARSON. O'FARRELL (1988) REPORTS ANIMALS AS BEING EXTIRPATED.

Ecological: ECOTONE OF COASTAL SAGE SCRUB, CHAMISE CHAPARRAL. ALSO NON-NATIVE GRASSLAND.

General:

Owner/Manager: UNKNOWN

Occurrence No.	46	**Map Index:** 04335	**EO Index:**	23992		**Element Last Seen:**	1994-09-15
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1994-09-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-03-17

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84666 / -117.00260	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3745154 E499759	**Elevation (ft):**	1700
PLSS:	T04S, R01W, Sec. 05 (S)	**Acres:**	36.9

Location: 1.0 MI NORTHWEST OF GILMAN HOT SPRINGS, EAST OF INTERSECTION GILMAN SPRINGS ROAD AND HIGHWAY 79.

Detailed Location: 3 CAPTURED IN THE WESTERN PORTION OF TRAP LINE 12, 1994. 1 TRAPPED, 1980.

Ecological: COASTAL SAGE SCRUB HABITAT. SPARCE RUDERAL GRASSLAND, WITH GENERALLY LOAMY SOILS AND PATCHES OF SANDY/LOAMY SUBSTRATE.

General:

Owner/Manager: RIV COUNTY-HWY COMMISSION

Occurrence No.	47	**Map Index:**	04319	**EO Index:**	9120	**Element Last Seen:**	1980-03-04
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	1988-09-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-01-11

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84600 / -117.00929	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3745081 E499140	**Elevation (ft):**	1650
PLSS:	T04S, R01W, Sec. 05 (S)	**Acres:**	0.0

Location: SAN JACINTO VALLEY, ABOUT 1.5 MI NW GILMAN HOT SPRINGS.

Detailed Location:

Ecological: AGRICULTURAL FIELD BORDERED BY RIVERSIDIAN SAGE SCRUB. SLOPE 0 TO 25%.

General:

Owner/Manager: PVT

Occurrence No.	48	**Map Index:**	03936	**EO Index:**	23988	**Element Last Seen:**	1980-03-07
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	1988-09-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-05-13

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77363 / -117.13058	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3737064 E487909	**Elevation (ft):**	2200
PLSS:	T04S, R02W, Sec. 31 (S)	**Acres:**	0.0

Location: ABOUT 5.0 MI E OF PERRIS.

Detailed Location: 16 TRAPPED IN 1980. REPORTED EXTIRPATED BY DEVELOPMENT IN 1988.

Ecological: TYPICAL COASTAL SAGE SCRUB HABITAT.

General:

Owner/Manager: UNKNOWN

Occurrence No.	52	**Map Index:**	03456	**EO Index:**	9225	**Element Last Seen:**	1990-07-14
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-08-26

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.74182 / -117.31563	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3733575 E470764	**Elevation (ft):**	2100
PLSS:	T05S, R04W, Sec. 08 (S)	**Acres:**	3412.7

Location: NORTH & WEST OF HWY 74, MOSTLY EAST OF ARROYO DEL TORO TO NORTH OF STEELE PEAK & EAST OF STEELE VALLEY

Detailed Location: ABUNDANCE VARIES: APPROX 2000 ACRES TRACE; 125 ACRES LOW; & 40 ACRES MEDIUM. 21 ANIMALS CAPTURED 1990 & 17 CAPTURED IN 1989 IN T05S, R04W, SEC 4

Ecological: TOPOGRAPHY RANGES FROM FLAT VALLEYS TO HILLY RUGGED AREAS & ROCKLAND. NON-NATIVE GRASSLAND BORDERDED BY RIVERSIDIAN SAGE SCRUB. SOIL: ARLINGTON, CAJALCO, CIENEBA, ESCONDIDO, FRIANT, HANFORD, HONCUT, LAS POSAS, LODA, & VISTA. SLOPE: 0-50%

General: SITE IS CURRENTLY PART OF STEELE PEAK SKR STUDY AREA. SHOULD REMAIN AS PART OF THE STUDY AREA.

Owner/Manager: BLM, OTHERS

Occurrence No.	54	**Map Index:** 03466	**EO Index:**	9444		**Element Last Seen:**	1998-03-XX
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1998-03-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Decreasing		**Record Last Updated:**	2010-02-22

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.93340 / -117.32099	**Accuracy:**	specific area
UTM:	Zone-11 N3754818 E470334	**Elevation (ft):**	1580
PLSS:	T03S, R04W, Sec. 05 (S)	**Acres:**	2489.0

Location: EXTENDS FROM 2 MI S OF UC RIVERSIDE TO W OF EDGEMONT, NW OF MARCH AFB. BOUNDED BY ALESSANDRO RD TO W & S, I-215 TO E.

Detailed Location: O'FARRELL HAS SURVEYED A LARGE PORTION OF THIS SITE. DENSITES: 1380 ACRES--LOW, 500 ACRES--MEDIUM. OTHER SOURCES INDICATE PATCHES OF HIGH DENSITY. 5 POLYGONS INDICATED AS ONE BREEDING POPULATION ON SOURCE DOCUMENTS.

Ecological: HABITAT IS ANNUAL GRASSLAND/RIVERSIDEAN COASTAL SAGE SCRUB. LEVEL TO GENTLY ROLLING TOPOGRAPHY. 2009 AERIAL PHOTOS SHOW SIGNIFICANT RESIDENTIAL AND LIGHT INDUSTRIAL DEVELOPMENT WITHIN THE EAST & WEST BOUNDARIES OF THE MAPPED FEATURE.

General: AUG-DEC 1988 SPECIES RECORDED IN LOW-HIGH DENSITIES THROUGHOUT SITE. OBS ON 26 JUL '89. 5 INDV'S TRAPPED 29 SEP '89. JAN '90 10 OBS. 24 ON MAR-APR '90. 10 TRAPPED 10-11 JUL '90. SPECIES OBS. 21 NOV '90. DEC '90-MAR '91:34 INDV'S TRAPPED.

Owner/Manager: PVT, DOD-MARCH AFB

Occurrence No.	60	**Map Index:** 03376	**EO Index:**	23981		**Element Last Seen:**	1990-07-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1990-07-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-01-14

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.79994 / -117.34270	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740026 E468278	**Elevation (ft):**	2040
PLSS:	T04S, R04W, Sec. 30 (S)	**Acres:**	392.3

Location: IDA LEONA ESTATES, LIES JUST S & SE OF HARFORD SPRINGS RESERVE, VICINITY OF INTERSECTION OF IDA LEONA RD & PIEDRAS RD

Detailed Location: 1983: PARCELS 1, 2, 3 (SECTION 25) AND 5, 6 (SECTION 19). 1990 CAPTURES WERE MADE IN NON-NATIVE GRASSLAND AND GRASSY OPENINGS WITHIN THE CHAPARRAL.

Ecological: HABITAT CONSISTS OF CHAPARRAL & DISTURBED NON-NATIVE GRASSLAND. 1983 RECOMMENDATION: NO SUBDIVISION OF PARCELS 1, 2, 3 & 4 AT THIS TIME-160 ACRE PLOT TOO OUTSTANDING FOR DEVELOPMENT. NO DEVELOPMENT OF ANY KIND ON CLAY KNOLL @ PARCELS 1 & 3.

General: 1983: PARCELS 1&2 CONTAIN 2 OR MORE SMALL POCKETS OF SKR. PARCEL 3 HAS SUBSTANTIAL POP AT SE EDGE OF CLAY KNOLL. PARCEL 5 & 6 HAVE POP ASSOCIATED W/PROPERTY TO THE EAST. 1 CAPT IN SEC 25 ON JAN '90. 1 CAPT ON 23 JUL '90 IN SE 1/4 OF SEC 19.

Owner/Manager: PVT

Occurrence No.	69	**Map Index:** 03315	**EO Index:** 9296	**Element Last Seen:**	1999-09-02
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1999-09-02
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2010-02-24

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.92047 / -117.36127	**Accuracy:**	specific area
UTM:	Zone-11 N3753397 E466606	**Elevation (ft):**	1300
PLSS:	T03S, R05W, Sec. 12 (S)	**Acres:**	2341.0

Location: BOUNDED ON THE S BY VAN BUREN BLVD, ON THE E BY ALESSANDRO BLVD, & ON THE N BY ARLINGTON AVE, 2.5 MILES SW OF RIVERSIDE.

Detailed Location: O'FARRELL & UPTAIN SURVEYED MOST OF THIS AREA & LABELLED IT ONE BREEDING POPULATION. DENSITIES: 70 ACRES-HIGH, 1500 ACRES-MEDIUM, 380 ACRES-LOW. 1998: 4 ACRES OF HABITAT OCCUPIED BY SPECIES IN N POLYGON. 1999: SKR PRESENT IN N SEC OF 24.

Ecological: SPARSE RIVERSIDIAN SAGE SCRUB/ANNUAL GRASSLAND, DISTURBED BY HEAVY SHEEP GRAZING. RIPARIAN AREAS ALONG DRAINAGES. IT IS LIKELY THAT PORTIONS OF THIS OCCURRENCE ARE EXTIRPATED DUE TO HABITAT LOSS/FRAGMENTATION APPARENT IN 2008 AERIAL IMAGES.

General: 18 FSF'S FROM 1988-90. '88: SW 1/4 OF SEC 13: DENSEST POP OF SKR SEEN BY AUTHOR IN 3 YRS WORK W/100+ ANIMALS PER ACRE. MOD-HIGH POP IN SEC 11 '89. 100'S TRAPPED APR '89 IN SEC 18. 201 INDV'S TRAPPED THROUGHOUT SITE BETWEEN JAN-OCT 1990.

Owner/Manager: CITY OF RIVERSIDE, PVT

Occurrence No.	70	**Map Index:** 20358	**EO Index:** 9422	**Element Last Seen:**	1991-10-XX
Occ. Rank:	Excellent		**Presence:** Presumed Extant	**Site Last Seen:**	1991-10-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2009-12-10

Quad Summary: Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81195 / -117.26332	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3741337 E475629	**Elevation (ft):**	1850
PLSS:	T04S, R04W, Sec. 23 (S)	**Acres:**	1589.7

Location: AREA INCLUDES MAJOR SEC OF MOTTE RIMROCK RESERVE, BOUNDED BY OLD ELSINORE RD ON W, SE CORNER ABOUT 2 MILES NW OF PERRIS.

Detailed Location: THERE ARE ELEVEN FIELD SURVEY FORMS FOR THIS OCCURRENCE WITH SUBSTANTIAL ADDITIONAL INFORMATION. THE N & SW PORTION OF THE SITE IS NOT PART OF THE MOTTE RIMROCK RESERVE.

Ecological: ANNUAL GRASSLANDS AND RIVERSIDIAN SAGE SCRUB. SOIL: CIENEBA, HANFORD, VISTA. SLOPE: 0-15%.

General: FROM TRACE TO HIGH ABUNDANCE THROUGHOUT PROPERTY. 6 TRAPPED 13 AUG 1989. MCC: LIVE TRAPPED FROM AUG '89-FEB '91; 21 AUG '89 21 INDV'S SW SEC 24. FEB '90 49 INDV'S/TWO NIGHTS NW SEC 24. PRICE REPORTED 254 INDIVIDUALS FROM NOV 1990-OCT 1991.

Owner/Manager: UCNR-MOTTE RIMROCK RESERVE,PVT

Occurrence No.	72	**Map Index:** 20249	**EO Index:**	9441		**Element Last Seen:**	1989-09-05
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-09-05
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-03-12

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.89808 / -117.31856	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3750901 E470546	**Elevation (ft):**	1700
PLSS:	T03S, R04W, Sec. 20 (S)	**Acres:**	0.0

Location: 0.5 MI NORTH OF VAN BUREN BLVD, AT THE JUNCTION WITH TRAUTWEIN ROAD, APPROXIMATELY 2 MI SW OF EDGEMONT.

Detailed Location: TRACE DISTRIBUTION

Ecological: FRINGE OF DISTURBED NON-NATIVE GRASSLAND AT THE BASE OF ROCK OUTCROP AND ALONG DIRT ROAD AT EDGE OF TILLED FIELD.

General:

Owner/Manager: UNKNOWN

Occurrence No.	73	**Map Index:** 20551	**EO Index:**	9299		**Element Last Seen:**	1998-03-07
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1998-03-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-06-21

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.83388 / -117.34117	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3743790 E468431	**Elevation (ft):**	1600
PLSS:	T04S, R04W, Sec. 07 (S)	**Acres:**	330.1

Location: 0.4 MILES WEST OF THE JUNCTION OF CAJALCO ROAD AND WOOD ROAD, 5.5 NW OF PERRIS

Detailed Location: 3 SITES SURVEYED IN AREA. PATCHY HABITAT - SOME AREAS WITH A HIGH DENSITY OF K-RATS.

Ecological: SPARSE ANNNUAL GRASSES AND FORBS, ESP. ERODIUM SPP. ALSO HORDEUM LEPORIUNUM SCHISMUS BARBATUS, BRASSICA GENICULATA. ALSO COASTAL SAGE SCRUB AND WETLAND AREAS.

General: SKR NOTED BUT NOT CAPTURED IN A 40-ACRE PARCEL NORTH OF CAJALCO ROAD, ON 14 MAY 1989. UNKNOWN NUMBER OBSERVED DURING JUN 1989. ~6 ACTIVE SKR BURROWS OBSERVED DURING SURVEYS CONDUCTED ON 7 MAR 1998.

Owner/Manager: PVT-BOLSA NURSERY

Occurrence No.	74	**Map Index:**	20248	**EO Index:**	9443	**Element Last Seen:**	1990-02-XX
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-02-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-03-12

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.95829 / -117.32054	**Accuracy:**	specific area
UTM:	Zone-11 N3757577 E470384	**Elevation (ft):**	1350
PLSS:	T02S, R04W, Sec. 32 (S)	**Acres:**	57.0

Location: 0.5 MI SOUTH OF UC RIVERSIDE.
Detailed Location: LOW DENSITY
Ecological: DISTURBED RIVERSIDIAN SAGE SCRUB,DOMINATED BY ENCELIA. SKR FOUND IN AREAS WHERE BOTH SHRUBS AND GROUND COVER OF ANNUAL GRASSES AND FORBS IS SPARSE. SOIL: CIENEBA. SLOPE: 0-20%.
General: SITE SURROUNDS LOCATION OF THE COUNTY SHERRIFF'S TRAINING FACILITY.
Owner/Manager: PVT

Occurrence No.	75	**Map Index:**	20247	**EO Index:**	9439	**Element Last Seen:**	1989-03-XX
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-03-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	1992-03-12

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.97834 / -117.26929	**Accuracy:**	specific area
UTM:	Zone-11 N3759787 E475125	**Elevation (ft):**	1800
PLSS:	T02S, R04W, Sec. 23 (S)	**Acres:**	205.0

Location: 2 MI NW OF I-60 JUNCTION WITH THE ESCONDIDO FWY (HWY 395).
Detailed Location: TRACE DISTRIBUTION ON PATCHES OF THE SITE.
Ecological: HABITAT IS A MIX OF RIVERSIDEAN SAGE SCRUB, NON-NATIVE GRASSLAND, & ABANDONED AGRICULTURAL LAND.
General: A BURN AREA WEST OF HOUSING DEVELOPMENT ON SITE MAY DEVELOP INTO SUITABLE HABITAT.
Owner/Manager: PVT

Occurrence No.	76	**Map Index:**	20552	**EO Index:**	9298	**Element Last Seen:**	1989-08-XX
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-16

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.84053 / -117.32229	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3744521 E470181	**Elevation (ft):**	1600
PLSS:	T04S, R04W, Sec. 08 (S)	**Acres:**	0.0

Location: 0.6 MI ENE OF CAJALCO RD JCT WITH WOOD RD, 4 MI NW OF PERRIS
Detailed Location:
Ecological: ANNUAL GRASSLAND IN ROLLING TERRAIN WITH SMALL KNOLLS AND SHALLOW DRAINAGES.
General: 4 ANIMALS RECORDED ON SITE.
Owner/Manager: PVT

Occurrence No.	77	**Map Index:**	20557	**EO Index:**	9301	**Element Last Seen:**	1989-08-12
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-16

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.77907 / -117.32180	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3737706 E470205	**Elevation (ft):**	2100
PLSS:	T04S, R04W, Sec. 32 (S)	**Acres:**	0.0

Location: 3 MI WSW OF PERRIS
Detailed Location:
Ecological: SAGE SCRUB, DISTURBED GRASSLAND; SEVERAL ROCKY AREAS, SOME OUTCROPS; GENERALLY RUGGED BUT LEVEL ALONG WESTERN PERIMETER.
General: 8 ANIMALS RECORDED ON SITE.
Owner/Manager: BLM

Occurrence No.	78	**Map Index:**	20559	**EO Index:**	23974	**Element Last Seen:**	1989-08-11
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-16

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.75472 / -117.28928	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3734997 E473208	**Elevation (ft):**	1700
PLSS:	T05S, R04W, Sec. 10 (S)	**Acres:**	0.0

Location: 0.75 MILES WEST OF JUNCTION OF SHARP RD AND SPRING ST. SOUTHWEST OF PERRIS.
Detailed Location:
Ecological: GENTLY SLOPING TERRAIN WITH SEVERAL SMALL CANYONS. VEGETATION IS PRIMARILY SAGE SCRUB; SPARSE COVER OF NON-NATIVE GRASSES OCCURS IN INTER-SHRUB AND OPEN AREAS. SOILS: LOAMS AND TERRACE ESCARPEMENTS.
General: 2 ANIMALS RECORDED ON SITE.
Owner/Manager: PVT

Occurrence No.	80	**Map Index:**	20556	**EO Index:**	9300	**Element Last Seen:**	1989-07-12
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-07-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-16

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.77571 / -117.34455	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3737341 E468098	**Elevation (ft):**	2200
PLSS:	T04S, R04W, Sec. 31 (S)	**Acres:**	0.0

Location: 1.6 MI SE OF LAKE MATHEWS DR JCT WITH GAVILON RD; 5 MI W OF PERRIS.
Detailed Location:
Ecological: NON-NATIVE GRASSLAND SURROUNDED BY CHAMISE CHAPARRAL AND RIVERSIDIAN SAGE SCRUB. SOIL: PRIMARILY CAJALCO SERIES WITH INTERSPERSED FALLBROOK, GREENFIELD, LAS POSAS AND VISTA SERIES.
General: SKR DISTRIBUTED ALONG DIRT ROADS AND IN OPEN DISTURBED PATCHES. LOW/MEDIUM ABUNDANCE WITH ONE PATCH OF HIGH.
Owner/Manager: UNKNOWN

Occurrence No.	81	**Map Index:** 20560	**EO Index:**	9833		**Element Last Seen:**	1989-03-04
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-03-04
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-01-30

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.81663 / -117.16303	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3741836 E484912	**Elevation (ft):**	1500
PLSS:	T04S, R03W, Sec. 14 (S)	**Acres:**	0.0

Location: ONE MI NORTH OF NUEVO ROAD JUNCTION WITH PICO AVENUE; ONE MI NW OF NUEVO.
Detailed Location:
Ecological: MOSTLY LEVEL TO GENTLY SLOPING TERRAIN WITH A SMALL ROCKY HILLSIDE ALONG SW PART OF SITE. MOST OF SITE SUBJECT TO DISKING. SOME HERBACEOUS COVER AND NON-NATIVE GRASSES; SOME DEGRADED RIPARIAN WOODLAND. SOIL: SANDY LOAMS AND SILTY CLAYS.
General: TWO ADULTS OBSERVED.
Owner/Manager: PVT

Occurrence No.	82	**Map Index:** 20359	**EO Index:**	9421		**Element Last Seen:**	1989-03-30
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-03-30
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-03-31

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.82097 / -117.25522	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3742335 E476381	**Elevation (ft):**	1700
PLSS:	T04S, R04W, Sec. 13 (S)	**Acres:**	0.0

Location: 0.6 MI SOUTH OF RIDER ST. JCT WITH PATTERSON AVE.
Detailed Location: IDENTIFIED BY SKR DIAGNOSTIC SIGNS. NO INFORMATION ON NUMBERS.
Ecological: SPARSE ANNUAL GRASSES AND FORBS, ESP. ERODIUM SPP.
General: SITE ADJACENT TO UC MOTTE RIMROCK RESERVE COULD BECOME PART OF IT.
Owner/Manager: EASTERN MWD

Occurrence No.	87	**Map Index:** 20246	**EO Index:**	9440		**Element Last Seen:**	1988-98-12
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	1988-08-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1995-11-14

Quad Summary: Steele Peak (3311773), Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.87485 / -117.30405	**Accuracy:**	specific area
UTM:	Zone-11 N3748321 E471880	**Elevation (ft):**	1680
PLSS:	T03S, R04W, Sec. 28 (S)	**Acres:**	11.0

Location: 1.2 MILES SOUTHEAST OF JUNCTION OF VAN BUREN BLVD AND TRAUTWEIN ROAD.
Detailed Location: LOW ABUNDANCE OVER 2 ACRES
Ecological: MARCH AIR FORCE BASE, SITE CONTAINS OLD CONCRETE BUILDING FOUNDATION. MUCH OF SURROUNDING AREA IS DISKED. SOIL: MONSERATE. NON-NATIVE GRASSLAND.
General:
Owner/Manager: DOD-MARCH AFB

Occurrence No.	88	**Map Index:**	20453	**EO Index:**	9351	**Element Last Seen:**	1990-09-29
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-09-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.97226 / -117.23018	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3759104 E478736	**Elevation (ft):**	2000
PLSS:	T02S, R03W, Sec. 30 (S)	**Acres:**	0.0

Location: 0.1 MI NE INDIAN ST. JCT WITH NECTAR AVE.

Detailed Location: 8 INDIVIDUALS REPORTED ON SITE.

Ecological: CHARACTERIZED BY HILLS & DRAINAGES. MESIC & XERIC TYPES OF COASTAL SAGE SCRUB ON HILLSIDES, MESIC ON NORTH-FACING & XERIC ON SOUTH-FACING. MESIC: ARTEMISIA TRIDENTATA, SAVIA MELLLIFERA, ERIUGONUM FASCICULATUM. XERIC: ENCILIA FARINOSA.

General:

Owner/Manager: PVT

Occurrence No.	89	**Map Index:**	20452	**EO Index:**	9352	**Element Last Seen:**	1988-08-14
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.97498 / -117.20848	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3759401 E480741	**Elevation (ft):**	2300
PLSS:	T02S, R03W, Sec. 28 (S)	**Acres:**	58.0

Location: 1.5 MI. ENE INDIAN ST JCT. WITH NECTAR AVE.

Detailed Location: ABUNDANCE LOW WITH SMALL PATCHES OF MEDIUM OVER 50 ACRES. DISTRIBUTION CONCENTRATED ON HILLTOPS, RIDGES, SWALES.

Ecological: NON-NATIVE GRASSLAND. AREA SURROUNDED BY CHAMISE CHAPARRAL COVERED SLOPES AND DRAINAGES WITH RIPARIAN. SLOPE: 0-10%. SOIL: CIENEBA, GREENFIELD.

General:

Owner/Manager: UNKNOWN

Occurrence No.	90	**Map Index:**	20454	**EO Index:**	9350	**Element Last Seen:**	1988-08-14
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.95948 / -117.18405	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3757678 E482995	**Elevation (ft):**	2000
PLSS:	T02S, R03W, Sec. 34 (S)	**Acres:**	29.1

Location: 0.2 MI WNW LOCUST AVE. JCT. WITH HENDRICK RD. ABOUT 2.5 MILES ENE OF SUNNYMEAD.

Detailed Location: ABUNDANCE TRACE WITH PATCHES OF LOW, OVER 35 ACRES.

Ecological: NON-NATIVE GRASSSLAND BORDERED BY RIVERSIDIAN SAGE SCRUB. SLOPE: 0-10%, SOIL: GORGONIO, HANFORD, MONSERATE.

General:

Owner/Manager: UNKNOWN

Occurrence No.	91	**Map Index:**	20451	**EO Index:**	9353	**Element Last Seen:**	1988-08-14
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	1992-04-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.98459 / -117.19754	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3760464 E481754	**Elevation (ft):**	2500
PLSS:	T02S, R03W, Sec. 21 (S)	**Acres:**	343.5

Location: 2 MI NW LOCUST AVE JCT. WITH HENDRICK RD. NE OF SUNNYMEAD.

Detailed Location: LOW ABUNDANCE OVER 360 ACRES. DISTRIBUTION ON RIDGE TOPS AND IN SWALES. POPULATION IN THE SE QUARTER OF SEC 21 HAS BEEN EXTIRPATED BY RURAL HOUSING.

Ecological: NON-NATIVE GRASSLAND SURROUNDED BY CHAMISE CHAPARRAL. SLOPE: 0-40%. SOIL: CIENEBA, GREENFIELD, VISTA.

General:

Owner/Manager: UNKNOWN

Occurrence No.	92	**Map Index:**	20450	**EO Index:**	9354	**Element Last Seen:**	1988-08-14
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-04-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.99115 / -117.19544	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3761192 E481949	**Elevation (ft):**	2380
PLSS:	T02S, R03W, Sec. 16 (S)	**Acres:**	7.4

Location: 2.5 MI NNW OF LOCUST AVE JCT. WITH HENDRICK RD.

Detailed Location: MEDIUM ABUNDANCE OVER 1 ACRE.

Ecological: NON-NATIVE GRASSLAND. SLOPE: 0-20%. SOIL: CIENEBA, FALLBROOK, GREENFIELD, VISTA.

General:

Owner/Manager: UNKNOWN

Occurrence No.	93	**Map Index:**	20455	**EO Index:**	9355	**Element Last Seen:**	1989-08-30
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-30
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1995-10-27

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.92796 / -117.17825	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3754182 E483524	**Elevation (ft):**	1870
PLSS:	T03S, R03W, Sec. 10 (S)	**Acres:**	0.0

Location: DIRECTLY NW OF PETIT ST. JCT WITH COTTONWOOD AVE. SOUTH OF HWY 60, SOUTHEAST OF SUNNYMEAD.
Detailed Location: 5 INDIVIDUALS LOCATED ON SITE.
Ecological: STEEP ROCKY SLOPES TO GENTLY SLOPING TERRAIN. ROCKY OUTCROPS OCCUR IN THE WESTERN, EASTERN, AND SOUTHERN SECTIONS OF THE SITE. VEGETATION CONSISTS OF SAGE SCRUB AND DISTURBED GRASSLAND. LOAMY SOILS.
General: SITE IS ISOLATED. POPULATION IS SMALL.
Owner/Manager: PVT

Occurrence No.	95	**Map Index:**	20352	**EO Index:**	9431	**Element Last Seen:**	1984-XX-XX
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	1988-08-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1995-10-27

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.83227 / -117.36688	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3743619 E466052	**Elevation (ft):**	1500
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	0.0

Location: DIRECTLY SOUTH OF CAJALCO RD. JCT. WITH EL SOBRANTE RD.
Detailed Location:
Ecological: AGRICULTURE AND NON-NATIVE GRASSLAND.
General:
Owner/Manager: PVT

Occurrence No.	96	**Map Index:**	20357	**EO Index:**	9425	**Element Last Seen:**	1988-08-19
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-01-02

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.79357 / -117.29154	**Accuracy:**	specific area
UTM:	Zone-11 N3739306 E473011	**Elevation (ft):**	2000
PLSS:	T04S, R04W, Sec. 27 (S)	**Acres:**	491.4

Location: 0.5 MI NNE OF SANTA ROSA RD. JCT. WITH POST RD. ABOUT 2 MI W OF PERRIS.
Detailed Location: TRACE DISTRIBUTION OVER 560 ACRES.
Ecological: NON-NATIVE GRASSLAND. SOIL: CIENEBA, ESCONDIDO, FRIANT, HANFORD, LODO, TEMESCAL, VISTA. SLOPE: 0-30%
General:
Owner/Manager: UNKNOWN

Occurrence No.	97	**Map Index:**	20351	**EO Index:**	9433	**Element Last Seen:**	1998-12-16
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1998-12-16
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	2009-12-03

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84230 / -117.36675	**Accuracy:**	specific area
UTM:	Zone-11 N3744731 E466068	**Elevation (ft):**	1500
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	106.9

Location: JUST EAST OF LAKE MATTHEWS ECOLOGICAL RESERVE, SOUTH OF MOCKINGBRID CANYON, EL SOBRANTE.

Detailed Location: BOUNDED BY EL SOBRANTE & MOCKINGBIRD CANYON ROADS ON THE WEST, HARLEY JOHN ROAD TO THE EAST, & CAJALCO ROAD TO THE SOUTH.

Ecological: NON-NATIVE GRASSLAND W/SCATTERED RIVERSIDIAN SAGE SCRUB. SCATTERED JUNIPERUS CALIFORNICA IN E & SE. SLOPE: 0-25%. 1988: LOW & MED DENSITY (90 ACRES) THROUGHOUT WITH LARGE PATCHES OF TRACE DENSITY (30 ACRES), OVER AN AREA OF 120 ACRES.

General: 1988 REPORT DOES NOT SPECIFY HOW MANY OBSERVATIONS. 20 INDV'S TRAPPED 16 DEC '98 AT TRAP LINE 14, SOUTH END OF POLY. 2008 AERIAL IMAGERY SHOWS LIGHT RESIDENTIAL DEVELOPMENT IN N POLYGON, WITH RELATIVELY UNDISTURBED HABITAT IN S 1/2 OF POLY.

Owner/Manager: PVT

Occurrence No.	98	**Map Index:**	20350	**EO Index:**	9432	**Element Last Seen:**	1999-06-24
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-06-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-08-25

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84885 / -117.34786	**Accuracy:**	specific area
UTM:	Zone-11 N3745451 E467818	**Elevation (ft):**	1600
PLSS:	T04S, R05W, Sec. 01 (S)	**Acres:**	158.0

Location: ABOUT 1.25 MI SW OF JCT OF OLEANDER AVE AND WOOD ROAD.

Detailed Location: MEDIUM DENSITY WITH PATCHES OF LOW DENSITY OVER 180 ACRES. AREA TO SOUTH WOULD BE SUITABLE WITH REMOVAL OF SOME COVER. 1999 LOCATION GIVEN AS T4S R5W SEC 1, "17-ACRE OUTLET TOWER LANDS".

Ecological: NON-NATIVE GRASSLAND, RIVERSIDIAN SAGE SCRUB AND UNVEGETATED SANDY LOAMS. SOIL: ARLINGTON, BUREN, CIENEBA, ESCONDIDO, FALLBROOK, HANFORD, VISTA. SLOPE: 0-30%

General: 24 JUN 1999: 6 ADULTS DETECTED/OBSERVED.

Owner/Manager: UNKNOWN

Occurrence No.	99	**Map Index:** 20349	**EO Index:** 9434	**Element Last Seen:**	1988-08-12
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1988-08-12
Occ. Type:	Natural/Native occurrence		**Trend:** Decreasing	**Record Last Updated:**	1996-01-02

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.85534 / -117.37118	**Accuracy:**	specific area
UTM:	Zone-11 N3746178 E465664	**Elevation (ft):**	1400
PLSS:	T04S, R05W, Sec. 02 (S)	**Acres:**	82.0

Location: 0.6 MI N EL SOBRANTE RD. JCT. WITH MOCKINGBIRD CANYON RD.
Detailed Location: LOW DENSITY OVER 80 ACRES.
Ecological: NON-NATIVE GRASSLAND WITH SCATTERED RIVERSIDIAN SAGE SCRUB. SOIL: BUREN CIENEBA, ESCONDIDO, HANFORD, VISTA. SLOPE: 0-15%
General:
Owner/Manager: PVT

Occurrence No.	100	**Map Index:** 20348	**EO Index:** 9436	**Element Last Seen:**	1988-08-19
Occ. Rank:	Poor		**Presence:** Presumed Extant	**Site Last Seen:**	1988-08-19
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1996-01-02

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.86692 / -117.36344	**Accuracy:**	specific area
UTM:	Zone-11 N3747460 E466384	**Elevation (ft):**	1600
PLSS:	T03S, R05W, Sec. 36 (S)	**Acres:**	15.5

Location: 1.6 MI NNE OF EL SOBRANTE RD. JCT. WITH MOCKINGBIRD CANYON RD.
Detailed Location: LOW DISTRIBUTION ALONG ROADS AND IN OPEN AREAS OVER 20 ACRES.
Ecological: NON-NATIVE GRASSLAND SURROUNDED BY RIVERSIDIAN SAGE SCRUB ON NORTH AND ORCHARD ON REMAINING SIDES. SOIL: CIENEBA, FALLBROOK. SLOPE: 0-35%
General:
Owner/Manager: UNKNOWN

Occurrence No.	101	**Map Index:** 20355	**EO Index:** 9427	**Element Last Seen:**	1990-07-XX
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1990-07-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1995-10-27

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.78232 / -117.35820	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3738078 E466836	**Elevation (ft):**	2250
PLSS:	T04S, R05W, Sec. 36 (S)	**Acres:**	143.6

Location: 0.5 MI S GAVILAN RD. JCT. WITH MATTEWS DRIVE
Detailed Location: LOW DENSITY FOUND OUTSIDE OF PLOW LINE ON OPEN DISTURBED GROUND, GENERALLY ADJACENT TO BUT NOT WITHIN CHAPARRAL.
Ecological: MIXED, MOSAIC OF DENSE CHAPARRAL AND PLOWED FIELDS.
General:
Owner/Manager: PVT

Occurrence No.	102 **Map Index:** 20356	**EO Index:**	9426	**Element Last Seen:**	1988-08-19
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-19
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-01-02

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.78023 / -117.33660	**Accuracy:**	specific area
UTM:	Zone-11 N3737839 E468835	**Elevation (ft):**	2250
PLSS:	T04S, R04W, Sec. 31 (S)	**Acres:**	53.5

Location: 1.6 MI SE OF GAVILAN RD. JCT. WITH SANTA ROSA ROAD.
Detailed Location: 60 ACRES OF MEDIUM ABUNDANCE AND 20 ACRES OF TRACE.
Ecological: NON-NATIVE GRASSLAND. SOIL: CIENEBA, FALLBROOK, VISTA. SLOPE: 0-5%
General:
Owner/Manager: UNKNOWN

Occurrence No.	116 **Map Index:** 20486	**EO Index:**	9293	**Element Last Seen:**	1990-03-XX
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1990-03-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1992-04-14

Quad Summary: Beaumont (3311688), El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.93740 / -117.00319	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3755215 E499705	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 05 (S)	**Acres:**	114.5

Location: 0.3 MI SOUTH OF SAN TIMOTEO CANYON RD. JCT. WITH I-10 AND NORTH OF HWY 60.
Detailed Location:
Ecological: HEAVILY GRAZED FIELDS OCCUPIED PRIMARILY BY NON-NATIVE ANNUAL GRASSES AND FORBS WITH OCCASIONAL REINVASIVE ERIOGONUM FASCICULATUM. SHEEP GRAZING SUSTAINS SPARSE VEGETATION.
General: SITE IS ISOLATED BY SR-60 AND I-10 FROM OTHER POPULATIONS.
Owner/Manager: PVT

Occurrence No.	117 **Map Index:** 20485	**EO Index:**	9360	**Element Last Seen:**	1989-12-XX
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1989-12-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1992-04-14

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.90315 / -117.00615	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3751417 E499431	**Elevation (ft):**	2500
PLSS:	T03S, R01W, Sec. 17 (S)	**Acres:**	117.3

Location: 2.2 MI S OF SAN TIMOTEO CANYON RD JCT. WITH I-10
Detailed Location: LOW ABUNDANCE OVER 110 ACRES.
Ecological: NON-NATIVE GRASSLAND WITH SCATTERED RIVERSIDIAN SAGE SCRUB AT THE SOUTH. SOIL: CIENEBA, RAMONA, SAN TIMOTEO, VISTA. SLOPE: 0-5%.
General:
Owner/Manager: PVT

Occurrence No.	118	**Map Index:** 20487	**EO Index:**	9366		**Element Last Seen:**	1989-08-31
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-08-31
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-04-14

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86164 / -117.00225	**Accurracy:**	1/5 mile
UTM:	Zone-11 N3746815 E499791	**Elevation (ft):**	2000
PLSS:	T03S, R01W, Sec. 32 (S)	**Acres:**	0.0

Location: EAST OF HWY 79. 3 MI N OF SANDERSON AVE. JCT. WITH MEAD RD.

Detailed Location: HIGH QUALITY HABITAT IN EXTREME SE CORNER. LIMITED IN AREA ALONG RIDGELINE. 2 INDIVIDUALS FOUND.

Ecological: STEEP CANYONS AND SLOPES WITH ROUNDED RIDGES; SAGE SCRUB WITH SOME DENSE CAHPARRAL STANDS. BURNED IN SEVERAL AREAS.

General:

Owner/Manager: BLM

Occurrence No.	119	**Map Index:** 20484	**EO Index:**	9362		**Element Last Seen:**	1990-07-26
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	1993-02-05
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-03-24

Quad Summary: El Casco (3311781), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.91616 / -117.11801	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3752866 E489091	**Elevation (ft):**	1560
PLSS:	T03S, R02W, Sec. 17 (S)	**Acres:**	156.8

Location: 1.5 MILES SOUTH OF HIGHWAY 60 AND GILMAN SPRINGS ROAD, ~2 MILES EAST OF MORENO, NORTH OF THE SAN JACINTO WILDLIFE AREA.

Detailed Location: LOW DENSITY. 1991 NE CORNER SEC 18 PIPELINE SURVEY.

Ecological: ABANDONED DAIRY OPERATION. RUDERAL FIELDS. DISTURBED, WEEDY VEGETATION; DOMINATED BY CHEESEWEED, RUSSIAN-THISTLE, RED BROME, RED-STEMMED FILAREE. SOILS ARE SILTY: SAN EMIGDIO FINE SANDY LOAM. SITE IS FLAT.

General: THE AREA IS PART OF SAN JACINTO WILDLIFE AREA SKR STUDY AREA. BEING CONSIDERED FOR DEVELOPMENT UNDER SECTION 10(A) PERMIT AND REMOVAL FROM SKR STUDY AREA. 33 BURROWS OBSERVED AT 4 POINTS IN SAMPLE AREA, 1991. NO K-RATS FOUND 1993

Owner/Manager: PVT

Occurrence No.	120	**Map Index:**	20483	**EO Index:**	19401	**Element Last Seen:**	1990-07-26
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-05-29

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.92786 / -117.11783	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3754163 E489109	**Elevation (ft):**	1800
PLSS:	T03S, R02W, Sec. 08 (S)	**Acres:**	20.4

Location: 1 MI NW OF ALESSANDRO BLVD. JCT. WITH GILMAN SPRINGS RD. WESTERN SLOPE OF THE BADLANDS.

Detailed Location: LOW DENSITY.

Ecological: DISTURBED WEEDY VEGETATION; DOMINATED BY CHEESEWEED, RUSSIAN-THISTLE, RED BROME, RED-STEMMED FILAREE. SOIL: SAN EMIDGIO FINE SANDY LOAM.

General: NE OF SAN JACINTO WILDLIFE AREA.

Owner/Manager: PVT

Occurrence No.	121	**Map Index:**	20488	**EO Index:**	9295	**Element Last Seen:**	2004-08-18
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-08-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-12-09

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90922 / -117.31416	**Accuracy:**	specific area
UTM:	Zone-11 N3752135 E470956	**Elevation (ft):**	1500
PLSS:	T03S, R04W, Sec. 17 (S)	**Acres:**	19.0

Location: JUST SOUTH OF ALESSANDRO BLVD AT BARTON STREET, WEST OF I-215 (ESCONDIDO FWY), NORTH OF GROVE COMMUNITY DR.

Detailed Location: MARCH STEPHENS' KANGAROO RAT PRESERVE, FORMERLY PART OF MARCH AIR RESERVE BASE. AREA LIES ALONG BOTH SIDES OF BARTON STREET, NORTHEAST OF KENNEDY DRIVE.

Ecological: ACTIVE DRY FARMED AGRICULTURAL FIELDS WITH RIPARIAN IN DRAINAGES AND ISOLATED RIVERSIDEAN SAGE SCRUB REMNANTS.

General: 1988: ISOLATED POPULATION FOUND OUTSIDE OF ORIGINAL PROJECT BOUNDARY. 1 TRAPPED 31 MAR 2004. 51 TRAPPED AND RELEASED BETWEEN 5-10 APR 2004. 131 INDIVIDUALS TRAPPED AND RELEASED BETWEEN 13-18 AUG 2004.

Owner/Manager: CENTER FOR NATURAL LANDS MGMT

Occurrence No.	128	**Map Index:**	20970	**EO Index:**	9224	**Element Last Seen:**	1990-08-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-08-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-05-01

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.74924 / -117.26652	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3734384 E475315	**Elevation (ft):**	1600
PLSS:	T05S, R04W, Sec. 11 (S)	**Acres:**	0.0

Location: JUST EAST OF HWY 74 ABOUT 2 MILES NORTH OF RAILROAD CANYON RESERVOIR.

Detailed Location: 8 INDIVIDUALS FOUND.

Ecological: CHAPARRAL AND SAGE SCRUB WITH ANNUAL GRASSLANDS ON RIDGETOPS.

General:

Owner/Manager: PVT

Occurrence No.	141	**Map Index:**	20987	**EO Index:**	9169	**Element Last Seen:**	1989-08-24
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-05-01

Quad Summary: Romoland (3311762), Lake Elsinore (3311763), Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.74909 / -117.24608	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3734363 E477208	**Elevation (ft):**	1500
PLSS:	T05S, R04W, Sec. 12 (S)	**Acres:**	0.0

Location: 3.5 MILES E OF ROMOLAND.

Detailed Location: 6 INDIVIDUALS FOUND. K-RATS OCCUR THROUGHOUT THE PROPERTY.

Ecological: FLAT TO GENTLY ROLLING HILLS WITH NON-NATIVE GRASSLANDS AND SAGE SCRUB. SOME EUCALYPTUS GROVES. SOILS ARE LOAMY.

General:

Owner/Manager: PVT

Occurrence No.	167	**Map Index:**	21101	**EO Index:**	9117	**Element Last Seen:**	1976-XX-XX
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	1988-09-20
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1992-05-18

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.01725 / -117.21308	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3764089 E480326	**Elevation (ft):**	1750
PLSS:	T02S, R03W, Sec. 08 (S)	**Acres:**	0.0

Location: HILLS SOUTHWEST OF REDLANDS.

Detailed Location: EXTIRPATED

Ecological:

General:

Owner/Manager: UNKNOWN

Occurrence No.	168	**Map Index:** 21102	**EO Index:**	9116	**Element Last Seen:**	1988-08-15
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	1988-08-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1992-05-18

Quad Summary: Redlands (3411712)
County Summary: Riverside

Lat/Long:	34.00953 / -117.24494	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3763239 E477382	**Elevation (ft):**	1700
PLSS:	T02S, R04W, Sec. 12 (S)	**Acres:**	14.1

Location: HILLS SOUTHWEST OF REDLANDS. ABOUT 3.5 MILES SOUTH OF I-10.
Detailed Location: TRACE ABUNDANCE OVER ABOUT 12 ACRES.
Ecological: NON-NATIVE GRASSLAND. SLOPE: 0-20%. SOIL: MONSERATE.
General:
Owner/Manager: UNKNOWN

Occurrence No.	189	**Map Index:** 21200	**EO Index:**	18620	**Element Last Seen:**	1988-09-18
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	1988-09-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1992-06-02

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.81375 / -117.17861	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3741519 E483469	**Elevation (ft):**	1580
PLSS:	T04S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: 0.3 MILES SE OF ORANGE AVE. JCT. WITH FOOTHILL AVE. ABOUT 3 MILES NE OF PERRIS & ABOUT 2 MILES S OF PERRIS RESERVOIR.
Detailed Location: 20 ACRES OF TRACE DISTRIBUTION IN SMALL DISJUNCT PATCHES.
Ecological: NON-NATIVE GRASSLAND AT BASE OF ROCKY SLOPES COVERED BY RIVERSIDIAN SAGE SCRUB. SLOPE: 0-20%. SOIL: HANFORD, VISTA.
General:
Owner/Manager: UNKNOWN

Occurrence No.	190	**Map Index:** 21201	**EO Index:**	17712	**Element Last Seen:**	1988-09-18
Occ. Rank:	Poor		**Presence:**	Presumed Extant	**Site Last Seen:**	1988-09-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1992-06-02

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.76837 / -117.13518	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3736482 E487482	**Elevation (ft):**	1850
PLSS:	T05S, R02W, Sec. 06 (S)	**Acres:**	6.4

Location: 1.3 MILES NE OF MAPES ROAD JCT WITH MENIFEE ROAD; 5 MILES E OF PERRIS.
Detailed Location: ABOUT 10 ACRES OF TRACE ABUNDANCE.
Ecological: NON-NATIVE GRASSLAND AT BASE OF ROCKY STEEP SLOPES COVERED BY RIVERSIDIAN SAGE SCRUB. SLOPE: 0-10%. SOIL: CIENEBA, HANFORD.
General:
Owner/Manager: UNKNOWN

Occurrence No.	191	**Map Index:** 21199	**EO Index:**	18106		**Element Last Seen:**	1988-09-18
Occ. Rank:	None		**Presence:**	Extirpated		**Site Last Seen:**	1988-09-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-06-02

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.76279 / -117.14392	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3735864 E486672	**Elevation (ft):**	1610
PLSS:	T05S, R03W, Sec. 01 (S)	**Acres:**	0.0

Location: 0.5 MILES NW OF MAPES ROAD JCT. WITH BRIGGS ROAD; 5 MILES ESE OF PERRIS.
Detailed Location: EXTIRPATED
Ecological: NON-NATVIE GRASSLAND WITH SCATTERED RIVERSIDIAN SAGE SCRUB.
General: REPORTED HERE BY LEPRE IN 1983.
Owner/Manager: UNKNOWN

Occurrence No.	192	**Map Index:** 21198	**EO Index:**	26959		**Element Last Seen:**	1990-07-09
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1990-07-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-06-02

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.75368 / -117.23851	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3734870 E477910	**Elevation (ft):**	1440
PLSS:	T05S, R03W, Sec. 07 (S)	**Acres:**	0.0

Location: 0.8 MILES WSW OF MAPES ROAD JCT WITH GOETZ ROAD; 1.5 MILES SOUTH OF PERRIS.
Detailed Location:
Ecological: SITE FORMERLY IN RIVERSIDIAN SAGE SCRUB BUT NOW HEAVILY DISTURBED AND MOST SHRUBS EXTIRPATED. SPARSE COVER OF ANNUAL GRASSES AND FORBS.
General:
Owner/Manager: UNKNOWN

Occurrence No.	193	**Map Index:** 21207	**EO Index:**	14874		**Element Last Seen:**	1991-01-09
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1991-01-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1995-10-27

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.83955 / -117.34812	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744420 E467791	**Elevation (ft):**	1700
PLSS:	T04S, R05W, Sec. 12 (S)	**Acres:**	54.7

Location: 0.7 MILES NE OF CAJALCO ROAD JCT. WITH GAVILAN RD.
Detailed Location: APPROXIMATELY 50 INDIVIDUALS. SURROUNDING AREAS REPORT MEDIUM TO LOW DENSITIES.
Ecological: SITE IS FLAT, HEAVILY DISTURBED ABANDONED FIELDS, APPARENTLY SUBJECT TO HEAVY GRAZING. NORTHERN SECTION OF SITE IS HILLY, ROCKY, DISTURBED RIVERSIDEAN SAGE SCRUB.
General: THIS AREA MAY REPRESENT AN EXTENSION OF THE NORTHERN POPULATION AND MAY INDICATE A LARGE AREA OF CONTIGUOUS HABITAT.
Owner/Manager: PVT

Occurrence No.	198	**Map Index:**	38388	**EO Index:**	33395	**Element Last Seen:**	1994-11-30
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1994-11-30
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-17

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.78671 / -117.34499	**Accuracy:**	80 meters
UTM:	Zone-11 N3738560 E468061	**Elevation (ft):**	2160
PLSS:	T04S, R04W, Sec. 30 (S)	**Acres:**	0.0

Location: HALL PROPERTY,EAST OF PIEDRAS ROAD, 0.35 MILE SOUTH OF SANTA ROSA ROAD AND 3.5 MILES NORTHWEST OF STEELE PEAK.

Detailed Location: NORTHWEST CORNER OF THE PROPERTY, AREA TO THE WEST AND NORTHWEST HAS THE HIGHEST POTENTIAL FOR OTHER SKR.

Ecological: LEVEL TO GENTLY SLOPING LAND WITH A VARIETY OF LOAM SOILS. CHAMISE CHAPARRAL IS DOMINANT VEGETATION TYPE WITH RUDERAL DISTURBED GRASSLAND A SECONDARY TYPE AND WHERE THE SKR WAS FOUND.

General: 1 FEMALE ADULT CAPTURED, 1994.

Owner/Manager: PVT

Occurrence No.	200	**Map Index:**	38668	**EO Index:**	33675	**Element Last Seen:**	1992-10-30
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-10-30
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-08-17

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.86915 / -117.30816	**Accuracy:**	specific area
UTM:	Zone-11 N3747690 E471498	**Elevation (ft):**	1700
PLSS:	T03S, R04W, Sec. 33 (S)	**Acres:**	25.4

Location: MARCH AFB, 0.25 MILES NNE OF INTERSECTION OF BARTON ST & NANDINA AVE, 0.4 MILE SW OF BARTON ST & MARIPOSA AVE.

Detailed Location: STEPHENS' K-RATS WERE FOUND IN ALL SECTIONS OF THE BASE COVERED BY THE SURVEY. SITE 1; DENSITY AT THIS SITE ESTIMATED AT 6 K-RATS PER HECTARE.

Ecological: EXTENSIVE AREA OF DISTURBED GRASSLAND: BROMUS SP., AVENA SP., ERODIUM CICUTARIUM, CRETHROGYNE FILAGINIFOLIA, HEMIZONIA SP., TRICHOSTEMA LANCEOLATUM, BRASSICA GENICULATA, EREMOCARPUS SETIGERUS. TOPOGRAPHY IS LEVEL TO GENTLY SLOPING.

General: 3 CAPTURED OCT 28-30 1992, 1 MALE & 1 FEMALE ADULT, & 1 JUVENILE FEMALE.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	208	**Map Index:** 55484	**EO Index:**	55484		**Element Last Seen:**	2003-08-06
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-08-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-05-13

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89794 / -117.02770	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3750840 E497438	**Elevation (ft):**	2000
PLSS:	T03S, R01W, Sec. 19 (S)	**Acres:**	0.0

Location: EAST SIDE OF LABORDE CANYON, 3.5 MILES SW OF BEAUMONT

Detailed Location:

Ecological: HABITAT CONSISTS OF NON-NATIVE (ANNUAL) GRASSLAND, DOMINATED BY BROMES. CHAMISE FORMS THE DOMINANT OVERSTORY IN THE SOUTHERN HALF OF THE TRAPLINE. WHIPPLE'S YUCCA IS COMMON ALONG THE NORTHERN HALF OF THE TRAPLINE.

General: IN AUG 2003, 3 ADULTS WERE CAPTURED (POSSIBLY 2 WERE RECAPTURES, AS ALL CAPTURES WERE AT THE SAME TRAP).

Owner/Manager: PVT-LOCKHEED CORP

Occurrence No.	215	**Map Index:** 55804	**EO Index:**	55820		**Element Last Seen:**	1993-08-11
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1993-08-11
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-06-14

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.86964 / -117.28290	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3747738 E473834	**Elevation (ft):**	1700
PLSS:	T03S, R04W, Sec. 34 (S)	**Acres:**	159.0

Location: RIVERSIDE NATIONAL CEMETERY, MARCH AIR FORCE BASE

Detailed Location:

Ecological:

General: 1 MALE CAPTURED/RELEASED, 10-12 AUG 1993; 2 MALES/1 FEMALE CAPTURED/RELEASED ON 8-10 NOV 1993.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	221	**Map Index:**	55852	**EO Index:**	55868	**Element Last Seen:**	1999-09-22
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-09-22
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-06-21

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.91788 / -117.05807	**Accuracy:**	80 meters
UTM:	Zone-11 N3753052 E494632	**Elevation (ft):**	1835
PLSS:	T03S, R02W, Sec. 11 (S)	**Acres:**	0.0

Location: WEST SIDE OF JACKRABBIT TRAIL, SOUTH OF HIGHWAY 60, IN THE BADLANDS AREA OF RIVERSIDE COUNTY.

Detailed Location: SPARSE SKR DISTRIBUTION WAS FOUND ALONG THE DRAINAGE EDGES, EXTENDING UP SLOPES; DISTRIBUTION WAS RESTRICTED TO GENTLER SLOPES.

Ecological: HABITAT CONSISTS OF DISTURBED ANNUAL GRASSLAND, RESULTING FROM A MASSIVE REGIONAL FIRE.

General: 22 SEP 1999: PATCHY SKR OCCUPATION OCCURS THROUGHOUT THE AREA, PRIMARILY RESTRICTED TO DRAINAGE BOTTOMS; OCCUPATION IS PRIMARILY THAT OF TRANSIENT INDIVIDUALS RATHER THAN THAT OF PERMANENT RESIDENTS.

Owner/Manager: UNKNOWN

Occurrence No.	222	**Map Index:**	63131	**EO Index:**	63223	**Element Last Seen:**	1992-10-29
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-10-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-01-28

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.88453 / -117.29880	**Accuracy:**	specific area
UTM:	Zone-11 N3749393 E472368	**Elevation (ft):**	1680
PLSS:	T03S, R04W, Sec. 28 (S)	**Acres:**	22.5

Location: ALONG DRAINAGE SOUTH OF VAN BUREN BLVD, APPROXIMATELY 1 MILE WSW OF ARNOLD HEIGHTS, MARCH AFB.

Detailed Location: STUDY AREA 4.

Ecological: NARROW BAND OF WILLOW RIPARIAN WOODLAND IN NATURAL DRAINAGE SURROUNDED BY DIST GRASSLAND, SCATTERED PATCHES OF SAGE SCRUB. TREE CANOPY BROKEN/SPARSE AT SOME LOCATIONS, SMALL STANDS OF CATTAILS PRESENT. TOPOGRAPHY: LEVEL TO SLIGHTLY SLOPING.

General: 2 ADULT MALES CAPTURED AND RELEASED ON 28-29 OCT 1992.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	230 **Map Index:** 77392	**EO Index:**	78301	**Element Last Seen:**	1998-06-23
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	1998-06-23
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-11-24

Quad Summary: Winchester (3311761), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.75129 / -117.10774	**Accuracy:**	specific area
UTM:	Zone-11 N3734585 E490020	**Elevation (ft):**	
PLSS:	T05S, R02W, Sec. 08 (S)	**Acres:**	143.0

Location: EAST OF JUPITER FLAT AND WATSON ROAD INTERSECTION, SW SIDE OF LAKEVIEW MOUNTAINS, 0.3 MILES N FROM THE TOWN OF HOMELAND.

Detailed Location: SEA VIEW/WATSON ROADS RUN THROUGH PLOT. MAPPED ACCORDING TO MAP PROVIDED.

Ecological: DISTURBED RIVERSIDEAN SAGE SCRUB AND ANNUAL GRASSLAND DOMINATED BY ENCELIA FARINOSA, ERIOGONUM FASCICULATUM, BRASSICA NIGRA, AVENA BARBATA, BROMUS MADRITENSIS, & AMSINCKIA MENZIESII. SOILS: ROCKY, SANDY LOAMS. SITE BURNED IN 1997.

General: 4 ADULTS RECORDED 23 JUNE 1998.

Owner/Manager: PVT

Occurrence No.	231 **Map Index:** 77430	**EO Index:**	78334	**Element Last Seen:**	2004-08-18
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2004-08-18
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2010-01-20

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90350 / -117.31295	**Accuracy:**	specific area
UTM:	Zone-11 N3751500 E471066	**Elevation (ft):**	1
PLSS:	T03S, R04W, Sec. 16 (S)	**Acres:**	15.0

Location: SSE OF ALESSANDRO BLVD & BARTON ST, 1.9 MI W OF I-215 (ESCONDIDO FWY) & INTERCHANGE 27A, 1.9 MI NW OF ARNOLD HEIGHTS.

Detailed Location: AREA LIES EAST OF BARTON STREET, AND TO THE NORTH OF KENNEDY DRIVE. MARCH STEPHENS' KANGAROO RAT PRESERVE (FORMERLY PART OF MARCH AFB). MAPPED ACCORDING TO COORDINATES PROVIDED.

Ecological: NON-NATIVE FORBS AND ANNUAL GRASSES INCLUDING ERIODONUM SP., BROMUS MADRITENSIS, B. DIANDRUS, HORDEUM PUSILLUM, VULPIA MYUROS, AND SCHISMUS BARBATUS. WAS A WILDLIFE PRESERVE @ TIME OF SURVEY, SURROUNDED BY URBANIZATION.

General: 22 ADULTS AND 4 JUV'S CAPTURED BETWEEN 24-29 MAR 2004. 29 ADULTS & 1 JUV CAPTURED BETWEEN 5-10 APR 2004. 32 ADULTS CAPTURED 5-10 AUG '04. 14 ADULTS & 1 JUV CAPTURED 13-18 AUG '04.

Owner/Manager: MARCH JPA

Occurrence No.	239	**Map Index:** 77792	**EO Index:**	78694		**Element Last Seen:**	2004-08-18
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	2004-08-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-01-13

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.91174 / -117.29243	**Accuracy:**	specific area
UTM:	Zone-11 N3752409 E472965	**Elevation (ft):**	1575
PLSS:	T03S, R04W, Sec. 15 (S)	**Acres:**	386.0

Location: SW CORNER OF I-215 (ESCONDIDO FWY) & ALESSANDRO BLVD INTERSECTION. MARCH STEPHENS' KANGAROO RAT PRESERVE.

Detailed Location: POLYGON MAPPED ACCORDING TO MAP PROVIDED. 1992: SITE 6

Ecological: HABITAT IS ANNUAL GRASSLAND/RIVERSIDEAN COASTAL SAGE SCRUB. LEVEL TO GENTLY ROLLING TOPOGRAPHY. 2004: WAS A WILDLIFE PRESERVE AT TIME OF STUDY, SURROUNDED BY URBANIZATION. TO BE DEVELOPED AS LIGHT INDUSTRIAL.

General: 8 SKR'S TRAPPED IN SEC 15 DURING 450 TRAP NIGHTS IN MAR 1983. SPECIES FOUND 15 AUG '88 IN LOW-MED ABUNDANCE. 14 ADULT FEMALES, 10 ADULT MALES, 1 JF & 1 JM CAPT 13-15 OCT '92. 1 ADULT 5-10 APR 2004. 4 ADULTS 13-18 AUG 2004.

Owner/Manager: MARCH JPA

Occurrence No.	240	**Map Index:** 77793	**EO Index:**	78695		**Element Last Seen:**	1988-03-XX
Occ. Rank:	None		**Presence:**	Extirpated		**Site Last Seen:**	1988-03-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Decreasing		**Record Last Updated:**	2010-01-12

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.94427 / -117.30192	**Accuracy:**	specific area
UTM:	Zone-11 N3756017 E472099	**Elevation (ft):**	1528
PLSS:	T03S, R04W, Sec. 04 (S)	**Acres:**	33.0

Location: E OF SYCAMORE CANYON, W OF ESCONDIDO FWY (I-215) & MORENO VALLEY FWY (SR 60) JCT, 0.3 MI W FROM THE TOWN OF BOX SPRINGS.

Detailed Location: BOUNDED BY SYCAMORE CANYON BLVD TO EAST & FAIR ISLE DRIVE ON THE NORTHWEST. FSF GIVES LOCATION AS SW 1/4 OF SEC 33. POLYGON MAPPED ACCORDING TO MAP PROVIDED.

Ecological: 1988: AREA PROPOSED FOR DEVELOPMENT.

General: SPECIES FOUND HERE IN 1988 DURING TRAPPING SURVEY. 2008: AERIAL IMAGERY SHOWS SITE AS COMPLETELY DEVELOPED AS HOUSING AND SPECIES EXTIRPATED FROM SITE.

Owner/Manager: PVT

Occurrence No.	241	**Map Index:** 77794	**EO Index:**	78696		**Element Last Seen:**	1989-07-30
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-07-30
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-01-11

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95338 / -117.29720	**Accuracy:**	specific area
UTM:	Zone-11 N3757026 E472538	**Elevation (ft):**	1575
PLSS:	T02S, R04W, Sec. 33 (S)	**Acres:**	73.0

Location: ALONG WEST & EAST SIDE OF MORTON ROAD, 0.3 MILES NORTH FROM THE TOWN OF BOX SPRINGS, 2 MILES SE FROM UC RIVERSIDE.

Detailed Location: MAPPED ACCORDING TO MAP AND QUADS GIVEN.

Ecological: TOPOGRAPHY SLOPING TO LEVEL. DOMINANT VEGETATION INCLUDES SEVERAL NON-NATIVE GRASSES & FALLOW AGRICULTURAL FIELDS. SOILS CONSIST OF SANDY LOAMS. PORTION USED TO BE OLD CHRISTMAS TREE FARM.

General: SPECIES FOUND ON 15 AUG 1988 DURING POPULATION ASSESSMENT. SIGNS OBS 12 JUN 1989 IN NE SECTION. 3 INDIVIDUALS TRAPPED IN NE SECTION ON 30 JUL 1989.

Owner/Manager: UNKNOWN

Occurrence No.	245	**Map Index:** 78175	**EO Index:**	79076		**Element Last Seen:**	1989-01-XX
Occ. Rank:	None		**Presence:**	Possibly Extirpated		**Site Last Seen:**	1989-01-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-02-23

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90581 / -117.32935	**Accuracy:**	specific area
UTM:	Zone-11 N3751762 E469550	**Elevation (ft):**	1556
PLSS:	T03S, R04W, Sec. 17 (S)	**Acres:**	69.0

Location: TRAUTWEIN RD & JOHN F. KENNEDY DR, 1.6 MI SW FROM SYCAMORE CANYON ECOLOGICAL RESERVE, 3 MI W FROM TOWN OF WEST MARCH.

Detailed Location: MAPPED ACCORDING TO MAP PROVIDED.

Ecological: 1988: ACTIVE, DRY FARMED AG FIELDS W/RIPARIAN IN DRAINAGES & ISOLATED RIVERSIDIAN SAGE SCRUB REMNANTS. LOW TO HIGH ABUNDANCE OF SKR. NOT RECOMMENDED FOR PROTECTION AS TOO CLOSE TO URBAN LEVELS OF DEVELOPMENT, NO LINKAGE TO POLYGON TO NW.

General: POLYGON WAS ONCE PART OF OCC #69 LOCATED TO THE NW. PREVIOUS NOTES STATED THIS POLYGON IS IN DANGER OF BEING SEPARATED FROM INTERACTION (BREEDING) W/THE MAIN POPULATION. 2009: AERIAL IMAGERY SHOWS AREA DEVELOPED & SPECIES LIKELY EXTIRPATED.

Owner/Manager: CITY OF RIVERSIDE, PVT

Dipodomys merriami parvus

Element Code: AMAFD03143

San Bernardino kangaroo rat

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:**	G5T1
	State:	None		**State:**	S1
	Other:	DFG_SSC-Species of Special Concern			

Habitat: **General:** ALLUVIAL SCRUB VEGETATION ON SANDY LOAM SUBSTRATES CHARACTERISTIC OF ALLUVIAL FANS AND FLOOD PLAINS.

Micro: NEEDS EARLY TO INTERMEDIATE SERAL STAGES.

Occurrence No.	3	**Map Index:**	44875	**EO Index:**	44875	**Element Last Seen:**	2006-10-18
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-10-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-08-30

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09392 / -117.19159	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3772586 E482326	**Elevation (ft):**	1190
PLSS:	T01S, R03W, Sec. 09 (S)	**Acres:**	1187.0

Location: SANTA ANA WASH, BETWEEN THE SAN BERNARDINO INT'L AIRPORT & CHURCH ST, N TO FIFTH STREET. 3.5 MI NW FROM TOWN OF MENTONE.

Detailed Location: 1993 LOCATION, "THE SANTA ANA RIVER WASH, REDLANDS." 1998 & 2002, FIFTH ST PROJECT. 2002 AROUND ROBERT'S READY MIX. 2005, S OF NORTON AFB. 2000 & 2006, ALABAMA & ORANGE ST PROJECT, 22 ADULTS TRAPPED, 2006 - RELOCATED OUTSIDE FENCED AREA.

Ecological: SOILS MOSTLY SANDY WITH INTERMIXED RIVERWASH. DISTURBED PIONEER ALLUVIAL FAN SAGE SCRUB; ERIOGONUM FASCICULATUM, HEMIZONIA SQUARROSA, NICOTIANNA GLAUCA, OENOTHERA CALIFORNICA, SALIX LASIOLEPIS, BACCHARIS SALICIFOLIA.

General: 2 COLL, BOTH TO SBCM, 1991. 3 COL '93 (MVZ #182964-182966). 8 IN '98. 2 COL, 2000. 22+ COL FOR LACM 7 JUN-18 AUG '02. 117 CAP, 26 TRAPLINES '02. 4 CAP '02. 1 OBS '04. 22 CAP '05. 22 ADULTS '06. 5 CAPT BETWEEN THIS OCC & OCC #10 18 OCT '06.

Owner/Manager: PVT, CITY OF HIGHLAND, SBD FC

Occurrence No.	10	**Map Index:**	45091	**EO Index:**	45091	**Element Last Seen:**	2006-10-18
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-10-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-02-01

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09514 / -117.14424	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3772714 E486693	**Elevation (ft):**	1500
PLSS:	T01S, R03W, Sec. 12 (S)	**Acres:**	2229.0

Location: SANTA ANA WASH, E OF CHURCH STREET EXTENDING TO MORTON CYN, JUST N OF REDLANDS AIRPORT, 1.6 MI N FROM TOWN OF MENTONE.

Detailed Location: JUNE 2000: SOME TRAPLINES CROSSED SEVERAL HABITATS (WASH & SCRUB). OCT 2000: LOCATION GIVEN AS SECTION 8, GREENSPOT. MAR, APR 2001: NOT PRESENT E 1/2 SEC 8. AUG 2001:SPECIES TRAPPED (285 TRAP NIGHTS) EAST, NORTH & WEST OF AIRPORT RUNWAY.

Ecological: HABITAT CONSISTS OF RIVERSIDIAN FAN SAGE SCRUB WITH SANDY SUBSTRATE. MATURE ALLUVIAL FAN SAGE SCRUB LOCATED AROUND AIRPORT. SURROUNDING LAND IS OPEN.

General: 12 CAPTURED JUNE 2000. 6 ADULTS BETWEEN THIS OCCURRENCE & OCC #14, OCT 2000 (NOT IN E 1/2 SEC 8). MAR, APR '01: NOT PRESENT. 9 M, 8 F (6 ADULTS, 8 SUB-ADULTS, 3 JUV) CAPT 14-15 AUG 2001. 5 CAPT BETWEEN THIS OCC & OCC #3 ON 18 OCT 2006.

Owner/Manager: SBVWCD, REDLANDS MUN AIRPORT

Occurrence No.	11	**Map Index:** 47193	**EO Index:**	47193		**Element Last Seen:**	2001-09-16
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2001-09-16
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-03-21

Quad Summary: Redlands (3411712), Harrison Mtn. (3411722)

County Summary: San Bernardino

Lat/Long:	34.12476 / -117.18964	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3776006 E482511	**Elevation (ft):**	1400
PLSS:	T01N, R03W, Sec. 34 (S)	**Acres:**	85.0

Location: ALONG CITY CREEK, EAST OF BOULDER AVENUE AND SOUTH OF THE CONFLUENCE OF CITY CREEK AND NORTH FORK CANAL, HIGHLAND.

Detailed Location: SITE IS LOCATED WITHIN USFWS PROPOSED CRITICAL HABITAT FOR SAN BERNARDINO KANGAROO RAT, ALL UNDEVELOPED, WITH HOUSING TO THE EAST AND WEST AND OPEN SPACE TO THE NORTH AND SOUTH.

Ecological: HABITAT CONSISTS OF MATURE RIVERSIDEAN ALLUVIAL FAN SCRUB, DOMINATED BY ADENOSTOMA FASCICULATUM, LEPIDOSPARTUM SQUAMATUM, ARTEMISIA CALIFORNICA, AND ERIOGONUM FASCICULATUM; SOME DISTURBED ALLUVIAL FAN SCRUB.

General: 1 INDIVIDUAL WAS CAPTURED AT THE BASE LINE ROAD PROJECT SITE IN 1998. 33 INDIVIDUALS CAPTURED/RELEASED IN 2001.

Owner/Manager: PVT

Occurrence No.	14	**Map Index:** 49711	**EO Index:**	49711		**Element Last Seen:**	2000-10-03
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2000-10-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2002-12-20

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07578 / -117.08504	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3770561 E492153	**Elevation (ft):**	2200
PLSS:	T01S, R02W, Sec. 22 (S)	**Acres:**	1260.9

Location: MILL CREEK, NORTH OF CRAFTON HILLS AND JUST EAST OF REDLANDS.

Detailed Location: LOCATION GIVEN AS SECTIONS 16 AND 22; CRAFTON HILLS, MILL CREEK AND GARNET STREET.

Ecological: HABITAT CONSISTS OF SANDY SUBSTRATE WITH OPEN ALLUVIAL FAN SCRUB.

General: 6 ADULTS DETECTED BETWEEN THIS OCCURRENCE AND OCCURRENCE 10 DURING OCT 2000.

Owner/Manager: UNKNOWN

Occurrence No.	16	**Map Index:** 57228	**EO Index:**	49724		**Element Last Seen:**	2004-07-07
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2004-07-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-03-24

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08040 / -117.14745	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3771080 E486396	**Elevation (ft):**	1540
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	41.1

Location: NORTH OF I-10 AND SOUTH OF SANTA ANA WASH, NE OF REDLANDS.

Detailed Location: 600 FEET SOUTH OF PIONEER AVE, NORTH OF SAN BERNARDINO AVE AND 0.55 MILE EAST OF JUDSON STREET. TRAP LINES 2, 3 - FROM SAN BERNARDINO AVE TO ~375 FEET NORTH OF ROAD. ONLY THE TOWNSHIP/RANGE/SEC GIVEN FOR 2004 OCCURRENCE.

Ecological: HABITAT AT TRAP LINES 2 & 3 CONSISTS OF RUDERAL VEGETATION. ERIOGONUM SCRUB (70% COVER-PRIMARILY ERIOGONUM FASCICULATUM, OLD ALLUVIAL WASH) & HERBACEOUS COVER (95%) LOCATED TO NORTH OF TRAP LINES 2, 3. SOILS ARE LOOSE, SANDY WITH SOME ROCK.

General: 8 INDIVIDUALS (10 CAPTURES) DURING 15, 16 AUG 2001. 18 CAPTURES (NUMBER OF INDIVIDUALS UNKNOWN) AT 4 TRAPLINES, BETWEEN 9-12 JUL 2002. 1 INDIVIDUAL OBS ON 7 JUL 2004.

Owner/Manager: UNKNOWN

Occurrence No.	17	**Map Index:** 50371	**EO Index:**	50371		**Element Last Seen:**	2002-12-07
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-12-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-03-03

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10820 / -117.19184	**Accuracy:**	80 meters
UTM:	Zone-11 N3774169 E482306	**Elevation (ft):**	1250
PLSS:	T01S, R03W, Sec. 04 (S)	**Acres:**	0.0

Location: EAST OF THE INTERSECTION OF HIGHWAY 30 AND EAST 5TH STREET, NORTH OF THE SANTA ANA RIVER WASH, HIGHLAND.

Detailed Location:

Ecological: HABITAT CONSISTS OF AGRICULTURAL DEVELOPMENT SURROUNDING THE CAPTURE SITE.

General: 1 INDIVIDUAL CAPTURED DURING SURVEYS CONDUCTED FROM 2-7 DEC 2002.

Owner/Manager: UNKNOWN

Occurrence No.	20	**Map Index:**	71045	**EO Index:**	71957	**Element Last Seen:**	1998-06-29
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1998-06-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-03-20

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.10274 / -117.19615	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3773565 E481907	**Elevation (ft):**	1220
PLSS:	T01S, R03W, Sec. 09 (S)	**Acres:**	0.0

Location: ROBERTSON'S READY MIX STORAGE SITE, EAST HIGHLAND.
Detailed Location:
Ecological:
General: 16 INDIVIDUALS WERE TRAPPED DURING A PRESENCE/ABSENCE STUDY.
Owner/Manager: PVT

Occurrence No.	21	**Map Index:**	71053	**EO Index:**	71964	**Element Last Seen:**	1998-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1998-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-03-21

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.11355 / -117.19299	**Accuracy:**	80 meters
UTM:	Zone-11 N3774763 E482200	**Elevation (ft):**	1250
PLSS:	T01S, R03W, Sec. 04 (S)	**Acres:**	0.0

Location: SE EDGE OF TOWN OF HIGHLAND, CITY CREEK FLOODPLAIN, E SIDE OF PERCOLATION BASIN.
Detailed Location:
Ecological:
General: 1 INDIVIDUAL CAPTURED DURING A PRESENCE/ABSENCE TRAPPING STUDY FOR THE SBKR AT THE STORM DRAIN PROJECT SITE.
Owner/Manager: PVT

Occurrence No.	22	**Map Index:**	77930	**EO Index:**	71968	**Element Last Seen:**	2007-07-17
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-07-17
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-01-28

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.08052 / -117.14096	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3771093 E486994	**Elevation (ft):**	1550
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	11.0

Location: REDLANDS SPORTS PARK, 0.4 MILES SE OF REDLANDS AIRPORT, ABOUT 0.9 MILES NW FROM THE TOWN OF MENTONE.
Detailed Location: JUST NORTH OF E SAN BERNARDINO AVENUE, WEST OF N. WABASH AVENUE, SOUTH OF SESSUMS DRIVE. MAPPED ACCORDING TO MAP PROVIDED. 2002: TRAPLINES D&E.
Ecological: DISTURBED ALLUVIAL FAN SCRUB. ENCELIA FARINOSA PROBABLY ONCE DOMINANT. HAD BEEN A CITRUS ORCHARD, TREES NOW REMOVED. TO BE DEVELOPED INTO A SPORTS PARK.
General: 12 CAPTURES AT 2 TRAPLINES BETWEEN 9-12 JUL 2002. 16 ADULTS TRAPPED 17 JULY 2007.
Owner/Manager: CITY OF REDLANDS

Occurrence No.	23	**Map Index:**	71057	**EO Index:**	71969	**Element Last Seen:**	1997-04-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1997-04-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-03-24

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: San Bernardino

Lat/Long:	34.08540 / -117.25325	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3771654 E476635	**Elevation (ft):**	1060
PLSS:	T01S, R04W, Sec. 13 (S)	**Acres:**	0.0

Location: IN THE VICINITY OF THE INTERSECTION OF CENTRAL AVE & PALM MEADOWS DR. SAN BERNARDINO.

Detailed Location:

Ecological: HABITAT IS DOMINATED BY A CALIFORNIA BUCKWHEAT (ERIOGONUM FASCICULATUM) OVERSTORY, WITH A SPARSE OPEN UNDERSTORY & A SANDY TO GRAVELY SUBSTRATE.

General: 9 INDIVIDUALS CAPTURED AT 2 TRAPPING GRID SITES IN APRIL 1997.

Owner/Manager: UNKNOWN

Occurrence No.	24	**Map Index:**	71058	**EO Index:**	71970	**Element Last Seen:**	2005-11-16
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-11-16
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-03-24

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09248 / -117.23066	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3772434 E478722	**Elevation (ft):**	1050
PLSS:	T01S, R03W, Sec. 07 (S)	**Acres:**	23.0

Location: SANTA ANA RIVER WASH SOUTH OF SAN BERNARDINO INTERNATIONAL AIRPORT.

Detailed Location: SOUTH OF THE SAN BERNARDINO INTERNATIONAL AIRPORT RD.

Ecological: HABITAT IS ALLUVIAL SAGE SCRUB VEGETATION CONSISTING OF E. FASCICULATUM, C. CALIFORNICA, L. SQUAMATUM, O. PARRYI, E. TRICHOCALYX, E. DENSIFOLIUM SANCTORUM, S. DOUGLASII. SOILS HERE ARE SANDY.

General: 8 INDIVIDUALS CAPTURED IN APRIL 1997. 10 ADULTS & 3 JUV/SUB ADULTS CAPTURED BETWEEN 15-16 NOV 2005.

Owner/Manager: UNKNOWN

Occurrence No.	25	**Map Index:**	71059	**EO Index:**	71971	**Element Last Seen:**	2005-11-16
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-11-16
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-03-24

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09633 / -117.22234	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3772859 E479489	**Elevation (ft):**	1050
PLSS:	T01S, R03W, Sec. 08 (S)	**Acres:**	22.0

Location: NORTH OF SANTA ANA RIVER, SOUTH EAST OF SAN BERNARDINO INTERNATIONAL AIRPORT.

Detailed Location: NORTH OF THE SAN BERNARDINO INTERNATIONAL AIRPORT RD.

Ecological: VARIABLE HABITAT TYPES ARE PRESENT, INCLUDING DISTURBED ANNUAL GRASSLAND WITH A FEW MINOR REMNANTS OF ALLUVIAL SAGE SCRUB, & SCATTERED PATCHES OF PURE ALLUVIAL SAGE SCRUB. SOILS HERE ARE SANDY OR SANDY LOAMY.

General: 2 INDIVIDUALS CAPTURED IN APRIL 1997. 5 ADULTS CAPTURED BETWEEN 15-16 NOV 2005.

Owner/Manager: UNKNOWN

Occurrence No.	34	**Map Index:** 77876	**EO Index:**	78763		**Element Last Seen:**	2007-08-20
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-08-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-03-09

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07590 / -117.11290	**Accuracy:**	specific area
UTM:	Zone-11 N3770578 E489582	**Elevation (ft):**	1857
PLSS:	T01S, R02W, Sec. 20 (S)	**Acres:**	15.0

Location: REDLANDS PERCOLATION BASINS, SOUTH OF MILL CREEK, 1.9 MILES ESE OF REDLANDS AIRPORT, 1.1 MI ENE FROM TOWN OF MENTONE,

Detailed Location: MENTONE PIPELINE PROJECT. BOUNDED TO THE WEST BY TENNESSEE STREET, ALONG AND TO THE SOUTH OF SAN BERNARDINO AVENUE, NORTH OF MADEIRA AVENUE, & SAPPHIRE AVENUE TO THE EAST. 3 TRAPPING SITES MAPPED ACCORDING TO UTM COORDINATES PROVIDED.

Ecological: ALLUVIAL FAN SCRUB DOMINATED BY ENCELIA FARINOSA. OPEN SPACE, PERCOLATION PONDS, OLD BUILDINGS, ROADS, DUMPING, AND VEGETATION REMOVAL IN AREA. SAN DIEGO POCKET MOUSE ALSO OBSERVED IN THIS AREA.

General: 15 ADULTS AND 1 JUVENILE CAPTURED ON 20 AUG 2007.

Owner/Manager: UNKNOWN, PVT

Occurrence No.	35	**Map Index:** 77881	**EO Index:**	78778		**Element Last Seen:**	2008-10-22
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2008-10-22
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-01-27

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08239 / -117.11015	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3771297 E489837	**Elevation (ft):**	1870
PLSS:	T01S, R02W, Sec. 17 (S)	**Acres:**	41.0

Location: MILL CREEK, JUST S OF GREENSPOT (HISTORICAL), 1.6 MILES N OF CRAFTON RESERVOIR, ABOUT 1.5 MI NE FROM TOWN OF MENTONE.

Detailed Location: JUST SOUTH OF FLORIDA AVE AND WEST OF AMETHYST STREET. MAPPED ACCORDING TO 1/4 SECTION PROVIDED (NW 1/4 OF SE 1/4 OF T01S R02W SECTION 17), AS COORDINATES GIVEN PUT LOCATION IN NW 1/4 OF T01S, R02W, SEC 21 WHICH DOESN'T MAP SITE DESCRIPTION

Ecological: OPEN SPACE WITH PERCOLATION PONDS TO THE SOUTH OF SITE. RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB. DOMINANT PLANTS INCLUDE: SCALEBROOM, CA BUCKWHEAT, CA SAGEBRUSH, GOLDEN ASTER, BRITTLEBRUSH, CHAMISE, VARIOUS ANNUAL FORBS, AND NON-NATIVE GRASSES.

General: 32 ADULTS CAPTURED ON 22 OCT 2008 DURING 420 TRAP NIGHTS OF EFFORT.

Owner/Manager: UNKNOWN

Occurrence No.	40	**Map Index:**	24993	**EO Index:**	79021	**Element Last Seen:**	1931-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1931-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-02-17

Quad Summary: Sunnymead (3311782), Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.01874 / -117.27110	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3764267 E474969	**Elevation (ft):**	1270
PLSS:	T02S, R04W (S)	**Acres:**	2755.2

Location: RECHE CANYON, 1.4 MILES EAST OF BLUE MOUNTAIN, ABOUT 4 MILES SE OF COLTON.

Detailed Location: EXTENDS SE FROM BARTON ROAD ALONG RECHE CANYON ROAD DOWN TO CONSOLE SPRINGS. 1898 RECORD "HERRON'S RANCH, RECHE CANYON, 4 MI SE COLTON." 1903 RECORDS LOCALITY GIVEN AS "RECHE CANYON." 1917 RECORDS STATE "RECHE CANYON, 3 MI SE OF COLTON."

Ecological:

General: USNM SPECIMEN #'S 31136 & 31137 COLL IN 1891 BY FRANK STEPHENS. UCLA #38 COLL IN 1898 BY F. STEPHENS. USNM #'S 127930-127932 &127975 COLL IN 1903 BY F. STEPHENS. UCLA #'S 1149-1150 COLL IN 1917 BY LM HUEY. SBMNH #'S 6989-6992 COLL IN 1931.

Owner/Manager: UNKNOWN

Occurrence No.	46	**Map Index:**	78148	**EO Index:**	79040	**Element Last Seen:**	1913-11-08
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1913-11-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-02-18

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.91920 / -117.15813	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3753209 E485383	**Elevation (ft):**	1619
PLSS:	T03S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: S OF MORENO VALLEY FWY (SR 60) & REDLANDS BLVD, NORTH OF LAKE PERRIS RECREATION AREA, MORENO.

Detailed Location: RECORD LOCALITY GIVEN AS "MORENO." COORDINATES PROVIDED PUT LOCATION BETWEEN BAY AVE & ALESSANDRO BLVD., JUST WEST OF REDLANDS BLVD. MAPPED ACCORDING TO COORDINATES PROVIDED.

Ecological:

General: LACM SPECIMEN #105 COLLECTED ON 8 NOV 1913 BY H.S. SWARTH.

Owner/Manager: UNKNOWN

Chaetodipus fallax fallax

Element Code: AMAFD05031

northwestern San Diego pocket mouse

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T3
	State:	None		**State:**	S2S3
	Other:	DFG_SSC-Species of Special Concern			
Habitat:	**General:**	COASTAL SCRUB, CHAPARRAL, GRASSLANDS, SAGEBRUSH, ETC. IN WESTERN SAN DIEGO CO.			
	Micro:	SANDY, HERBACEOUS AREAS, USUALLY IN ASSOCIATION WITH ROCKS OR COARSE GRAVEL.			

Occurrence No.	2	**Map Index:**	38388	**EO Index:**	33458	**Element Last Seen:**	1994-11-30
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1994-11-30
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-25

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.78671 / -117.34499	**Accuracy:**	80 meters
UTM:	Zone-11 N3738560 E468061	**Elevation (ft):**	2160
PLSS:	T04S, R04W, Sec. 30 (S)	**Acres:**	0.0

Location: HALL PROPERTY,EAST OF PIEDRAS ROAD, 0.35 MILE SOUTH OF SANTA ROSA ROAD AND 3.5 MILES NORTHWEST OF STEELE PEAK.
Detailed Location: NORTHWEST CORNER OF THE PROPERTY.
Ecological: LEVEL TO GENTLY SLOPING LAND WITH A VARIETY OF LOAM SOILS. CHAMISE CHAPARRAL IS DOMINANT VEGETATION TYPE WITH RUDERAL DISTURBED GRASSLAND A SECONDARY TYPE.
General: 1 FEMALE ADULT CAPTURED, 1994.
Owner/Manager: PVT

Occurrence No.	3	**Map Index:**	04335	**EO Index:**	33459	**Element Last Seen:**	1994-09-16
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1994-09-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-25

Quad Summary: San Jacinto (3311678), Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.84666 / -117.00260	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3745154 E499759	**Elevation (ft):**	1700
PLSS:	T04S, R01W, Sec. 05 (S)	**Acres:**	36.9

Location: 1.0 MI NORTHWEST OF GILMAN HOT SPRINGS, EAST OF INTERSECTION GILMAN SPRINGS ROAD AND HIGHWAY 79.
Detailed Location: CAPTURED AT TRAP SITES 12 AND 13.
Ecological: COASTAL SAGE SCRUB HABITAT. SPARCE RUDERAL GRASSLAND, WITH GENERALLY LOAMY SOILS AND PATCHES OF SANDY/LOAMY SUBSTRATE.
General: 3 CAPTURED JULY 1994 AND 2 CAPTURED SEPT 1994.
Owner/Manager: RIV COUNTY-HWY COMMISSION

Occurrence No.	4	**Map Index:**	38453	**EO Index:**	33460	**Element Last Seen:**	1994-07-28
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1994-07-27
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-25

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86317 / -117.00879	**Accuracy:**	80 meters
UTM:	Zone-11 N3746984 E499187	**Elevation (ft):**	1980
PLSS:	T03S, R01W, Sec. 32 (S)	**Acres:**	0.0

Location: HIGHWAY 79, 2 AIR MILES NNW OF GILMAN HOT SPRINGS AND 0.3 MILE NE OF WATER TANKS IN LAMB CANYON.
Detailed Location: TRAP SITE #4, UPHILL AND WEST OF HIGHWAY 79
Ecological: COASTAL SAGE SCRUB HABITAT.
General: 1 CAPTURED, 1994, AGE UNDETERMINED.
Owner/Manager: PVT

Occurrence No.	14	**Map Index:** 38525	**EO Index:**	33532		**Element Last Seen:**	1992-06-26
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-06-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-04-01

Quad Summary: El Casco (3311781), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.95419 / -117.13208	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3757084 E487796	**Elevation (ft):**	2100
PLSS:	T02S, R02W, Sec. 31 (S)	**Acres:**	1860.0

Location: THE BADLANDS, NORTH OF HIGHWAY 60 AND EAST OF REDLANDS BLVD, 6.5 MILES EAST OF SUNNYMEAD.

Detailed Location: THE HIGHEST FREQUENCY OF OCCURRENCE OF SDPM IN TRAPLINES WAS IN THE WESTERN AND SOUTHERN AREAS OF THE PROPERTY.

Ecological: SAGE SCRUB IS THE PREDOMINANT VEGETATION COMMUNITY OVER MOST OF THE PROPERTY, OTHERS ARE: SOUTHERN MIXED CHAPARRAL, DISTURBED GRASSLAND, COAST LIVE OAK WOODLAND, CULTIVATED FIELDS, & LIMITED RIPARIAN SCRUB & WOODLAND HABITATS.

General: 61 CAPTURED MAY AND JUNE, 1992, TRAPLINES F, H, I, J, K, L,M, N, O, P, Q, T, V.

Owner/Manager: UNKNOWN

Occurrence No.	16	**Map Index:** 38536	**EO Index:**	33543		**Element Last Seen:**	1995-04-27
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	1995-04-27
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-04-02

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.94255 / -117.35973	**Accuracy:**	specific area
UTM:	Zone-11 N3755844 E466756	**Elevation (ft):**	1200
PLSS:	T03S, R05W, Sec. 01 (S)	**Acres:**	16.1

Location: 0.3 MILE WSW INTERSECTION OF ARLINGTON AVE & ALESSANDRO BLVD, RIVERSIDE.

Detailed Location:

Ecological: MOST OF THE PROPERTY IS EXTREMELY DENSE NON-NATIVE GRASSLAND, RIVERSIDEAN SAGE SCRUB IS THE OTHER DOMINANT PLANT ASSOCIATION. A SMALL RIPARAIN AREA IS ALSO PRESENT. SITE IS SURROUNDED BY RESIDENCES.

General: 10 INDIVIDUALS CAPTURED 4/27/95. OTHER SPECIES CAPTURED PEROMYSCUS MANICULATUS & DIPODOMYS AGILIS; NO D. STEPHENSI CAPTURED.

Owner/Manager: CITY OF RIVERSIDE

Occurrence No.	17	**Map Index:**	38542	**EO Index:**	33549	**Element Last Seen:**	1992-10-15
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-10-15
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-01-28

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.91150 / -117.29539	**Accuracy:**	specific area
UTM:	Zone-11 N3752382 E472693	**Elevation (ft):**	1600
PLSS:	T03S, R04W, Sec. 15 (S)	**Acres:**	23.4

Location: WEST MARCH AIR FORCE BASE, AT INTERSECTION OF PIPELINE AND OLD RAILROAD GRADE, ~1 MILE SW OF EDGEMONT.

Detailed Location:

Ecological: MIXTURE OF HABITAT TYPES, DISTURBED GRASSLAND (DOMINANT), RIPARIAN WOODLAND, WILLOW SCRUB WITH MULEFAT AND TAMARISK AND SPARSE SAGE SCRUB, ROCK OUTCROPS.

General: 23 CAPTURED ON TRAP LINE #6. OTHER SPECIES: DIPODOMYS STEPHENSI, PEROMYSCUS MANICULAUS AND REITHRODONTOMYS MEGALOTIS; ALL TRAPPED AT LOCATION #6.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	22	**Map Index:**	47633	**EO Index:**	47659	**Element Last Seen:**	1999-06-24
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-06-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-12

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.85028 / -117.35357	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3745611 E467291	**Elevation (ft):**	1500
PLSS:	T04S, R05W, Sec. 01 (S)	**Acres:**	644.8

Location: WEST OF LAKE MATHEWS; VICINITY OF EASTERN END OF MOCKINGBIRD CANYON.

Detailed Location: NEAR 17 ACRE OUTLET TOWER

Ecological: HABITAT CONSISTS OF MODERATE TO DENSE RIVERSIDIAN SAGE SCRUB TO UNVEGETATED, SANDY LOAM. SURROUNDING LAND IS VACANT, DISKED.

General: ONE ADULT CAPTURED 24 JUN 1999.

Owner/Manager: UNKNOWN

Occurrence No.	24	**Map Index:**	47670	**EO Index:**	47670	**Element Last Seen:**	1999-06-06
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-06-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-16

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84052 / -117.14831	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744483 E486278	**Elevation (ft):**	1500
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	95.3

Location: ALONG THE RAMONA EXPRESSWAY, EAST OF POZOS AVE TO 0.2 MILES WEST OF THE SAN JACINTO RIVER.

Detailed Location:

Ecological: TOPOGRAPHY CONSISTS OF LEVEL TO GENTLE SLOPES VEGETATED BY GRASSES AND WEEDS. SOILS RANGE FROM LOAMY TO SALINE/ALKALINE.

General: TWO ADULTS OBSERVED.

Owner/Manager: PVT

Occurrence No.	25	**Map Index:**	47422	**EO Index:**	47672	**Element Last Seen:**	1999-01-XX
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-01-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-04-16

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.93873 / -117.22892	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3755386 E478844	**Elevation (ft):**	1650
PLSS:	T03S, R03W, Sec. 06 (S)	**Acres:**	87.0

Location: NW OF PERRIS RESERVOIR, LOCATED WITHIN TOWN OF SUNNYMEAD.

Detailed Location: MAPPED THE AREA SOUTH OF HWY 60 & NORTH OF URBAN AREA OF SUNNYMEAD.

Ecological: HABITAT CONSISTS OF DISTURBED ANNUAL GRASSLAND AND SAGE SCRUB. LAND SURROUNDING SITE IS CULTIVATED.

General: DEC 1997 - JAN 1999: A TOTAL OF 12 INDIVIDUALS OBSERVED WITHIN THIS AREA AND SECTIONS 19 & 30 TO THE SOUTH.

Owner/Manager: UNKNOWN

Occurrence No.	26	**Map Index:**	33779	**EO Index:**	47674	**Element Last Seen:**	1999-01-XX
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-01-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-12-30

Quad Summary: Lakeview (3311771), Perris (3311772), El Casco (3311781), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.88322 / -117.13013	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3749215 E487966	**Elevation (ft):**	1600
PLSS:	T03S, R02W, Sec. 30 (S)	**Acres:**	1992.0

Location: SAN JACINTO WILDLIFE AREA, 2.4 - 4.4 MILES SOUTH OF STATE ROUTE 60, NE OF PERRIS RESERVOIR.

Detailed Location: SECTIONS 19 & 30

Ecological: HABITAT CONSISTS OF DISTURBED ANNUAL GRASSLAND AND SAGE SCRUB. SURROUNDING AREA COMPRISED OF CULTIVATED LAND AND ROADS.

General: DEC 1997 - JAN 1999: A TOTAL OF 12 INDIVIDUALS OBSERVED BETWEEN THIS OCCURRENCE AND OCCURRENCE 32 TO THE SOUTH (SECTION 6).

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	27	**Map Index:**	20103	**EO Index:**	47708	**Element Last Seen:**	2000-01-XX
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2000-01-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-05-31

Quad Summary: San Jacinto (3311678), Beaumont (3311688), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86729 / -116.95571	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3747442 E504096	**Elevation (ft):**	2400
PLSS:	T03S, R01W (S)	**Acres:**	12357.1

Location: NORTH EDGE 3 MILES SOUTH OF BEAUMONT AND SOUTH TO GILMAN HOT SPRINGS.

Detailed Location: AREA COVERED INCLUDES THE FOLLOWING TOWNSHIP, RANGE AND SECTION: 4S 1W SECTIONS 9-11 AND 1-5; 3S 1W SECTIONS 33-36 AND 25-28; 3S 1E SECTIONS 30, 31. SOME SURROUNDING LAND IS USED AS HAZARDOUS WASTE REMEDIATION SITE.

Ecological: HABITAT CONSISTS OF CHAPARRAL, SAGE SCRUB, NON-NATIVE ANNUAL GRASS, COAST LIVE OAK WOODLAND, RIPARIAN WOODLAND AND SCRUB.

General: EIGHT ADULTS OBSERVED WITHIN AREA BETWEEN NOV 1999 & JAN 2000.

Owner/Manager: DFG-SAN JACINTO WA, BLM, PVT

Occurrence No.	30	**Map Index:**	49721	**EO Index:**	49722	**Element Last Seen:**	2001-08-14
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2001-08-14
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-02-27

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08569 / -117.14017	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3771666 E487068	**Elevation (ft):**	1560
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	16.8

Location: REDLANDS MUNICIPAL AIRPORT, NORTH OF I-10, NE OF REDLANDS

Detailed Location: CENTRAL TO EASTERN END OF AIRPORT, TRAP LINES 1, 2.

Ecological: HABITAT CONSISTS OF MATURE ALLUVIAL FAN SAGE SCRUB. SPECIES COMPRISED OF ENCELIA FARINOSA, ERIODICTYON TRICHOCALYX, ARTEMISIA CALIFORNICA, LEPIDOSPARTUM SQUAMATUM, ERIOGONUM FASCICULATUM. ENCELIA BECOMES DOMINANT TO THE WEST.

General: 37 CAPTURED (210 TRAP NIGHTS) ON 14 AUG 2001.

Owner/Manager: REDLANDS MUNI AIRPORT

Occurrence No.	31	**Map Index:** 57228	**EO Index:**	49725		**Element Last Seen:**	2002-07-12
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-07-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-11-01

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08040 / -117.14745	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3771080 E486396	**Elevation (ft):**	1500
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	41.1

Location: NORTH OF I-10 AND SOUTH OF SANTA ANA WASH, NE OF REDLANDS.

Detailed Location: 600 FEET SOUTH OF PIONEER AVE, NORTH OF SAN BERNARDINO AVE & 0.55 MILE EAST OF JUDSON STREET. TRAP LINES 1 & 3 - FROM SAN BERNARDINO AVE TO ~625 FEET NORTH OF ROAD.

Ecological: HABITAT CONSISTS OF ERIOGONUM SCRUB (70% COVER-PRIMARILY ERIOGONUM FASCICULATUM, OLD ALLUVIAL WASH) & HERBACEOUS COVER (95%) AT TRAP LINE 1 & RUDERAL AT TRAP LINE 3. SOILS ARE LOOSE, SANDY WITH SOME ROCK.

General: 103 CAPTURES (NUMBER OF INDIVIDUALS UNKNOWN) BETWEEN 14-16 AUG 2001. 4 CAPTURES (NUMBER OF INDIVIDUALS UNKNOWN) BETWEEN 9-12 JUL 2002.

Owner/Manager: UNKNOWN

Occurrence No.	32	**Map Index:** 49747	**EO Index:**	49747		**Element Last Seen:**	1999-01-XX
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-01-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2002-12-30

Quad Summary: Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.85232 / -117.13004	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3745789 E487970	**Elevation (ft):**	1500
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	682.1

Location: SAN JACINTO WILDLIFE AREA, 5.4 TO 6.4 MILES SOUTH OF STATE ROUTE 60, EAST OF PERRIS RESERVOIR.

Detailed Location: SECTION 6

Ecological: HABITAT CONSISTS OF DISTURBED ANNUAL GRASSLAND AND SAGE SCRUB. SURROUNDING AREA COMPRISED OF CULTIVATED LAND AND ROADS.

General: DEC 1997 - JAN 1999: A TOTAL OF 12 INDIVIDUALS OBSERVED BETWEEN THIS OCCURRENCE AND OCCURRENCE 26 TO THE NORTH (SECTIONS 19 & 30).

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	33	**Map Index:** 50047	**EO Index:**	50047	**Element Last Seen:**	2001-08-14
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2001-08-14
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2003-01-30

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.08435 / -117.15507	**Accuracy:**	specific area
UTM:	Zone-11 N3771519 E485694	**Elevation (ft):**	1360
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	5.7

Location: REDLANDS MUNICIPAL AIRPORT, NORTH OF I-10, NE OF REDLANDS
Detailed Location: WEST END OF RUNWAY, TRAP LINE 3
Ecological: HABITAT CONSISTS OF ERIOGONUM-DOMINATED SAGE SCRUB
General: 4 CAPTURED (50 TRAP NIGHTS) ON 14 AUG 2001
Owner/Manager: REDLANDS MUNI AIRPORT

Occurrence No.	43	**Map Index:** 57557	**EO Index:**	57573	**Element Last Seen:**	2002-01-12
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-01-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-10-21

Quad Summary: San Jacinto (3311678), Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.83746 / -117.00036	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744134 E499966	**Elevation (ft):**	1500
PLSS:	T04S, R01W, Sec. 08 (S)	**Acres:**	108.5

Location: LOCATED JUST W OF GILMAN HOT SPRINGS. BOUNDED ON THE WEST BY SANDERSON AVENUE AND SOUTH BY SAN JACINTO RIVER.
Detailed Location: TWO TRAP LINES ONE IN THE SOUTHERN PORTION AND ONE IN THE NORTHEASTERN PORTION.
Ecological: HABITAT IS A MIX OF GRASSLAND, COASTAL SAGE SCRUB, MULEFAT/ WILLOW SCRUB AND RUDERAL.
General: 46 INDIVIDUALS CAUGHT 25-30 MAR 2001 WHILE SURVEYING ON THE SOUTHERN PORTION. 250 INDIVIDUALS CAUGHT WHILE SURVEYING 7-12 JAN 2002 IN THE NORTHEASTERN PORTION.
Owner/Manager: UNKNOWN

Occurrence No.	52	**Map Index:** 54754	**EO Index:**	57662	**Element Last Seen:**	2002-07-25
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-07-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-10-25

Quad Summary: El Casco (3311781), Yucaipa (3411711)
County Summary: Riverside

Lat/Long:	33.98268 / -117.07161	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3760238 E493385	**Elevation (ft):**	2200
PLSS:	T02S, R02W, Sec. 22 (S)	**Acres:**	3941.5

Location: OAK VALLEY PROPERTY, BETWEEN I-10 AND SAN TIMOTEO CANYON, SOUTH OF THE SAN BERNARDINO/RIVERSIDE COUNTY LINE.
Detailed Location:
Ecological: HABITAT CONSISTS OF A GRASSLAND AND COASTAL SAGE SCRUB ECOTONE. AIMOPHILA RUFICEPS CANESCENS IN VICINITY.
General: 109 INDIVIDUALS CAPTURED BETWEEN 11 MAY AND 25 JUL 2002.
Owner/Manager: PVT

Occurrence No.	53	**Map Index:** 57662	**EO Index:**	57678		**Element Last Seen:**	2002-06-18
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-06-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-10-25

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92348 / -117.04842	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3753673 E495524	**Elevation (ft):**	1900
PLSS:	T03S, R02W, Sec. 12 (S)	**Acres:**	140.0

Location: LOCATED IN THE BADLANDS ABOUT 1 MILE SOUTH OF HIGHWAY 60.
Detailed Location:
Ecological: HABITAT IS NONNATIVE GRASSLAND, COASTAL SAGE SCRUB, CHAPARRAL, DESERT WILLOW AND RUDERAL.
General: 368 INDIVIDUALS CAPTURED WHILE SURVEYING 12-18 JUN 2002.
Owner/Manager: UNKNOWN

Occurrence No.	54	**Map Index:** 57669	**EO Index:**	57685		**Element Last Seen:**	1994-11-15
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	1994-11-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-10-25

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.93432 / -117.34434	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3754927 E468175	**Elevation (ft):**	1300
PLSS:	T03S, R04W, Sec. 06 (S)	**Acres:**	48.0

Location: LOCATED ON THE EASTERN SIDE OF RIVERSIDE ALONG ALESSANDRO BLVD NEAR CASTLE VIEW SCHOOL.
Detailed Location: 6 TRANSECTS SET ONLY 4 RESULTED IN CAPTURES OF CHAETODIPUS FALLAX FALLAX. 5 OF THE TRANSECTS WERE CLUSTERED IN THE EASTERN PORTION OF THE SITE.
Ecological: HABITAT CONSISTS OF MIXED GRASSLAND AND SAGE SCRUB, RIPARIAN, WASH BOTTOM (ADJACENT TO RECENTLY BURNED AREA)
General: TRAPPING PERIOD: 10-15 NOV 1994. TRANSECT A: 4 INDIVIDUALS, C: 4 INDIVIDUALS, D: 11 INDIVIDUALS, E: 9 INDIVIDUALS.
Owner/Manager: PVT

Occurrence No.	55	**Map Index:** 57673	**EO Index:**	57689	**Element Last Seen:**	1994-07-04
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1994-07-04
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-10-25

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.04066 / -117.11694	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3766670 E489205	**Elevation (ft):**	2100
PLSS:	T01S, R02W, Sec. 32 (S)	**Acres:**	615.1

Location: LOCATED IN YUCAIPA. IN RESEVOIR CANYON, ABUTTING INTERSTATE 10.

Detailed Location: SIX TRANSECTS WERE SET, HOWEVER, 51% OF INDIVIDUALS WERE CAUGHT IN TRANSECT E LOCATED IN THE SW PORTION OF SITE ABOUT 0.3 MILES N OF I-10.

Ecological: STEEPLY SLOPED WITH SOILS RANGING FROM SANDY TO GRAVELLY LOAM. HABITAT CONSISTS OF: BURNED SAGE SCRUB, GRASSLAND WITH SAGE SCRUB, RIVERSIDEAN SAGE SCRUB, HIGHLY DISTURBED GRASSLAND. SITE ADJACENT TO RESIDENTAL DEVELOPMENT & CITRUS OPERATION

General: 20 INDIVIDUALS CAPTURED 12 AUG 1991. 38 INDIVIDUALS CAPTURED FROM 29 JUN - 4 JUL 1994.

Owner/Manager: UNKNOWN

Occurrence No.	56	**Map Index:** 57678	**EO Index:**	57694	**Element Last Seen:**	2000-10-03
Occ. Rank:	Poor		**Presence:**	Presumed Extant	**Site Last Seen:**	2000-10-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-10-25

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07517 / -117.08780	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3770495 E491898	**Elevation (ft):**	2100
PLSS:	T01S, R02W, Sec. 21 (S)	**Acres:**	1892.9

Location: LOCATED ON THE EDGE OF THE CRAFTON HILLS. ABOUT 1.5 MILES EAST OF MENTONE.

Detailed Location:

Ecological: HABITAT CONSISTS OF: FLOOD PLAIN AND TERRACES, LOAMY SAND WITH SOME COBBLES. RIVERSIDIAN ALLUVIAL FAN SCRUB, AND RIPARIAN WOODLAND. HABITAT IN 1999 RATED GOOD, IN 2000 RATED FAIR-POOR.

General: 28 ADULTS OBSERVED ON 15 APR 1999, BURROW SITES OBSERVED AS WELL WHILE SURVEYING SEC 16 & 21. 182 ADULTS OBSERVED ON 3 OCT 2000, BURROW SITES ALSO OBSERVED WHILE SURVEYING SEC 16 & 22.

Owner/Manager: UNKNOWN

Occurrence No.	57	**Map Index:** 58069	**EO Index:**	57698	**Element Last Seen:**	2002-11-12
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-11-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-12-01

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10039 / -117.21734	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3773309 E479952	**Elevation (ft):**	1150
PLSS:	T01S, R03W, Sec. 08 (S)	**Acres:**	635.0

Location: EASTERN END OF NORTON AFB.

Detailed Location:

Ecological: RELATIVELY UNDISTURBED ALLUVIAL SCRUB VEGETATION, SOME AREAS OF DEEP SANDY SOIL. MAIN ELEMENTS INCLUDE: BRASSICA, BROMUS, CROTON, ERIASTRUM. HABITAT RATINGS FROM EXCELLENT (3 OF 4 SITES) TO POOR.

General: 75 INDIVIDUALS CAPTURED 12 NOV 2002.

Owner/Manager: DOD-NORTON AFB

Occurrence No.	58	**Map Index:** 57695	**EO Index:**	57711	**Element Last Seen:**	2002-12-07
Occ. Rank:	Poor		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-12-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-10-26

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10778 / -117.19994	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3774125 E481558	**Elevation (ft):**	1225
PLSS:	T01S, R03W, Sec. 04 (S)	**Acres:**	66.7

Location: IN HIGHLAND, ABOUT 0.6 MILES SOUTH OF WHERE HIGHWAY 30 CROSSES CITY CREEK. SITE OF PROPOSED 5TH ST. BRIDGE.

Detailed Location: ALL BUT ONE CAPTURE ON THE WESTERN SIDE OF CITY CREEK BED.

Ecological: DISTURBED RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB & RUDERAL

General: 53 INDIVIDUALS OBSERVED 7 JUN-18 AUG 2002, BURROW SITES ALSO OBSERVED. 1 INDIVIDUAL OBSERVED 2-7 DEC 2002, BURROW SITE ALSO OBSERVED.

Owner/Manager: UNKNOWN

Occurrence No.	83	**Map Index:** 57779	**EO Index:**	57795	**Element Last Seen:**	1992-07-02
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-07-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-12-02

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.83696 / -117.36141	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744138 E466560	**Elevation (ft):**	1500
PLSS:	T04S, R05W, Sec. 12 (S)	**Acres:**	470.1

Location: ABOUT 0.7 MILES EAST OF LAKE MATTHEWS & 0.15 MILES NORTH OF THE INTERSECTION BETWEEN EL SOBRANTE ROAD & CAJALCO ROAD.

Detailed Location:

Ecological:

General: 28 MALES & 12 FEMALES TRAPPED ON 30 MAY-1 JUN 1992 IN THE NE 1/4 OF SEC. 11. 21 MALES & 11 FEMALES TRAPPED ON 30 MAY-6 JUN 1992 IN THE NW 1/4 OF SEC. 12. 8 MALES 11 FEMALES TRAPPED ON 2-4 JUN & 29 JUN-2 JUL 1992 IN THE SW 1/4 OF SEC. 12.

Owner/Manager: UNKNOWN

Occurrence No.	91	**Map Index:** 57807	**EO Index:**	57823	**Element Last Seen:**	2002-07-19
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2002-07-19
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2004-11-01

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10726 / -117.17538	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3774063 E483824	**Elevation (ft):**	1300
PLSS:	T01S, R03W, Sec. 03 (S)	**Acres:**	31.3

Location: LOCATED IN EAST HIGHLANDS. NORTH SIDE OF SANTA ANA WASH. SITE IS BOUNDED BY 5TH STREET ON NORTH & CHURCH STREET ON EAST.

Detailed Location:

Ecological: HABITAT CONSISTS OF RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB, DISTURBED/RUDERAL ANNUAL GRASSLAND & RIPARIAN. DIPODOMYS MERRIAMI PARVUS & PEROGNATHUS LONGIMEMBRIS BREVIANASUS ALSO KNOWN FROM THIS SITE.

General: 12 INDIVIDUALS CAPTURED OVER FOUR TRANSECTS (600 TRAP NIGHTS) WHILE SURVEYING 15-19 JUL 2002.

Owner/Manager: UNKNOWN

Occurrence No.	92	**Map Index:**	57809	**EO Index:**	57825	**Element Last Seen:**	2002-07-12
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2002-07-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-11-01

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08103 / -117.14109	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3771150 E486982	**Elevation (ft):**	1550
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	19.4

Location: LOCATED NEAR THE INTERSECTION OF WABASH AVENUE AND PIONEER AVENUE IN THE CITY OF REDLANDS.

Detailed Location:

Ecological: DIPODOMYS MERRIAMI PARVUS ALSO KNOWN FROM THIS SITE.

General: 2 CAPTURES BETWEEN 9-12 JUL 2002.

Owner/Manager: UNKNOWN

Onychomys torridus ramona

Element Code: AMAFF06022

southern grasshopper mouse

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G5T3?
	State:	None	**State:**	S3?
	Other:	DFG_SSC-Species of Special Concern		
Habitat:	**General:**	DESERT AREAS, ESPECIALLY SCRUB HABITATS WITH FRIABLE SOILS FOR DIGGING. PREFERS LOW TO MODERATE SHRUB COVER.		
	Micro:	FEEDS ALMOST EXCLUSIVELY ON ARTHROPODS, ESPECIALLY SCORPIONS & ORTHOPTERAN INSECTS.		

Occurrence No.	29	**Map Index:**	58483	**EO Index:**	58519	**Element Last Seen:**	1938-12-27
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1938-12-27
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-12-10

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.91928 / -117.05986	**Accuracy:**	1 mile
UTM:	Zone-11 N3753207 E494466	**Elevation (ft):**	2000
PLSS:	T03S, R02W, Sec. 11 (S)	**Acres:**	0.0

Location: ABOUT 1.5 MILES NORTH OF EDEN HOT SPRINGS.

Detailed Location:

Ecological:

General: ONE MALE SPECIMEN COLLECTED BY F. DURHAM ON 27 DEC 1938 AT "1.5 MI N OF EDEN HOT SPRINGS." DEPOSITED AT MVZ # 88417.

Owner/Manager: UNKNOWN

Occurrence No.	30	**Map Index:** 24632	**EO Index:**	58520		**Element Last Seen:**	1908-09-08
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1908-09-08
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-12-10

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90468 / -117.29379	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3751625 E472838	**Elevation (ft):**	1580
PLSS:	T03S, R04W, Sec. 15 (S)	**Acres:**	0.0

Location: 0.25 MILE SW OF THE INTERSECTION OF CACTUS ROAD AND PLUMMER ROAD, MARCH AIR FORCE BASE.

Detailed Location:

Ecological:

General: 7 TOTAL SPECIMENS (3 FEMALE & 4 MALE) COLLECTED 7-8 SEP 1908 BY H. WILDER AT "7 MI SE RIVERSIDE [SCHELLINGER RANCH]." DEPOSITED AT MVZ # 2464-2469 & 2490.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	33	**Map Index:** 03634	**EO Index:**	58523		**Element Last Seen:**	1923-09-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1923-09-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-12-10

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78085 / -117.22794	**Accuracy:**	1 mile
UTM:	Zone-11 N3737880 E478896	**Elevation (ft):**	1450
PLSS:	T04S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: PERRIS.

Detailed Location:

Ecological:

General: ONE MALE SPECIMEN COLLECTED 23 SEP 1923 BY F. STEPHENS AT "PERRIS." DEPOSITED AT LACM # 727.

Owner/Manager: UNKNOWN

Neotoma lepida intermedia

Element Code: AMAFF08041

San Diego desert woodrat

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T3?
	State:	None		**State:**	S3?
	Other:	DFG_SSC-Species of Special Concern			

Habitat: **General:** COASTAL SCRUB OF SOUTHERN CALIFORNIA FROM SAN DIEGO COUNTY TO SAN LUIS OBISPO COUNTY.

Micro: MODERATE TO DENSE CANOPIES PREFERRED. THEY ARE PARTICULARLY ABUNDANT IN ROCK OUTCROPS & ROCKY CLIFFS & SLOPES.

Occurrence No.	43	**Map Index:** 47633	**EO Index:**	47633		**Element Last Seen:**	1999-06-24
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-06-24
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2002-04-11

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.85028 / -117.35357	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3745611 E467291	**Elevation (ft):**	1500
PLSS:	T04S, R05W, Sec. 01 (S)	**Acres:**	644.8

Location: WEST OF LAKE MATHEWS; VICINITY OF EASTERN END OF MOCKINGBIRD CANYON.

Detailed Location: NEAR 17 ACRE OUTLET TOWER

Ecological: HABITAT CONSISTS OF MODERATE TO DENSE RIVERSIDIAN SAGE SCRUB TO UNVEGETATED, SANDY LOAM. SURROUNDING LAND IS VACANT. DIRT ROADS RUN THROUGH THE AREA.

General: ONE ADULT CAPTURED 24 JUN 1999.

Owner/Manager: UNKNOWN

Occurrence No.	46	**Map Index:** 69607	**EO Index:**	49721		**Element Last Seen:**	2007-02-14
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-02-14
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-07-03

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08579 / -117.14050	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3771677 E487037	**Elevation (ft):**	1560
PLSS:	T01S, R03W, Sec. 13 (S)	**Acres:**	23.0

Location: REDLANDS MUNICIPAL AIRPORT, NORTH OF I-10, NE OF REDLANDS.

Detailed Location: 2001 TRAPPING EFFORT LOCATED IN THE CENTRAL TO EASTERN END OF AIRPORT, TRAP LINES 1 & 2.

Ecological: HABITAT CONSISTS OF MATURE ALLUVIAL FAN SAGE SCRUB. SPECIES COMPRISED OF ENCELIA FARINOSA, ERIODICTYON TRICHOCALYX, ARTEMISIA CALIFORNICA, LEPIDOSPARTUM SQUAMATUM, ERIOGONUM FASCICULATUM. ENCELIA FARINOSA BECOMES DOMINANT TO THE WEST.

General: 13 CAPTURED (210 TRAP NIGHTS) ON 14 AUG 2001. 1 ADULT OBSERVED ON A PRICKLY PEAR NEAR A NEST ON 14 FEB 2007.

Owner/Manager: REDLANDS MUNI AIRPORT, PVT

Occurrence No.	47	**Map Index:** 33789	**EO Index:**	50407		**Element Last Seen:**	2005-07-15
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2005-07-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-03-11

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.83703 / -117.00191	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744086 E499822	**Elevation (ft):**	1450
PLSS:	T04S, R01W, Sec. 08 (S)	**Acres:**	393.0

Location: NORTH OF THE SAN JACINTO RIVER AND WEST OF GILMAN HOT SPRINGS, 3.5 MILES NNW OF SAN JACINTO

Detailed Location: 2001: SW 1/4 OF THE SW 1/4 OF T4S, R1W SECTION 9. 2002: NW 1/4 OF THE T4S, R1W SW 1/4 OF SECTION 9. 2005: E 1/2 OF T4S, R1W SECTION 8.

Ecological: HABITAT CONSISTS OF GRASSLAND, COASTAL SAGE SCRUB, MULEFAT SCRUB, AND ALLUVIAL FAN SAGE SCRUB. OTHER RARE SPECIES AT THIS SITE INCLUDE PEROGNATHUS LONGIMEMBRIS BREVINASUS AND CHAETODIPUS FALLAX FALLAX.

General: 2001: 4 ADULTS WERE CAPTURED AND RELEASED FROM 25-30 MAR. 2002: 14 ADULTS WERE CAPTURED AND RELEASED FROM 7-12 JAN. 2005: 20 INDIVIDUALS FOUND 10-15 JUL.

Owner/Manager: UNKNOWN

Occurrence No.	54	**Map Index:** 50372	**EO Index:**	50423		**Element Last Seen:**	2002-08-18
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-08-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-03-05

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10757 / -117.20445	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3774102 E481143	**Elevation (ft):**	1200
PLSS:	T01S, R03W, Sec. 04 (S)	**Acres:**	35.2

Location: WEST OF THE INTERSECTION OF HIGHWAY 30 AND EAST 5TH STREET, NORTH OF THE SANTA ANA RIVER, HIGHLAND

Detailed Location:

Ecological: HABITAT CONSISTS OF DISTURBED RIVERSIDEAN SAGE SCRUB SURROUNDING THE CAPTURE SITE; IMMEDIATE HABITAT TEMPORARILY GONE DURING BRIDGE CONSTRUCTION. OTHER RARE TAXA AT THIS SITE INCLUDE CHAETODIPUS FALLAX FALLAX AND DIPODOMYS MERRIAMI PARVUS.

General: 5 ADULTS AND JUVENILES COLLECTED FROM 7 JUN-18 AUG 2002 AND DEPOSITED AT LACM.

Owner/Manager: UNKNOWN

Occurrence No.	111	**Map Index:**	73883	**EO Index:**	74870	**Element Last Seen:**	2000-10-03
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2000-10-03
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-03-11

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08406 / -117.09507	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3771480 E491228	**Elevation (ft):**	
PLSS:	T01S, R02W, Sec. 16 (S)	**Acres:**	2573.0

Location: VICINITY OF SANTA ANA WASH AND PERCOLATION BASINS NORTH AND EAST OF REDLANDS, JUST SOUTH OF SAN BERNARDINO NF.

Detailed Location: T1S R2W SECTIONS 8, 16, 21 & 22.

Ecological: LOAMY & COBBLEY SAND SUBSRATE, OPEN ALLUVIAL FAN SCRUB & RIPARIAN WOODLAND. FLOOD PLAIN & TERRACES. OVERALL SITE QUALITY VARIED FROM GOOD TO FAIR TO POOR.

General: 1999: 15 FOUND IN SECTIONS 16 & 21 ON 15 APR. 2000: 16 FOUND IN SECTIONS 8, 16 & 22 ON 3 OCT.

Owner/Manager: BLM, UNKNOWN

Taxidea taxus

Element Code: AMAJF04010

American badger

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5
	State:	None		**State:** S4
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern		
Habitat:	**General:**	MOST ABUNDANT IN DRIER OPEN STAGES OF MOST SHRUB, FOREST, AND HERBACEOUS HABITATS, WITH FRIABLE SOILS.		
	Micro:	NEEDS SUFFICIENT FOOD, FRIABLE SOILS & OPEN, UNCULTIVATED GROUND. PREYS ON BURROWING RODENTS. DIGS BURROWS.		

Occurrence No.	204	**Map Index:**	24993	**EO Index:**	56976	**Element Last Seen:**	1908-07-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1908-07-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-09-23

Quad Summary: Sunnymead (3311782), Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.01874 / -117.27110	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3764267 E474969	**Elevation (ft):**	1600
PLSS:	T02S, R04W (S)	**Acres:**	2755.2

Location: RECHE CANYON, NEAR COLTON.

Detailed Location: AREA MAPPED IS RECHE CANYON.

Ecological:

General: MVZ #2705; FEMALE COLLECTED BY C. H. RICHARDSON JR ON 26 JUL 1908.

Owner/Manager: UNKNOWN

Occurrence No.	337	**Map Index:** 59385	**EO Index:**	59421	**Element Last Seen:**	1990-06-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1990-06-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2005-01-18

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.86661 / -117.12764	**Accuracy:**	80 meters
UTM:	Zone-11 N3747373 E488193	**Elevation (ft):**	1440
PLSS:	T03S, R02W, Sec. 31 (S)	**Acres:**	0.0

Location: ~2 MILES NORTH OF LAKEVIEW, SAN JACINTO WILDLIFE AREA
Detailed Location:
Ecological: HABITAT CONSISTS OF FLOODPLAIN VEGETATION: ANNUAL ATRIPLEX, SUAEDA TORREYANA, AND ANNUAL GRASSES.
General: ON 29 JUN 1990, 1 WAS OBSERVED RUNNING FROM AN IRRIGATION DITCHTO A LEVEE SURROUNDING A 0.25-ACRE DRY RESERVOIR; THE FOLLOWING MORNING, AN ACTIVE BURROW WAS FOUND.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	338	**Map Index:** 59387	**EO Index:**	59423	**Element Last Seen:**	1990-01-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1990-01-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2005-01-18

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86535 / -117.10506	**Accuracy:**	80 meters
UTM:	Zone-11 N3747232 E490281	**Elevation (ft):**	1400
PLSS:	T03S, R02W, Sec. 32 (S)	**Acres:**	0.0

Location: ~2 MILES NE OF LAKEVIEW, SAN JACINTO WILDLIFE AREA.
Detailed Location:
Ecological: HABITAT CONSISTS OF CHENOPOD SCRUB, DOMINATED BY ATRIPLEX CANESCENS, ENCELIA FARINOSA, AND ARTEMISIA CALIFORNICA.
General: DURING JAN 1990, THE CARCASS OF A JUVENILE (TL = 75MM) WAS FOUND.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	418	**Map Index:** 73795	**EO Index:**	74763	**Element Last Seen:**	2007-05-09
Occ. Rank:	Excellent		**Presence:**	Presumed Extant	**Site Last Seen:**	2007-05-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2009-04-22

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.92350 / -117.25603	**Accuracy:**	specific area
UTM:	Zone-11 N3864590 E476614	**Elevation (ft):**	2240
PLSS:	T10N, R04W, Sec. 25 (S)	**Acres:**	10.0

Location: ALONG HWY 58, ABOUT 1.8 MI WEST OF HWY 58 AT VALLEY VIEW RD, ABOUT 3.5 MI WEST OF HINKLEY.
Detailed Location: MAPPED TO PROVIDED COORDINATES.
Ecological: HABITAT CONSISTS OF CREOSOTE BUSH/WHITE BURSAGE VEGETATION COMMUNITY. SANDY, GRAVELLY SUBSTRATE WITH 0-1% SLOPE. BURROWING OWL SIGNS ALSO DETECTED AT THIS SITE. AUTHOR DESCRIBED HABITAT AS "EXCELLENT."
General: ON 9 MAY 2007 REPORTER DETERMINED SITE TO BE A DIGGING AREA FOR AMERICAN BADGER.
Owner/Manager: UNKNOWN

Emys marmorata

Element Code: ARAAD02030

western pond turtle

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3G4
	State:	None		**State:**	S3
	Other:	BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive			
Habitat:	**General:**	A THOROUGHLY AQUATIC TURTLE OF PONDS, MARSHES, RIVERS, STREAMS & IRRIGATION DITCHES, USUALLY WITH AQUATIC VEGETATION, BELOW 6000 FT ELEVATION.			
	Micro:	NEED BASKING SITES AND SUITABLE (SANDY BANKS OR GRASSY OPEN FIELDS) UPLAND HABITAT UP TO 0.5 KM FROM WATER FOR EGG-LAYING.			

Occurrence No.	849 **Map Index:** 03634	**EO Index:**	28226	**Element Last Seen:**	1933-XX-XX
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1987-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-11-30

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78085 / -117.22794	**Accuracy:**	1 mile
UTM:	Zone-11 N3737880 E478896	**Elevation (ft):**	1450
PLSS:	T04S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: PERRIS, APPROXIMATELY 15 MI E SANTA MONICA MTNS.

Detailed Location:

Ecological:

General: FEMALE CARAPACE & PLASTRON COLLECTED (AMNH# 69797) AND FULL MALE SKELETON COLLECTED (AMNH# 69798) BY J. H. GEYGER IN 1933. BRATTSTROM (1990) CONSIDERS THIS POP EXTIRPATED.

Owner/Manager: UNKNOWN

Gopherus agassizii

Element Code: ARAAF01010

desert tortoise

Listing Status:	**Federal:**	Threatened	**CNDDB Element Ranks:**	**Global:**	G4
	State:	Threatened		**State:**	S2
	Other:	IUCN_VU-Vulnerable			
Habitat:	**General:**	MOST COMMON IN DESERT SCRUB, DESERT WASH, AND JOSHUA TREE HABITATS; OCCURS IN ALMOST EVERY DESERT HABITAT.			
	Micro:	REQUIRE FRIABLE SOIL FOR BURROW AND NEST CONSTRUCTION. CREOSOTE BUSH HABITAT WITH LG ANNUAL WILDFLOWER BLOOMS PREFERRED.			

Occurrence No.	1	**Map Index:**	03129	**EO Index:**	14806	**Element Last Seen:**	2004-04-12
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-04-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	2006-08-04

Quad Summary: West Ord Mountain (3411668), Minneola (3411677), Daggett (3411678), Harvard Hill (3411686), Yermo (3411687), Nebo (3411688), Victorville (3411753), Adelanto (3411754), Shadow Mountains SE (3411755), Stoddard Well (3411761), Turtle Valley (3411762), Helendale (3411763), Victorville NW (3411764), Shadow Mountains (3411765), Adobe Mountain (3411766), Hi Vista (3411767), Barstow SE (3411771), Hodge (3411772), Wild Crossing (3411773), Astley Rancho (3411774), Red Buttes (3411775), Jackrabbit Hill (3411776), Rogers Lake South (3411777), Redman (3411778), Barstow (3411781), Hinkley (3411782), Twelve Gauge Lake (3411783), Kramer Hills (3411784), Kramer Junction (3411785), Leuhman Ridge (3411786), Rogers Lake North (3411787), Edwards (3411788), Rosamond Lake (3411871), Bissell (3411881), Alvord Mtn. West (3511616), Coyote Lake (3511617), Lane Mountain (3511618), Langford Well (3511626), Paradise Range (3511627), Williams Well (3511628), Mud Hills (3511711

County Summary: Kern, Los Angeles, San Bernardino

Lat/Long:	35.02758 / -117.38310	**Accuracy:**	specific area
UTM:	Zone-11 N3876168 E465052	**Elevation (ft):**	
PLSS:	T11N, R06W, Sec. 34 (S)	**Acres:**	1782558.0

Location: FREMONT-STODDARD; FREMONT VALLEY SOUTH TO THE VICINITY OF ADELANTO AND HWY 14 EAST TO CALICO MOUNTAINS, W MOJAVE DESERT.

Detailed Location: LARGEST OF 4 PRIMARY POPS IN CALIF. IN 1977, ESTIMATED DENSITIES WERE 20 TO >250 TORTOISES/SQ MI. AS OF 1987, EVIDENCE SUGGESTS MAJOR DECLINES IN ESTIMATED DENSITY IN MOST AREAS.

Ecological: AREA COVERS APPROX. 1700 SQ MILES, FROM 2000 TO >4000 FT ELEV W/SEVERAL VEG COMMUNITIES INCLUDED.

General:

Owner/Manager: BLM, PVT, DFG, DOD, STATE

Occurrence No.	95	**Map Index:**	72453	**EO Index:**	73424	**Element Last Seen:**	2007-03-24
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-03-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-11-26

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.92043 / -117.26711	**Accuracy:**	80 meters
UTM:	Zone-11 N3864251 E475602	**Elevation (ft):**	2255
PLSS:	T10N, R04W, Sec. 35 (S)	**Acres:**	0.0

Location: 2.25 MI WSW OF THE JUNCTION OF YELLOWSTONE RD & HWY 58, HINKLEY.

Detailed Location:

Ecological: CREOSOTE BUSH/WHITE BURSAGE VEGETATION COMMUNITY; GRAVELLY SUBSTRATE; 0-2% SLOPE; NO ANNUALS PRESENT.

General: 1 ADULT OBSERVED ON 24 MAR 2007. LOCATION IS BETWEEN FREMONT-KRAMER AND SUPERIOR-CRONESE DESERT TORTOISE CRITICAL HABITAT UNITS.

Owner/Manager: BLM

Occurrence No.	96	**Map Index:** 72454	**EO Index:**	73425	**Element Last Seen:**	2007-05-18
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	2007-05-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2008-11-26

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.92657 / -117.25667	**Accuracy:**	80 meters
UTM:	Zone-11 N3864930 E476556	**Elevation (ft):**	2245
PLSS:	T10N, R04W, Sec. 25 (S)	**Acres:**	0.0

Location: 1.70 MI WNW OF THE JUNCTION OF YELLOWSTONE RD & HWY 58, HINKLEY.

Detailed Location:

Ecological: CREOSOTE BUSH/WHITE BURSAGE VEGETATION COMMUNITY; GRAVELLY SUBSTRATE; 0-2% SLOPE; NO ANNUALS PRESENT.

General: 1 ADULT OBSERVED ON 18 MAY 2007. LOCATION IS BETWEEN FREMONT-KRAMER AND SUPERIOR-CRONESE DESERT TORTOISE CRITICAL HABITAT UNITS.

Owner/Manager: UNKNOWN

Occurrence No.	107	**Map Index:** 72692	**EO Index:**	73525	**Element Last Seen:**	2006-05-04
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	2006-05-04
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2008-10-23

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.99402 / -117.30512	**Accuracy:**	80 meters
UTM:	Zone-11 N3872423 E472155	**Elevation (ft):**	2110
PLSS:	T10N, R04W, Sec. 04 (S)	**Acres:**	0.0

Location: JUST SOUTH OF ROY ST, 1.34 MI E OF HARPER LAKE RD, LOCKHART.

Detailed Location:

Ecological: HABITAT CONSISTS OF A STRIP OF DESERT SALTBUSH SCRUB AT THE EDGE OF A FALLOW ALFALFA FIELD. MOJAVE CREOSOTE BUSH SCRUB TO SOUTH. A. POLYCARPA DOMINATING. ALLUVIAL PLAIN. SOILS: SILT, SAND. ASPECT: NE. SLOPE: 0-1%.

General: TORTOISE OBSERVED ON 4 MAY 2006. TORTOISE WAS MARKED; EPOXY MARK ON 4TH RIGHT COSTAL "HLR 102". SURROUNDING AREA IS OPEN DESERT, ON SITE & TOWARDS S (BLM), W (PRIVATE) BUT FALLOW AG FIELDS ADJACENT ON N; TRANSMISSION LINE CORRIDOR.

Owner/Manager: PVT

Anniella pulchra pulchra

Element Code: ARACC01012

silvery legless lizard

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3G4T3T4Q
	State:	None		**State:**	S3
	Other:	DFG_SSC-Species of Special Concern, USFS_S-Sensitive			
Habitat:	**General:**	SANDY OR LOOSE LOAMY SOILS UNDER SPARSE VEGETATION.			
	Micro:	SOIL MOISTURE IS ESSENTIAL. THEY PREFER SOILS WITH A HIGH MOISTURE CONTENT.			

Occurrence No.	14	**Map Index:**	44549	**EO Index:**	44549	**Element Last Seen:**	1999-11-XX
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-11-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2000-12-28

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.01714 / -117.14661	**Accuracy:**	80 meters
UTM:	Zone-11 N3764066 E486463	**Elevation (ft):**	2110
PLSS:	T02S, R03W, Sec. 12 (S)	**Acres:**	0.0

Location: SOUTH EDGE OF SUNSET DRIVE, 0.5 MILE SOUTH OF REDLANDS COUNTRY CLUB, REDLANDS

Detailed Location:

Ecological: HABITAT CONSISTS OF BUCKWHEAT/CHAMISE SCRUB, BORDERED BY MODERATELY TO HIGHLY-DISTURBED DEVELOPMENT

General: 1 FEMALE FOUND INJURED (MASSIVE INJURY TO ITS POSTERIOR QUARTER) ALONG SUNSET DRIVE IN NOV 1999; LIZARD WAS COLLECTED AND IT DIED THE FOLLOWING DAY.

Owner/Manager: PVT

Occurrence No.	31	**Map Index:**	60866	**EO Index:**	60902	**Element Last Seen:**	2005-02-03
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-02-03
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-06

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.07625 / -117.15100	**Accuracy:**	80 meters
UTM:	Zone-11 N3770621 E486067	**Elevation (ft):**	1515
PLSS:	T01S, R03W, Sec. 24 (S)	**Acres:**	0.0

Location: <0.1 MILE SOUTH OF SAN BERNARDINO AVENUE AND 0.3 MILE EAST OF JUDSON STREET, WEST OF MENTONE

Detailed Location:

Ecological: DOMINANT PLANT COMMUNITY IS AGRICULTURE (ORANGE GROVES); AREA HAS NOT BEEN ACTIVELY FARMED FOR AWHILE, AND SAGE SCRUB PLANTS HAVE BEGUN TO EMERGE.

General: 1 ADULT AND 1 JUVENILE OBSERVED UNDER A FLAT PIECE OF WOOD, IN SANDY SOIL, ON THE BANK OF A MAN-MADE RESERVOIR.

Owner/Manager: UNKNOWN

Occurrence No.	44	**Map Index:** 69605	**EO Index:**	70378		**Element Last Seen:**	2007-02-14
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-02-14
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-07-03

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.08716 / -117.13658	**Accuracy:**	80 meters
UTM:	Zone-11 N3771829 E487399	**Elevation (ft):**	1586
PLSS:	T01S, R02W, Sec. 18 (S)	**Acres:**	0.0

Location: EAST SIDE OF OPAL AVENUE, EAST OF REDLANDS MUNICIPAL AIRPORT.
Detailed Location:
Ecological: HABITAT CONSISTS OF OVERGROWN COASTAL SAGE SCRUB, DOMINATED BY ERIODICTYON TRICHOCALYX, ENCELIA FARIMOSA, OPUNTIA SPP, AND ERIOGONUM FASCICULATUM.
General: 1 ADULT DETECTED IN LEAF LITTER NEAR A PRICKLY PEAR ON 14 FEB 2007.
Owner/Manager: PVT

Phrynosoma blainvillii

Element Code: ARACF12100

coast horned lizard

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G4G5
	State:	None		**State:** S3S4
	Other:	BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive		
Habitat:	**General:**	FREQUENTS A WIDE VARIETY OF HABITATS, MOST COMMON IN LOWLANDS ALONG SANDY WASHES WITH SCATTERED LOW BUSHES.		
	Micro:	OPEN AREAS FOR SUNNING, BUSHES FOR COVER, PATCHES OF LOOSE SOIL FOR BURIAL, & ABUNDANT SUPPLY OF ANTS & OTHER INSECTS.		

Occurrence No.	5	**Map Index:** 03401	**EO Index:**	28147		**Element Last Seen:**	197X-XX-XX
Occ. Rank:	None		**Presence:**	Extirpated		**Site Last Seen:**	1992-04-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1996-01-11

Quad Summary: Riverside East (3311783), San Bernardino South (3411713)
County Summary: Riverside, San Bernardino

Lat/Long:	34.01362 / -117.32865	**Accuracy:**	1 mile
UTM:	Zone-11 N3763714 E469654	**Elevation (ft):**	1000
PLSS:	T02S, R04W, Sec. 08 (S)	**Acres:**	0.0

Location: HIGHGROVE.
Detailed Location: NO LIZARDS FOUND IN 1992 SURVEY.
Ecological: HABITAT LOST TO COMMERCIAL AND RESIDENTIAL DEVELOPMENT. SOME OF THE ORCHARDS AND GROVES STILL PRESENT BUT CULTIVATION HAS ELIMINATED ANY FORM OF HABITAT FOR CONCEALMENT AND FOOD SOURCE.
General: 1970'S RECORD FROM MCGURTY 1980 REPT TO DFG, PG A-32. 1992 RECORD FROM LESTER G. MILROY III.
Owner/Manager: UNKNOWN

Occurrence No.	8	**Map Index:** 03634	**EO Index:** 28145	**Element Last Seen:**	1930-05-27
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1930-05-27
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2011-03-03

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.78085 / -117.22794	**Accuracy:**	1 mile
UTM:	Zone-11 N3737880 E478896	**Elevation (ft):**	1450
PLSS:	T04S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: PERRIS.
Detailed Location: SDNHM SPECIMEN #2721STATED LOCALITY AS "PERRIS." MAPPED TO CITY OF PERRIS.
Ecological:
General: SDNHM SPECIMEN #2721 COLLECTED BY L.M. KLAUBER ON 27 MAY 1930.
Owner/Manager: UNKNOWN

Occurrence No.	45	**Map Index:** 03444	**EO Index:** 12294	**Element Last Seen:**	1989-09-19
Occ. Rank:	Good		**Presence:** Presumed Extant	**Site Last Seen:**	1989-09-19
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1996-02-15

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.97001 / -117.30199	**Accuracy:**	1 mile
UTM:	Zone-11 N3758871 E472102	**Elevation (ft):**	2200
PLSS:	T02S, R04W, Sec. 28 (S)	**Acres:**	0.0

Location: BOX SPRINGS RESERVE NEAR UC RIVERSIDE. ALSO IN MORENO VALLEY, INTERSECTION OF CLARK ST. & FRESH SKY RD.
Detailed Location: AN INHOLDING IN A COUNTY PARK.
Ecological: MORENO VALLEY SITE: SPARSE SYCAMORE RIPARIAN WOODLAND SURROUNDED BY RIVERSIDEAN SAGE SCRUB DOMINATED BY ENCELIA FARINOSA.
General: ONE INDIVIDUAL AND SEVERAL SCATS OBSERVED AT MORENO VALLEY SITE.
Owner/Manager: UCNR-BOX SPRINGS RESERVE

Occurrence No.	119	**Map Index:** 34146	**EO Index:** 481	**Element Last Seen:**	1992-04-18
Occ. Rank:	Excellent		**Presence:** Presumed Extant	**Site Last Seen:**	1992-04-18
Occ. Type:	Natural/Native occurrence		**Trend:** Stable	**Record Last Updated:**	1998-10-26

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.80473 / -117.34371	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740558 E468186	**Elevation (ft):**	2000
PLSS:	T04S, R04W, Sec. 19 (S)	**Acres:**	807.6

Location: IDA LEONA ESTATES AND HARFORD SPRINGS COUNTY PARK.
Detailed Location: HIGH DENSITY POPULATIONS FOUND IN IDA LEONA ESTATES PARCELS 1-4, AND 7. 5 JUVENILES (41-51 MM SNOUT/VENT LENGTH) FOUND IN HARFORD SPRINGS COUNTY PARK IN 1992.
Ecological: JUNIPER AND ALLUVIAL SCRUB HABITAT. OAK AND CHAPARRAL HABITAT IN EXCELLENT CONDITION. POGONOMYRMEX ANT SPECIES PRESENT.
General: PART OF THE AREA IS A WILDLIFE RESERVE. SURROUNDING AREAS ARE 5-10 ACRE RANCHES.
Owner/Manager: PVT, RIV COUNTY-PARKS & REC

Occurrence No.	216	**Map Index:** 03699	**EO Index:**	28014		**Element Last Seen:**	1967-04-25
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1967-04-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2006-01-25

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.97665 / -117.20909	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3759586 E480685	**Elevation (ft):**	2400
PLSS:	T02S, R03W, Sec. 20 (S)	**Acres:**	0.0

Location: RECHE CANYON, 7.6 MI S BARTON RD INTERSECTION.
Detailed Location:
Ecological:
General: LACM SPECIMEN #52785.
Owner/Manager: UNKNOWN

Occurrence No.	223	**Map Index:** 03359	**EO Index:**	28010		**Element Last Seen:**	1957-06-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1957-06-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2006-04-18

Quad Summary: Steele Peak (3311773), Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.86939 / -117.35900	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3747732 E466796	**Elevation (ft):**	1700
PLSS:	T03S, R05W, Sec. 36 (S)	**Acres:**	0.0

Location: NEAR THREE SISTERS. APPROX 4 MI NE OF LAKE MATHEWS.
Detailed Location: EXACT LOCATION UNKNOWN. LOCATION STATED AS "NEAR THREE SISTERS" AND SO AREA MAPPED IS THREE SISTERS AND THE SURROUNDING AREA.
Ecological:
General: LACM SPECIMEN #101392 COLLECTED 26 JUN 1957 BY R.B. LOOMIS.
Owner/Manager: UNKNOWN

Occurrence No.	227	**Map Index:** 03398	**EO Index:**	28007		**Element Last Seen:**	1966-04-16
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1966-04-16
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2006-01-25

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.73972 / -117.33544	**Accuracy:**	1 mile
UTM:	Zone-11 N3733347 E468928	**Elevation (ft):**	1800
PLSS:	T05S, R04W, Sec. 18 (S)	**Acres:**	0.0

Location: ARROYO DEL TORO, 4 MI N OF ELSINORE.
Detailed Location: LOCATION GIVEN AS "2 MI W, 4 MI N ELSINORE, ARROYO DEL TORO". MAPPED IN VICINITY OF ARROYO DEL TORO WHICH IS DUE NORTH OF LAKE ELSINORE.
Ecological:
General: LACM SPECIMENS #101414-101416 COLLECTED 16 APR 1966.
Owner/Manager: UNKNOWN

Occurrence No.	243	**Map Index:** 04203	**EO Index:**	27991		**Element Last Seen:**	1937-06-12
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1937-06-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-03-17

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89556 / -117.05503	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3750577 E494911	**Elevation (ft):**	1700
PLSS:	T03S, R02W, Sec. 23 (S)	**Acres:**	0.0

Location: EDEN HOT SPRING, 0.5 MI NW OF MOUNT EDEN.

Detailed Location: SDNHM #27299 STATED LOCALITY AS "EDEN HOT SPRING" MAPPED TO EDEN HOT SPRING EXACT LOCATION UNKNOWN.

Ecological:

General: SDNHM SPECIMEN #27299, COLLECTED BY L.M. KLAUBER ON 12 JUN 1937.

Owner/Manager: UNKNOWN

Occurrence No.	248	**Map Index:** 03533	**EO Index:**	27990		**Element Last Seen:**	1935-05-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-04-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Decreasing		**Record Last Updated:**	2011-03-17

Quad Summary: Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84647 / -117.25558	**Accuracy:**	1 mile
UTM:	Zone-11 N3745162 E476355	**Elevation (ft):**	1500
PLSS:	T04S, R04W, Sec. 01 (S)	**Acres:**	0.0

Location: VAL VERDE, 5 MILES NNW OF PERRIS ALONG I-215.

Detailed Location: SDNHM #23702 STATED LOCALITY AS " VAL VERDE".

Ecological: AREA LOST AS HABITAT FOR WILDLIFE.

General: SDNHM SPECIMEN #23702 COLLECTED BY L.M. KLAUBER ON 23 MAY 1935. NEGATIVE DATA SUBMITTED FROM MILROY ON 12 APRIL 1992.

Owner/Manager: UNKNOWN

Occurrence No.	252	**Map Index:** 03583	**EO Index:**	27982		**Element Last Seen:**	1926-05-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1926-05-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1989-08-10

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: San Bernardino

Lat/Long:	34.04750 / -117.23476	**Accuracy:**	1 mile
UTM:	Zone-11 N3767447 E478332	**Elevation (ft):**	1200
PLSS:	T01S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: BRYN MAWR, 2.5 MI WSW OF REDLANDS.

Detailed Location:

Ecological:

General: UCD SPECIMEN #3695.

Owner/Manager: UNKNOWN

Occurrence No.	328	**Map Index:**	20085	**EO Index:**	9898	**Element Last Seen:**	1989-09-19
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-09-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1991-12-04

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95568 / -117.28878	**Accuracy:**	80 meters
UTM:	Zone-11 N3757279 E473317	**Elevation (ft):**	1700
PLSS:	T02S, R04W, Sec. 34 (S)	**Acres:**	0.0

Location: CITY OF MORENO VALLEY, AT THE INTERSECTION OF CLARK STREET AND FRESH SKY ROAD.

Detailed Location:

Ecological: HABITAT IS A SPARSE SYCAMORE RIPARIAN WOODLAND SURROUNDED BY RIVERSIDEAN SAGE SCRUB, DOMINATED BY ENCELIA FARINOSA.

General: ONE ADULT LIZARD AND SEVERAL HORNED LIZARD SCATS FOUND IN THE AREA.

Owner/Manager: PVT

Occurrence No.	389	**Map Index:**	21751	**EO Index:**	7851	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-01-04

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.82041 / -117.27564	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3742278 E474491	**Elevation (ft):**	1750
PLSS:	T04S, R04W, Sec. 14 (S)	**Acres:**	181.1

Location: TWO MILES WEST OF MAYER FARMS AT HIGHWAY 395, 15 MILES SOUTH OF RIVERSIDE.

Detailed Location: NON-SPECIFIC POLYGON COVERS SW AND NE PARTS OF SEC 14, SMALL WESTERN PORTION OF SEC 13, AND SW CORNER OF SEC 11. POLYGON CONSISTS OF 3 UNATTACHED PORTIONS.

Ecological: HABITAT IS NON-NATIVE GRASSLAND; DOMINANTS: BROMUS RUBENS, LASTHENIA SP., ERODIUM CICUTARIUM, AND SCHISMUS BARBATUS. ELEVATION RANGE: 1700-1800 FEET. MODERATE SLOPE.

General: ONE LIZARD SIGHTED IN 1990. LOCATION SOMEWHERE WITHIN NON-NATIVE GRASSLAND. SITE IS PART OF MOTTE RESERVE MITIGATION SITE.

Owner/Manager: MWD

Occurrence No.	431 **Map Index:** 39955	**EO Index:**	34957	**Element Last Seen:**	1991-07-14
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1991-07-14
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-10-19

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10038 / -117.18132	**Accuracy:**	80 meters
UTM:	Zone-11 N3773300 E483275	**Elevation (ft):**	1290
PLSS:	T01S, R03W, Sec. 10 (S)	**Acres:**	0.0

Location: SANTA ANA WASH, 2.6 MILES NORTH OF I-10 ON ORANGE STREET, REDLANDS

Detailed Location: INTERMEDIATE-AGE ALLUVIAL VEGETATION SCRUB HABITAT, SUBSTRATUM IS A SANDY LOAM

Ecological: PERDOMINANT PERENNIAL VEGETATION: ERIODICTYON TRICHOCALYX, ERIOGONUM FASCICULATUM, OPUNTIA PARRYI, AND SCATTERED JUNIPERUS CALIFORNICUS AND YUCCA WHIPPLEI

General: 8 ADULTS, 4 MALE & 4 FEMALE; 1 JUVENILE FEMALE; 1 HATCHLING FEMALE. OTHER INFORMATION: TAIL CONDITION; SNOUT TO TAIL LENGTH; SNOUT TO VENT LENGTH; DATES CAPTURED AND MARKED; WEATHER AND TEMPERATURES.

Owner/Manager: UNKNOWN

Occurrence No.	432 **Map Index:** 39956	**EO Index:**	34958	**Element Last Seen:**	2003-07-09
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2003-07-09
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-02-23

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80946 / -117.25833	**Accuracy:**	specific area
UTM:	Zone-11 N3741059 E476090	**Elevation (ft):**	1960
PLSS:	T04S, R04W, Sec. 24 (S)	**Acres:**	65.8

Location: UNIVERSITY OF CALIFORNIA'S MOTTE RIMROCK RESERVE, 1 MILE WSW OF MAYER FARMS AT HIGHWAY 395. NORTH OF PERRIS.

Detailed Location: 1991: RIVERSIDIAN INTERIOR COASTAL SAGE SCRUB, ON TOP OF A GENTLY SLOPING, NORTHWEST FACING HILL. SUBSTRATUM OF DECOMPOSED GRANITE, CIENEBA ROCKY SANDY LOAM, OCCASIONAL OUTCROPS OF GRANITE BOULDERS. 2003: OBSERVATIONS ON ROADS/TRAILS.

Ecological: DOMINANT PERENNIAL VEGETATION: ERIOGONUM FASCICULATUM, ENCELIA FARINOSA, SALVIA MELLIFERA, S. APIANA, ARTEMISIA CALIFORNICA. 2003: ANTS ABUNDANT.

General: 4 ADULT MALES; 1 JUV MALE; 10 HATCHLINGS (2 FEMALE, 7 MALE 1 UNKNOWN) OTHER INFO: TAIL CONDITION; SNOUT-TAIL & SNOUT-VENT LENGTH; DATES CAPTURED & MARKED; WEATHER & TEMPS. 9-10 JUL 2003: 4 ADULTS OBSERVED.

Owner/Manager: UCNR-MOTTE RIMROCK RESERVE

Occurrence No.	433 **Map Index:** 35093	**EO Index:**	34962	**Element Last Seen:**	1991-07-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1991-07-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-10-20

Quad Summary: Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long:	34.09891 / -117.11429	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3773129 E489457	**Elevation (ft):**	1740
PLSS:	T01S, R02W, Sec. 08 (S)	**Acres:**	0.0

Location: 2.8 MILES NNE OF MENTONE, SANTA ANA WASH, WEST AND SOUTH OF GREENSPOT ROAD.
Detailed Location: EXACT LOCATION(S) NOT WELL DESCRIBED.
Ecological: COARSE, SANDY SOIL. SAGE SCRUB WITH ASSOCIATE SPECIES ENCELIA FARINOSA, ERIODICTYON TRICHOCALYX, SALVIA APIANA, HAPLOPAPPUS LINEARIFOLIUS, ERIOGONUM FASICULATUM, AND MIRABILIS CALIFORNIA.
General: 21 INDIVIDUAL WERE OBSERVED WITHIN THE STUDY AREA EITHER ALONG THE MAIN STEM OF SANTA ANA RIVER OR IN ADJACENT ABRADED SANDY HABITATS. SPECIES EXPECTED THROUGHOUT STUDY AREA IN LOOSE SANDY HABITATS.
Owner/Manager: UNKNOWN

Occurrence No.	491 **Map Index:** 52685	**EO Index:**	52685	**Element Last Seen:**	2000-05-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2003-09-29

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.82326 / -117.32261	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3742606 E470145	**Elevation (ft):**	1860
PLSS:	T04S, R04W, Sec. 17 (S)	**Acres:**	0.0

Location: 0.5 MILE SOUTH OF CAJALCO ROAD AND 3.3 MILES NE OF GAVILAN PEAK, 4.2 MILES NW OF PERRIS
Detailed Location:
Ecological: HABITAT ON PROJECT CONSISTS OF RIVERSIDIAN SAGE SCRUB.
General: UNKNOWN NUMBER OBSERVED AT 1 LOCATION DURING CALIFORNIA GNATCATHER SURVEYS CONDUCTED BETWEEN 22 MAR AND 22 MAY 2000. PROJECT SITE IS SURROUNDED BY RURAL RESIDENTIAL, ORCHARDS AND OPEN SPACE.
Owner/Manager: UNKNOWN

Occurrence No.	505 **Map Index:** 53925	**EO Index:**	53925	**Element Last Seen:**	2003-06-08
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-08
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-01-13

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.90257 / -117.01548	**Accuracy:**	specific area
UTM:	Zone-11 N3751353 E498568	**Elevation (ft):**	2200
PLSS:	T03S, R01W, Sec. 20 (S)	**Acres:**	12.5

Location: 2.75 MILES SW OF BEAUMONT
Detailed Location:
Ecological: HABITAT CONSISTS OF CHAPARRAL, DOMINATED BY CHAMISE AND BLACK SAGE.
General: 1 ADULT OBSERVED ON 9 APR 2003; 1 ADULT OBSERVED ON 8 JUN 2003.
Owner/Manager: PVT

Occurrence No.	506	**Map Index:**	53926	**EO Index:**	53926	**Element Last Seen:**	2003-06-17
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-17
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-01-13

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89542 / -117.00391	**Accuracy:**	80 meters
UTM:	Zone-11 N3750561 E499637	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 20 (S)	**Acres:**	0.0

Location: 2.8 MILES SSW OF BEAUMONT

Detailed Location:

Ecological: HABITAT CONSISTS OF A SANDY/ROCKY AREA OF CHAMISE CHAPARRAL.

General: 1 ADULT OBSERVED ON 17 JUN 2003.

Owner/Manager: PVT

Occurrence No.	528	**Map Index:**	59976	**EO Index:**	60012	**Element Last Seen:**	2004-06-23
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-06-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-02-14

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.92762 / -117.02465	**Accuracy:**	80 meters
UTM:	Zone-11 N3754131 E497721	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: 0.3 MILE SOUTH OF HIGHWAY 60, 2.5 MILES WEST OF BEAUMONT

Detailed Location:

Ecological: HABITAT CONSISTS OF CHAPARRAL AND NON-NATIVE GRASSLAND WITH ORV USE.

General: 1 ADULT OBSERVED ON 23 JUN 2004.

Owner/Manager: PVT

Occurrence No.	533	**Map Index:**	62597	**EO Index:**	62634	**Element Last Seen:**	2005-09-15
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-09-15
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-09-19

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.75861 / -117.29139	**Accuracy:**	80 meters
UTM:	Zone-11 N3735430 E473014	**Elevation (ft):**	1800
PLSS:	T05S, R04W, Sec. 03 (S)	**Acres:**	0.0

Location: WEST END OF OLIVE AVENUE, 0.7 MILE WEST OF SPRING STREET, 3.5 MILES WSW OF PERRIS

Detailed Location:

Ecological: HABITAT CONSISTS PRIMARILY OF RUDERAL VEGETATION (DOVEWEED AND NON-NATIVE GRASSES); GENERAL TOPOGRAPHY WAS A SLOPING HILLSIDE. A NATIVE ANT SOURCE WAS PRESENT ON THE DIRT ROAD WHERE THIS SITE IS CENTERED.

General: 1 ADULT OBSERVED ON 15 SEP 2005.

Owner/Manager: RIV COUNTY

Occurrence No.	541	**Map Index:** 69434	**EO Index:**	70210		**Element Last Seen:**	2006-04-24
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-04-24
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-05-30

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.80815 / -117.31652	**Accuracy:**	80 meters
UTM:	Zone-11 N3740929 E470704	**Elevation (ft):**	2390
PLSS:	T04S, R04W, Sec. 20 (S)	**Acres:**	0.0

Location: ABOUT 5.3 MILES WNW OF PERRIS, 1.7 MILES NE OF RANCHO DE LAS PIEDRAS.
Detailed Location: MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY SOURCE.
Ecological: RELATIVELY UNDISTURBED SHORT SCRUB AT THE TOP OF A RIDGE.
General: 3 ADULTS OBSERVED ON 24 APR 2006. OBSERVED WHILE CONDUCTING JURISDICTIONAL DELINEATION OF ONSITE DRAINGE.
Owner/Manager: PVT

Occurrence No.	550	**Map Index:** 69446	**EO Index:**	70226		**Element Last Seen:**	2005-04-07
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2005-04-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-05-31

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.94063 / -117.01419	**Accuracy:**	80 meters
UTM:	Zone-11 N3755573 E498688	**Elevation (ft):**	2300
PLSS:	T03S, R01W, Sec. 05 (S)	**Acres:**	0.0

Location: WEST OF BEAUMONT, ABOUT 0.7 MILES WSW OF INTERSECTION OF SAN TIMOTEO CANYON RD AND I-10.
Detailed Location: MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY SOURCE.
Ecological: SPARSE COASTAL SAGE SCRUB WITH GRASSLAND ECOTONE.
General: 2 ADULTS OBSERVED ON 7 APR 2005.
Owner/Manager: PVT

Occurrence No.	735	**Map Index:** 81134	**EO Index:**	82118		**Element Last Seen:**	2008-04-04
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2008-04-04
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-02-23

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.84128 / -117.31026	**Accuracy:**	80 meters
UTM:	Zone-11 N3744601 E471294	**Elevation (ft):**	1660
PLSS:	T04S, R04W, Sec. 09 (S)	**Acres:**	0.0

Location: MEAD VALLEY, 0.4 MI NW OF CAJALCO RD AND ALEXANDER ST INTERSECTION, 1.3 MI WNW OF MEAD VALLEY PO.
Detailed Location: MAPPED TO PROVIDED COORDINATES.
Ecological: THIS SITE ALSO HAS AT LEAST 10 BURROWING OWLS. GRANITE SPINY LIZARD, GREATER ROADRUNNER WERE ALSO OBSERVED. LEAST BELL'S VIREO LOCATED ON ADJACENT CONSERVATION EASEMENT.
General: ONE ADULT WAS OBSERVED ON 4 APRIL 2008.
Owner/Manager: UNKNOWN

Occurrence No.	741	**Map Index:**	81317	**EO Index:**	82298	**Element Last Seen:**	1991-08-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-08-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-01-12

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.90361 / -117.03386	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3751470 E496869	**Elevation (ft):**	2140
PLSS:	T03S, R01W, Sec. 18 (S)	**Acres:**	0.0

Location: LABORDE CANYON, ABOUT 2.0 MI S OF HWY 60 AT JACKRABBIT TRAIL AND NORTHEAST OF EDEN HOT SPRINGS, SW THE TOWN OF BEAUMONT.

Detailed Location: OLD LOCKHEED COORPORATION WEAPON TEST SITE. ELEVATION RANGE IS 2200 TO 2480M.

Ecological: HABITAT CONSISTS OF MIXED CHAPARRAL (CHAMISE, RED BERRY, SHRUB OAK), GRADING INTO RIVERSIDEAN SAGE SCRUB (CALIFORNIA BUCKWHEAT, COASTAL SAGE SCRUB, WHITE SAGE). WEEDY AREA IS DOMINATED BY SHORT PODDED MUSTARD, RED-STEMMED FILAREE.

General: UNKNOWN NUMBERS OF INDIVIDUALS WERE OBSERVED DURING STEPHEN'S KANGAROO RAT SURVEY FROM 30 JUL TO 26 AUG 1991. STEPHEN'S KANGAROO RAT AND ORANGE-THROATED WHIPTAIL WERE OBSERVED DURING SURVEYS.

Owner/Manager: PVT-LOCKHEED CORP

Occurrence No.	767	**Map Index:**	82016	**EO Index:**	82995	**Element Last Seen:**	1929-06-01
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1929-06-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-03-14

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.80143 / -117.14620	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3740149 E486466	**Elevation (ft):**	1485
PLSS:	T04S, R03W, Sec. 25 (S)	**Acres:**	0.0

Location: NUEVO, RIVERSIDE COUNTY.

Detailed Location: SDNHM SPECIMEN #12009 STATED LOCALITY AS "NUEVO". MAPPED TO TOWN OF NUEVO - EXACT LOCATION IS UNKNOWN.

Ecological:

General: SDNHM SPECIMEN #12009 COLLECTED BY CLYDE SEARL ON 1 JUN 1929.

Owner/Manager: UNKNOWN

Occurrence No.	768	**Map Index:** 47583	**EO Index:**	82997		**Element Last Seen:**	1929-07-08
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1929-07-08
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-03-14

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.91849 / -117.15671	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3753129 E485514	**Elevation (ft):**	1600
PLSS:	T03S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: MORENO, RIVERSIDE COUNTY.

Detailed Location: SDNHM SPECIMEN #12103-4 STATED LOCALITY AS "MORENO". MAPPED TO TOWN OF MORENO. EXACT LOCATION IS UNKNOWN.

Ecological:

General: SDNHM SPECIMEN# 12103-4 COLLECTED BY CLYDE SEARL ON 8 JUL 1929.

Owner/Manager: UNKNOWN

Occurrence No.	769	**Map Index:** 68463	**EO Index:**	83002		**Element Last Seen:**	1936-05-21
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1936-05-21
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-03-16

Quad Summary: Steele Peak (3311773), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.88574 / -117.28002	**Accuracy:**	1 mile
UTM:	Zone-11 N3749522 E474105	**Elevation (ft):**	1600
PLSS:	T03S, R04W, Sec. 27 (S)	**Acres:**	0.0

Location: MARCH AIR FORCE BASE, RIVERSIDE COUNTY.

Detailed Location: SDNHM SPECIMENS 14179 AND 25580 STATED LOCALITY AS "MARCH AIR FORCE BASE". EXACT LOCATIONS UNKNOWN.

Ecological:

General: SDNHM SPECIMEN #14179 COLLECTED BY L.H. COOK ON 16 JUN 1930. SDNHM SPECIMEN #25580 COLLECTED BY L.M. KLAUBER ON 21 MAY 1936.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	771	**Map Index:** 58911	**EO Index:**	83030		**Element Last Seen:**	1935-05-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1935-05-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-03-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.05602 / -117.18288	**Accuracy:**	1 mile
UTM:	Zone-11 N3768382 E483122	**Elevation (ft):**	1400
PLSS:	T01S, R03W, Sec. 27 (S)	**Acres:**	0.0

Location: REDLANDS, SAN BERNARDINO COUNTY.

Detailed Location: SDNHM #23705 STATED LOCALITY AS "REDLAND, SAN BERNARDINO COUNTY." EXACT LOCATION IS UNKNOWN.

Ecological:

General: SDNHM SPECIMEN #23705 COLLECTED BY L.M. KLAUBER ON 23 MAY 1935.

Owner/Manager: UNKNOWN

Aspidoscelis hyperythra

Element Code: ARACJ02060

orangethroat whiptail

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5
	State:	None		**State:**	S2
	Other:	DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern			
Habitat:	**General:**	INHABITS LOW-ELEVATION COASTAL SCRUB, CHAPARRAL, AND VALLEY-FOOTHILL HARDWOOD HABITATS.			
	Micro:	PREFERS WASHES & OTHER SANDY AREAS WITH PATCHES OF BRUSH & ROCKS. PERENNIAL PLANTS NECESSARY FOR ITS MAJOR FOOD-TERMITES			

Occurrence No.	6	**Map Index:**	33878	**EO Index:**	27670	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-04-11

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.96823 / -117.30066	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3758674 E472224	**Elevation (ft):**	2200
PLSS:	T02S, R04W, Sec. 28 (S)	**Acres:**	321.8

Location: BOX SPRING RESERVE (UCNLWRS) NEAR UC RIVERSIDE

Detailed Location: TOWNSHIP 2S, RANGE 4W, EAST HALF OF SECTION 28.

Ecological:

General: AN INHOLDING IN A COUNTY PARK.

Owner/Manager: UCNR-BOX SPRINGS RESERVE

Occurrence No.	43	**Map Index:**	24993	**EO Index:**	27669	**Element Last Seen:**	1966-05-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1966-05-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-02-28

Quad Summary: Sunnymead (3311782), Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.01874 / -117.27110	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3764267 E474969	**Elevation (ft):**	1500
PLSS:	T02S, R04W (S)	**Acres:**	2755.2

Location: RECHE CANYON, 5 MILES SOUTHEAST OF COLTON.

Detailed Location: 1908: RECHE CANYON NEAR COLTON. 1966: 2 MI NW UP RECHE CANYON. AREA MAPPED IS RECHE CANYON.

Ecological: HABITAT CONSISTED OF "SANDY WASH, ON A HILL SPARSELY COVERED WITH VEGETATION, AND IN THE DUST BY THE ROADSIDE." 2 OF THE 1908 SPECIMENS WERE FOUND "IN THE ACT OF COPULATION."

General: 5 COLLECTED (MVZ #19-21, 53, 54) BY RICHARDSON JR & CAMP DURING JULY 1908. 1 INDIVIDUAL (LACM #99905) COLLECTED BY V.A. PARIS ON 13 MAY 1966. BRATTSTROM REPORTED SPECIES WAS STILL EXTANT AT OR NEAR THIS SITE IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	47	**Map Index:**	48124	**EO Index:**	64210	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-02-28

Quad Summary: Riverside East (3311783), Riverside West (3311784)

County Summary: Riverside

Lat/Long:	33.97883 / -117.36985	**Accuracy:**	1 mile
UTM:	Zone-11 N3759870 E465836	**Elevation (ft):**	900
PLSS:	T02S, R05W, Sec. 23 (S)	**Acres:**	0.0

Location: RIVERSIDE.

Detailed Location: LOCATION STATED AS RIVERSIDE. LOCATION MAPPED AT THE OLDER PORTION OF RIVERSIDE SINCE IT WAS FROM 1922 OR EARLIER.

Ecological: AREA HAS BEEN HEAVILY DEVELOPED SINCE 1994 ACCORDING TO AIR PHOTOS. MORE RESEARCH IS NEEDED TO DETERMINE IF THERE IS SUITABLE HABITAT OR IF THE SPECIES IS EXTANT TO THE WEST.

General: VAN DENBURGH, AN EARLY EXPERT ON CALIFORNIA REPTILES, REPORTED THIS SITE AS A LOCALITY FOR THE SPECIES IN 1922.

Owner/Manager: UNKNOWN

Occurrence No.	55	**Map Index:**	03634	**EO Index:**	63541	**Element Last Seen:**	1918-03-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1918-03-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-03-05

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78085 / -117.22794	**Accuracy:**	1 mile
UTM:	Zone-11 N3737880 E478896	**Elevation (ft):**	1450
PLSS:	T04S, R03W, Sec. 31 (S)	**Acres:**	0.0

Location: PERRIS.

Detailed Location: MAPPED TO THE GENERAL LOCAITON OF PROVIDED LOCALITY "PERRIS."

Ecological:

General: LACM# 7757, COLLECTED 26 MAR 1918. ACCORDING TO BRATTSTROM, SPECIES IS STILL PROBABLY AT SITE OR IN IMMEDIATE VICINITY IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	72	**Map Index:**	63452	**EO Index:**	63544	**Element Last Seen:**	1955-04-02
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1955-04-02
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-03-05

Quad Summary: Riverside East (3311783), San Bernardino South (3411713)

County Summary: Riverside

Lat/Long:	33.99580 / -117.28091	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3761726 E474056	**Elevation (ft):**	1600
PLSS:	T02S, R04W, Sec. 15 (S)	**Acres:**	0.0

Location: PIGEON PASS.

Detailed Location: LOCATION GIVEN AS "RIVERSIDE CO: PIGEON PASS."

Ecological:

General: LACM #14749, COLLECTED BY CUNNINGHAM 2 APR 1955. ACCORDING TO BRATTSTROM, STILL AT SITE OR IN IMMEDIATE VICINITY IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	75	**Map Index:**	03359	**EO Index:**	27659	**Element Last Seen:**	1957-04-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1957-04-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-03-05

Quad Summary: Steele Peak (3311773), Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.86939 / -117.35900	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3747732 E466796	**Elevation (ft):**	1700
PLSS:	T03S, R05W, Sec. 36 (S)	**Acres:**	0.0

Location: GENERAL AREA OF THREE SISTERS PEAKS, SE OF RIVERSIDE.

Detailed Location: EXACT LOCATION UNKNOWN. LOCATION STATED AS "2 MI W, 1 MI S WOODCREST (8 MI S RIVERSIDE) THREE SISTERS PEAKS." LOCATION IS MAPPED TO INCLUDE THREE SISTERS PEAKS AND SURROUNDING AREA.

Ecological:

General: LACM SPECIMEN #99856 COLLECTED BY R.B. LOOMIS 26 APR 1957. ACCORDING TO BRATTSTROM, STILL EXTANT AT SITE OR IN IMMEDIATE VICINITY IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	77 **Map Index:** 03364	**EO Index:**	12281	**Element Last Seen:**	1957-05-03
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1957-05-03
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-03-05

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84040 / -117.35861	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3744518 E466820	**Elevation (ft):**	1540
PLSS:	T04S, R05W, Sec. 12 (S)	**Acres:**	0.0

Location: NEAR MOCKINGBIRD CANYON, 2 MI S THREE SISTERS, 12 MI S RIVERSIDE.

Detailed Location: LOCATION MAPPED TO INCLUDE AREA 2 MILES SOUTH OF THREE SISTERS.

Ecological: THE GENERAL AREA HAD LITTLE DEVELOPMENT IN 1994, AND THE NORTHERN PORTION OF THE OCCURRENCE UNDERWENT GRADING AND DEVELOPMENT IN 2002 ACCORDING TO AIR PHOTOS.

General: LACM SPECIMENS 99854-5 COLLECTED BY R.B. LOOMIS ON 3 MAY 1957. ACCORDING TO BRATTSTROM, STILL AT SITE OR IN IMMEDIATE VICINITY DURING 1990.

Owner/Manager: UNKNOWN

Occurrence No.	78 **Map Index:** 03303	**EO Index:**	27656	**Element Last Seen:**	1989-06-22
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1989-06-22
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-03-06

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.85851 / -117.37847	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3746532 E464990	**Elevation (ft):**	1400
PLSS:	T03S, R05W, Sec. 35 (S)	**Acres:**	0.0

Location: MOCKINGBIRD CANYON ROAD, 5.5 MILE SE OF ARLINGTON (ORIGINAL SITE DESCRIPTION, 1959).

Detailed Location: 1930: MOCKINGBIRD CYN. 1952: MOCKINGBIRD CANYON, JUST E OF ARLINGTON. 1989 SURVEY SAMPLED AT WINTERS LANE AND MOCKINGBIRD CANYON ROAD. SITE 1; OBSERVED AT RIPARIAN EDGE. LACM# 99857-60; SBMNH #12: LOCATION STATED AS "LAKE MATHEWS."

Ecological: 2 SITES DESCRIBED AS RIPARIAN. SITE 1: MULEFAT, CHAMISE, ELDERBERRY. SITE 2: CHAMISE, MULEFAT, GRASSES, BUCKWHEAT.

General: LACM: #7758-60 JUL 1930, #99860 APR '49, #99859 MAY '51, #99857-8 MAR '52, #99852-3, APR '59. MVZ #56475 MAY '52. SBMNH #12 JUN '53. 2 TRANSECTS SAMPLED & 5 LIZARDS SEEN 1989. BRATTSTROM REPORTED STILL EXTANT AT SITE OR IN VICINITY 1990.

Owner/Manager: UNKNOWN

Occurrence No.	82	**Map Index:** 03350	**EO Index:**	27652		**Element Last Seen:**	1968-06-27
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1968-06-27
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2012-03-06

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.79126 / -117.36026	**Accuracy:**	1 mile
UTM:	Zone-11 N3739070 E466649	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 25 (S)	**Acres:**	0.0

Location: 3 MI S CAJALCO RD ON GAVILAN HILLS RD.

Detailed Location: LOCATION FOR LACM 115682 IS "S OF CAJALCO RD ON GAVILAN HILLS RD." LOCATION FOR LACM #115683-86 IS "3 MI S OF CAJALCO RD ON GAVILAN HILLS RD." AREA MAPPED ALONG GAVILAN HILLS RD 3 MILES S OF CAJALCO RD.

Ecological:

General: LACM COLLECTIONS BY M. RUGGLES: #115682 ON 11 JUL 1966, & #115683-86 ON 27 JUN 1968. ACCORDING TO BRATTSTROM, STILL EXTANT AT OR NEAR THIS SITE IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	91	**Map Index:** 03384	**EO Index:**	13111		**Element Last Seen:**	1983-07-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1983-07-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-10-22

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81763 / -117.34371	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3741988 E468191	**Elevation (ft):**	2020
PLSS:	T04S, R04W, Sec. 18 (S)	**Acres:**	0.0

Location: IDA LEONA ESTATES, 0.3 MILE WEST OF BIRD PEAK, ~1.4 MILES SE OF INTERSECTION OF GAVILAN AND CAJALCO ROADS, PARCEL 9.

Detailed Location:

Ecological: FOUND MOST COMMONLY NEAR TEMPORARY DRAINAGES OR PERMANENT WATER.

General: INDIVIDUALS SIGHTED, CONSIDERED A LOCAL ENDEMIC. DISTRIBUTION PARALLELS THAT OF STEPHENS KANGAROO RAT.

Owner/Manager: PVT

Occurrence No.	92 **Map Index:** 03386	**EO Index:**	27653	**Element Last Seen:**	1993-04-17
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1993-04-17
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-10-22

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.80555 / -117.34041	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740648 E468492	**Elevation (ft):**	2000
PLSS:	T04S, R04W, Sec. 19 (S)	**Acres:**	43.8

Location: IDA LEONA ESTATES, E OF HARFORD SPINGS CO. PARK, 0.4 MI NW OF GAVILAN MINE, 1.3 MI NE OF LAKE MATHEWS DR & GAVILAN RD
Detailed Location:
Ecological: HABITAT CONSISTS OF JUNIPER AND ALLUVIAL SCRUB, SURROUNDED BY OAK AND CHAPARRAL HABITAT.
General: INDIVIDUALS OBSERVED IN 1983. 1 MALE AND 2 FEMALES OBSERVED EXCHANGING COURTSHIP DISPLAYS.
Owner/Manager: PVT

Occurrence No.	125 **Map Index:** 17867	**EO Index:**	9918	**Element Last Seen:**	1989-09-22
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	1989-09-22
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1991-12-16

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.80261 / -117.18041	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3740284 E483300	**Elevation (ft):**	1500
PLSS:	T04S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: ABOUT 2.5 MILES SOUTH OF PERRIS RESERVOIR AND 2.5 MILES NORTHEAST OF PERRIS.
Detailed Location:
Ecological: HABITAT IS SPARSE COASTAL SAGE SCRUB, INTERRUPTED BY ROCKY OUTCROPS, ON A SE-FACING SLOPE.
General: ONE ADULT OBSERVED.
Owner/Manager: PVT

Occurrence No.	126	**Map Index:** 17868	**EO Index:**	9917	**Element Last Seen:**	1989-06-11
Occ. Rank:	Poor		**Presence:**	Presumed Extant	**Site Last Seen:**	1989-06-11
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2012-03-05

Quad Summary: Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77985 / -117.13077	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3737754 E487892	**Elevation (ft):**	2000
PLSS:	T04S, R02W, Sec. 31 (S)	**Acres:**	0.0

Location: IN LAKEVIEW MOUNTAINS, ABOUT 3 MILES NORTHEAST OF ROMOLAND.

Detailed Location: 1955: LOCATION GIVEN AS "RIVERSIDE CO: 5 MI E PERRIS."

Ecological: CHAMISE CHAPARRAL - BURNED WITHIN THE LAST YEAR. COMMON PLANTS INCLUDE ADENOSTOMA FASCICULATA, ERIOGONUM FASCICULATUM, RHUS OVATA. SPARSE VEGETATION ON SIDES OF DRY DRAINAGES WITH GRANITE ROCK OUTCROPS.

General: LACM #14748, COLLECTED BY CUNNINGHAM 2 APR 1955. 2 ADULTS OBSERVED IN SPARSE BURNED CHAPARRAL ON BANKS OF SEASONAL DRAINAGES (NO WATER PRESENT) 11 JUN 1989. ACCORDING TO BRATTSTROM, PROBABLY STILL AT SITE OR IN IMMEDIATE VICINITY IN 1990.

Owner/Manager: PVT

Occurrence No.	128	**Map Index:** 17862	**EO Index:**	9879	**Element Last Seen:**	1991-06-28
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	1991-06-28
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2006-03-08

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84818 / -117.00538	**Accuracy:**	80 meters
UTM:	Zone-11 N3745323 E499501	**Elevation (ft):**	1600
PLSS:	T04S, R01W, Sec. 05 (S)	**Acres:**	0.0

Location: AREA NW THE INTERSECTION OF STATE ROUTE 79 AND GILMAN SPRINGS ROAD, NW OF GILMAN HOT SPRINGS.

Detailed Location: LIZARDS SEEN DURING SEVERAL VISITS TO THIS SITE.

Ecological: MIXED RIVERSIDEAN COASTAL SAGE SCRUB AND RUDERAL PLANT ASSOCIATION; BRITTLE-BRUSH, SHORT-POD MUSTARD, SLENDER WILD OATS, PRICKLY PEARS, RANCHER'S FIDDLENECK.

General: DATES OF SIGHTINGS ARE AS FOLLOWS: 19 APRIL 1991 (ONE OBSERVED), 13 MAY 1991 (ONE OBSERVED), AND 28 JUNE 1991 (TWO OBSERVED).

Owner/Manager: RIV COUNTY, CALTRANS

Occurrence No.	143	**Map Index:**	20058	**EO Index:**	9902	**Element Last Seen:**	1990-06-19
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-06-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1991-12-18

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.02374 / -117.17111	**Accuracy:**	80 meters
UTM:	Zone-11 N3764801 E484202	**Elevation (ft):**	1600
PLSS:	T02S, R03W, Sec. 02 (S)	**Acres:**	0.0

Location: SOUTH OF REDLANDS, BETWEEN SAN TIMOTEO CANYON AND I-10, APPROXIMATELY 0.5 MI EAST OF HILLSIDE CEMETERY.

Detailed Location:

Ecological: HABITAT IS COASTAL SAGE SCRUB AND CHAPARRAL, HEAVILY IMPACTED BY PAST GRAZING AND FREQUENT BURNING. LARGE COMPONENT OF WEEDY ANNUAL GRASSES.

General: TWO ADULTS OBSERVED.

Owner/Manager: PVT

Occurrence No.	144	**Map Index:**	20013	**EO Index:**	1314	**Element Last Seen:**	1991-06-XX
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-06-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1995-12-07

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.05836 / -117.09792	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3768631 E490963	**Elevation (ft):**	2200
PLSS:	T01S, R02W, Sec. 28 (S)	**Acres:**	0.0

Location: WESTERN END OF CRAFTON HILLS, NEAR REDLANDS.

Detailed Location:

Ecological: NON-NATIVE ANNUAL GRASS WITH SCATTERED NATIVE SHRUBS SUCH AS ERIOGONUM FASCICULATUM AND SAMBUCUS MEXICANA.

General: ONE OBSERVED.

Owner/Manager: PVT

Occurrence No.	182	**Map Index:**	20929	**EO Index:**	9251	**Element Last Seen:**	1990-06-11
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-06-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-12-08

Quad Summary: Winchester (3311761), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.74982 / -117.10575	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3734422 E490205	**Elevation (ft):**	1740
PLSS:	T05S, R02W, Sec. 08 (S)	**Acres:**	0.0

Location: HOMELAND, 0.75 MI NE OF JUNCTION OF JUNIPER FLAT ROAD AND HWY 74.

Detailed Location: CAS LOCATION GIVEN AS 8 MI W OF HEMET.

Ecological: PERENNIALS: MALOSMA LAURINA, ERIOGONUM SP, ARTEMISIA TRIDENTATA, AALVIA LUECOPHYLOA, SALVIA APIANA

General: 1 COLLECTED (CAS# 57780) 16 MAY 1923. 1 OBSERVED BY LEATERMAN AND STRONG, 1990. ALSO, AT SITE OR IN IMMEDIATE VICINITY IN 1990 (BRATTSTROM).

Owner/Manager: UNKNOWN

Occurrence No.	187	**Map Index:** 21100	**EO Index:**	22143		**Element Last Seen:**	1989-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1992-06-23

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.93408 / -117.33090	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3754896 E469418	**Elevation (ft):**	1500
PLSS:	T03S, R04W, Sec. 05 (S)	**Acres:**	0.0

Location: HILLS BETWEEN ESCONDIDO FREEWAY (HWY 60) & ALLESANDRO BLVD, SOUTHEAST OF RIVERSIDE.
Detailed Location:
Ecological:
General: SOURCE CITED AS D. STRONG AND B. LEATHERMAN. OBSERVED 500 METERS OFF CANYON CREST ROAD. SURVEY #9
Owner/Manager: UNKNOWN

Occurrence No.	188	**Map Index:** 21088	**EO Index:**	22134		**Element Last Seen:**	1989-07-25
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-07-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-11-10

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.96257 / -117.18853	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3758021 E482582	**Elevation (ft):**	2080
PLSS:	T02S, R03W, Sec. 27 (S)	**Acres:**	0.0

Location: 0.7 MILES NW OF MORENO BEACH DRIVE (HENDRICK RD) & LOCUST AVENUE, ON RECHE CANYON ROAD, ABOUT 3 MILES ENE OF SUNNYMEAD.
Detailed Location: TWO SURVEYS AT THIS LOCATION; #7 CUT SHORT DUE TO A RAPTOR'S NEST WITH YOUNG PRESENT.
Ecological: SITE #7: RIPARIAN; STRONG SLOPE; BACHARIS SP, CHAMISE, ERIOGONUM FASCICULATUM. SITE #8: CHAPARRAL; GENTAL SLOPE; ADENOSTOMA FASCICULATUM, ERIOGONUM FASCICULATUM.
General: SOURCE CITED AS D. STRONG AND B. LEATHERMAN. SURVEY NUMBERS 7 AND 8; OBSERVED 1 AND 2 LIZARDS RESPECTIVELY.
Owner/Manager: UNKNOWN

Occurrence No.	189	**Map Index:** 21090	**EO Index:**	22145		**Element Last Seen:**	1989-07-28
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-07-28
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-11-10

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.94676 / -117.14560	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3756262 E486545	**Elevation (ft):**	1840
PLSS:	T03S, R03W, Sec. 36 (S)	**Acres:**	0.0

Location: 0.3 MILES WEST OF THEODORE ROAD ON IRONWOOD AVENUE, MORENO VALLEY, 5 MILES EAST OF SUNNYMEAD.
Detailed Location:
Ecological: COASTAL SAGE. PERENNIALS: SALVIA MELLIFERA, S. OPIANA, ERIOGONUM FASCICULATUM.
General: 1 LIZARD COLLECTED ON SURVEY #10, 1989.
Owner/Manager: UNKNOWN

Occurrence No.	190 **Map Index:** 21089	**EO Index:**	8978	**Element Last Seen:**	1989-08-03
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-03
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-11-10

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.93076 / -117.17961	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3754493 E483399	**Elevation (ft):**	1840
PLSS:	T03S, R03W, Sec. 10 (S)	**Acres:**	0.0

Location: HILL AREA 0.5 MILES SOUTH OF THE POMONA FREEWAY AT MORENO BEACH DRIVE, 3 MILES ESE OF SUNNYMEAD, MORENO VALLEY.

Detailed Location: LIZARD FOUND 0.4 MILES UP A DIRT ROAD WEST OFF MORENO BEACH DR.

Ecological: COASTAL SAGE. SALVIA OPIANA, ADENOSTOMA FASCICULATUM, ERIOGONUM FASCICULATUM.

General: 2 MALES AND 1 FEMALE OBSERVED ON SURVEYS NUMBERS 13 AND 14.

Owner/Manager: UNKNOWN

Occurrence No.	193 **Map Index:** 21134	**EO Index:**	22135	**Element Last Seen:**	1989-08-01
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1989-08-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-03-20

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89949 / -117.06361	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3751013 E494119	**Elevation (ft):**	1800
PLSS:	T03S, R02W, Sec. 23 (S)	**Acres:**	0.0

Location: ABOUT 1 MILE N OF GILMAN SPRINGS ROAD ON JACKRABBIT TRAIL, ABOUT 0.5 MILES NW OF EDEN HOT SPRINGS, IN THE BADLANDS.

Detailed Location: 1916 LOCATION STATED AS "NR MYSTIC LAKE, RIVERSIDE?"

Ecological: MIX OF RIPARIAN, GRASSLAND, AND CHAPARRAL. PERENNIALS: SALVIA APIANA, S. MELLIFERA. STRONG SLOPE; AVERAGE 75 DEGREES; EAST FACING.

General: LACM #7750-56, COLLECTED 14 MAY 1916. 1 PREGNANT FEMALE OBSERVED ON 1 AUG 1989. ACCORDING TO BRATTSTROM, STILL AT OR NEAR VICINITY OF 1916 LOCATION IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	194	**Map Index:** 21209	**EO Index:**	9030		**Element Last Seen:**	1989-06-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-06-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-11-10

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.78218 / -117.31232	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3738048 E471084	**Elevation (ft):**	1900
PLSS:	T04S, R04W, Sec. 33 (S)	**Acres:**	0.0

Location: ABOUT 1 MILE WEST OF POST ROAD ON SANTA ROSA (ROAD), ABOUT 5 MILES WEST OF PERRIS.

Detailed Location: APPROXIMATELY 150 METERS FROM RIPARIAN THAT PARALLELS ROAD.

Ecological: CHAPARRAL; PERENNIALS IN ORDER OF DOMINANCE: SALVIA MELLIFERA, ADENOSTOMA FASCICULATUM, ERIOGONUM FASCICULATUM. ROCKY, SANDY SOUTH FACING SLOPE.

General: 2 LIZARDS OBSERVED ON SURVEY #4 BY LEATHERMAN AND STRONG.

Owner/Manager: UNKNOWN

Occurrence No.	209	**Map Index:** 21750	**EO Index:**	7852		**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2006-04-11

Quad Summary: Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.81980 / -117.26417	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3742208 E475552	**Elevation (ft):**	1750
PLSS:	T04S, R04W, Sec. 14 (S)	**Acres:**	680.9

Location: MOTTE RIMROCK RESERVE. AREA 1.9 MILES NW TO 1.2 MILES SW OF MAYER FARMS AT HIGHWAY 395 (I-15E). NORTH OF PERRIS.

Detailed Location: 1990: NS POLYGON INCLUDES EASTERN 2/3 OF SECTION 14, SOUTH-CENTRAL PART OF SECTION 11, WEST-CENTRAL PART OF SEC 13, AND NW CORNER OF SECTION 24. 1995-99: NW TO SE TRENDING AREA - WEST CENTRAL PORTION OF SECTION 24.

Ecological: HABITAT IS RIVERSIDIAN SAGE SCRUB; DOMINANTS: ERIOGONUM FASICULATUM AND ARTEMISIA CALIFORNICA. PATCHES OF GRASSLAND ON SITE. MODERATE SLOPE. ELEVATION RANGE: 1700-1800 FEET.

General: SEVENTEEN WHIPTAILS SIGHTED IN RIVERSIDIAN SAGE SCRUB HABITAT DURING 1990. TOTAL OF 509 LIZARDS TRAPPED (RANGE 27 - 75 LIZARDS/ARRAY). 22 SAMPLE PERIODS BETWEEN 11 JUL 1995 & 6 OCT 1999 FOR THE MOTTE RESERVE ARRAYS.

Owner/Manager: UCNR-MOTTE RIMROCK RESERVE

Occurrence No.	217	**Map Index:**	24634	**EO Index:**	6474	**Element Last Seen:**	1993-06-08
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1993-06-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1994-01-13

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.88280 / -117.30924	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3749204 E471402	**Elevation (ft):**	1760
PLSS:	T03S, R04W, Sec. 28 (S)	**Acres:**	0.0

Location: SOUTH OF VAN BUREN BLVD, 2.5 MILES WEST OF I-215, MARCH AIR FORCE BASE.

Detailed Location: 4 ADULTS AND 1 JUVENILE CAPTURED IN PITFALL TRAPS. ANIMALS WERE NOT MARKED BEFORE RELEASE, SO IT IS UNKNOWN IF THERE WERE ANY RECAPTURES.

Ecological: HABITAT CONSISTS OF GRASSLAND, DOMINATED BY BROMUS, BRASSICA, AND SALSOLA.

General: SITE IS LOCATED ON VACANT AIR FORCE BASE PROPERTY, AND MAY LATER BE EITHER ADDED TO THE EXISTING K-RAT RESERVE OR CONVEYED TO A PRIVATE DEVELOPER.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	240	**Map Index:**	33534	**EO Index:**	29665	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-04-11

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95208 / -117.29253	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3756881 E472970	**Elevation (ft):**	1600
PLSS:	T02S, R04W, Sec. 34 (S)	**Acres:**	0.0

Location: 0.5 MILE NORTH OF THE INTERSECTION OF HWY 395 & HWY 60, 1.5 MILE SE OF UC RIVERSIDE.

Detailed Location: 1919: BOX SPRINGS RD., 3 MI OUT FROM RIVERSIDE. 1987: 0.5 MI N JNT HWY 60 AND HWY 395, W BOX SPRINGS MT. 1989: BOX SPRINGS.

Ecological:

General: 1 COLLECTED (MVZ HERP #7919) BY J.E. LAW ON 21 APR 1919. 4 INDIVIDUALS OBSERVED ON 8 NOVEMBER 1987. UNKNOWN NUMBER DETECTED BY MAYHEW DURING 1989. ACCORDING TO BRATTSTROM, STILL AT OR NEAR THIS SITE IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	259	**Map Index:** 03755	**EO Index:**	35134		**Element Last Seen:**	1989-08-03
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-08-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-11-10

Quad Summary: Perris (3311772), Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.86913 / -117.18566	**Accuracy:**	1 mile
UTM:	Zone-11 N3747661 E482828	**Elevation (ft):**	1650
PLSS:	T03S, R03W, Sec. 34 (S)	**Acres:**	0.0

Location: 20 METERS WEST OF CAMP NATURE THEATRE, LOT 17, LAKE PERRIS STATE RECREATIONAL AREA.
Detailed Location: SURVEY #15
Ecological: VEGETATION TYPE CLASSIFIED AS GRASSLAND, 80% GRASS COVER. PERENNIALS PRESENT, IN ORDER OF DOMINANCE: SALVIA OPIANA & ADENOSTOMA FASCICULATUM.
General: 1 OBSERVED, 1989.
Owner/Manager: DPR-LAKE PERRIS SRA

Occurrence No.	260	**Map Index:** 40133	**EO Index:**	35135		**Element Last Seen:**	1989-08-03
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1989-08-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-11-10

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.84148 / -117.17086	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3744593 E484192	**Elevation (ft):**	1600
PLSS:	T04S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: 300 METERS NORTH OF BIG ROCK, BERNASCONI BEACH, LAKE PERRIS STATE RECREATION AREA.
Detailed Location: SURVEY #16. LIZARDS OBSERVED OFF PAVED ROAD FOR CYCLISTS, ETC.
Ecological: DENSE, THICK FOLIAGE, MOSTLY SALVIA OPIANA AND BRASSICA SP; ALSO MARRUBIUM SP.
General: 2 LIZARDS OBSERVED, 1989.
Owner/Manager: DPR-LAKE PERRIS SRA

Occurrence No.	325	**Map Index:** 52683	**EO Index:**	52683		**Element Last Seen:**	2000-05-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2000-05-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-09-29

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.82640 / -117.32229	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3742955 E470176	**Elevation (ft):**	1800
PLSS:	T04S, R04W, Sec. 17 (S)	**Acres:**	74.3

Location: 0.6 TO 1 MILE SOUTH OF CAJALCO ROAD AND 3.4 MILES NE OF GAVILAN PEAK, 4.5 MILES NW OF PERRIS
Detailed Location:
Ecological: HABITAT ON PROJECT SITE CONSISTS OF RIVERSIDIAN SAGE SCRUB.
General: UNKNOWN NUMBER OBSERVED AT 1 TO 2 LOCATIONS DURING CALIFORNIA GNATCATHER SURVEYS CONDUCTED BETWEEN 22 MAR AND 22 MAY 2000. PROJECT SITE IS SURROUNDED BY RURAL RESIDENTIAL, ORCHARDS AND OPEN SPACE.
Owner/Manager: UNKNOWN

Occurrence No.	332 **Map Index:** 54491	**EO Index:**	54491	**Element Last Seen:**	2003-04-XX
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-02-25

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.03636 / -117.08994	**Accuracy:**	80 meters
UTM:	Zone-11 N3766191 E491697	**Elevation (ft):**	2200
PLSS:	T01S, R02W, Sec. 33 (S)	**Acres:**	0.0

Location: SW OF YUCAIPA INTERMEDIATE SCHOOL AND 0.2 MILE NORTH OF WEST YUCAIPA BOULEVARD, YUCAIPA

Detailed Location:

Ecological: HABITAT CONSISTS OF NON-NATIVE GRASSLANDS WITH A SMALL AMOUNT OF RIVERSIDEAN SAGE SCRUB; A STAND OF MATURE EUCALYPTUS IS LOCATED IN THE EASTERN PORTION OF THE SITE ALONG WITH STEEP, NARROW FINGERS OF CHAPARRAL HABITAT AND COAST LIVE OAKS.

General: 1 ADULT MALE OBSERVED FORAGING DURING APR 2003.

Owner/Manager: PVT

Occurrence No.	348 **Map Index:** 55888	**EO Index:**	55904	**Element Last Seen:**	1992-11-24
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1992-11-24
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-06-23

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.87854 / -117.29037	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3748727 E473146	**Elevation (ft):**	1680
PLSS:	T03S, R04W, Sec. 27 (S)	**Acres:**	0.0

Location: WEST MARCH AFB, 0.4 MI S OF VAN BUREN BLVD AND 1.3 MI DIRECTLY E THE END OF KRAMERIA AVE, 1 MILE SW OF ARNOLD HEIGHTS

Detailed Location: SITE 3.

Ecological: HABITAT CONSISTS OF SPARSE SHRUB COVER. TWO SHALLOW PONDS, SEPARATED BY A HIGH DRY AREA, ON SITE. WESTERN POND CONTAINS MATURE TREES FORMING A RELATIVELY CLOSED CANOPY, WHILE EASTERN POND HAS FEWER, YOUNGER TREES W/ MORE OPEN CANOPY.

General: UNKNOWN NUMBER OBSERVED BETWEEN 13 OCT - 24 NOV 1992 DURING BIRD AND SMALL MAMMAL SURVEYS. RESIDENTIAL DEVELOPMENT LOCATED APPROXIMATELY 50 METERS TO THE SOUTH.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	352	**Map Index:**	58348	**EO Index:**	58384	**Element Last Seen:**	2004-10-13
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-10-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-12-07

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.81187 / -117.04611	**Accuracy:**	80 meters
UTM:	Zone-11 N3741298 E495732	**Elevation (ft):**	1735
PLSS:	T04S, R02W, Sec. 24 (S)	**Acres:**	0.0

Location: HILLSIDES 1 MILE SW OF THE JUNCTION OF PICO ROAD AND MEAD ROAD, WEST SIDE OF THE SAN JACINTO VALLEY
Detailed Location:
Ecological: HABITAT CONSISTS OF RIVERSIDEAN SAGE SCRUB WITHIN RUGGED HILLS WITH ROCKY OUTCROPPINGS; NEARBY WAS A SEEP CONTAINING SYCAMORE WOODLAND.
General: 2 ADULTS OBSERVED ON 13 OCT 2004.
Owner/Manager: UNKNOWN

Occurrence No.	354	**Map Index:**	58351	**EO Index:**	58387	**Element Last Seen:**	2004-10-07
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-10-07
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-12-07

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.80450 / -117.04933	**Accuracy:**	80 meters
UTM:	Zone-11 N3740481 E495433	**Elevation (ft):**	2120
PLSS:	T04S, R02W, Sec. 24 (S)	**Acres:**	0.0

Location: HILLSIDE 1.5 MILES NW OF THE INTERSECTION OF WARREN ROAD AND COTTONWOOD AVENUE, SAN JACINTO VALLEY
Detailed Location:
Ecological: HABITAT CONSISTS OF RUGGED HILLS WITH RIVERSIDEAN SAGE SCRUB, SOUTHERN MIXED CHAPARRAL, AND ROCKY OUTCROPPINGS.
General: 1 ADULT OBSERVED ON 7 OCT 2004, ALONG A DIRT ROAD.
Owner/Manager: UNKNOWN

Occurrence No.	358	**Map Index:**	63085	**EO Index:**	63158	**Element Last Seen:**	1963-08-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1963-08-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-12-01

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.95438 / -117.34533	**Accuracy:**	1 mile
UTM:	Zone-11 N3757152 E468091	**Elevation (ft):**	1000
PLSS:	T02S, R04W, Sec. 31 (S)	**Acres:**	0.0

Location: 3 MILES EAST OF RIVERSIDE.
Detailed Location: LOCATION MAPPED ACCORDING TO COORDINATES PROVIDED BY MVZ WITH A MAXIMUM ERROR DISTANCE OF 1 MILE.
Ecological:
General: 1 COLLECTED (MVZ# 76325) BY T. J. PAPENFUSS AND C. J. RALPH ON 13 AUG 1963. ACCORDING TO BRATTSTROM, STILL AT SITE OR IN IMMEDIATE VICINITY IN 1990.
Owner/Manager: UNKNOWN

Occurrence No.	360	**Map Index:**	63658	**EO Index:**	63753	**Element Last Seen:**	1991-04-19
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-04-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-01-12

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86374 / -117.00857	**Accuracy:**	80 meters
UTM:	Zone-11 N3747048 E499206	**Elevation (ft):**	1900
PLSS:	T03S, R01W, Sec. 32 (S)	**Acres:**	0.0

Location: ALONG WEST SIDE OF SR 79, APPROXIMATELY 1.25 MILES N OF THE JUNCTION WITH GILMAN SPRINGS ROAD, NW OF GILMAN HOT SPRINGS.

Detailed Location:

Ecological: MIXED RIVERSIDEAN COASTAL SAGE SCRUB AND RUDERAL PLANT ASSOCIATION. COASTAL SAGE, CALIFORNIA ENCELIA, BRITTLE-BUSH, RED BROME, SLENDER WILD OATS, SHORT-POD MUSTARD, AND RED-STEMMED FILAREE.

General: 1 ADULT OBSERVED ON 19 APR 1991.

Owner/Manager: RIV COUNTY, CALTRANS

Aspidoscelis tigris stejnegeri

Element Code: ARACJ02143

coastal whiptail

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G5T3T4
	State: None		**State:**	S2S3
	Other:			

Habitat:
General: FOUND IN DESERTS & SEMIARID AREAS WITH SPARSE VEGETATION AND OPEN AREAS. ALSO FOUND IN WOODLAND & RIPARIAN AREAS.
Micro: GROUND MAY BE FIRM SOIL, SANDY, OR ROCKY.

Occurrence No.	2	**Map Index:**	24633	**EO Index:**	6475	**Element Last Seen:**	1993-06-08
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1993-06-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-06-23

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.88078 / -117.29251	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3748975 E472949	**Elevation (ft):**	1680
PLSS:	T03S, R04W, Sec. 27 (S)	**Acres:**	130.8

Location: SOUTH SIDE OF VAN BUREN BLVD (EXTENDING 0.5 MILE SOUTH), 1.5 MILES WEST OF I-215, MARCH AIR FORCE BASE.

Detailed Location: OCT-NOV 1992: SITES 2A, 2B, & 3 - UNKNOWN NUMBER OBSERVED. 1993: 4 INDIVIDUALS WERE TRAPPED UTILIZING PITFALL TRAPS. NO ANIMALS MARKED BEFORE RELEASE, SO IT IS UNKNOWN IF ANY WERE RECAPTURES.

Ecological: HABITAT IN NORTH PORTION CONSISTS OF GRASSLAND, DOMINATED BY BROMUS, BRASSICA, AND SALSOLA. SOUTH PORTION: DISTURBED GRASSLAND - PORTIONS OF AREA FORMERLY LANDFILL OR SCRAPED, 2 SHALLOW PONDS ON SITE.

General: THIS SITE IS VACANT LAND WITHIN THE AIR FORCE BASE; IT HAS NOT YET BEEN DECIDED WHETHER IT WILL BE PRESERVED AS AN ADDITION TO THE K-RAT PRESERVE OR CONVEYED TO A PRIVATE DEVELOPER. RESIDENTIAL AREA LOCATED TO THE SOUTH.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	34	**Map Index:**	48080	**EO Index:**	48525	**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-08-09

Quad Summary: Perris (3311772), Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.80844 / -117.25624	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740946 E476283	**Elevation (ft):**	1900
PLSS:	T04S, R04W, Sec. 24 (S)	**Acres:**	167.6

Location: MOTTE RIMROCK RESERVE. 1 MILE SOUTHWEST OF MAYER FARMS AT HIGHWAY 395 (I-15E). NORTH OF PERRIS.
Detailed Location: PIT-FALL TRAP ARRAYS 1 TO 10; FOUND IN ALL ARRAYS.
Ecological: MOTTE RESERVE IS MODERATE SIZED FRAGMENT DOMINATED BY COASTAL SAGE SCRUB WITH PATCHES OF GRASSLAND. SITE IS RELATIVELY FLAT, SURROUNDED BY LOW DENSITY HOUSES. SITE IS PART OF THE STEPHENS K-RAT HCP.
General: TOTAL OF 347 LIZARDS TRAPPED (RANGE 9 - 69 LIZARDS/ARRAY). 22 SAMPLE PERIODS BETWEEN 11 JUL 1995 & 6 OCT 1999 FOR ALL OF THE MOTTE RESERVE ARRAYS.
Owner/Manager: UCNR-MOTTE RIMROCK RESERVE

Occurrence No.	80	**Map Index:**	59974	**EO Index:**	60010	**Element Last Seen:**	2004-06-23
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-06-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-02-14

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92871 / -117.02436	**Accuracy:**	80 meters
UTM:	Zone-11 N3754252 E497747	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: 0.25 MILE SOUTH OF HIGHWAY 60, 2.5 MILES WEST OF BEAUMONT
Detailed Location:
Ecological: HABITAT CONSISTS OF CHAPARRAL AND NON-NATIVE GRASSLAND WITH ORV USE.
General: 1 ADULT OBSERVED ON 23 JUN 2004.
Owner/Manager: PVT

Occurrence No.	89	**Map Index:**	75681	**EO Index:**	76706	**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-07-06

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.98428 / -117.18583	**Accuracy:**	80 meters
UTM:	Zone-11 N3760429 E482835	**Elevation (ft):**	2418
PLSS:	T02S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: NORTHWEST OF THE BADLANDS, 4 MILES NE OF SUNNYMEAD AND 1.4 MILES S OF THE RIVERSIDE/SAN BERNARDINO COUNTY LINE.
Detailed Location: .
Ecological: DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB. MODERATE TO STEEP ROLLING HILLS.
General: 1 OBSERVED AT THIS LOCATION.
Owner/Manager: PVT

Occurrence No.	90	**Map Index:** 75683	**EO Index:**	76707		**Element Last Seen:**	2007-06-01
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-06-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-06-30

Quad Summary: Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.97558 / -117.17578	**Accuracy:**	80 meters
UTM:	Zone-11 N3759462 E483762	**Elevation (ft):**	2246
PLSS:	T02S, R03W, Sec. 22 (S)	**Acres:**	0.0

Location: NORTHWEST EDGE OF THE BADLANDS, 4 MILES NE OF SUNNYMEAD AND 2 MILES S OF THE RIVERSIDE/SAN BERNARDINO COUNTY LINE.
Detailed Location: 0.65 MILE EAST OF JORDAN DRIVE AND 0.75 MILE NORTH OF WALTHER AVE, WEST OF UNNAMED CREEK.
Ecological: DISTURBED, REGROWN, AND UNDISTURBED SAGE SCRUB. MODERATE TO STEEP ROLLING HILLS.
General: 1 OBSERVED AT THIS LOCATION.
Owner/Manager: PVT

Charina trivirgata

Element Code: ARADA01020

rosy boa

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G4G5
	State:	None		**State:** S3S4
	Other:	IUCN_LC-Least Concern, USFS_S-Sensitive		
Habitat:	**General:**	DESERT & CHAPARRAL FROM THE COAST TO THE MOJAVE & COLORADO DESERTS. PREFERS MODERATE TO DENSE VEGETATION & ROCKY COVER.		
	Micro:	HABITATS WITH A MIX OF BRUSHY COVER & ROCKY SOIL SUCH AS COASTAL CANYONS & HILLSIDES, DESERT CANYONS, WASHES & MOUNTAINS		

Occurrence No.	42	**Map Index:** 80678	**EO Index:**	81694		**Element Last Seen:**	2007-04-24
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-04-24
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-11-16

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.90745 / -117.30425	**Accuracy:**	80 meters
UTM:	Zone-11 N3751936 E471872	**Elevation (ft):**	1767
PLSS:	T03S, R04W, Sec. 16 (S)	**Acres:**	0.0

Location: ON FORMER MARCH AIR FORCE BASE, 1.2 MI SW OF E ALESSANDRO BLVD & I-215 JUNCTION, 1.75 MILES NW OF ARNOLD HEIGHTS.
Detailed Location: JUST SOUTH OF CACTUS AVE BETWEEN HOUSING DEVELOPMENTS. MAPPED ACCORDING TO UTM COORDINATES PROVIDED.
Ecological: AREA CURRENTLY UTILIZED BY PYROTECHNIC BUSINESS. SURROUNDING LANDS MANAGED BY CNLM AS STEPHENS' KANGAROO RAT HABITAT.
General: 1 ADULT BOA OBSERVED ON 24 APR 2007 NEAR BURNT OUT BUILDING WITHIN PREVIOUS SECURE AREA ON FORMER MARCH AIR FORCE BASE.
Owner/Manager: DOD-MARCH AFB

Diadophis punctatus modestus

Element Code: ARADB10015

San Bernardino ringneck snake

Listing Status: **Federal:** None | **CNDDB Element Ranks:** **Global:** G5T2T3
State: None | **State:** S2?
Other: USFS_S-Sensitive

Habitat: **General:** MOST COMMON IN OPEN, RELATIVELY ROCKY AREAS. OFTEN IN SOMEWHAT MOIST MICROHABITATS NEAR INTERMITTENT STREAMS.

Micro: AVOIDS MOVING THROUGH OPEN OR BARREN AREAS BY RESTRICTING MOVEMENTS TO AREAS OF SURFACE LITTER OR HERBACEOUS VEG.

Occurrence No.	1 **Map Index:** 39705	**EO Index:**	34715	**Element Last Seen:**	1997-04-16
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1997-04-16
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-09-14

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10295 / -117.00852	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3773571 E499213	**Elevation (ft):**	3460
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: THURMAN FLATS PICNIC AREA, ON THE NORTH SIDE OF MILL CREEK (AND HWY 38), 4 MILES NORTH OF YUCAIPA.

Detailed Location:

Ecological: HABITAT CONSISTS OF SYCAMORE ALDER RIPARIAN FOREST, WITH AN UNDERSTORY OF BLACKBERRY BRAMBLE, ARROYO WILLOWS, AND MULEFAT ALONG STREAM MARGINS. STREAM IS ROCKY/COBBLY, WITH A WIDE FLOODPLAIN AND UPLAND BENCH; CHAPARRAL ALONG CANYON WALLS.

General: 1 ADULT OBSERVED ON 16 APRIL 1997.

Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	5 **Map Index:** 54959	**EO Index:**	54960	**Element Last Seen:**	2000-05-22
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-22
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-03-30

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.83424 / -117.31888	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3743823 E470494	**Elevation (ft):**	1600
PLSS:	T04S, R04W, Sec. 08 (S)	**Acres:**	959.7

Location: 0.5 MILE N OF CAJALCO RD AND 1 MILE S OF CAJALCO RD, EAST OF WOOD RD AND WEST OF ALEXANDER ST, 6 MILES NE OF PERRIS.

Detailed Location: 1 DETECTION IN NE PORTION & 2 IN SE PORTION OF SITE FOR NORTHERN RED-DIAMOND RATTLESNAKE & SAN BERNARDINO RING-NECKED SNAKE - SYMBOLS ON MAP ARE SAME FOR BOTH SPECIES & SO IT IS NOT CLEAR WHICH SPECIES WAS FOUND AT WHICH LOCATION.

Ecological: SPECIES DETECTED WITHIN RIVERSIDEAN SAGE SCRUB AND NON-NATIVE GRASSLAND ON PROJECT SITE. AREA NORTH OF CAJALCO RD IS RELATIVELY FLAT WITH CITRUS ORCHARDS IN WEST AND GRASSLAND/ROCK OUTCROPS IN REMAINING AREA. NORTH AREA GRAZED BY SHEEP.

General: SPECIES DETECTED ON PROJECT SITE DURING FOCUSED CALIFORNIA GNATCATCHER SURVEYS CONDUCTED BETWEEN 22 MAR AND 22 MAY 2000. SURVEYS CONDUCTED FOR THE BOULDER SPRINGS PROJECT SITE.

Owner/Manager: UNKNOWN

Lampropeltis zonata (parvirubra)

Element Code: ARADB19062

California mountain kingsnake (San Bernardino population)

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G4G5
	State:	None		**State:** S2?
	Other:	BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive		
Habitat:	**General:**	BIGCONE SPRUCE & CHAPARRAL AT LOWER ELEV. BLACK OAK, INCENSE CEDAR, JEFFREY PINE & PONDEROSA PINE AT HIGHER ELEVATIONS.		
	Micro:	WELL-LIT CANYONS WITH ROCKY OUTCROPS OR ROCKY TALUS.		

Occurrence No.	2	**Map Index:**	39705	**EO Index:**	34707	**Element Last Seen:**	1997-04-17
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1997-04-17
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-09-14

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10295 / -117.00852	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3773571 E499213	**Elevation (ft):**	3460
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: THURMAN FLATS PICNIC AREA, ON THE NORTH SIDE OF MILL CREEK (AND HWY 38), 4 MILES NORTH OF YUCAIPA.

Detailed Location:

Ecological: HABITAT CONSISTS OF SYCAMORE ALDER RIPARIAN FOREST, WITH AN UNDERSTORY OF BLACKBERRY BRAMBLE, ARROYO WILLOWS, AND MULEFAT ALONG STREAM MARGINS. STREAM IS ROCKY/COBBLY, WITH A WIDE FLOODPLAIN AND UPLAND BENCH.

General: 1 ADULT OBSERVED ON 17 APRIL 1997.

Owner/Manager: USFS-SAN BERNARDINO NF

Thamnophis hammondii

Element Code: ARADB36160

two-striped garter snake

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G3
	State:	None		**State:** S2
	Other:	BLM_S-Sensitive, DFG_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive		
Habitat:	**General:**	COASTAL CALIFORNIA FROM VICINITY OF SALINAS TO NORTHWEST BAJA CALIFORNIA. FROM SEA TO ABOUT 7,000 FT ELEVATION.		
	Micro:	HIGHLY AQUATIC, FOUND IN OR NEAR PERMANENT FRESH WATER. OFTEN ALONG STREAMS WITH ROCKY BEDS AND RIPARIAN GROWTH.		

Occurrence No.	5	**Map Index:**	23965	**EO Index:**	26499	**Element Last Seen:**	1993-07-31
Occ. Rank:	None			**Presence:**	Possibly Extirpated	**Site Last Seen:**	1997-01-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1997-04-10

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.12061 / -117.08642	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3775532 E492030	**Elevation (ft):**	2150
PLSS:	T01S, R02W, Sec. 04 (S)	**Acres:**	0.0

Location: SANTA ANA RIVER, 0.5 MILE DOWNSTREAM FROM THE WARM SPRINGS CANYON JUNCTION, NORTH OF REDLANDS.

Detailed Location:

Ecological: HABITAT WAS MIXED RIPARIAN, DOMINATED BY WILLOW & ALDER STANDS INTERSPERSED WITH OPEN HERBACEOUS COMMUNITIES & ALLUVIAL SCRUB. CONSTRUCTION OF "SEVEN OAKS DAM" HAS DESTROYED MOST RIPARIAN VEGETATION IN THAT PART OF CANYON.

General: ONE 12-INCH SNAKE OBSERVED 7/31/93.

Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	50	**Map Index:**	39705	**EO Index:**	34708	**Element Last Seen:**	1997-04-16
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1997-04-16
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-09-14

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10295 / -117.00852	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3773571 E499213	**Elevation (ft):**	3460
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: THURMAN FLATS PICNIC AREA, ON THE NORTH SIDE OF MILL CREEK (AND HWY 38), 4 MILES NORTH OF YUCAIPA.

Detailed Location:

Ecological: HABITAT CONSISTS OF SYCAMORE ALDER RIPARIAN FOREST, WITH AN UNDERSTORY OF BLACKBERRY BRAMBLE, ARROYO WILLOWS, AND MULEFAT ALONG STREAM MARGINS. STREAM IS ROCKY/COBBLY, WITH A WIDE FLOODPLAIN AND UPLAND BENCH; CHAPARRAL ALONG CANYON WALLS.

General: 1 ADULT OBSERVED ON 16 APRIL 1997.

Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	92	**Map Index:** 63127	**EO Index:**	63219		**Element Last Seen:**	2005-10-05
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2005-10-05
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2005-11-08

Quad Summary: Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long:	34.10811 / -117.09936	**Accuracy:**	80 meters
UTM:	Zone-11 N3774148 E490835	**Elevation (ft):**	1955
PLSS:	T01S, R02W, Sec. 04 (S)	**Acres:**	0.0

Location: SANTA ANA RIVER, ALONG THE ACCESS ROAD TO SEVEN OAKS DAM, JUST UPSTREAM FROM CUTTLE WEIR, NE OF REDLANDS

Detailed Location: THIS SITE WAS DISTURBED DURING CONSTRUCTION OF SEVEN OAKS DAM AND IS RECOVERING. RIVER BED CHANGES WHEN HIGH WATER FLOWS OCCUR.

Ecological: HABITAT CONSISTS OF PERMANENT WATER WITH A PATCH OF RIPARIAN VEGETATION (PRIMARILY WILLOWS) IN THE SANTA ANA RIVER CHANNEL ABOVE CUTTLE WEIR; STEEP CANYON WALLS ON BOTH SIDES OF RIVER. ROAD WAS PAVED; SURROUNDING AREAS SPARSELY VEGETATED.

General: 1 JUVENILE OBSERVED ON 5 OCT 2005.

Owner/Manager: UNKNOWN

Occurrence No.	143	**Map Index:** 80372	**EO Index:**	81358		**Element Last Seen:**	2001-07-27
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2001-07-27
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-10-12

Quad Summary: Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long:	34.11956 / -117.06733	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3775415 E493790	**Elevation (ft):**	2520
PLSS:	T01S, R02W, Sec. 02 (S)	**Acres:**	112.0

Location: CREEK IN WARM SPRINGS CANYON, TRIBUTARY TO SANTA ANA RIVER. 0.7 MI N OF CRAM PEAK.

Detailed Location: MAPPED TO SURVEY REACH LOCATIONSHOWN ON MAP #18, ATTACHED TO REPORT BAC02R0002.

Ecological: USGS MONITORING SITE.

General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED DURING USGS FIELD SURVEY FOR RANA MUSCOSA ON 27 JUL 2001.

Owner/Manager: USFS-SAN BERNARDINO NF

Crotalus ruber

Element Code: ARADE02090

red-diamond rattlesnake

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G4
	State:	None	**State:**	S2?
	Other:	DFG_SSC-Species of Special Concern		
Habitat:	**General:**	CHAPARRRAL, WOODLAND, GRASSLAND, & DESERT AREAS FROM COASTAL SAN DIEGO COUNTY TO THE EASTERN SLOPES OF THE MOUNTAINS.		
	Micro:	OCCURS IN ROCKY AREAS & DENSE VEGETATION. NEEDS RODENT BURROWS, CRACKS IN ROCKS OR SURFACE COVER OBJECTS.		

Occurrence No.	21	**Map Index:** 42990	**EO Index:**	42990		**Element Last Seen:**	1988-03-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1988-03-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2000-05-22

Quad Summary: Riverside East (3311783), San Bernardino South (3411713)
County Summary: Riverside

Lat/Long:	33.98724 / -117.26744	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3760773 E475298	**Elevation (ft):**	1800
PLSS:	T02S, R04W, Sec. 23 (S)	**Acres:**	663.3

Location: PIGEON PASS ROAD NORTH OF HIGHWAY 60, RIVERSIDE COUNTY.
Detailed Location: SPECIFIC SITE LOCATION NOT GIVEN SO IT WAS MAPPED TO THE ROAD AS DESCRIBED ABOVE.
Ecological:
General: 1 FEMALE COLLECTED (SVL: 109, TL 114, WT 660.9) AND HOUSED AT THE UCLA MUSEUM.
Owner/Manager: UNKNOWN

Occurrence No.	33	**Map Index:** 47523	**EO Index:**	47523		**Element Last Seen:**	1931-04-18
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1931-04-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2002-04-02

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.95415 / -117.30958	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3757115 E471395	**Elevation (ft):**	1500
PLSS:	T02S, R04W, Sec. 33 (S)	**Acres:**	0.0

Location: BOX SPRINGS CANYON, JUST SOUTHEAST OF RIVERSIDE.
Detailed Location:
Ecological:
General: SAN DIEGO NATURAL HISTORY MUSEUM #0004385 AND #0004386.
Owner/Manager: UNKNOWN

Occurrence No.	34	**Map Index:** 47524	**EO Index:**	47524		**Element Last Seen:**	1939-06-03
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1939-06-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2002-04-02

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.98332 / -117.28881	**Accuracy:**	1 mile
UTM:	Zone-11 N3760344 E473323	**Elevation (ft):**	2280
PLSS:	T02S, R04W, Sec. 22 (S)	**Acres:**	0.0

Location: BOX SPRINGS GRADE (BOX SPRINGS MOUNTAINS), JUST EAST OF RIVERSIDE.
Detailed Location:
Ecological:
General: SAN DIEGO NATURAL HISTORY MUSEUM # 0031757
Owner/Manager: UNKNOWN

Occurrence No.	40	**Map Index:** 47528	**EO Index:**	47528	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-04-02

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.84040 / -117.37108	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3744522 E465667	**Elevation (ft):**	1480
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	0.0

Location: EAST OF LAKE MATHEWS; ALONG EL SOBRANTE ROAD, 0.5 MILE WEST OF JUNCTION WITH CAJALCO ROAD.
Detailed Location:
Ecological:
General: LA COUNTY MUSEUM #0116021
Owner/Manager: UNKNOWN

Occurrence No.	42	**Map Index:** 47529	**EO Index:**	47529	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-04-02

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.81896 / -117.35923	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3742140 E466755	**Elevation (ft):**	1840
PLSS:	T04S, R05W, Sec. 13 (S)	**Acres:**	0.0

Location: EAST OF LAKE MATHEWS; ALONG GAVILAN HILLS ROAD ABOUT 1 MILE SOUTH OF CAJALCO ROAD.
Detailed Location:
Ecological:
General: LA COUNTY MUSEUM #0116023. NO DATE GIVEN.
Owner/Manager: UNKNOWN

Occurrence No.	49	**Map Index:** 47571	**EO Index:**	47571	**Element Last Seen:**	1939-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1939-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-04-04

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774), Riverside West (3311784)
County Summary: Riverside

Lat/Long:	33.86355 / -117.38110	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3747092 E464749	**Elevation (ft):**	1320
PLSS:	T03S, R05W, Sec. 35 (S)	**Acres:**	1092.1

Location: MOCKINGBIRD CANYON, 2.5 MILES NE OF LAKE MATHEWS.
Detailed Location: 2 INDIVIDUALS LOCATED WITHIN CANYON.
Ecological:
General: CAS-SU #0010109 AND #0010110.
Owner/Manager: UNKNOWN

Occurrence No.	53 **Map Index:** 47547	**EO Index:**	47547	**Element Last Seen:**	1923-05-16
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1923-05-16
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2002-04-02

Quad Summary: Winchester (3311761), Romoland (3311762), Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.74770 / -117.11110	**Accuracy:**	1 mile
UTM:	Zone-11 N3734187 E489710	**Elevation (ft):**	1660
PLSS:	T05S, R02W, Sec. 08 (S)	**Acres:**	0.0

Location: DIRECTIONS GIVEN AS "8 MILES WEST OF HEMET", WHICH PUTS IT IN THE VICINITY OF HOMELAND.

Detailed Location:

Ecological:

General: CAS #0057781. COLLECTED DURING EXPEDITION TO SOUTHERN CALIFORNIA AND LOWER CALIFORNIA.

Owner/Manager: UNKNOWN

Occurrence No.	54 **Map Index:** 47583	**EO Index:**	47583	**Element Last Seen:**	1929-06-01
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1929-06-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2002-04-04

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.91849 / -117.15671	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3753129 E485514	**Elevation (ft):**	1600
PLSS:	T03S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: MORENO

Detailed Location: NO OTHER LOCATION INFORMATION GIVEN.

Ecological:

General: SAN DIEGO NATURAL HISTORY MUSEUM #0011921

Owner/Manager: UNKNOWN

Occurrence No.	59 **Map Index:** 47557	**EO Index:**	47557	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2002-04-03

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.73639 / -117.34114	**Accuracy:**	1 mile
UTM:	Zone-11 N3732980 E468399	**Elevation (ft):**	2000
PLSS:	T05S, R04W, Sec. 18 (S)	**Acres:**	0.0

Location: 4 MILES NORTH OF LAKE ELSINORE.

Detailed Location: COLLECTIONS FROM STOVEPIPE CANYON, ARROYO DEL TORO, AND 3 MILES NORTH OFF HWY 71 ON EL TORO RD.

Ecological:

General: LA COUNTY MUSEUM #0052563, # 0105004 AND # 0105005

Owner/Manager: UNKNOWN

Occurrence No.	60	**Map Index:** 47558	**EO Index:**	47558	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-04-03

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.73676 / -117.29783	**Accuracy:**	1 mile
UTM:	Zone-11 N3733008 E472411	**Elevation (ft):**	1800
PLSS:	T05S, R04W, Sec. 16 (S)	**Acres:**	0.0

Location: 2 MILES WEST AND 4.5 MILES NORTH OF ELSINORE.
Detailed Location: NO OTHER LOCATION INFORMATION GIVEN.
Ecological:
General: LA COUNTY MUSEUM #0105003
Owner/Manager: UNKNOWN

Occurrence No.	64	**Map Index:** 47525	**EO Index:**	47525	**Element Last Seen:**	1947-06-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1947-06-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-06-17

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.93871 / -117.29383	**Accuracy:**	1 mile
UTM:	Zone-11 N3755399 E472845	**Elevation (ft):**	1000
PLSS:	T03S, R04W, Sec. 03 (S)	**Acres:**	0.0

Location: BOX SPRINGS (CITRUS EXPERIMENT STATION); SE OF RIVERSIDE.
Detailed Location:
Ecological:
General: 26 JUN 1947: SAN DIEGO NATURAL HISTORY MUSEUM #0038372.
Owner/Manager: UNKNOWN

Occurrence No.	72	**Map Index:** 48124	**EO Index:**	48124	**Element Last Seen:**	1959-09-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1959-09-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2002-06-17

Quad Summary: Riverside East (3311783), Riverside West (3311784)
County Summary: Riverside

Lat/Long:	33.97883 / -117.36985	**Accuracy:**	1 mile
UTM:	Zone-11 N3759870 E465836	**Elevation (ft):**	900
PLSS:	T02S, R05W, Sec. 23 (S)	**Acres:**	0.0

Location: RIVERSIDE.
Detailed Location: SINCE THE COLLECTION WAS MADE IN 1959, THE LOCATION WAS MAPPED AT THE NORTHERN END (THE OLDER PART) OF RIVERSIDE.
Ecological:
General: CSPUP #0000502.
Owner/Manager: UNKNOWN

Occurrence No.	78	**Map Index:** 51599	**EO Index:**	51599		**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-06-19

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.86801 / -117.19197	**Accuracy:**	specific area
UTM:	Zone-11 N3747538 E482244	**Elevation (ft):**	1700
PLSS:	T03S, R03W, Sec. 33 (S)	**Acres:**	15.6

Location: ABOUT 0.45 MI NORTHEAST OF LAKE PERRIS DAM.

Detailed Location: PIT-FALL TRAP ARRAYS 7 & 8.

Ecological: OVERALL THE LAKE PERRIS SITE IS A VERY LARGE STUDY AREA DOMINATED BY BRITTLE BUSH, WITH LARGE AREAS OF GRASSLAND & BOULDER FIELDS. MOST ARRAYS ON SOUTH FACING SLOPES, ALTHOUGH SOME ARE FLAT. THIS SITE INCLUDED IN STEPHENS K-RAT HCP.

General: 2 SNAKES CAPTURED. 24 SAMPLE PERIODS BETWEEN 11 JULY 1995 & 6 OCT 1999 FOR ALL OF THE LAKE PERRIS ARRAYS, NOT KNOWN EXACTLY WHICH DATES APPLY TO THESE TWO ARRAYS.

Owner/Manager: DFG, DPR

Occurrence No.	79	**Map Index:** 51600	**EO Index:**	51600		**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2003-06-19

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.86385 / -117.20339	**Accuracy:**	80 meters
UTM:	Zone-11 N3747078 E481187	**Elevation (ft):**	1600
PLSS:	T03S, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: 0.27 MI EAST OF KINE AVENUE & 0.38 MI WEST OF LAKE PERRIS DAM.

Detailed Location: PIT-FALL TRAP ARRAY 1.

Ecological: OVERALL THE LAKE PERRIS SITE IS A VERY LARGE STUDY AREA DOMINATED BY BRITTLE BUSH, WITH LARGE AREAS OF GRASSLAND & BOULDER FIELDS. MOST ARRAYS ON SOUTH FACING SLOPES, ALTHOUGH SOME ARE FLAT. THIS SITE INCLUDED IN STEPHENS K-RAT HCP.

General: 1 SNAKE CAPTURED. 24 SAMPLE PERIODS BETWEEN 11 JULY 1995 & 6 OCT 1999 FOR ALL OF THE LAKE PERRIS ARRAYS, NOT KNOWN EXACTLY WHICH DATES APPLY TO THIS ARRAY.

Owner/Manager: DFG, DPR

Occurrence No.	80	**Map Index:**	48077	**EO Index:**	51601	**Element Last Seen:**	1999-10-06
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-10-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-06-19

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84562 / -117.14635	**Accuracy:**	80 meters
UTM:	Zone-11 N3745048 E486460	**Elevation (ft):**	1550
PLSS:	T04S, R03W, Sec. 01 (S)	**Acres:**	0.0

Location: ABOUT 1.1 MILES EAST OF PERRIS RESERVOIR, EAST OF BERNASCONI HILLS. 0.3 MI NORTH OF MARTIN ST.

Detailed Location: PIT-FALL TRAP ARRAY 15.

Ecological: OVERALL THE LAKE PERRIS SITE IS A VERY LARGE STUDY AREA DOMINATED BY BRITTLE BUSH, WITH LARGE AREAS OF GRASSLAND & BOULDER FIELDS. MOST ARRAYS ON SOUTH FACING SLOPES, ALTHOUGH SOME ARE FLAT. THIS SITE INCLUDED IN STEPHENS K-RAT HCP.

General: TWO SNAKES CAPTURED. 24 SAMPLE PERIODS BETWEEN 11 JULY 1995 & 6 OCT 1999 FOR ALL OF THE LAKE PERRIS ARRAYS, NOT KNOWN EXACTLY WHICH DATES APPLY TO THIS ARRAY.

Owner/Manager: DFG, DPR

Occurrence No.	89	**Map Index:**	53213	**EO Index:**	54899	**Element Last Seen:**	2002-04-09
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2002-04-09
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-03-29

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.76412 / -117.30166	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3736044 E472064	**Elevation (ft):**	2100
PLSS:	T05S, R04W, Sec. 04 (S)	**Acres:**	657.6

Location: NORTH OF STEELE PEAK AND EAST OF STEELE VALLEY, SOUTHWEST OF ELLIS AVE, 3.3 MILES SW OF PERRIS.

Detailed Location: LOCATION GIVEN AS TOWNSHIP 5S RANGE 4W SECTION 4.

Ecological: HABITAT CONSISTS OF COASTAL SAGE SCRUB WITH ROCK OUTCROPPINGS, GRANITIC SOIL. GOLDEN EAGLE, BELL'S SAGE SPARROW AND QUINO CHECKERSPOT ALSO IN VICINITY.

General: 1 ADULT OBSERVED SUNNING ON 9 APR 2002.

Owner/Manager: UNKNOWN

Occurrence No.	95 **Map Index:** 54959	**EO Index:**	54959	**Element Last Seen:**	2000-05-22
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-22
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2004-03-30

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.83424 / -117.31888	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3743823 E470494	**Elevation (ft):**	1600
PLSS:	T04S, R04W, Sec. 08 (S)	**Acres:**	959.7

Location: 0.5 MILE N OF CAJALCO RD AND 1 MILE S OF CAJALCO RD, EAST OF WOOD RD AND WEST OF ALEXANDER ST, 6 MILES NE OF PERRIS.

Detailed Location: 1 DETECTION IN NE PORTION & 2 IN SE PORTION OF SITE FOR NORTHERN RED-DIAMOND RATTLESNAKE & SAN BERNARDINO RING-NECKED SNAKE - SYMBOLS ON MAP ARE SAME FOR BOTH SPECIES & SO IT IS NOT CLEAR WHICH SPECIES WAS FOUND AT WHICH LOCATION.

Ecological: SPECIES DETECTED WITHIN RIVERSIDEAN SAGE SCRUB AND NON-NATIVE GRASSLAND ON PROJECT SITE. AREA NORTH OF CAJALCO RD IS RELATIVELY FLAT WITH CITRUS ORCHARDS IN WEST AND GRASSLAND/ROCK OUTCROPS IN REMAINING AREA. NORTH AREA GRAZED BY SHEEP.

General: SPECIES DETECTED ON PROJECT SITE DURING FOCUSED CALIFORNIA GNATCATCHER SURVEYS CONDUCTED BETWEEN 22 MAR AND 22 MAY 2000. SURVEYS CONDUCTED FOR THE BOULDER SPRINGS PROJECT SITE.

Owner/Manager: UNKNOWN

Occurrence No.	103 **Map Index:** 62996	**EO Index:**	63069	**Element Last Seen:**	2005-07-26
Occ. Rank:	Excellent	**Presence:**	Presumed Extant	**Site Last Seen:**	2005-07-26
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-10-31

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.75900 / -117.05601	**Accuracy:**	80 meters
UTM:	Zone-11 N3735436 E494813	**Elevation (ft):**	1600
PLSS:	T05S, R02W, Sec. 02 (S)	**Acres:**	0.0

Location: MOUTH OF REINHARDT CANYON, JUST WEST OF CALIFORNIA AVE AND 1 MILE NORTH OF STATE ROUTE 74, 5 MILES WEST OF HEMET.

Detailed Location: LOCATION MAPPED ACCORDING TO LAT-LONG COORDINATES GIVEN.

Ecological: SUBSTRATE CONSISTS OF SAND AND GRANITE.

General: 7 ADULTS AND 3 JUVENILES OBSERVED ON 26 JUL 2005.

Owner/Manager: PVT

Riversidian Alluvial Fan Sage Scrub

Element Code: CTT32720CA

Riversidian Alluvial Fan Sage Scrub

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G1
	State:	None		**State:** S1.1
	Other:			
Habitat:	**General:**			
	Micro:			

Occurrence No.	2 **Map Index:** 03924	**EO Index:**	24585	**Element Last Seen:**	1986-07-01
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	1986-07-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-07-13

Quad Summary: Forest Falls (3411618), Yucaipa (3411711), Redlands (3411712), Harrison Mtn. (3411722)

County Summary: San Bernardino

Lat/Long:	34.10419 / -117.10839	**Accuracy:**	specific area
UTM:	Zone-11 N3773713 E490002	**Elevation (ft):**	1500
PLSS:	T01S, R03W, Sec. 12 (S)	**Acres:**	7259.5

Location: SANTA ANA WASH AND MILL CREEK; NORTH OF REDLANDS AND CRAFTON HILLS.

Detailed Location: ON SOBOBA STONY LOAM SAND AND FLOOD CHANNEL DEPOSITS; REWORKED DURING HIGH WATER. BOUNDARY PER 1985 AERIAL PHOTOS.

Ecological: ERIASTRUM DENSIFOLIUM, ERICAMERIA PINIFOLIA, YUCCA WHIPPLEI, JUNIPERUS CALIFORNICA, OPUNTIA OCCIDENTALIS, O. PARRYI, RHUS INTEGRIFOLIA.

General: SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: BLM, SBD VALLEY FCD, OTHERS

Occurrence No.	22 **Map Index:** 04268	**EO Index:**	24632	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-07-13

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.05183 / -117.03051	**Accuracy:**	specific area
UTM:	Zone-11 N3767903 E497184	**Elevation (ft):**	2900
PLSS:	T01S, R01W, Sec. 30 (S)	**Acres:**	50.1

Location: WILSON CREEK, BETWEEN JEFFERSON AND BRYANT STREETS, NORTH OF YUCAIPA.

Detailed Location: MAPPED PER INTERPRETATION OF 1980 AERIAL PHOTOS.

Ecological:

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Southern Riparian Forest

Element Code: CTT61300CA

Southern Riparian Forest

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4
	State:	None		**State:**	S4
	Other:				
Habitat:	**General:**				
	Micro:				

Occurrence No.	16 **Map Index:** 04110	**EO Index:**	16034	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Decreasing	**Record Last Updated:**	1998-07-23

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.01574 / -117.08171	**Accurracy:**	specific area
UTM:	Zone-11 N3763904 E492455	**Elevation (ft):**	2160
PLSS:	T02S, R02W (S)	**Acres:**	24.5

Location: TRIBUTARY TO YUCAIPA CREEK, BETWEEN WEST AVE AND HWY 10, SW OF YUCAIPA.

Detailed Location: BOUNDARY REPRESENTS EXTENT AS INTERPRETED FROM 1980 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Southern Coast Live Oak Riparian Forest

Element Code: CTT61310CA

Southern Coast Live Oak Riparian Forest

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4
	State:	None		**State:**	S4
	Other:				
Habitat:	**General:**				
	Micro:				

Occurrence No.	137 **Map Index:** 03917	**EO Index:**	13411	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-08-28

Quad Summary: Yucaipa (3411711), Redlands (3411712)
County Summary: Riverside, San Bernardino

Lat/Long:	34.00300 / -117.13306	**Accuracy:**	specific area
UTM:	Zone-11 N3762496 E487712	**Elevation (ft):**	1780
PLSS:	T02S, R02W, Sec. 18 (S)	**Acres:**	74.7

Location: LIVE OAK CANYON, FROM ABOUT 1680 TO 1800 FT, SE OF REDLANDS.

Detailed Location: EXTANT, 1978, PER INTERPRETATION OF AERIAL PHOTOS BUT NARROWER CORRIDOR WITH THIN CANOPY SURROUNDED BY RESIDENTIAL DEVELOPMENT.

Ecological: QUERCUS AGRIFOLIA WOODLAND FORMING CLOSED CANOPY ACCORDING TO WIESLANDER SURVEY.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	143 **Map Index:** 03351	**EO Index:**	15914	**Element Last Seen:**	1980-04-10
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-08-31

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.80962 / -117.35774	**Accuracy:**	specific area
UTM:	Zone-11 N3741104 E466889	**Elevation (ft):**	1880
PLSS:	T04S, R05W (S)	**Acres:**	44.6

Location: ALONG GAVILAN ROAD IN VICINITY OF HARFORD SPRING, EAST OF LAKE MATHEWS.

Detailed Location: EXTANT, 1980, PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY QUERCUS AGRIFOLIA AND SALIX SPP.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	163	**Map Index:** 04283	**EO Index:**	15901	**Element Last Seen:**	1980-02-13
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1980-02-13
Occ. Type:	Natural/Native occurrence		**Trend:**	Decreasing	**Record Last Updated:**	1998-08-31

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.88488 / -117.01753	**Accuracy:**	specific area
UTM:	Zone-11 N3749392 E498378	**Elevation (ft):**	1820
PLSS:	T03S, R01W, Sec. 30 (S)	**Acres:**	38.0

Location: UNNAMED TRIBUTARY TO LABORDE CANYON, CONFLUENCE ABOUT 1.5 MILES U/S OF SAN JACINTO VALLEY.

Detailed Location: EXTANT, 1980, PER INTERPRETATION OF AERIAL PHOTOS BUT BOUNDARY REDUCED D/S BECAUSE COVER IS VERY THIN.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY QUERCUS AGRIFOLIA.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Southern Cottonwood Willow Riparian Forest

Element Code: CTT61330CA

Southern Cottonwood Willow Riparian Forest

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3
	State:	None		**State:**	S3.2
	Other:				
Habitat:	**General:**				
	Micro:				

Occurrence No.	63	**Map Index:** 04262	**EO Index:**	15788	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1998-07-20

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.04547 / -117.02857	**Accuracy:**	specific area
UTM:	Zone-11 N3767198 E497362	**Elevation (ft):**	2840
PLSS:	T01S, R01W, Sec. 31 (S)	**Acres:**	91.0

Location: OAK GLEN CREEK, FROM JUNCTION WITH WILSON CREEK U/S ABOUT 1.25 MILES, NE OF YUCAIPA.

Detailed Location: MAPPED FROM INTERPRETATION OF 1978 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	73	**Map Index:** 03353	**EO Index:**	15779		**Element Last Seen:**	1980-04-10
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-07-20

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.75613 / -117.35675	**Accuracy:**	specific area
UTM:	Zone-11 N3735173 E466960	**Elevation (ft):**	1840
PLSS:	T05S, R05W, Sec. 12 (S)	**Acres:**	177.4

Location: MIDDLE-UPPER PORTIONS OF UNNAMED TRIBUTARY TO WALKER CANYON, JUST WEST OF STOVEPIPE & BULL CANYON ROADS.

Detailed Location: EXTANT, 1980, PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY SALIX SPP.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	74	**Map Index:** 03348	**EO Index:**	12477		**Element Last Seen:**	1980-04-10
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-07-20

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.85597 / -117.34768	**Accuracy:**	specific area
UTM:	Zone-11 N3746240 E467838	**Elevation (ft):**	1460
PLSS:	T04S, R05W, Sec. 01 (S)	**Acres:**	167.4

Location: MOCKINGBIRD CANYON BETWEEN MOCKINGBIRD CANYON ROAD & WOOD ROAD ENE OF LAKE MATHEWS.

Detailed Location: EXTANT, 1980, PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED SALIX SPP STAND.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	81 **Map Index:** 04304	**EO Index:**	15774	**Element Last Seen:**	1980-04-10
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1991-05-13
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-07-20

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86346 / -117.01124	**Accuracy:**	specific area
UTM:	Zone-11 N3747017 E498960	**Elevation (ft):**	1680
PLSS:	T03S, R01W, Sec. 32 (S)	**Acres:**	28.9

Location: LAMB CANYON, FROM ABOUT 1600 TO 1800 FT, TRIBUTARY TO SAN JACINTO RIVER, EAST OF LAKEVIEW.

Detailed Location: MAPPED FROM INTERPRETATION OF 1980 AERIAL PHOTOS. THE FOREST IS CONFINED TO THE BOTTOM OF THE STEEP-WALLED CANYON.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY POPULUS FREMONTII.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: BLM

Occurrence No.	98 **Map Index:** 04180	**EO Index:**	15759	**Element Last Seen:**	1980-02-01
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1980-02-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-07-20

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.95492 / -117.06340	**Accuracy:**	specific area
UTM:	Zone-11 N3757159 E494142	**Elevation (ft):**	2170
PLSS:	T02S, R02W (S)	**Acres:**	37.9

Location: SAN TIMENTO CANYON, NEAR HINDA.

Detailed Location: MAPPED FROM INTERPRETATION OF 1980 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	101	**Map Index:** 04443	**EO Index:**	15756		**Element Last Seen:**	1935-XX-XX
Occ. Rank:	None		**Presence:**	Extirpated		**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-07-20

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.81698 / -116.97105	**Accuracy:**	specific area
UTM:	Zone-11 N3741863 E502679	**Elevation (ft):**	1500
PLSS:	T04S, R01W (S)	**Acres:**	408.4

Location: SAN JACINTO RIVER BED, FROM JUST SOUTH OF GILMAN HOT SPRINGS FOR 2 MILES U/S.

Detailed Location: EXTIRPATED BY AGRICULTURE PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY POPULUS FREMONTII.

General: SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	102	**Map Index:** 04411	**EO Index:**	15754		**Element Last Seen:**	1935-XX-XX
Occ. Rank:	None		**Presence:**	Extirpated		**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-07-20

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.82820 / -116.98158	**Accuracy:**	specific area
UTM:	Zone-11 N3743107 E501704	**Elevation (ft):**	1490
PLSS:	T04S, R01W (S)	**Acres:**	415.5

Location: SAN JACINTO RIVER BED, FROM JUST BELOW (WEST OF) GILMAN HOT SPRINGS TO 2 MILES ABOVE (EAST).

Detailed Location: EXTIRPATED BY DEVELOPMENT OF A GOLF COURSE PER INTERPRETATION OF 1980 AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY POPULUS FREMONTII.

General: SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Canyon Live Oak Ravine Forest

Element Code: CTT61350CA

Canyon Live Oak Ravine Forest

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3
	State:	None		**State:**	S3.3
	Other:				
Habitat:	**General:**				
	Micro:				

Occurrence No.	46 **Map Index:** 04196	**EO Index:**	15694	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-08-02

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.09267 / -117.05545	**Accurracy:**	specific area
UTM:	Zone-11 N3772432 E494884	**Elevation (ft):**	3400
PLSS:	T01S, R02W, Sec. 11 (S)	**Acres:**	25.0

Location: TRIBUTARY TO MILL CREEK, SW OF MORTON PEAK, SAN BERNARDINO NF.

Detailed Location: EXTANT 1985 PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY (1935) AS CLOSED CANOPY QUERCUS CHRYSOLEPIS.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: USFS-SAN BERNARDINO NF

Southern Sycamore Alder Riparian Woodland

Element Code: CTT62400CA

Southern Sycamore Alder Riparian Woodland

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4
	State:	None		**State:**	S4
	Other:				
Habitat:	**General:**				
	Micro:				

Occurrence No.	165	**Map Index:** 04316	**EO Index:**	15400		**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-07-22

Quad Summary: Forest Falls (3411618), Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10125 / -117.00925	**Accuracy:**	specific area
UTM:	Zone-11 N3773382 E499147	**Elevation (ft):**	3000
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	80.9

Location: MILL CREEK CANYON. FROM 3240 TO 3880 FT, EAST OF REDLANDS.

Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS.

Ecological: CLOSED CANOPY QUERCUS CHRYSOLEPIS, PLATANUS RACEMOSA & ALNUS RHOMBIFOLIA ACCORDING TO WIESLANDER SURVEY.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	167	**Map Index:** 03701	**EO Index:**	15399		**Element Last Seen:**	1985-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1985-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-07-22

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.01515 / -117.20624	**Accuracy:**	specific area
UTM:	Zone-11 N3763854 E480957	**Elevation (ft):**	1580
PLSS:	T02S, R03W, Sec. 08 (S)	**Acres:**	28.1

Location: ABOUT 1 MILE SOUTH OF REDLANDS (SIDING), SE OF SAN TIMOTEO CANYON.

Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS; TWO STANDS ARTIFICIALLY CONNECTED BUT ACTUALLY SEPARATED BY ROAD. DRAINAGE LEADS TO SMALL LEVEE.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	168	**Map Index:**	03870	**EO Index:**	15398	**Element Last Seen:**	1985-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.12036 / -117.13997	**Accuracy:**	specific area
UTM:	Zone-11 N3775510 E487092	**Elevation (ft):**	1640
PLSS:	T01S, R03W, Sec. 37 (S)	**Acres:**	41.2

Location: PLUNGE CREEK, IMMEDIATELY U/S FROM JUNCTION W/ NORTH FORK CANAL, EAST OF HARLEM SPRINGS.

Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS; SIZE DECREASED BECAUSE COVER DECREASES U/S.

Ecological: CLOSED CANOPY ALNUS RHOMBIFOLIA & PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: USFS-SAN BERNARDINO NF, PVT

Occurrence No.	169	**Map Index:**	03673	**EO Index:**	15397	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	1998-07-22

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.98360 / -117.21746	**Accuracy:**	specific area
UTM:	Zone-11 N3760359 E479914	**Elevation (ft):**	2200
PLSS:	T02S, R03W, Sec. 20 (S)	**Acres:**	32.4

Location: RECHE CANYON, FROM CONSOLE SPRINGS TO <1 MILE UPSTREAM, NORTHEAST OF SUNNYMEAD.

Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS BUT BOUNDARY DECREASED PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: CLOSED CANOPY PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	170	**Map Index:**	03757	**EO Index:**	15395	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	1998-07-22

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.98710 / -117.17877	**Accuracy:**	specific area
UTM:	Zone-11 N3760740 E483488	**Elevation (ft):**	1920
PLSS:	T02S, R03W, Sec. 15 (S)	**Acres:**	112.9

Location: TWO NORTH-FACING DRAINAGES IN THE BADLANDS, EAST OF CAMP TREE MONT.

Detailed Location: IN 1935 INCLUDED REACH D/S OF CONFLUENCE, NOW CULTIVATED. THE REMAINDER EXTANT, 1935, PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: CLOSED CANOPY PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	171	**Map Index:**	03443	**EO Index:**	15396	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.98468 / -117.30189	**Accuracy:**	specific area
UTM:	Zone-11 N3760498 E472116	**Elevation (ft):**	1400
PLSS:	T02S, R04W, Sec. 21 (S)	**Acres:**	35.7

Location: UNNAMED TRIBUTARY TO BELVEDERE HEIGHTS AREA, WEST SIDE OF BOX SPRINGS MTNS.

Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	172	**Map Index:**	03437	**EO Index:**	15394	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.97549 / -117.30541	**Accuracy:**	specific area
UTM:	Zone-11 N3759480 E471787	**Elevation (ft):**	1500
PLSS:	T02S, R04W, Sec. 28 (S)	**Acres:**	44.3

Location: UNNAMED TRIBUTARY TO UC RIVERSIDE FROM BOX SPRINGS RESERVE.

Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	173	**Map Index:**	03432	**EO Index:**	15393	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.95498 / -117.30422	**Accuracy:**	specific area
UTM:	Zone-11 N3757205 E471890	**Elevation (ft):**	1380
PLSS:	T02S, R04W, Sec. 33 (S)	**Acres:**	73.5

Location: BOX SPRINGS CANYON, FROM ABOUT 1300 TO 1420 FT.
Detailed Location: MAPPED PER INTERPRETATION OF 1985 AERIAL PHOTOS. FRAGMENTED BY HIGHWAY CONSTRUCTION.
Ecological: CLOSED CANOPY PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.
General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.
Owner/Manager: PVT

Occurrence No.	174	**Map Index:**	03415	**EO Index:**	12465	**Element Last Seen:**	1980-02-01
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1980-02-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.93539 / -117.31673	**Accuracy:**	specific area
UTM:	Zone-11 N3755037 E470728	**Elevation (ft):**	1300
PLSS:	T03S, R04W, Sec. 05 (S)	**Acres:**	145.9

Location: SYCAMORE CANYON, FROM ABOUT 1100 TO 1460 FT.
Detailed Location: EXTANT, 1980, BUT INCREASED BOUNDARY PER INTERPRETATION OF AERIAL PHOTOS.
Ecological: CLOSED CANOPY SALIX SPP & PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.
General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.
Owner/Manager: PVT

Occurrence No.	175	**Map Index:**	03373	**EO Index:**	15392	**Element Last Seen:**	1980-02-01
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1980-02-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.91507 / -117.34538	**Accuracy:**	specific area
UTM:	Zone-11 N3752792 E468072	**Elevation (ft):**	1420
PLSS:	T03S, R04W, Sec. 18 (S)	**Acres:**	204.5

Location: UNNAMED INTERMITTENT CREEK WEST OF TRAUTWEIN ROAD & ALESSANDRO BLVD JUNCTION.
Detailed Location: EXTANT, 1980, AND BOUNDARY EXTENDED U/S AND D/S PER INTERPRETATION OF AERIAL PHOTOS.
Ecological: CLOSED CANOPY PLATANUS RACEMOSA ACCORDING TO WIESLANDER SURVEY.
General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.
Owner/Manager: PVT

Occurrence No.	176	**Map Index:** 03379	**EO Index:** 15390	**Element Last Seen:**	1980-02-01
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1980-02-01
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.90373 / -117.34347	**Accuracy:**	specific area
UTM:	Zone-11 N3751534 E468245	**Elevation (ft):**	1500
PLSS:	T03S, R04W, Sec. 18 (S)	**Acres:**	52.1

Location: UNNAMED TRIBUTARY TO PRENDA DAM RESERVOIR, FROM ABOUT ROBERTS ROAD TO RIVERSIDE CORPORATE BOUNDARY.

Detailed Location: MAPPED PER INTERPRETATION OF 1980 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	181	**Map Index:** 03413	**EO Index:** 15387	**Element Last Seen:**	1980-04-10
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.77855 / -117.32006	**Accuracy:**	specific area
UTM:	Zone-11 N3737648 E470366	**Elevation (ft):**	1900
PLSS:	T04S, R04W, Sec. 35 (S)	**Acres:**	24.6

Location: UNNAMED TRIBUTARY TO CREEK RUNNING ALONG SANTA ROSA ROAD, NW OF STEELE PEAK/STEELE VALLEY.

Detailed Location: EXTANT, 1985, PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY AS CLOSED CANOPY PLATANUS RACEMOSA.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: BLM

Occurrence No.	182	**Map Index:** 03425	**EO Index:**	12464	**Element Last Seen:**	1980-04-10
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.78593 / -117.31491	**Accuracy:**	specific area
UTM:	Zone-11 N3738465 E470845	**Elevation (ft):**	1980
PLSS:	T04S, R04W, Sec. 33 (S)	**Acres:**	87.3

Location: ALONG SANTA ROSA ROAD & UNNAMED SOUTH-FLOWING TRIBUTARY APPROXIMATELY 1 MILE NORTH OF STEELE VALLEY.

Detailed Location: EXTANT, 1980, PER INTERPRETATION OF AERIAL PHOTOS. MAY EXTEND FURTHER D/S; PHOTOCOVERAGE LIMITED.

Ecological: MAPPED BY WIESLANDER SURVEY AS CLOSED CANOPY QUERCUS AGRIFOLIA AND PLATANUS RACEMOSA.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: BLM, PVT

Occurrence No.	193	**Map Index:** 04040	**EO Index:**	13374	**Element Last Seen:**	1985-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1985-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.09899 / -117.09626	**Accuracy:**	specific area
UTM:	Zone-11 N3773136 E491120	**Elevation (ft):**	2160
PLSS:	T02S, R02W (S)	**Acres:**	50.3

Location: MORTON CANYON, FROM WASH TO <1 MILE U/S, NE OF REDLANDS.

Detailed Location: EXTANT, 1988, AND EXTENDED BOUNDARY PER INTERPRETATION OF AERIAL PHOTOS.

Ecological: MAPPED BY WIESLANDER SURVEY AS CLOSED CANOPY PLATANUS RACEMOSA.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	232 **Map Index:** 03571	**EO Index:**	15554	**Element Last Seen:**	1985-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1985-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-07-22

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.08504 / -117.23667	**Accuracy:**	specific area
UTM:	Zone-11 N3771610 E478165	**Elevation (ft):**	1100
PLSS:	T01S, R03W (S)	**Acres:**	23.7

Location: ADJACENT TO SOUTH SIDE OF SANTA ANA RIVER, NORTH OF MARIGOLD.

Detailed Location: MAPPED BY INTERPRETATION OF 1985 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD CHECK OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Southern Riparian Scrub

Element Code: CTT63300CA

Southern Riparian Scrub

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G3
	State: None		**State:**	S3.2
	Other:			
Habitat:	**General:**			
	Micro:			

Occurrence No.	41	**Map Index:**	04010	**EO Index:**	15301	**Element Last Seen:**	1985-02-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-02-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-23

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.09237 / -117.10655	**Accurracy:**	specific area
UTM:	Zone-11 N3772403 E490170	**Elevation (ft):**	1840
PLSS:	T01S, R02W, Sec. 08 (S)	**Acres:**	40.8

Location: TRIBUTARY TO SANTA ANA WASH, SOUTH OF MORTON CANYON, NE OF REDLANDS.

Detailed Location:

Ecological: 1985 EXTENT MAPPED FROM INTERPRETATION OF AERIAL PHOTOGRAPHS. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Occurrence No.	45	**Map Index:**	04230	**EO Index:**	15299	**Element Last Seen:**	1980-04-10
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1980-04-10
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-07-23

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.82733 / -117.04733	**Accurracy:**	specific area
UTM:	Zone-11 N3743012 E495620	**Elevation (ft):**	1450
PLSS:	T04S, R02W, Sec. 13 (S)	**Acres:**	102.7

Location: UNNAMED INTERMITTENT CREEK PARALLEL TO & JUST SW OF PICO ROAD, SAN JACINTO VALLEY.

Detailed Location:

Ecological: 1980 EXTENT MAPPED FROM INTERPRETATION OF AERIAL PHOTOGRAPHS. UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Southern Willow Scrub

Element Code: CTT63320CA

Southern Willow Scrub

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3
	State:	None		**State:**	S2.1
	Other:				
Habitat:	**General:**				
	Micro:				

Occurrence No.	31 **Map Index:** 04042	**EO Index:**	15266	**Element Last Seen:**	1980-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1980-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-07-21

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.05256 / -117.10018	**Accurracy:**	specific area
UTM:	Zone-11 N3767988 E490754	**Elevation (ft):**	2200
PLSS:	T01S, R02W, Sec. 28 (S)	**Acres:**	36.9

Location: WEST-FACING DRAINAGE OF CRAFTON HILLS, SE OF REDLANDS.

Detailed Location: MAPPED FROM INTERPRETATION OF 1980 AERIAL PHOTOS.

Ecological: UNABLE TO CONVERT TO FLORISTIC CLASSIFICATION, LACKS SPP. INFO.

General: NEEDS FIELD VERIFICATION OF VEGETATION CONDITION, COMPOSITION. SEE WWW.DFG.CA.GOV/BIOGEODATA/VEGCAMP/NATURAL_COMM_BACKGROUND.ASP TO INTERPRET AND ADDRESS THE PRESENCE OF RARE COMMUNITIES.

Owner/Manager: PVT

Ceratochrysis longimala

Element Code: IIHYM71040

Desert cuckoo wasp

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G1
	State: None		**State:**	S1
	Other:			
Habitat:	**General:**			
	Micro:			

Occurrence No.	1 **Map Index:** 48124	**EO Index:**	59315	**Element Last Seen:**	1915-03-12
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1915-03-12
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-12-14

Quad Summary: Riverside East (3311783), Riverside West (3311784)

County Summary: Riverside

Lat/Long:	33.97883 / -117.36985	**Accurracy:**	1 mile
UTM:	Zone-11 N3759870 E465836	**Elevation (ft):**	900
PLSS:	T02S, R05W, Sec. 23 (S)	**Acres:**	0.0

Location: RIVERSIDE.

Detailed Location: SINCE THE COLLECTION WAS MADE IN 1915, THE LOCATION WAS MAPPED AT THE NORTHERN END (THE OLDER PART) OF RIVERSIDE.

Ecological: COLLECTED ON ENCELIA FARINOSA.

General: HISTORICAL SPECIMEN (HOLOTYPE MALE). ON PERMANENT LOAN TO CAS.

Owner/Manager: UNKNOWN

Carolella busckana

Element Code: IILEM2X090

Busck's gallmoth

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G1G3
	State: None		**State:**	SH
	Other:			
Habitat:	**General:**			
	Micro:			

Occurrence No.	1 **Map Index:** 60375	**EO Index:**	60411	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	None	**Presence:**	Extirpated	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-03-07

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: San Bernardino

Lat/Long:	34.04823 / -117.26110	**Accurracy:**	1 mile
UTM:	Zone-11 N3767535 E475901	**Elevation (ft):**	1160
PLSS:	T01S, R04W, Sec. 36 (S)	**Acres:**	0.0

Location: LOMA LINDA.

Detailed Location:

Ecological:

General: HISTORICAL RECORD. PARATYPES #3 AND 4.

Owner/Manager: UNKNOWN

Euphydryas editha quino

Element Code: IILEPK405L

quino checkerspot butterfly

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:** G5T1
	State:	None		**State:** S1
	Other:	XERCES_CI-Critically Imperiled		
Habitat:	**General:**	SUNNY OPENINGS WITHIN CHAPARRAL & COASTAL SAGE SHRUBLANDS IN PARTS OF RIVERSIDE & SAN DIEGO COUNTIES.		
	Micro:	HILLS & MESAS NEAR THE COAST. NEED HIGH DENSITIES OF FOOD PLANTS PLANTAGO ERECTA, P. INSULARIS, ORTHOCARPUS PURPURESCENS		

Occurrence No.	34 **Map Index:** 46609	**EO Index:**	46609	**Element Last Seen:**	1998-01-22
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1998-01-22
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2001-11-28

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80159 / -117.34614	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3740210 E467960	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 24 (S)	**Acres:**	0.0

Location: 5 MILES WNW OF PERRIS. 0.55 MILES DIRECLTY WEST OF GAVILAN MINE & 1.7 MILES ESE OF GAVILAN PEAK.

Detailed Location:

Ecological:

General: 22 JAN 1998: 2 MATURE LARVAE OBSERVED. 1 LARVA FOUND AT SLIGHTLY DIFFERENT LOCATION ON DIFFERENT DATE - EXACT LOCATION AND DATE NOT GIVEN.

Owner/Manager: UNKNOWN

Texosporium sancti-jacobi **Element Code:** NLTEST7980

woven-spored lichen

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G3
	State: None		**State:**	S1.1
	Other:			

Habitat: **General:** CHAPARRAL.

Micro: OPEN SITES; IN CALIFORNIA W/ADENOSTOMA FAS., ERIOGONUM, SELAGINELLA. AT PINNACLES, ON SMALL MAMMAL PELLETS. 290-660M.

Occurrence No.	19	**Map Index:** 56301	**EO Index:**	56317		**Element Last Seen:**	2002-12-12
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2002-12-12
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-08-02

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80870 / -117.35723	**Accurracy:**	80 meters
UTM:	Zone-11 N3741002 E466936	**Elevation (ft):**	2320
PLSS:	T04S, R05W, Sec. 24 (S)	**Acres:**	0.0

Location: GAVILAN HILLS, HARTFORD SPRINGS PARK.

Detailed Location: SE1/4 OF NW1/4 SEC 24.

Ecological: RARE ON OLD TWIGS IN SOIL DUFF AND ON RABBIT DUNG ON DECOMPOSED GRANITIC SOILS. CHAMISE CHAPARRAL.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 2002 COLLECTION BY RIEFNER. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Cymopterus deserticola **Element Code:** PDAPI0U090

desert cymopteris

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G2
	State:	None		**State:**	S2
	Other:	Rare Plant Rank - 1B.2, BLM_S-Sensitive			
Habitat:	**General:**	JOSHUA TREE WOODLAND, MOJAVEAN DESERT SCRUB. MOST OCCURRENCES LOCATED NEAR OR IN EDWARDS AFB.			
	Micro:	ON FINE TO COARSE, LOOSE, SANDY SOIL OF FLATS IN OLD DUNE AREAS WITH WELL-DRAINED SAND. 625-910M.			

Occurrence No.	14	**Map Index:**	24353	**EO Index:**	7058	**Element Last Seen:**	1991-04-02
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-04-02
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1993-11-11

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.99531 / -117.36891	**Accuracy:**	80 meters
UTM:	Zone-11 N3872585 E466334	**Elevation (ft):**	2180
PLSS:	T10N, R05W, Sec. 02 (S)	**Acres:**	0.0

Location: 5 MILES NORTH OF HAWES AUXILLARY AIRPORT AND 2 MILES EAST OF HARPER LAKE ROAD.

Detailed Location: MAPPED IN THE NE 1/4 OF THE NE 1/4 OF SECTION 2, JUST NORTH OF THE DIRT ROAD CUTTING DIAGONALLY ACROSS THE SECTION. NEAR DWP TOWER 33-3, SOUTH OF TRANSMISSION LINE ACCESS ROAD AND NORTH OF LUZ TRANSMISSION LINE.

Ecological: MOJAVE CREOSOTE BUSH SCRUB ON LOOSE SANDY SOIL. DOMINANTS ARE LARREA TRIDENTATA AND AMBROSIA DUMOSA WITH ORYZOPSIS HYMINOIDES, MENTZELIA, SCHISMUS, AND ERODIUM CICUTARIUM.

General: 4 PLANTS SEEN IN 1989, 19 IN 1990, AND 12 IN 1991.

Owner/Manager: BLM

Occurrence No.	15	**Map Index:**	24352	**EO Index:**	7057	**Element Last Seen:**	1998-05-15
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1998-05-15
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2000-02-18

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.99290 / -117.30972	**Accuracy:**	specific area
UTM:	Zone-11 N3872299 E471734	**Elevation (ft):**	2100
PLSS:	T10N, R04W, Sec. 04 (S)	**Acres:**	30.3

Location: 5 MILES NORTH OF TWELVE GAUGE LAKE AND 1.2 MILES EAST OF HARPER LAKE ROAD AT JCT WITH SANTA FE AVE, WEST OF HINKLEY.

Detailed Location: IN THE NW 1/4 OF THE NW 1/4 OF SECTION 4. ABOUT 1.2 MILES EAST OF HARPER LAKE ROAD ALONG TRANSMISSION LINE ACESS ROAD, JUST SOUTH OF AN ALFALFA FIELD. SITE REPRESENTS SIGNIFICANT RANGE EXTENSION FROM EDWARDS AFB OCCURRENCES.

Ecological: MOJAVE CREOSOTE BUSH SCRUB/MIXED SALTBUSH SCRUB ON LOOSE SANDY SOIL OF A BROAD, FAIRLY INACTIVE WASH. DOMINATED BY ATRIPLEX POLYCARPA, HYMENOCLEA SALSOLA, PSOROTHAMNUS ARBORESCENS ARBORESCENS, LYCIUM COOPERI, ET AL.

General: 78 PLANTS FOUND IN INTENSIVE SURVEY IN 1989, 15 PLANTS OBSERVED IN BRIEF 1990 SURVEY, 4 PLANTS IN 1991 LATE SEASON SURVEY, 5 PLANTS OBSERVED IN 1998.

Owner/Manager: BLM

Ambrosia pumila

Element Code: PDAST0C0M0

San Diego ambrosia

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:**	G1
	State:	None		**State:**	S1
	Other:	Rare Plant Rank - 1B.1			
Habitat:	**General:**	CHAPARRAL, COASTAL SCRUB, VALLEY AND FOOTHILL GRASSLAND.			
	Micro:	SANDY LOAM OR CLAY SOIL. IN VALLEYS; PERSISTS WHERE DISTURBANCE HAS BEEN SUPERFICIAL. SOMETIMES ON MARGINS OR NEAR VERNAL POOLS. 20-415M.			

Occurrence No.	54 **Map Index:** 70802	**EO Index:**	71713	**Element Last Seen:**	2005-06-02
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2009-05-13
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-04-27

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.74939 / -117.30230	**Accurracy:**	2/5 mile
UTM:	Zone-11 N3734410 E472000	**Elevation (ft):**	1900
PLSS:	T05S, R04W, Sec. 09 (S)	**Acres:**	0.0

Location: 0.5 MILE SE OF STEELE PEAK, 4 MILES SW OF PERRIS, AND 6 MILES NNE OF LAKE ELSINORE, NW OF HWY 74.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS ABOUT 0.5 MILE SSE OF STEELE PEAK IN SECTION 9 TO ENCOMPASS AREAS WITH LOWER ELEVATIONS. LABEL SAYS SPECIMEN WAS COLLECTED IN T6S R4W SECTION 9. ELEVATION IS GIVEN AS 1880-2000 FT.

Ecological: COASTAL SAGE SCRUB WITH ELEMENTS OF CHAPARRAL, SMALL CANYON WITH RUNNING STREAM. LOCALLY COMMON, PROSTRATE PERENNIAL ON ALKALI FLAT AT BASE OF HILLS.

General: OCCURRENCE BASED ON A 2005 COLLECTION BY SALVATO & CLEMONS; POPULATION DESCRIBED AS "LOCALLY COMMON". NO PLANTS COULD BE LOCATED IN 2009.

Owner/Manager: BLM

Eriophyllum mohavense

Element Code: PDAST3N070

Barstow woolly sunflower

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G2
	State:	None		**State:**	S2
	Other:	Rare Plant Rank - 1B.2, BLM_S-Sensitive			
Habitat:	**General:**	DESERT CHENOPOD SCRUB, MOJAVEAN DESERT SCRUB, DESERT PLAYAS.			
	Micro:	MOSTLY IN OPEN, SILTY OR SANDY AREAS W/SALTBUSH SCRUB, OR CREO. BUSH SCRUB. BARREN RIDGES OR MARGINS OF PLAYAS. 500-900M			

Occurrence No.	4	**Map Index:**	03363	**EO Index:**	16841	**Element Last Seen:**	1983-03-15
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1983-03-15
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-19

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.97183 / -117.33117	**Accuracy:**	80 meters
UTM:	Zone-11 N3869969 E469769	**Elevation (ft):**	2200
PLSS:	T10N, R04W, Sec. 07 (S)	**Acres:**	0.0

Location: 3 MILES NORTH OF HIGHWAY 58 ON HARPER LAKE ROAD, NORTH OF TWELVE GAUGE LAKE.
Detailed Location: MAPPED ALONG WEST SIDE OF ROAD WITHIN THE NE 1/4 SE 1/4 SECTION 7.
Ecological: IN CLAY/SAND ON FLAT TO ROLLING GROUND. ASSOCIATED WITH MIXED ATRIPLEX SP.
General: FEWER THAN 50 PLANTS SEEN IN 1983 BY ALBISTON.
Owner/Manager: BLM

Occurrence No.	9	**Map Index:**	03486	**EO Index:**	12538	**Element Last Seen:**	1985-04-11
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-04-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-19

Quad Summary: Twelve Gauge Lake (3411783)
County Summary: San Bernardino

Lat/Long:	34.92197 / -117.25606	**Accuracy:**	80 meters
UTM:	Zone-11 N3864419 E476612	**Elevation (ft):**	2245
PLSS:	T10N, R04W, Sec. 25 (S)	**Acres:**	0.0

Location: SOUTH SIDE OF HIGHWAY 58, ABOUT 1.7 MI W OF VALLEY VIEW RD AND 4.2 MI E OF HARPER LAKE RD, E OF TWELVE GAUGE LAKE.
Detailed Location: MAPPED WITHIN THE SW 1/4 SW 1/4 SECTION 25.
Ecological: IN GRAVELLY MARGINS OF SALTBUSH SCRUB ASSOCIATED WITH CHORIZANTHE SPINOSA, ERODIUM CICUTARIUM, AMSINCKIA TESSELLATA, BROMUS RUBENS, DICHELOSTEMMA PULCHELLUM, AND CHAENACTIS CARPHOCLINIA.
General: 12 PLANTS SEEN IN 1985 BY MARTZ.
Owner/Manager: UNKNOWN

Occurrence No.	10	**Map Index:**	03297	**EO Index:**	16836	**Element Last Seen:**	1986-03-21
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1986-03-21
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-19

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.93112 / -117.36090	**Accuracy:**	80 meters
UTM:	Zone-11 N3865464 E467039	**Elevation (ft):**	2290
PLSS:	T10N, R05W, Sec. 25 (S)	**Acres:**	0.0

Location: BOTH SIDES OF HIGHWAY 58, ABOUT 0.3 MILE EAST OF ROAD TO HAWES AUXILLIARY AIRPORT, WEST OF TWELVE GAUGE LAKE.

Detailed Location: WITHIN THE SE 1/4 NW 1/4 SECTION 25.

Ecological: IN MARGINS OF PLAYA AREAS ON COARSE SOILS; SALTBUSH SCRUB SURROUNDING. ASSOCIATED WITH CHORIZANTHE SPINOSA, COREOPSIS CALLIOPSIDEA, ERODIUM CICUTARIUM, LEPIDIUM FLAVUM, MALACOTHRIX COULTERI, CHAENACTIS CARPHOCLINIA, AND SCHISMUS SP.

General: SEVERAL THOUSAND PLANTS SEEN ALONG BOTH SIDES OF ROAD IN 1985 BY MARTZ. ABOUT 30 PLANTS SEEN ON SOUTH SIDE OF ROAD IN 1986. MARTZ SUGGESTS THAT ADDITIONAL POPULATIONS ARE HIGHLY LIKELY TO OCCUR IN SIMILAR HABITAT ELSEWHERE IN THIS AREA.

Owner/Manager: PVT, CALTRANS

Occurrence No.	11	**Map Index:**	03392	**EO Index:**	16835	**Element Last Seen:**	1985-04-11
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1985-04-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-03-19

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.92359 / -117.31568	**Accuracy:**	80 meters
UTM:	Zone-11 N3864615 E471166	**Elevation (ft):**	2285
PLSS:	T10N, R04W, Sec. 29 (S)	**Acres:**	0.0

Location: SOUTH SIDE HIGHWAY 58, ABOUT 0.8 MILE EAST OF HARPER LAKE ROAD, NORTHEAST OF TWELVE GAUGE LAKE.

Detailed Location: MAPPED WITHIN THE SE 1/4 SE 1/4 SECTION 29.

Ecological: IN GRAVELLY MARGINS OF PLAYAS IN SALTBUSH SCRUB. ASSOCIATED WITH CHORIZANTHE SPINOSA, COREOPSIS CALLIOPSIDEA, ERODIUM CICUTARIUM, LEPIDIUM SP., MALACOTHRIX COULTERI, AND CHAENACTIS CARPHOCLINIA.

General: MORE THAN 200 PLANTS SEEN IN 1985 BY MARTZ.

Owner/Manager: UNKNOWN

Occurrence No.	23	**Map Index:** 38403	**EO Index:**	33410	**Element Last Seen:**	2010-04-21
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	2010-04-21
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2010-08-24

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.93833 / -117.33138	**Accuracy:**	specific area
UTM:	Zone-11 N3866254 E469737	**Elevation (ft):**	2280
PLSS:	T10N, R04W, Sec. 19 (S)	**Acres:**	30.0

Location: HARPER LAKE ROAD ABOUT 0.5-1 MILE NORTH OF HIGHWAY 58, EAST OF HAWES AUXILLARY AIRPORT.

Detailed Location: MAPPED BY CNDDB AS 5 COLONIES BASED ON A 1988 BAGLEY MAP AND 2010 GOLDEN COORDINATES.

Ecological: GROWING IN SALTBUSH SCRUB WITH ATRIPLEX SP., SCHISMUS ARABICUS, ERODIUM CICUTARIUM, CHORIZANTHE SPINOSA, AND COREOPSIS SP. SILTY-SANDY LOAM SOILS WITH COARSE SAND/FINE GRAVEL ON SURFACE.

General: 230 PLANTS OBSERVED IN THE 4 COLONIES ON THE WEST SIDE OF HARPER LAKE RD IN 1988. 68+ PLANTS SEEN IN COLONY JUST NORTH OF THE SOUTH-MOST COLONY IN 1991. 27 PLANTS SEEN IN COLONY ON THE EAST SIDE OF THE ROAD IN 2010. INCLUDES FORMER EO #24.

Owner/Manager: BLM

Occurrence No.	58	**Map Index:** 79027	**EO Index:**	79983	**Element Last Seen:**	1991-05-05
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1991-05-05
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2010-06-08

Quad Summary: Twelve Gauge Lake (3411783)

County Summary: San Bernardino

Lat/Long:	34.91545 / -117.32993	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3863716 E469861	**Elevation (ft):**	2300
PLSS:	T10N, R04W, Sec. 31 (S)	**Acres:**	90.0

Location: HELENDALE ROAD, NEAR KRAMER JUNCTION.

Detailed Location: MAPPED BY CNDDB AS BEST GUESS ALONG HELENDALE ROAD BETWEEN HIGHWAY 58 AND DIRT ROAD INTERSECTION APPROXIMATELY 1 MILE SOUTH IN VICINITY OF ELEVATION GIVEN BY SOURCE.

Ecological:

General: UNKNOWN NUMBER OF PLANTS SEEN BY CLIFTON IN 1991.

Owner/Manager: BLM

Centromadia pungens ssp. laevis

Element Code: PDAST4R0R4

smooth tarplant

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G3G4T2
	State:	None		**State:**	S2.1
	Other:	Rare Plant Rank - 1B.1			
Habitat:	**General:**	VALLEY AND FOOTHILL GRASSLAND, CHENOPOD SCRUB, MEADOWS, PLAYAS, RIPARIAN WOODLAND.			
	Micro:	ALKALI MEADOW, ALKALI SCRUB; ALSO IN DISTURBED PLACES. 0-480M.			

Occurrence No.	3	**Map Index:**	28185	**EO Index:**	4016	**Element Last Seen:**	1948-05-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1948-05-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-09-06

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: San Bernardino

Lat/Long:	34.05251 / -117.26303	**Accuracy:**	1 mile
UTM:	Zone-11 N3768009 E475724	**Elevation (ft):**	1000
PLSS:	T01S, R04W (S)	**Acres:**	0.0

Location: LOMA LINDA.

Detailed Location:

Ecological: GROWING ON HARD ALKALINE SOILS.

General: TWO COLLECTIONS FROM THIS VICINITY; ROOS #3829 IN 1948, AND MUNZ AND JOHNSTON #8902 IN 1924.

Owner/Manager: UNKNOWN

Occurrence No.	4	**Map Index:**	28241	**EO Index:**	3536	**Element Last Seen:**	2009-06-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2009-06-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-09

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.92573 / -117.30797	**Accuracy:**	80 meters
UTM:	Zone-11 N3753964 E471534	**Elevation (ft):**	1460
PLSS:	T03S, R04W, Sec. 09 (S)	**Acres:**	0.0

Location: SYCAMORE CANYON; APPROXIMATELY 1 KM NORTH OF ALESSANDRO BLVD, WEST OF EDGEMONT.

Detailed Location: ALONG TRAIL NEXT TO EDGE OF EAST RIVER BANK. MAPPED BY CNDDB IN THE SE 1/4 OF THE NW 1/4 OF SECTION 9 ACCORDING TO 2009 HERNANDEZ & SPARKS COORDINATES.

Ecological: RIPARIAN AND GRASS. DOMINANT SPECIES INCLUDE BROMUS MADRITENSIS, SALIX GOODDINGII, S. LAEVIGATA, AND DEINANDRA PANICULATA.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 2009. A 1991 REISER COLLECTION FROM "SYCAMORE CANYON PARK WEST OF EUCALYPTUS STREET" IS ALSO ATTRIBUTED TO THIS SITE; UNABLE TO LOCATE EUCALYPTUS STREET.

Owner/Manager: UNKNOWN

Occurrence No.	7	**Map Index:**	28239	**EO Index:**	2587	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-08-15

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.84172 / -117.30995	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3744649 E471323	**Elevation (ft):**	1620
PLSS:	T04S, R04W, Sec. 09 (S)	**Acres:**	0.0

Location: NORTH OF CAJALCO ROAD AND WEST OF ALEXANDER STREET, MEAD VALLEY.

Detailed Location:

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS SITE NAME PROVIDED BY REISER IN "RARE PLANTS OF SAN DIEGO COUNTY."

Owner/Manager: UNKNOWN

Occurrence No.	8	**Map Index:**	28238	**EO Index:**	3563	**Element Last Seen:**	2008-05-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2008-05-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-19

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80446 / -117.35013	**Accuracy:**	80 meters
UTM:	Zone-11 N3740530 E467592	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 24 (S)	**Acres:**	0.0

Location: HARFORD SPRINGS COUNTY PARK; 800 METERS EAST OF GAVILAN ROAD, NORTHWEST CORNER OF GAVILAN PLATEAU.

Detailed Location: NEAR DIRT TRAIL. MAPPED BY CNDDB NEAR THE CENTER OF THE SE 1/4 OF SECTION 24 ACCORDING TO 2008 GALVIN COORDINATES.

Ecological: IN WET PLACES ALONG RIPARIAN WOODLAND. RIPARIAN SCRUB SURROUNDED BY NON-NATIVE GRASSLAND. DOMINATED BY ADENOSTOMA FASCICULATUM AND ERIOGONUM FASCICULATUM.

General: TWO 1980 BOYD COLLECTIONS FROM HARFORD SPRINGS COUNTY PARK ARE ATTRIBUTED TO THIS SITE. AREA SEARCHED IN 2003 BUT NO PLANTS WERE FOUND. UNKNOWN NUMBER OF PLANTS OBSERVED IN 2008 AT MAPPED LOCATION.

Owner/Manager: RIV COUNTY

Occurrence No.	9	**Map Index:**	28237	**EO Index:**	2569	**Element Last Seen:**	2003-08-01
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-08-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-19

Quad Summary: Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.83846 / -117.12957	**Accuracy:**	specific area
UTM:	Zone-11 N3744253 E488011	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 07 (S)	**Acres:**	21.0

Location: BOTH SIDES OF THE RAMONA EXPRESSWAY, BETWEEN LAKEVIEW AND SAN JACINTO RIVER, SE OF PERRIS RESERVOIR.

Detailed Location: MAPPED BY CNDDB AS 3 POLYGONS BASED ON 1990 BRAMLET MAPS (W AND E POLYGONS) AND 1999 & 2003 UCR COORDINATES (MIDDLE POLYGON).

Ecological: RUDERAL ROADSIDE SETTING WITH ATRIPLEX ARGENTEA, SALSOLA IBERICA, AVENA FATUA, A. BARBATA, AMBROSIA ACANTHICARPA, BROMUS DIANDRUS, B. RUBENS, SCHISMUS BARBATA, CRESSA TRUXILLENSIS, AND CYNODON DACTYLON.

General: WEST-MOST POLYGON: 2500 PLANTS OBSERVED IN 1990. EAST-MOST POLYGON: 100 PLANTS OBSERVED IN 1990. MIDDLE POLYGON: <100 PLANTS OBSERVED ON ROADSIDE IN 1999, UNKNOWN NUMBER OF PLANTS OBSERVED IN 2003. INCLUDES FORMER OCCURRENCE #10.

Owner/Manager: PVT

Occurrence No.	11	**Map Index:**	28232	**EO Index:**	2510	**Element Last Seen:**	1990-09-05
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-09-05
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-28

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78993 / -117.20404	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3738882 E481111	**Elevation (ft):**	1410
PLSS:	T04S, R03W, Sec. 28 (S)	**Acres:**	24.7

Location: PERRIS VALLEY STORM DRAIN, ABOUT 0.25 MILE NORTH OF SAN JACINTO AVE, NORTHEAST OF PERRIS.

Detailed Location: ON LEVEE EAST OF CHANNEL WITHIN THE CENTER OF THE SW 1/4 OF SECTION 28.

Ecological: IN WEED PATCH BETWEEN DIRT ROAD AND STORM DRAIN WITH SALSOLA IBERICA. PLOWED FIELDS WITH ATRIPLEX ARGENTEA, EREMOCARPUS SETIGERUS, LEPTOCHLOA UNINERVIA, POLYPOGON MONSPELIENSIS, CHENOPODIUM ALBUM, HELIANTHUS ANNUUS, SORGHUM HALEPENSE, ETC.

General: 1 PLANT OBSERVED IN 1990. WHITE SUGGESTS SITE SHOULD SHOULD BE RETAINED AS OPEN SPACE / GREENBELT ALONG THE CHANNEL.

Owner/Manager: PVT

Occurrence No.	12	**Map Index:**	28234	**EO Index:**	2453	**Element Last Seen:**	2008-06-26
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2008-06-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-22

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77450 / -117.19771	**Accuracy:**	80 meters
UTM:	Zone-11 N3737171 E481693	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: SOUTH OF THE SAN JACINTO RIVER AT CONFLUENCE WITH PERRIS VALLEY STORM DRAIN, ABOUT 1 MILE EAST OF PERRIS.

Detailed Location: SITE IS MAPPED ABOUT 0.25 MILE NORTH OF ELLIS AVE ALONG I-215. A 2008 WHITE & WOOD COLLECTION FROM "I-215 JUST N OF SAN JACINTO RIVER CROSSING" IN SECTION 33 ALSO ATTRIBUTED HERE BUT MAY BE FROM FURTHER NW.

Ecological: RUDERAL HABITAT DOMINATED BY SALSOLA IBERICA AND ATRIPLEX SERENANA. ASSOCIATED WITH HEMIZONIA KELLOGGII, ATRIPLEX ARGENTEA, BROMUS DIANDRUS, HELIANTHUS ANNUUS, BRASSICA GENICULATA, SORGHUM HALIPENSIS, LACTUCA SERRIOLA, CENTAUREA, ET AL.

General: 15 PLANTS IN 1990. 1993 KIRTLAND COLLECTION FROM "ALONG I-215 BETWEEN 4TH ST & 1/4 MI S OF SAN JACINTO RIVER" ATTRIBUTED HERE. ID NEEDS CONFIRMATION; SOME COLLECTIONS FROM AREA ANNOTATED TO SSP. PUNGENS.

Owner/Manager: UNKNOWN

Occurrence No.	13 **Map Index:** 28235	**EO Index:**	2441	**Element Last Seen:**	1990-07-25
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-25
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-08-15

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77396 / -117.18321	**Accuracy:**	80 meters
UTM:	Zone-11 N3737108 E483036	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 34 (S)	**Acres:**	0.0

Location: ABOUT 0.25 MILE NORTHWEST OF ELLIS ROAD AT SHERMAN ROAD, ABOUT 2.5 MILES EAST OF PERRIS.

Detailed Location:

Ecological: VALLEY SINK SCRUB WITH OPEN SALT PANS. ASSOCIATED WITH SUAEDA TORREYANA, DISTICHLIS SPICATA, BASSIA HYSSOPIFOLIA, BRASSICA GENICULATA, ATRIPLEX ARGENTEA, SALSOLA IBERICA, GEDTUCA MEGALURA, HAPLOPAPPUS VENETUS, AND MARRUBIUM VULGARE.

General: 15 PLANTS OBSERVED IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	14 **Map Index:** 28233	**EO Index:**	2466	**Element Last Seen:**	1990-07-20
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-20
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-04-27

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.76652 / -117.21562	**Accuracy:**	specific area
UTM:	Zone-11 N3736289 E480033	**Elevation (ft):**	1420
PLSS:	T05S, R03W, Sec. 05 (S)	**Acres:**	15.0

Location: PERRIS VALLEY AIRPORT, BETWEEN NORTH END OF AIRSTRIP AND CASE ROAD, SOUTH OF PERRIS.

Detailed Location: MAPPED WITHIN THE SE 1/4 OF THE NW 1/4 OF SECTION 5.

Ecological: VALLEY SINK SCRUB WITH ATRIPLEX ARGENTEA, A. SEMIBACCATA, SUAEDA TORREYANA, SALSOLA IBERICA, FRANKENIA GRANDIFOLIA, SIDA LEPROSA, ERODIUM CICUTARIUM, BROMUS DIANDRUS, B. RUBENS, SALICORNIA SUBTERMINALIS, LEPIDIUM DICTYOCARPUM, ET AL.

General: 130 PLANTS OBSERVED IN 1990. THE RARE ATRIPLEX CORONATA VAR. NOTATIOR IS ALSO IN THIS AREA.

Owner/Manager: UNKNOWN

Occurrence No.	15 **Map Index:** 28231	**EO Index:**	3786	**Element Last Seen:**	2006-06-01
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-01
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-12-19

Quad Summary: Lakeview (3311771), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87252 / -117.11774	**Accuracy:**	specific area
UTM:	Zone-11 N3748028 E489110	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 32 (S)	**Acres:**	35.0

Location: DFG SAN JACINTO WILDLIFE AREA, JUST EAST OF DAVIS ROAD NEAR VISITOR CENTER, APPROXIMATELY 2.5 MILES NORTH OF LAKEVIEW.

Detailed Location: MAPPED BY CNDDB AS 3 POLYGONS IN THE SE 1/4 OF THE SW 1/4 OF SECTION 29 AND THE NW 1/4 OF SECTION 32.

Ecological: VALLEY SINK SCRUB WITH ATRIPLEX ARGENTEA, A. ROSEA, SUAEDA TORREYANA, SALSOLA IBERICA, SISYMBRIUM IRIO, FRANKENIA GRANDIFOLIA, SALICORNIA SUBTERMINALIS, HORDEUM LEPORINUM, & MEDICAGO POLYMORPHA. SOIL IS SANDY LOAM & SILTY CLAY, ALKALINE.

General: NE-MOST POLY: 1200 PLANTS IN 1990, UNK # IN 2003, 155 IN 2004. MIDDLE POLY: ~450 IN 2004. SW-MOST POLYGON: 200 IN 1990, PRESENT IN "ENTIRE FIELD" IN 1999, 8000 ESTIMATED IN 2003, 1800 IN 2004, UNKNOWN NUMBER IN 2006. INCLUDES FORMER EO #16.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	17 **Map Index:** 28229	**EO Index:**	3752	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-08-16

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86616 / -117.09513	**Accuracy:**	80 meters
UTM:	Zone-11 N3747320 E491201	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 33 (S)	**Acres:**	0.0

Location: DFG SAN JACINTO WILDLIFE AREA, IN DUCK PONDS 1.5 MILES EAST OF DAVIS ROAD & 0.5 MILE NORTH OF SAN JACINTO RIVER.

Detailed Location: MAPPED NEAR THE NE CORNER OF THE SW 1/4 OF SECTION 33.

Ecological:

General: 3 PLANTS OBSERVED IN 1990. ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1990 MAP BY ERC ENVIRONMENTAL AND ENERGY SERVICES CO.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	18	**Map Index:**	28228	**EO Index:**	3746	**Element Last Seen:**	1990-05-10
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-05-10
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-09-06

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84962 / -117.10424	**Accuracy:**	specific area
UTM:	Zone-11 N3745487 E490356	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	9.7

Location: 1 MILE EAST OF DAVIS ROAD & 0.7 MILE NORTH OF THE RAMONA EXPRESSWAY, NORTHEAST OF LAKEVIEW.

Detailed Location: TWO COLONIES MAPPED; NORTHERN ONE IN DRY TIRE TRACKS ON EAST SIDE OF DIRT ROAD 200 METERS NORTH OF MARVIN ROAD, SOUTH OF THE SAN JACINTO RIVER CHANNEL. SECOND COLONY IS ABOUT 300 METERS TO THE SOUTH.

Ecological: GROWING IN DISTURBED FIELD/ALKALI MEADOW WITH CRESSA, BASSIA, DISTICHLIS, AND ATRIPLEX.

General: 548 PLANTS OBSERVED IN 1990 (533 IN ONE STAND; 15 IN THE OTHER). PLANTS ARE SMALL, DISPERSED - NOT A HIGH QUALITY STAND.

Owner/Manager: UNKNOWN

Occurrence No.	19	**Map Index:**	28227	**EO Index:**	3743	**Element Last Seen:**	1990-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-08-16

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.85944 / -117.08496	**Accuracy:**	specific area
UTM:	Zone-11 N3746574 E492141	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 03 (S)	**Acres:**	4.4

Location: SOUTH SIDE OF SAN JACINTO RIVER, ABOUT 1.1 MILES NORTHWEST OF BRIDGE STREET CROSSING, NORTHEAST OF LAKEVIEW.

Detailed Location: MAPPED IN THE NW-MOST CORNER OF SECTION 3 ALONG THE RIVER LEVEE.

Ecological:

General: 1100 PLANTS OBSERVED IN 1990. ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1990 MAP BY ERC.

Owner/Manager: UNKNOWN

Occurrence No.	20	**Map Index:**	28226	**EO Index:**	3708	**Element Last Seen:**	1990-04-10
Occ. Rank:	Excellent			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-04-10
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-27

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.85459 / -117.06941	**Accuracy:**	specific area
UTM:	Zone-11 N3746035 E493579	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 03 (S)	**Acres:**	16.5

Location: BOTH SIDES OF BRIDGE STREET ON NORTH SIDE OF SAN JACINTO RIVER, NORTHEAST OF LAKEVIEW.

Detailed Location: TWO COLONIES ALONG THE NORTH LEVEE OF THE RIVER; NORTH COLONY IS ABOUT 50 FEET WEST OF BRIDGE STREET, THE SECOND IS NEAR THE GAGING STATION EAST OF BRIDGE STREET.

Ecological: FALLOW, PLOWED FIELD WITH DENSE, HEAVY SOILS AND LEVEL TOPOGRAPHY.

General: 5000 PLANTS OBERSERVED IN WESTERN COLONY AND 10 IN EASTERN COLONY IN 1990. WESTERN COLONY IS A RELATIVELY PURE, EXTENSIVE STAND. GREATER THAN 1000 PLANTS ESTIMATED IN 1999.

Owner/Manager: UNKNOWN

Occurrence No.	21	**Map Index:**	28225	**EO Index:**	3690	**Element Last Seen:**	1990-04-10
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-04-10
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-08-16

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84986 / -117.04696	**Accuracy:**	80 meters
UTM:	Zone-11 N3745510 E495655	**Elevation (ft):**	1450
PLSS:	T04S, R02W, Sec. 01 (S)	**Acres:**	0.0

Location: 0.15 MILE NORTH OF SAN JACINTO RIVER AND 1.2 MILES EAST OF BRIDGE STREET, SAN JACINTO VALLEY.

Detailed Location: SCATTERED CLUMPS IN UNCULTIVATED BASIN NEXT TO STAGING AREA FOR FARM EQUIPMENT.

Ecological: LARGE INDIVIDUALS INTERSPERSED AMONG DENSE COVER OF PHALARIS, CONYZA, LACTUCA, BRASSICA, AND HELIANTHUS.

General: 140 PLANTS OBSERVED IN 1990.

Owner/Manager: UNKNOWN

Occurrence No.	22	**Map Index:** 28224	**EO Index:** 3664	**Element Last Seen:**	1990-04-10
Occ. Rank:	Fair		**Presence:** Presumed Extant	**Site Last Seen:**	1990-04-10
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1996-09-06

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.83283 / -117.03172	**Accurracy:**	specific area
UTM:	Zone-11 N3743621 E497064	**Elevation (ft):**	1450
PLSS:	T04S, R01W, Sec. 07 (S)	**Acres:**	6.9

Location: NORTHEAST EDGE OF DUCK POND/AG DRAINAGE DITCH ABOUT 0.7 MI NORTH OF RAMONA EXPRESSWAY AT WARREN RD, SAN JACINTO VALLEY.

Detailed Location: PLANTS DISTRIBUTED IN SEVERAL PATCHES NEAR THE 'ELBOW' OF A NARROW AGRICULTURAL DRANAGE DITCH (DUCK POND?) ALONG EASTERN AND NORTHERN FOOT OF SMALL HILL.

Ecological: AGRICULTURAL DRAINAGE DITCH WITH MELILOTUS, HELIANTHUS, LACTUCA, AND BASSIA.

General: 1524 PLANTS OBSERVED IN 1990. SITE/OCCURRENCE COULD BE ENHANCED BY CLEARING THE WEEDY SPECIES.

Owner/Manager: UNKNOWN

Occurrence No.	23	**Map Index:** 28223	**EO Index:** 3644	**Element Last Seen:**	1999-07-30
Occ. Rank:	Good		**Presence:** Presumed Extant	**Site Last Seen:**	1999-07-30
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2011-12-22

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.82083 / -117.02565	**Accurracy:**	specific area
UTM:	Zone-11 N3742291 E497626	**Elevation (ft):**	1460
PLSS:	T04S, R01W, Sec. 18 (S)	**Acres:**	70.0

Location: JUST SOUTH OF THE RAMONA EXPRESSWAY, MOSTLY BETWEEN WARREN ROAD AND SANDERSON AVENUE, SAN JACINTO VALLEY.

Detailed Location: SEVERAL COLONIES MAPPED AS 5 POLYGONS MOSTLY IN THE SOUTH 1/2 OF SECTION 18.

Ecological: ALKALINE SINK SCRUB WITH SUAEDA TORREYANA, BASSIA HYSSOPIFOLIA, SISYMBRIUM IRIO, HORDEUM LEPORINUM, ATRIPLEX ARGENTEA EXPANSA, A. SERENANA, DISTICHLIS SPICATA, LEPIDIUM DICTYOTUM, MATRICARIA MATRICARIOIDES, AND PLANTAGO BIGELOVII.

General: ABOUT 31,000 PLANTS OBSERVED IN 11 COLONIES IN 1990-1991. 1000+ PLANTS ESTIMATED NEAR THE CENTER OF OCCURRENCE IN 1999.

Owner/Manager: PVT

Occurrence No.	24	**Map Index:**	28221	**EO Index:**	3622	**Element Last Seen:**	2009-06-08
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2009-06-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-01-04

Quad Summary: San Jacinto (3311678), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.81919 / -117.00207	**Accuracy:**	specific area
UTM:	Zone-11 N3742109 E499808	**Elevation (ft):**	1460
PLSS:	T04S, R01W, Sec. 17 (S)	**Acres:**	28.0

Location: ALONG RAMONA BLVD, FROM SANDERSON AVE SE ABOUT 0.6 MILE, SAN JACINTO VALLEY.

Detailed Location: WEST SIDE OF RAMONA BLVD. MAPPED BY CNDDB AS 3 POLYGONS ACCORDING TO A 1991 BRAMLET MAP AND 2009 COORDINATES IN THE SE 1/4 OF SECTION 17 AND THE NE 1/4 OF THE NE 1/4 OF SECTION 20.

Ecological: DISTURBED ALKALINE MEADOW WITH BASSIA HYSSOPIFOLIA, AVENA FATUA, HORDEUM LEPORINUM, BROMUS DIANDRUS, SISYMBRIUM IRIO, ATRIPLEX ARGENTEA EXPANSA, SUAEDA TORREYANA, SPERGULARIA MARINA, DISTICHLIS SPICATA, LEPIDIUM DICTYOTUM, AND HELIANTHUS.

General: NW-MOST POLYGON: 7000 PLANTS OBSERVED IN 1991 (LARGEST # IN DITCH ON S SIDE OF RAMONA BLVD), UNKNOWN NUMBER OF PLANTS IN 1999, "ABUNDANT" IN 2001, 1000 PLANTS ESTIMATED IN 2003. TWO SE-MOST POLYGONS: FEWER THAN 10 PLANTS OBSERVED IN 2009.

Owner/Manager: PVT

Occurrence No.	25	**Map Index:**	28222	**EO Index:**	3630	**Element Last Seen:**	1992-05-XX
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-07-30
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-01-10

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.81181 / -117.03256	**Accuracy:**	specific area
UTM:	Zone-11 N3741291 E496986	**Elevation (ft):**	1480
PLSS:	T04S, R01W, Sec. 19 (S)	**Acres:**	9.0

Location: JUST EAST OF WARREN ROAD, ABOUT 0.8 MILE SOUTH OF THE RAMONA EXPRESSWAY, SAN JACINTO VALLEY.

Detailed Location: SINGLE COLONY MAPPED FOR THIS OCCURRENCE IN THE SW 1/4 OF THE NW 1/4 OF SECTION 19. PLANTS ALSO OCCUR IN SECTIONS 20, 28 AND 29 ACCORDING TO WHITE. CNDDB ONLY HAS MAP DETAIL FOR COLONY IN SECTION 19. MORE INFO NEEDED FOR OTHER COLONIES.

Ecological: AGRICULTURAL FIELDS, DRAINAGE DITCH, DIRT BERMS AND ROADSIDES.

General: 2000 PLANTS OBSERVED IN 1990. SPECIES ABUNDANT IN THE AREA (SECTIONS 19, 20, 28, 29) IN 1992; PROTECTION OF SITE IS DOUBTFUL ACCORDING TO WHITE. NO PLANTS OBSERVED IN 1999; DRAINAGE DITCH HAS BEEN CLEARED; POSSIBLY IN SURROUNDING FIELDS?

Owner/Manager: PVT

Occurrence No.	26 **Map Index:** 28220	**EO Index:**	3615	**Element Last Seen:**	2001-XX-XX
Occ. Rank:	Poor	**Presence:**	Presumed Extant	**Site Last Seen:**	2001-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-02-06

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.78862 / -117.02980	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3738719 E497240	**Elevation (ft):**	1500
PLSS:	T04S, R01W, Sec. 30 (S)	**Acres:**	22.0

Location: VICINITY OF COTTONWOOD LAKE; NEAR THE JUNCTION OF COTTONWOOD AVE AND WARREN RD, SAN JACINTO VALLEY.

Detailed Location: MAPPED BY CNDDB AS 3 POLYGONS. TWO EASTERN POLYGONS ARE SPECIFIC FEATURES BASED ON A 1990 ERC MAP. WESTERN POLYGON JUST NNW OF JCT OF COTTONWOOD AVE & WARREN RD IS NON-SPECIFIC (MAPPED IN VERNAL POOL AREA BUT MAY BE FROM SURROUNDING AREA).

Ecological: WEST-MOST POLYGON MAPPED AROUND ALKALI VERNAL POOLS WHICH HAVE BEEN DISTURBED BY CREATION OF DIRT ACCESS ROADS, THICK OVERBURDEN OF MANURE AND AGRICULTURAL ACTIVITIES.

General: 4000 PLANTS OBSERVED IN TWO EASTERN COLONIES IN 1990. 50 PLANTS WERE ESTIMATED ALONG THE ROADSIDE IN THIS AREA IN 1999 (MAP DETAIL NOT PROVIDED). WEST COLONY WAS OBSERVED IN 2001.

Owner/Manager: PVT

Occurrence No.	27 **Map Index:** 28219	**EO Index:**	3581	**Element Last Seen:**	2005-06-10
Occ. Rank:	Poor	**Presence:**	Presumed Extant	**Site Last Seen:**	2005-06-10
Occ. Type:	Natural/Native occurrence	**Trend:**	Decreasing	**Record Last Updated:**	2011-12-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.78623 / -117.01438	**Accurracy:**	specific area
UTM:	Zone-11 N3738454 E498668	**Elevation (ft):**	1500
PLSS:	T04S, R01W, Sec. 32 (S)	**Acres:**	45.0

Location: SOUTH SIDE OF COTTONWOOD AVE, FROM SANDERSON AVE TO ABOUT 0.5 MILE WEST OF SANDERSON AVE, SAN JACINTO VALLEY.

Detailed Location: MAPPED BY CNDDB AS 2 POLYGONS IN THE NE 1/4 OF THE NE 1/4 OF SECTION 31 AND THE NORTH 1/2 OF THE NW 1/4 OF SECTION 32.

Ecological: EASTERN POLYGON: MOST OF THE SITE APPEARS TO HAVE BEEN PLANTED IN BARLEY. LIMITED OPEN AREAS ON SITE CONTAIN RUDERAL VEGETATION OR BARE GROUND. THE RUDERAL SPECIES INCLUDE HIRSCHFELDIA INCANA, AMBROSIA PSILOSTACHYA, SALSOLA TRAGUS, ETC.

General: WESTERN COLONY: 95 PLANTS OBSERVED IN 1990, 50 PLANTS ESTIMATED IN 1999. 100+ PLANTS OBSERVED ACROSS SITE IN 2005.

Owner/Manager: PVT

Occurrence No.	28	**Map Index:**	28218	**EO Index:**	3572	**Element Last Seen:**	2010-05-03
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2010-05-03
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.77079 / -117.03285	**Accuracy:**	specific area
UTM:	Zone-11 N3736743 E496957	**Elevation (ft):**	1510
PLSS:	T05S, R01W, Sec. 06 (S)	**Acres:**	45.0

Location: JUST NORTH OF TRES CERRITOS; NEAR THE JUNCTION OF WARREN ROAD AND ESPLANADE AVENUE, SAN JACINTO VALLEY.

Detailed Location: MAPPED AS TWO POLYGONS IN THE WEST 1/2 OF THE NW 1/4 OF SECTION 6, THE EAST 1/2 OF THE NE 1/4 OF SECTION 1, THE SW 1/4 OF THE SW 1/4 OF SECTION 31 AND THE SE 1/4 OF THE SE 1/4 OF SECTION 36.

Ecological: RUDERAL / DISTURBED VEGETATION ALONG THE DIRT ROADS. CHINO SILT LOAM SOILS, DRAINED, SALINE-ALKALI & TRAVER LOAMY FINE SAND, SALINE-ALKALI, ERODED.

General: 8000 PLANTS IN 1990 & 1999 IN PORTION OF W POLYGON S OF ESPLANADE AVE. UNKNOWN NUMBER OF PLANTS OBSERVED IN PORTION OF W POLY N OF ESPLANADE AVE & E OF WARREN RD IN 2003. HUNDREDS OBSERVED W OF WARREN RD IN 2008. COMMON IN E POLY IN 2010.

Owner/Manager: PVT

Occurrence No.	29	**Map Index:**	28217	**EO Index:**	3566	**Element Last Seen:**	1981-08-10
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1981-08-10
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-05-03

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.77211 / -117.05407	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3736890 E494992	**Elevation (ft):**	1800
PLSS:	T05S, R02W, Sec. 02 (S)	**Acres:**	0.0

Location: ALONG REINHARDT CREEK SOUTH OF MAZE STONE COUNTY PARK, BETWEEN HEMET AND HOMELAND NORTH OF HIGHWAY 74.

Detailed Location:

Ecological: LOCALLY COMMON IN DENSE WEEDY GROWTH AT EDGE OF STREAM IN MOIST GRANITIC SOIL.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1981 COLLECTION BY TILFORTH AND WISURA.

Owner/Manager: UNKNOWN

Occurrence No.	34	**Map Index:**	28212	**EO Index:**	3913	**Element Last Seen:**	2005-07-19
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-07-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-21

Quad Summary: Winchester (3311761), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.74072 / -117.04107	**Accuracy:**	specific area
UTM:	Zone-11 N3733409 E496195	**Elevation (ft):**	1500
PLSS:	T05S, R02W, Sec. 13 (S)	**Acres:**	99.0

Location: ALONG SAN DIEGO CANAL FROM JUST SOUTH OF STETSON AVE NORTH TO NEAR ROSE RD, WEST OF WARREN RD, SAN JACINTO VALLEY.

Detailed Location: MAPPED BY CNDDB AS 12 POLYGONS BASED ON 1990, 1995 & 2004 MAPS, 1999 COORDINATES AND 2005 COORDINATES IN SECTIONS 12, 13 AND EXTENDING INTO THE NW 1/4 OF THE NW 1/4 OF SECTION 24.

Ecological: ANNUAL GRASSLAND / ALKALI GRASSLAND. ASSOCIATES INCLUDE LOLIUM PERENNE, PHALARIS MINOR, HORDEUM MURINUM, CRESSA TRUXILLENSIS, SUAEDA MOQUINII, AND LASTHENIA CALIFORNICA.

General: SECTION 12: 4800+ PLANTS IN 1990, 350 PLANTS IN 1993, ~30 IN 1999, OCCASIONAL IN 2003, 1 PLANT IN 2004 IN SMALL PORTION OF SITE, ~10,000 PLANTS IN APRIL 2005. >9000 PLANTS OBS IN 1994 THROUGHOUT EO. ALSO OBSERVED IN JULY 2005 THROUGHOUT EO.

Owner/Manager: PVT

Occurrence No.	62	**Map Index:**	49406	**EO Index:**	49406	**Element Last Seen:**	1999-03-17
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-03-17
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2002-11-14

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.83495 / -117.36540	**Accuracy:**	specific area
UTM:	Zone-11 N3743915 E466190	**Elevation (ft):**	1466
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	1.1

Location: 0.1 AIR MILE NE OF INTERSECTION OF CAJALCO ROAD & EL SOBRANTE ROAD.

Detailed Location: FIELD SURVEY FORM DESCRIBES LOCATION AS 500' EAST OF INTERSECTION & 300' NORTH OF CAJALCO ROAD.

Ecological: MOIST ALKALINE MEADOW/GRASSLAND. ASSOC: HORDEUM MURINUM SSP. LEPORINUM, BROMUS MADRITENSIS, DISTICHLIS SPICATA, FRANKENIA SALINA, HELIANTHUS ANNUS, AMSINCKIA MENZIESII, CALANDRINA CILIATA, HIRSHFELDIA INCANA, ISOCOMA MENZIESII, ET AL.

General: 635 PLANTS OBSERVED IN 1999. STATUS OF CAJALCO CREEK DAM CONSTRUCTION UNKNOWN. HAND REMOVAL OF RIPARIAN VEGETATION BEGAN IN 1999 IN PREPARATION FOR CONSTRUCTION.

Owner/Manager: MWD

Occurrence No.	68	**Map Index:**	49433	**EO Index:**	49433	**Element Last Seen:**	2003-07-31
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-07-31
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-21

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.82957 / -117.14731	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3743269 E486368	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 13 (S)	**Acres:**	0.0

Location: JUST SOUTH OF LAKEVIEW HOT SPRINGS, SOUTHEAST OF LAKE PERRIS.

Detailed Location: MAPPED BY CNDDB AS BEST GUESS TO ENCOMPASS INFO IN A 1991 BRAMLET COLLECTION, MAPS FROM 1991 BRAMLET FIELD SURVEY FORMS FOR NAVARRETIA FOSSALIS WITH CENTROMADIA MENTIONED AS AN ASSOCIATE, AND 1999 & 2003 UCR COORDINATES. NEED MAP DETAIL.

Ecological: DISTURBED ALKALI GRASSLAND WITH HORDEUM GENICULATUM, POLYPOGON MONSPELIENSIS, CIRSIUM VULGARE, RUMEX CRISPUS, MELILOTUS INDICA, ATRIPLEX ARGENTEA, HELIOTROPIUM CURASSAVICUM, AND EPILOBIUM ADENOCAULON.

General: SCARCE IN DRY ALKALI FLATS BUT COMMON IN WET AREAS IN 1989. 1,684 PLANTS OBSERVED IN 1991 JUST SOUTH OF MWD COLORADO AQUEDUCT EASEMENT ROAD (395 M E OF ITS INTERSECTION WITH POZOS AVE). UNKNOWN # OF PLANTS AT N END OF OCC IN 1999 & 2003.

Owner/Manager: UNKNOWN

Occurrence No.	71	**Map Index:**	49518	**EO Index:**	49518	**Element Last Seen:**	2003-05-08
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-05-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-01-24

Quad Summary: Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84582 / -117.12266	**Accuracy:**	specific area
UTM:	Zone-11 N3745067 E488651	**Elevation (ft):**	1425
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	39.0

Location: ALONG SAN JACINTO RIVER, APPROXIMATELY 0.6 AIR MILE NORTH OF LAKEVIEW.

Detailed Location: MAPPED BY CNDDB AS 3 POLYGONS IN THE SE 1/4 SEC 6 & SW 1/4 OF SEC 5. TWO W POLYGONS ARE BASED ON A 1998 METROPOLITAN WATER DISTRICT MAP. E POLYGON IS BASED ON 1999 UCR COORDINATES AND MAY HAVE BEEN THE SAME SITE AS TAYLOR'S 2003 COLLECTION.

Ecological: MARGIN OF AGRICULTURAL FIELD WITH ABUNDANT SISYMBRIUM ALTISSIMUM AND MALVA PARVIFLORA.

General: 11 PLANTS IN NW-MOST POLYGON AND 458 PLANTS IN SW-MOST POLYGON IN 1996. EASTERN POLYGON: 1000+ PLANTS IN 1999. UNKNOWN NUMBER OF PLANTS OBSERVED IN 2003 IN THE SW 1/4 OF THE SW 1/4 OF SECTION 5.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	73	**Map Index:**	53944	**EO Index:**	53944	**Element Last Seen:**	2003-04-25
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-01-15

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.77635 / -117.02312	**Accuracy:**	specific area
UTM:	Zone-11 N3737359 E497859	**Elevation (ft):**	1500
PLSS:	T04S, R01W, Sec. 31 (S)	**Acres:**	0.5

Location: APPROXIMATELY 0.2 AIR MILE NORTH OF ESPLANADE AVENUE, 0.4 AIR MILE WEST OF CAWSTON AVENUE, SAN JACINTO VALLEY.

Detailed Location: ONE SMALL COLONY MAPPED IN THE SW 1/4 OF THE SE 1/4 OF SECTION 31.

Ecological: PLANTS LOCATED ON THE SLOPES OF DRY, ABANDONED RESERVOIR. CHINO SILT LOAM SOILS, DRAINED, SALINE-ALKALI & TRAVER LOAMY FINE SAND, SALINE-ALKALI, ERODED.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 2003.

Owner/Manager: PVT

Occurrence No.	74	**Map Index:**	53945	**EO Index:**	53945	**Element Last Seen:**	1993-06-08
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1993-06-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2004-01-15

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78592 / -117.17569	**Accuracy:**	80 meters
UTM:	Zone-11 N3738433 E483734	**Elevation (ft):**	1415
PLSS:	T04S, R03W, Sec. 34 (S)	**Acres:**	0.0

Location: SOUTH OF SAN JACINTO AVENUE, APPROXIMATELY 0.6 AIR MILE EAST OF SAN JACINTO RIVER.

Detailed Location: EXACT LOCATION UNKNOWN, MAPPED IN THE VICINITY OF ATRIPLEX CORONATA V. NOTATIOR OCCURRENCE PROVIDED IN THE NE 1/4 OF THE NE 1/4 OF SECTION 34.

Ecological: PLANTS GROWING ALONG RIVER FLOOD PLAIN IN DISTURBED SEASONALLY FLOODED ALKALI VERNAL PLAINS. ASSOCIATES: ATRIPLEX ROSEA, A. ARGENTA, SUAEDA MOQUINII, HORDEUM INTERCEDENS, H. MURINUM, PLAGIOBOTHRYS LEPTOCLADUS, HEMIZONIA FASCICULATA, ET AL.

General: UNKNOWN NUMBER OF INDIVIDUALS OBSERVED IN 1993. NEEDS FIELDWORK TO CONFIRM LOCATION.

Owner/Manager: PVT

Occurrence No.	84	**Map Index:** 61158	**EO Index:**	61194		**Element Last Seen:**	1995-06-08
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1995-06-08
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2005-04-29

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86560 / -117.10134	**Accuracy:**	80 meters
UTM:	Zone-11 N3747259 E490625	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 33 (S)	**Acres:**	0.0

Location: SAN JACINTO WILDLIFE AREA. LOVELL UNIT, ALONG ACCESS ROAD.
Detailed Location: 1.83 KM EAST OF DAVIS ROAD AND 762 M NORTH OF THE SAN JACINTO RIVER CHANNEL.
Ecological: ANNUAL GRASSLAND.
General: APPROXIMATELY 2000 PLANTS OBSERVED IN 1995.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	85	**Map Index:** 61159	**EO Index:**	61195		**Element Last Seen:**	2004-04-02
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2004-04-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2005-04-29

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.75706 / -117.02886	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3735220 E497327	**Elevation (ft):**	1520
PLSS:	T05S, R01W, Sec. 07 (S)	**Acres:**	0.0

Location: TRES CERRITOS. 3 AIR MILES WNW OF HEMET. EAST OF THE LAKEVIEW MOUNTAINS.
Detailed Location: MOUTH OF CANYON ON THE SOUTH SIDE. JUST NORTH OF ROSE ROAD.
Ecological: ANNUAL GRASSLAND WITH SMALL VERNAL POOLS ON CLAY-LOAM SOIL. (TRAVERS SERIES).
General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 2004 COLLECTION BY SANDERS; MENTIONED AS COMMON IN 2004.
Owner/Manager: UNKNOWN

Occurrence No.	86	**Map Index:** 61196	**EO Index:**	61232		**Element Last Seen:**	1995-08-16
Occ. Rank:	None		**Presence:**	Possibly Extirpated		**Site Last Seen:**	1999-07-30
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2012-01-24

Quad Summary: Winchester (3311761), Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.74728 / -117.05855	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3734137 E494576	**Elevation (ft):**	1600
PLSS:	T05S, R02W, Sec. 11 (S)	**Acres:**	324.0

Location: WEST OF HEMET; NORTH OF FLORIDA AVE (HWY 74) & WEST OF CALIFORNIA AVE, SE MARGIN OF LAKEVIEW.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN THE SOUTH 1/2 OF SECTION 11, BASED ON T-R-S PROVIDED BY WHITE.
Ecological: MAJOR HABITATS ARE ARTEMISIA CALIFORNICA / ERIOGONUM FASCICULATUM COASTAL SAGE SCRUB IN GRANITIC BOULDER FIELD FOOTHILLS, & MINOR DRAINAGEWAYS & ROADSIDES WITHIN DRY-FARMED GRAIN FIELD.
General: ABOUT 15 PLANTS OBSERVED IN 1995. NEED MAP DETAIL FOR THIS SITE. NOT OBSERVED IN 1999; MUCH OF THE AREA HAS BEEN DEVELOPED.
Owner/Manager: PVT

Occurrence No.	87	**Map Index:** 61197	**EO Index:**	61233	**Element Last Seen:**	1992-06-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-06-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2011-12-15

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.97679 / -117.10440	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3759587 E490356	**Elevation (ft):**	1900
PLSS:	T02S, R02W, Sec. 20 (S)	**Acres:**	29.8

Location: SAN TIMOTEO CANYON, 3.2 MILES SOUTHEAST OF REDLANDS BLVD.

Detailed Location:

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1992 COLLECTION BY BALLMER. A 1992 SANDERS COMMUNICATION NOTES THAT THE COLLECTION WAS MADE IN "SAN TIMOTEO CANYON, ACROSS THE ROAD FROM THE OLD SCHOOL HOUSE." INCLUDES FORMER EO #6.

Owner/Manager: UNKNOWN

Occurrence No.	88	**Map Index:** 61198	**EO Index:**	61234	**Element Last Seen:**	1995-09-22
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1995-09-22
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2005-05-03

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.90533 / -117.29549	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3751698 E472681	**Elevation (ft):**	1500
PLSS:	T03S, R04W, Sec. 15 (S)	**Acres:**	0.0

Location: MARCH AIR FORCE BASE. WEST OF PLUMMER RD & SOUTH OF CACTUS RD, 0.7 MILE WEST OF I-215.

Detailed Location:

Ecological: NEAR BY RARELY WITHIN SEASONAL DRAINAGES. WEEDY GRASSLAND WITH REMNANT COASTAL SAGE SCRUB AND WILLOW RIPARIAN VEGETATION IN PATCHES.

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1995 COLLECTION BY WHITE; MENTIONED AS "COMMON IN INFREQUENT PATCHES" IN 1995. NEEDS FIELDWORK.

Owner/Manager: DOD-MARCH AFB

Occurrence No.	98	**Map Index:** 84505	**EO Index:**	85525	**Element Last Seen:**	1993-06-11
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1993-06-11
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2011-12-14

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.85065 / -117.13263	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3745604 E487730	**Elevation (ft):**	1445
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	40.0

Location: NNW OF LAKEVIEW; ~0.75 AIR MILE NORTH OF THE JUNCTION OF SAN JACINTO RIVER AND MARTIN ST, EAST OF BERNASCONI HILLS.

Detailed Location: MAPPED BY CNDDB ACCORDING TO TRS INFORMATION ON COLLECTION LABEL IN THE NE 1/4 OF THE SW 1/4 OF SECTION 6.

Ecological: EDGE OF DRYING FLOOD AREA WITH ECHINODORUS BERTEROI AND AMMANNIA ROBUSTA.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1993 GREENE COLLECTION.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	99	**Map Index:** 84506	**EO Index:**	85527	**Element Last Seen:**	2008-06-20
Occ. Rank:	Poor		**Presence:**	Presumed Extant	**Site Last Seen:**	2008-06-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2012-01-24

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.80479 / -117.20144	**Accuracy:**	80 meters
UTM:	Zone-11 N3740530 E481354	**Elevation (ft):**	1415
PLSS:	T04S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: PERRIS VALLEY; ALONG E SUNSET RD ABOUT 0.1 MILE WEST OF ITS JUNCTION WITH EVANS RD, NE PERRIS.

Detailed Location: MAPPED BY CNDDB ACCORDING TO 2008 DICUS COORDINATES IN THE EAST 1/2 OF THE SW 1/4 OF SECTION 21.

Ecological: DISTURBED / RUDERAL FIELD ASSOCIATED WITH A MAN-MADE DRAINAGE. RECENT WEED ABATEMENT CONSTITUTES A DISTURBANCE.

General: 1 PLANT OBSERVED IN 2008.

Owner/Manager: PVT

Occurrence No.	100	**Map Index:** 84513	**EO Index:**	85533	**Element Last Seen:**	2008-04-15
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	2008-04-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2011-12-15

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.76896 / -117.19319	**Accuracy:**	specific area
UTM:	Zone-11 N3736557 E482110	**Elevation (ft):**	1414
PLSS:	T05S, R03W, Sec. 04 (S)	**Acres:**	14.0

Location: INTERSTATE 215 APPROXIMATELY 0.5 MILE SE OF THE SAN JACINTO RIVER CROSSING, SE OF PERRIS.

Detailed Location: BOTH SIDES OF FREEWAY IN SCATTERED PATCHES.

Ecological: ALKALI GRASSLANDS IN ROADSIDE DITCH. THE RARE ATRIPLEX CORONATA VAR. NOTATIOR ALSO AT THIS SITE.

General: 200+ PLANTS OBSERVED IN 2008.

Owner/Manager: UNKNOWN

Occurrence No.	101 **Map Index:** 84514	**EO Index:**	85534	**Element Last Seen:**	2001-04-27
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2001-04-27
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-12-15

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.89658 / -117.08658	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3750693 E491994	**Elevation (ft):**	1440
PLSS:	T03S, R02W, Sec. 21 (S)	**Acres:**	0.0

Location: EAST SIDE OF MYSTIC LAKE ABOUT 50 YARDS WEST OF GILMAN HOT SPRINGS ROAD, NEAR SAN JACINTO.
Detailed Location: MAPPED BY CNDDB AS BEST GUESS AROUND THE ALKALINE AREA ON THE NE END OF MYSTIC LAKE (NOT ON TOPO).
Ecological: ALKALINE PLAYA
General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 2001 REISER COLLECTION. NEEDS FIELDWORK.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	102 **Map Index:** 84515	**EO Index:**	85535	**Element Last Seen:**	2010-09-08
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2010-09-08
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-12-15

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.95970 / -117.06934	**Accuracy:**	specific area
UTM:	Zone-11 N3757690 E493592	**Elevation (ft):**	2100
PLSS:	T02S, R02W, Sec. 34 (S)	**Acres:**	10.0

Location: SAN TIMOTEO CANYON; 1.3 MILES SE OF SAN TIMOTEO CANYON ROAD AND RAILROAD CROSSING, BEAUMONT BADLANDS.
Detailed Location: MAPPED BY CNDDB ACCORDING TO A 2008 WHITE MAP MOSTLY IN THE NE 1/4 OF THE NE 1/4 OF SECTION 34.
Ecological: AREA OF ALKALI SOIL ADJACENT TO SEEP SURROUNDED BY WILLOWS AND NON-NATIVE GRASSLANDS.
General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 2007. 1000+ PLANTS OBSERVED IN 2008 BETWEEN OCCURRENCES 102, 103, & 104. "UNCOMMON" IN 2010.
Owner/Manager: PVT

Occurrence No.	103 **Map Index:** 84516	**EO Index:**	85536	**Element Last Seen:**	2008-06-24
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	2008-06-24
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-12-15

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.96579 / -117.07499	**Accuracy:**	specific area
UTM:	Zone-11 N3758365 E493071	**Elevation (ft):**	2050
PLSS:	T02S, R02W, Sec. 27 (S)	**Acres:**	2.0

Location: SAN TIMOTEO CANYON; 0.8 MILE SE OF SAN TIMOTEO CANYON ROAD AND RAILROAD CROSSING, BEAUMONT BADLANDS.
Detailed Location: MAPPED BY CNDDB ACCORDING TO A 2008 WHITE MAP IN THE NW 1/4 OF THE SE 1/4 OF SECTION 27.
Ecological: ALKALI GRASSLAND / DISTURBED GRASSLAND.
General: 1000+ PLANTS OBSERVED IN 2008 BETWEEN OCCURRENCES 102, 103, & 104. SITE MAY NOW BE EXTIRPATED.
Owner/Manager: PVT

Occurrence No.	104	**Map Index:**	84517	**EO Index:**	85537	**Element Last Seen:**	2008-06-24
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2008-06-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	2011-12-15

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.97066 / -117.08201	**Accuracy:**	specific area
UTM:	Zone-11 N3758906 E492423	**Elevation (ft):**	2050
PLSS:	T02S, R02W, Sec. 27 (S)	**Acres:**	5.0

Location: SAN TIMOTEO CANYON; FROM 0.05 TO 0.40 MILE SE OF SAN TIMOTEO CANYON ROAD AND RAILROAD CROSSING, BEAUMONT BADLANDS.

Detailed Location: MAPPED BY CNDDB AS 3 POLYGONS ACCORDING TO A 2008 WHITE MAP IN THE NW 1/4 OF SECTION 27.

Ecological: ALKALI GRASSLAND / DISTURBED GRASSLAND.

General: 1000+ PLANTS OBSERVED IN 2008 BETWEEN OCCURRENCES 102, 103, & 104.

Owner/Manager: PVT

Occurrence No.	105	**Map Index:**	84518	**EO Index:**	85538	**Element Last Seen:**	1992-05-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-05-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-15

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.90705 / -117.13114	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3751858 E487875	**Elevation (ft):**	1520
PLSS:	T03S, R02W, Sec. 18 (S)	**Acres:**	76.0

Location: WEST SIDE OF DAVIS ROAD, 1 MILE SOUTH OF ALESSANDRO BLVD, SAN JACINTO VALLEY.

Detailed Location: MAPPED BY CNDDB AS BEST GUESS AROUND DAVIS ROAD CENTERED AT ABOUT 1 MILE SOUTH OF ALESSANDRO ROAD.

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1992 SLEIGH & HAIMOV COLLECTION. NEEDS FIELDWORK.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	111	**Map Index:**	84556	**EO Index:**	85573	**Element Last Seen:**	1969-11-06
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1969-11-06
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-22

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.80270 / -117.40270	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740353 E462725	**Elevation (ft):**	
PLSS:	T04S, R05W, Sec. 21 (S)	**Acres:**	332.0

Location: LAKE MATTHEWS DRIVE, GAVILAN HILLS AREA.

Detailed Location: C.H. MICK PROPERTY. CNDDB UNABLE TO LOCATE "C.H. MICK PROPERTY"; MAPPED AS A BEST GUESS AROUND THE ENTIRE LENGTH OF LAKE MATTHEWS DRIVE.

Ecological: GRAINFIELD.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1969 SIEDSCHLAG COLLECTION. NEEDS FIELDWORK.

Owner/Manager: PVT

Lasthenia glabrata ssp. coulteri

Element Code: PDAST5L0A1

Coulter's goldfields

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4T3
	State:	None		**State:**	S2.1
	Other:	Rare Plant Rank - 1B.1, BLM_S-Sensitive			
Habitat:	**General:**	COASTAL SALT MARSHES, PLAYAS, VALLEY AND FOOTHILL GRASSLAND, VERNAL POOLS.			
	Micro:	USUALLY FOUND ON ALKALINE SOILS IN PLAYAS, SINKS, AND GRASSLANDS. 1-1400M.			

Occurrence No.	8	**Map Index:** 23773	**EO Index:**	20411		**Element Last Seen:**	2004-04-22
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2004-04-22
Occ. Type:	Natural/Native occurrence		**Trend:**	Fluctuating		**Record Last Updated:**	2010-12-06

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89518 / -117.08681	**Accuracy:**	specific area
UTM:	Zone-11 N3750537 E491973	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 21 (S)	**Acres:**	89.0

Location: WEST OF GILMAN SPRINGS ROAD (HIGHWAY 79) AND NORTHWEST OF QUAIL RANCH GOLF COURSE, SAN JACINTO VALLEY.

Detailed Location: ALONG THE NORTHEAST MARGIN OF MYSTIC LAKE. 150-762M WEST OF GILMAN SPRINGS RD. AND 600-1300M SOUTH OF BOLD STYLE AVE. WITHIN THE SE 1/4 NE 1/4 SECTION 21, NE 1/4 SE 1/4 SECTION 21, SW 1/4 NE 1/4 SECTION 21, AND THE NW 1/4 SW 1/4 SECTION 22.

Ecological: ALKALI PLAYA, GROWING IN WET AREAS, DENSE STANDS. ASSOCIATED WITH SUAEDA TORREYANA, SCIRPUS MARITIMUS, POLYPOGON MONSPELIENSIS, BASSIA HYSSOPIFOLIA, JUNCUS BUFONIUS, ATRIPLEX ARGENTEA, ETC. ATRIPLEX CORONATA VAR. NOTATIOR ALSO PRESENT.

General: ~250,000 PLANTS IN 1992, ~20,000 PLANTS IN 2001, 300,000 PLANTS IN 2003, AND ~17,550 PLANTS IN 2004. MUNZ 1922 COLLECTION "NEAR MORENO - SAN JACINTO LAKE" AND REISER 2001 COLLECTION "EAST SIDE OF MYSTIC LAKE" ATTRIBUTED TO THIS SITE.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	9	**Map Index:** 23774	**EO Index:**	7287		**Element Last Seen:**	1992-05-06
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-05-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1997-03-31

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.88208 / -117.09235	**Accuracy:**	specific area
UTM:	Zone-11 N3749085 E491460	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 28 (S)	**Acres:**	12.9

Location: DUCK PONDS SOUTH OF THE INTERSECTION OF WEST CONTOUR ROAD AND LAKE STREET, SAN JACINTO VALLEY.

Detailed Location: ALONG SOUTH CONTOUR ROAD. MAPPED AS TWO POLYGONS. EAST POLYGON IS 122M S OF THE POND THAT IS ON THE EASTERN BOUNDARY OF THE DUCK CLUB AND W OF MYSTIC LAKE. WEST POLYGON IS 60M NE OF THE MAIN DUCK POND AREA AND 150M SE OF INTERSECTION.

Ecological: GROWING IN ALKALI SINK PLAYA IN ASSOCIATION WITH ATRIPLEX CORONATA VAR. NOTATIOR, PLAGIOBOTHRYS LEPTOCLADUS, PHACELIA CILIATA, RUMEX PERSICARIOIDES, BASSIA HYSSOPIFOLIA, ATRIPLEX ARGENTEA, SPERGULARIA MARINA, AND MATRICARIA SP., ETC.

General: UNKNOWN NUMBER OF PLANTS SEEN IN 1992.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	10 **Map Index:** 23775	**EO Index:**	2514	**Element Last Seen:**	2008-02-19
Occ. Rank:	Excellent	**Presence:**	Presumed Extant	**Site Last Seen:**	2008-02-19
Occ. Type:	Natural/Native occurrence	**Trend:**	Fluctuating	**Record Last Updated:**	2010-12-07

Quad Summary: Lakeview (3311771), Perris (3311772), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87641 / -117.11729	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3748459 E489152	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 29 (S)	**Acres:**	175.0

Location: NORTH AND WEST OF DUCK PONDS, ON THE EAST AND WEST SIDE OF DAVIS ROAD, SAN JACINTO VALLEY.

Detailed Location: MAPPED AS A SERIES OF POLYS BASED ON A 1993 DICE MAP, UCR SHAPEFILE, COORDINATES FROM SANDERS & MENUZ, AND MULTIPLE COLLECTIONS. POLYS SPAN FROM CENTER OF SEC 31 E INTO SEC 32 AND NE INTO SEC 29. ADDITIONAL POP INFO AVAILABLE AT CNDDB.

Ecological: GROWING ON AN ALKALI PLAYA DEVELOPED ON SILTY CLAY SOIL IN AREA SEASONALLY INUNDATED. ASSOCIATED WITH PLAGIOBOTHRYS LEPTOCLADUS, RUMEX SP., SPERGULARIA SP., SISYMBRIUM IRIO, SUAEDA MOQUINII, HORDEUM DEPRESSUM, LEPIDIUM DICTYOTUM, ETC.

General: EST # PLANTS IN SEC 29: CENTER POLY: 500,000 IN 1992, 501,060 IN 2003, 220,000 IN 2004; S POLY: 48,950 IN 2004. SEC 32: NW POLY: 1000 IN 1992, 100,000 IN '03, & 300 IN '04; S POLY: 1,000 IN '03 & 12 IN '04. SEEN IN 2008. INCL EO #12 & #48.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	13 **Map Index:** 23764	**EO Index:**	2509	**Element Last Seen:**	2004-04-21
Occ. Rank:	Excellent	**Presence:**	Presumed Extant	**Site Last Seen:**	2004-04-21
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2010-12-20

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84612 / -117.12039	**Accuracy:**	specific area
UTM:	Zone-11 N3745101 E488861	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	42.0

Location: 0.6 MILE NORTH OF RAMONA EXPRESSWAY ALONG BOTH SIDES OF DAVIS ROAD, NORTH OF LAKEVIEW.

Detailed Location: MAPPED AS 3 POLYGONS WITHIN THE SE 1/4 SE 1/4 SECTION 6 AND THE SW 1/4 SW 1/4 SECTION 5 EXTENDING INTO THE SE 1/4 SW 1/4 SECTION 5. MAPPED ACCORDING TO MAP PROVIDED BY DICE, COORDINATES BY BRAMLET AND SHAPEFILE FROM UCR.

Ecological: GROWING IN ALKALI PLAYA AND GRASSLAND COMMUNITIES. MARGIN OF AGRICULTURAL FIELD OF WINTER GRAIN. ASSOCIATED SPECIES INCLUDE PLAGIOBOTHRYS LEPTOCLADUS, HORDEUM INTERCEDENS, SUAEDA MOQUINII, BASSIA HYSSOPIFOLIA, PLANTAGO ELONGATA, ETC.

General: W POLY HAD 250,000 PLANTS AND E POLY HAD 100,000 PLANTS IN 1992 ESTIMATED BY BRAMLET. E POLY HAD ~500,000 PLANTS IN 2003 AND ~200,000 IN 2004. S POLY HAD 21 PLANTS IN 2003. 1996 ROOS COLLECTION "1 MILE N OF LAKEVIEW" ATTRIB TO THIS SITE.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	14	**Map Index:** 23765	**EO Index:**	12375		**Element Last Seen:**	2005-03-03
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2005-03-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-11-16

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.82194 / -117.02603	**Accuracy:**	specific area
UTM:	Zone-11 N3742414 E497591	**Elevation (ft):**	1460
PLSS:	T04S, R01W, Sec. 18 (S)	**Acres:**	10.0

Location: SOUTH OF RAMONA EXPRESSWAY AND 0.4 MILE EAST OF WARREN ROAD, SAN JACINTO VALLEY.

Detailed Location: MAPPED AS TWO POLYGONS: N POLYGON FROM ROBERTS COORDINATES AND S POLYGON FROM BRAMLET MAP. SOUTH POLYGON EXTENDS FROM 0-150M NORTH OF MWD AQUEDUCT MAINTENANCE ROAD, 620M EAST OF WARREN ROAD, AND 150-300M SOUTH OF THE RAMONA EXPRESSWAY.

Ecological: GROWING WITHIN ALKALI PLAYA AND ALKALINE SINK SCRUB COMMUNITIES. ASSOCIATES INCLUDE SUAEDA TORREYANA, BASSIA HYSSOPIFOLIA, ATRIPLEX ARGENTEA, DISTICHLIS SPICATA, SPERGULARIA MARINA, HORDEUM MURINUM, LEPIDIUM SP., AND PLANTAGO BIGELOVII.

General: SOUTH POLYGON: UNKNOWN NUMBER OF PLANTS OBSERVED IN 1991, APPROXIMATELY 130,000 PLANTS OBSERVED IN 1992. NORTH POLYGON: 500,000+ PLANTS OBSERVED IN 2005.

Owner/Manager: UNKNOWN

Occurrence No.	15	**Map Index:** 23766	**EO Index:**	7288		**Element Last Seen:**	1992-04-09
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-04-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2011-08-08

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.83295 / -117.14079	**Accuracy:**	80 meters
UTM:	Zone-11 N3743643 E486972	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	0.0

Location: WEST OF LAKEVIEW, ALONG THE SAN JACINTO RIVER, SOUTHEAST OF LAKEVIEW HOT SPRINGS.

Detailed Location: 100 FT EAST OF THE SAN JACINTO RIVER AND 500 FT NORTH OF THE MWD AQUEDUCT. IN THE SE 1/4 SE 1/4 SECTION 12. THE WEST SIDE OF THE SAN JACINTO RIVER SHOULD ALSO BE SEARCHED AS A 1977 HELMKAMP COLLECTION SAYS IT OCCURS ON THE WEST SIDE ALSO.

Ecological: GROWING IN ALKALINE SINK SCRUB/ALKALI PLAYA. ASSOCIATED SPECIES INCLUDE CRESSA TRUXILLENSIS, SUAEDA TORREYANA, PLAGIOBOTHRYS LEPTOCLADUS, SPERGULARIA MARINA, ETC. NAVARRETIA FOSSALIS AND ATRIPLEX CORONATA VAR. NOTATIOR ALSO PRESENT.

General: OBSERVED IN 1991. APPROXIMATELY 8000 PLANTS OBSERVED IN 1992. HELMKAMP 1977 COLLECTION "W SIDE OF THE SAN JACINTO RIVER 0.5 MI SOUTH OF THE RAMONA EXPRESSWAY" ATTRIBUTED TO THIS SITE.

Owner/Manager: UNKNOWN

Occurrence No.	16	**Map Index:** 23767	**EO Index:**	17780		**Element Last Seen:**	1992-04-09
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-04-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-11-16

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.82410 / -117.14596	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3742663 E486492	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 13 (S)	**Acres:**	0.0

Location: BETWEEN 10TH STREET AND 11TH STREET, EAST SIDE OF THE SAN JACINTO RIVER, SW OF LAKEVIEW.

Detailed Location: TWO COLONIES: (1) 15M TO 100M E OF THE SAN JACINTO RIVER AND W OF EXISTING DIRT ACCESS ROAD, 440M S OF MWD EASEMENT ROAD (NE 1/4 OF NE 1/4 SEC 13); (2) 120M N OF THE END OF 11TH STREET, 45M E OF SAN JACINTO RIVER (SW 1/4 OF NE 1/4 SEC 13).

Ecological: GROWING IN AN ALKALI GRASSLAND.

General: COLLECTIONS BY BRAMLET ARE ONLY SOURCES FOR THIS SITE. POPULATION ESTIMATED AT (1) 800 PLANTS AND (2) 5,000 PLANTS IN 1992. INCLUDES FORMER OCCURRENCE #17.

Owner/Manager: UNKNOWN

Occurrence No.	18	**Map Index:** 23771	**EO Index:**	22306		**Element Last Seen:**	1996-04-20
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	1996-04-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-11-17

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.81513 / -117.15546	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3741669 E485611	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 24 (S)	**Acres:**	81.0

Location: BETWEEN 11TH AND 13TH STREET ON THE EAST AND WEST SIDE OF THE SAN JACINTO RIVER.

Detailed Location: MAPPED AS TWO POLYGONS. N POLY FROM BRAMLET MAP: W SIDE OF POZOS RD, 200FT S OF ROAD FORK, 1300FT NW OF RIVER. S POLY FROM TWO BRAMLET COLLECTIONS: 267M S OF 12TH ST AND 120M E OF RIVER; EAST OF PIPELINE AND 13TH ST INTERSECTION.

Ecological: GROWING IN ALKALINE SINK SCRUB WITHIN A SWALE. ASSOCIATES INCLUDE ATRIPLEX ARGENTEA SSP. EXPANSA, LEPIDIUM DICTYOTUM, SUAEDA TORREYANA, CRESSA TRUXILLENSIS, PLAGIOBOTHRYS LEPTOCLADUS, MATRICARIA MATRICARIOIDES, POLYGONUM AVICULARE, ETC.

General: AREA IS A POTENTIAL RESERVE AREA IN THE RIVERSIDE CO. MSHCP. NORTH POLY: OBSERVED IN 1991. SOUTH POLY: 2 POPS OBSERVED, ONE WITH 10,000 THE OTHER WITH 30,000 PLANTS IN 1992; UNKNOWN NUMBER IN 1996 NEAR 13TH ST. INCL FORMER EO #19 AND #20.

Owner/Manager: UNKNOWN

Occurrence No.	47	**Map Index:**	31522	**EO Index:**	2511	**Element Last Seen:**	2004-05-12
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-05-12
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-12-06

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86403 / -117.10036	**Accuracy:**	specific area
UTM:	Zone-11 N3747085 E490716	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 33 (S)	**Acres:**	33.0

Location: 2 MILES NORTHEAST OF LAKEVIEW BETWEEN HILLS AND SAN JACINTO RIVER, SAN JACINTO WILDLIFE AREA.

Detailed Location: WITHIN THE OLD DUCK PONDS OF THE LOVELL UNIT. MAPPED AS TWO POLYGONS BASED ON A 1993 DICE MAP AND UCR SHAPEFILE. IN THE SW 1/4 SECTION 33.

Ecological: ALKALI GRASSLAND WITH WILLOWS SOIL. SILTY CLAY AND STRONGLY ALKALINE. ASSOCIATED SPECIES INCLUDE SUAEDA MOQUINII, SISYMBRIUM IRIO, HORDEUM MURINUM SSP. LEPORINUM, BROMUS MADRITENSIS SSP. RUBENS, PLANTAGO ELONGATA, AND FRANKENIA SALINA.

General: UNKNOWN NUMBER OF PLANTS SEEN IN 1995 BY BRAMLET. NE POLYGON HAD ~38,400 PLANTS AND SW POLYGON HAD ~35,000 PLANTS IN 2004.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	49	**Map Index:**	31523	**EO Index:**	2515	**Element Last Seen:**	2004-04-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-04-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-12-06

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89782 / -117.11218	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3750832 E489627	**Elevation (ft):**	1460
PLSS:	T03S, R02W, Sec. 20 (S)	**Acres:**	65.0

Location: 0.2-0.5 MILE SOUTH OF AIR FORBES AVENUE BETWEEN VIRGINIA STREET AND CASSALERIA AVENUE, SAN JACINTO WILDLIFE AREA.

Detailed Location: MAPPED AS THREE POLYGONS IN THE S 1/2 NW 1/4 AND THE SW 1/4 NE 1/4 SECTION 20. NW POLYGON BASED ON UCR SHAPEFILE, E POLYGON BASED ON COLLECTION WITH TRS BY GREENE AND SW POLYGON BASED ON DICE MAP AND UCR SHAPEFILE COORDINATES.

Ecological: ON THE BERM BETWEEN THE WESTERN PONDS.

General: UNKNOWN NUMBER OF PLANTS OBSERVED "ON THE BERM BETWEEN THE WESTERN PONDS" IN THE SW 1/4 OF THE NE 1/4 OF SECTION 20 IN 1993. 1 PLANT SEEN IN NW POLYGON IN 2004. REMAINING POLYGON BASED ON A 1993 MAP AND 2004 COORDINATES.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	78	**Map Index:** 80897	**EO Index:**	81876		**Element Last Seen:**	1998-03-22
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1998-03-22
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-12-20

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84028 / -117.13462	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3744455 E487544	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 07 (S)	**Acres:**	13.0

Location: ON NORTH SIDE OF RAMONA EXPRESSWAY JUST EAST OF THE SAN JACINTO RIVER, 1.5 MILES WEST OF LAKEVIEW.

Detailed Location: 200-300 FEET EAST OF THE SAN JACINTO RIVER. MAPPED BY CNDDB AS BEST GUESS JUST EAST OF THE JUNCTION OF THE SAN JACINTO RIVER AND THE RAMONA EXPRESSWAY.

Ecological: IN DITCH NEXT TO ROAD SHOULDER.

General: ONLY SOURCES OF INFORMATION FOR THIS SITE ARE TWO CHAN COLLECTIONS FROM 1997 AND 1998.

Owner/Manager: UNKNOWN

Occurrence No.	79	**Map Index:** 80899	**EO Index:**	81878		**Element Last Seen:**	1995-05-05
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1995-05-05
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-11-30

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84078 / -117.14218	**Accuracy:**	80 meters
UTM:	Zone-11 N3744511 E486844	**Elevation (ft):**	1427
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	0.0

Location: 90 METERS SOUTHEAST OF RAMONA EXPRESSWAY AND MARTIN ROAD INTERSECTION, 7.5 KM WEST OF LAKEVIEW.

Detailed Location: IN THE SE 1/4 NE 1/4 SECTION 12.

Ecological: ALKALI PLAYA ON WILLOWS SILTY CLAY, STRONGLY SALINE-ALKALINE. ASSOCIATED SPECIES INCLUDE RUMEX MARITIMUS, PLAGIOBOTHRYS LEPTOCLADUS, HORDEUM DEPRESSUM, AND SUAEDA MOQUINII.

General: APPROXIMATELY 5000 PLANTS SEEN IN 1995 BY BRAMLET.

Owner/Manager: UNKNOWN

Occurrence No.	96	**Map Index:** 80992	**EO Index:**	81981		**Element Last Seen:**	2003-04-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-04-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-12-06

Quad Summary: El Casco (3311781), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.88367 / -117.12546	**Accuracy:**	80 meters
UTM:	Zone-11 N3749265 E488397	**Elevation (ft):**	1450
PLSS:	T03S, R02W, Sec. 30 (S)	**Acres:**	0.0

Location: 0.1 MILE EAST OF DAVIS ROAD AND 0.6 MILE NORTH OF MARTIN STREET, SAN JACINTO VALLEY.

Detailed Location: WEST OF PIPELINE IN THE SE 1/4 NE 1/4 SECTION 30. MAPPED ACCORDING TO GPS POINT IN UCR SHAPEFILE.

Ecological:

General: 14,100 PLANTS ESTIMATED IN 2003.

Owner/Manager: UNKNOWN

Occurrence No.	97	**Map Index:** 80999	**EO Index:**	81988		**Element Last Seen:**	2004-04-28
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2004-04-28
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-12-20

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.85503 / -117.11583	**Accuracy:**	80 meters
UTM:	Zone-11 N3746088 E489284	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	0.0

Location: APPROXIMATELY 1 MILE NORTH OF RAMONA EXPRESSWAY, 0.3 MILE EAST OF DAVIS ROAD, NORTH OF LAKEVIEW.

Detailed Location: IN THE NW 1/4 SECTION 5 JUST SOUTH OF HILL AND ROAD. MAPPED ACCORDING TO GPS POINT IN UCR SHAPEFILE.

Ecological:

General: 28,500 PLANTS ESTIMATED IN 2004. A 1996 ROOS COLLECTION FROM "1 MILE NORTH OF LAKEVIEW" IS ALSO ATTRIBUTED TO THIS SITE.

Owner/Manager: DFG-SAN JACINTO WA

Trichocoronis wrightii var. wrightii

Element Code: PDAST9F031

Wright's trichocoronis

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4T3
	State:	None		**State:**	S1.1
	Other:	Rare Plant Rank - 2.1			
Habitat:	**General:**	MARSHES AND SWAMPS, RIPARIAN FOREST, MEADOWS AND SEEPS, VERNAL POOLS.			
	Micro:	MUD FLATS OF VERNAL LAKES, DRYING RIVER BEDS, ALKALI MEADOWS. 5-435M.			

Occurrence No.	1	**Map Index:** 24638	**EO Index:**	6881		**Element Last Seen:**	1991-06-18
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1991-06-18
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1993-12-13

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.83056 / -117.15225	**Accuracy:**	80 meters
UTM:	Zone-11 N3743379 E485911	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	0.0

Location: 1 KM (0.7 MI) SOUTHWEST OF LAKEVIEW HOT SPRINGS.

Detailed Location: IN A SMALL MARSH AREA 833M WEST OF THE SAN JACINTO RIVER, 433M EAST OF THE INTERSECTION OF POZOS AVE AND THE MWD COLORADO AQUEDUCT EASEMENT.

Ecological: GROWING IN AN ALKALI MEADOW. ASSOCIATES INCLUDE CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, FRANKENIA GRANDIFOLIA, JUNCUS MEXICANUS, ATRIPLEX ARGENTEA, BOISDUVALIA, HORDEUM DEPRESSUM, POLYPOGON MONSPELIENSIS, AND TYPHA DOMINGENSIS.

General: 315 PLANTS OBSERVED IN 1991. SOILS ARE WILLOWS SILTY CLAY AND ARE DEEP AND STRONGLY SALINE-ALKALINE. NAVARRETIA FOSSALIS IS ALSO FOUND AT THIS SITE.

Owner/Manager: PVT

Occurrence No.	2	**Map Index:** 24636	**EO Index:**	6884	**Element Last Seen:**	1993-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1993-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1993-11-16

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.84968 / -117.13394	**Accuracy:**	80 meters
UTM:	Zone-11 N3745497 E487609	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	0.0

Location: 1 KM (0.7 MI) NORTH OF THE RAMONA EXPRESSWAY AT THE SAN JACINTO RIVER, NORTHWEST OF LAKEVIEW.
Detailed Location:
Ecological:
General: MAP DETAIL IS ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	3	**Map Index:** 24637	**EO Index:**	6883	**Element Last Seen:**	1980-05-19
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1980-05-19
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1993-11-16

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.84101 / -117.14579	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3744537 E486511	**Elevation (ft):**	1400
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	0.0

Location: 2.5 KM (1.5 MI) WEST OF LAKEVIEW ALONG THE RAMONA EXPRESSWAY.
Detailed Location: MAPPED NORTH OF LAKEVIEW HOT SPRINGS.
Ecological: GROWING ON THE DRYING BED OF THE SAN JACINTO RIVER.
General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS 1980 COLLECTION BY SANDERS AND BOYD (#1418, UCR).
Owner/Manager: UNKNOWN

Occurrence No.	4	**Map Index:** 24635	**EO Index:**	6885	**Element Last Seen:**	1937-06-07
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1937-06-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1993-12-13

Quad Summary: Lakeview (3311771), El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.88790 / -117.09815	**Accuracy:**	1 mile
UTM:	Zone-11 N3749731 E490923	**Elevation (ft):**	1420
PLSS:	T03S, R02W (S)	**Acres:**	0.0

Location: SAN JACINTO LAKE (AKA MYSTIC LAKE), NORTH OF LAKEVIEW.
Detailed Location: SAN JACINTO LAKE = VERNAL LAKE IN THE SAN JACINTO VALLEY NORTH OF LAKEVIEW.
Ecological: GROWING IN MUD FLAT OF VERNAL LAKE.
General: AREA KNOWN FROM THREE COLLECTIONS, THE MOST RECENT BEING A 1937 COLLECTION BY ROOS (#2505, UCR). AREA SHOULD BE FIELD CHECKED FOR PRESENCE OF SUITABLE HABITAT.
Owner/Manager: UNKNOWN

Symphyotrichum defoliatum

Element Code: PDASTE80C0

San Bernardino aster

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G2
	State:	None		**State:** S2
	Other:	Rare Plant Rank - 1B.2, BLM_S-Sensitive, USFS_S-Sensitive		
Habitat:	**General:**	MEADOWS AND SEEPS, MARSHES AND SWAMPS, COASTAL SCRUB, CISMONTANE WOODLAND, LOWER MONTANE CONIFEROUS FOREST, GRASSLAND.		
	Micro:	VERNALLY MESIC GRASSLAND OR NEAR DITCHES, STREAMS AND SPRINGS; DISTURBED AREAS. 2-2040M.		

Occurrence No.	24	**Map Index:** 60519	**EO Index:**	60555	**Element Last Seen:**	1951-10-19
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1951-10-19
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2010-04-27

Quad Summary: El Casco (3311781), Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.98250 / -117.11993	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3760222 E488921	**Elevation (ft):**	2000
PLSS:	T02S, R02W, Sec. 20 (S)	**Acres:**	71.0

Location: EL CASCO, SAN TIMOTEO CANYON.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS ALONG THE PORTION OF SAN TIMOTEO CANYON NEAR EL CASCO; HOWEVER THIS AREA IS SLIGHTLY LOWER IN ELEVATION (~1800 FT) THAN THE ELEVATION ON COLLECTION LABEL (2000 FT).

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1951 ROOS COLLECTION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Berberis nevinii

Element Code: PDBER060A0

Nevin's barberry

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:** G1
	State:	Endangered		**State:** S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive		
Habitat:	**General:**	CHAPARRAL, CISMONTANE WOODLAND, COASTAL SCRUB, RIPARIAN SCRUB.		
	Micro:	ON STEEP, N-FACING SLOPES OR IN LOW GRADE SANDY WASHES. 290-1575M.		

Occurrence No.	4	**Map Index:** 03726	**EO Index:**	21586		**Element Last Seen:**	2003-05-08
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-05-08
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-10-21

Quad Summary: Redlands (3411712)

County Summary: Riverside, San Bernardino

Lat/Long:	34.00729 / -117.19848	**Accuracy:**	specific area
UTM:	Zone-11 N3762982 E481671	**Elevation (ft):**	1600
PLSS:	T02S, R03W, Sec. 09 (S)	**Acres:**	37.0

Location: SIDE CANYON OF SAN TIMOTEO CANYON, S OF REDLANDS.

Detailed Location: SITE IS ACCESSIBLE BY POWERLINE ACCESS RD BTWN HORSE RANCH & DAIRY FARM. PLANTS ARE WIDELY SPACED ON THE BANKS OF EPHEMERAL STREAM IN BOTTOM OF CYN FLOODPLAIN. 1 SHRUB SEEN 0.2 MI SSW OF POWERLINE RD IN 2003, GROWING AMIDST A LARGE RHAMNUS.

Ecological: SANDY ALLUVIAL SOIL. ASSOCIATED W/ SAMBUCUS MEXICANA, RHAMNUS CROCEA, CHILOPSIS LINEARIS, PRUNUS ILICIFOLIA, CHRYSOTHAMNUS NAUSEOSUS, LEPIDOSPARTUM SQUAMATUM, LOTUS SCOPARIUS, ARTEMISIA DRACUNCULUS, CEANOTHUS CRASSIFOLIUS, ETC.

General: 5 PLANTS IN 1982, 5 IN 1985, 7 IN 1987 (WITH SOME THAT APPEAR TO BE FENCED), AND AN UNKNOWN # SEEN IN 1988. ONLY 1 INDIVIDUAL SEEN IN 2003. GOOD PLANT DIVERSITY BUT ONLY FAIR QUALITY DUE TO DISTURBANCE FROM GRAZING AND ORVS.

Owner/Manager: PVT

Occurrence No.	5	**Map Index:** 03577	**EO Index:**	21584		**Element Last Seen:**	199X-XX-XX
Occ. Rank:	Poor		**Presence:**	Presumed Extant		**Site Last Seen:**	199X-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-05-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.03196 / -117.23733	**Accuracy:**	80 meters
UTM:	Zone-11 N3765725 E478090	**Elevation (ft):**	1500
PLSS:	T02S, R03W, Sec. 06 (S)	**Acres:**	0.0

Location: NEAR MOUTH OF SCOTT CYN, SW OF REDLANDS.

Detailed Location: IN POWERLINE RIGHT-OF-WAY. AN UNDATED ROOS COLLECTION FROM "HILLS AT S END OF MOUNTAIN VIEW AVE" ALSO ATTRIBUTED TO THIS SITE. SITE QUALITY IS FAIR TO POOR DUE TO THERE BEING 1 VERY OLD, NON-REPRODUCING PLANT SURROUNDED BY WEEDS.

Ecological: ON STEEP BANK OF AN EPHEMERAL STREAM IN A NARROW CANYON. ASSOCIATED W/ ERIOGONUM FASICULATUM, RHAMNUS CROCEA, PRUNUS ILICIFOLIA, ARTEMISIA CALIFORNICA, CHRYSOTHAMNUS NAUSEOSUS, OPUNTIA PARRYI, LEPIDOSPARTUM SQUAMATUM, ADENOSTEMA, ETC.

General: ONE PLANT SEEN BY ROOS IN 1952 & NOTED "RARE" IN 1955. ONE PLANT IN 1982, 1985, 1986, & 1987. PLANT ALSO SEEN IN THE 1990'S, BUT EXACT DATE UNK. PLANT WAS BURNED RECENTLY BY A FIRE AT THIS SITE; IMPACT UNKNOWN (A. SANDERS, PERS COMM 1997).

Owner/Manager: CITY OF LOMA LINDA?

Occurrence No.	40	**Map Index:** 36535	**EO Index:**	31532	**Element Last Seen:**	199X-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	199X-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1997-08-28

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.02449 / -117.21490	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3764892 E480160	**Elevation (ft):**	1500
PLSS:	T02S, R03W, Sec. 05 (S)	**Acres:**	0.0

Location: SOUTH OF REDLANDS; 2.3 AIRMI SW OF MCKINLEY SCHOOL. JUST OFF OF PILGRIM ROAD.

Detailed Location: UNDER THE POWERLINES. NW1/4 OF SW1/4 OF SECTION 5.

Ecological:

General: LARGE, APPARENTLY CLONAL RING. UNKNOWN WHEN PLANTS SEEN AT THIS SITE. NO MAP RECEIVED AT CNDDB; MAPPED BASED ON TRS GIVEN (T02S R03W NW 1/4 OF SW 1/4 OF SECTION 5). 1988 COLLECTION BY SANDERS ATTRIBUTED TO THIS SITE.

Owner/Manager: UNKNOWN

Occurrence No.	47	**Map Index:** 71260	**EO Index:**	72165	**Element Last Seen:**	1999-01-01
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1999-01-01
Occ. Type:	Transplant Outside of Native Hab./Range		**Trend:**	Unknown	**Record Last Updated:**	2008-05-08

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.95733 / -117.37214	**Accuracy:**	1/10 mile
UTM:	Zone-11 N3757488 E465616	**Elevation (ft):**	1020
PLSS:	T02S, R05W, Sec. 35 (S)	**Acres:**	0.0

Location: GRANITIC KNOLL ABOUT 0.1 MI SW OF VICTORIA HILL (PEAK 1005), W OF THE CORNER OF IVY ST AND VICTORIA AVE, RIVERSIDE.

Detailed Location: SMALL LAND-LOCKED GRANITIC KNOLL WITH COASTAL SAGE SCRUB.

Ecological: ASSOCIATED WITH ENCELIA FARINOSA, ERIOGONUM FASCICULATUM, LESSINGIA FILAGINIFOLIA, DUDLEYA LANCEOLATA & GNAPHALIUM CANESCENS.

General: 1 PLANT SEEN IN 1999. PROVANCE 1999 SPECIMEN LABEL MENTIONS THAT THE "PLANT IS A LARGE SOLITARY SHRUB GROWING FROM CRACKS IN GRANITIC OUTCROP; PRESUMABLY ESCAPED FROM CULTIVATION BUT CERTAINLY NOT INTENTIONALLY PLANTED AT THIS LOCATION".

Owner/Manager: UNKNOWN

Harpagonella palmeri **Element Code:** PDBOR0H010

Palmer's grapplinghook

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G4
	State: None		**State:**	S3.2
	Other: Rare Plant Rank - 4.2			
Habitat:	**General:** CHAPARRAL, COASTAL SCRUB, VALLEY AND FOOTHILL GRASSLAND.			
	Micro: CLAY SOILS; OPEN GRASSY AREAS W/IN SHRUBLAND. 15-830M.			

Occurrence No.	7	**Map Index:** 15952	**EO Index:**	25463		**Element Last Seen:**	1986-04-02
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	1986-04-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Increasing		**Record Last Updated:**	2008-02-05

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.79938 / -117.35021	**Accuracy:**	specific area
UTM:	Zone-11 N3739967 E467582	**Elevation (ft):**	2040
PLSS:	T04S, R05W, Sec. 25 (S)	**Acres:**	59.7

Location: HARFORD SPRINGS COUNTY PARK, ALONG S BORDER & SMALL HILL TO S OF IDA LEONA RD, GAVILAN PLATEAU.
Detailed Location: POLYGON IS LOCATED IN NE1/4 SEC 25 AND SE1/4 SEC 24.
Ecological: ON HARD BOSANKO CLAY SOIL IN SCRUB OAK WOODLAND WITH FRITILLARIA BIFLORA, ALLIUM FIMBRAIATUM MUNZII, JUNIPERUS CALIFORNICUS.
General: LESS THAN 1000 REPORTED IN 1978; ALSO SEEN IN 1983. GOOD REPRODUCTION FOR SEVERAL YEARS.
Owner/Manager: RIV COUNTY, PVT

Occurrence No.	35	**Map Index:** 20413	**EO Index:**	13194		**Element Last Seen:**	1990-04-24
Occ. Rank:	None		**Presence:**	Possibly Extirpated		**Site Last Seen:**	1990-04-24
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-08-12

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.79320 / -117.36544	**Accuracy:**	80 meters
UTM:	Zone-11 N3739287 E466170	**Elevation (ft):**	2100
PLSS:	T04S, R05W, Sec. 26 (S)	**Acres:**	0.0

Location: GAVILAN PLATEAU, ABOUT 0.4 MI W OF JCT OF LAKE MATHEWS DR AND GAVILAN RD.
Detailed Location: 0.1 MI E OF ORANGE GROVE FRONTAGE RD.
Ecological: BOSANKU CLAY SOILS IN ANNUAL GRASSLAND. WITH BROMUS RUBENS, APIASTRUM ANGUSTIFOLIUM, PLANTAGO ERECTA, PECTOCARYA PENICILLATA, ERODIUM, ETC.
General: 75 PLANTS SEEN IN 1990. 2008 AERIALS SHOW DEVELOPMENT IN THE AREA; NEEDS FIELD CHECKING.
Owner/Manager: UNKNOWN

Caulanthus simulans **Element Code:** PDBRA0M0H0

Payson's jewel-flower

Listing Status:	**Federal:** None	**CNDDB Element Ranks:**	**Global:**	G3
	State: None		**State:**	S3.2
	Other: Rare Plant Rank - 4.2, USFS_S-Sensitive			
Habitat:	**General:** CHAPARRAL, COASTAL SCRUB.			
	Micro: FREQUENTLY IN BURNED AREAS, OR IN DISTURBED SITES SUCH AS STREAMBEDS; ALSO ON ROCKY, STEEP SLOPES. 90-2200M.			

Occurrence No.	1	**Map Index:** 04186	**EO Index:**	13241	**Element Last Seen:**	1982-04-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1982-04-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2007-11-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.83342 / -117.06479	**Accuracy:**	80 meters
UTM:	Zone-11 N3743688 E494004	**Elevation (ft):**	1940
PLSS:	T04S, R02W, Sec. 11 (S)	**Acres:**	0.0

Location: LAKEVIEW MTNS, MT RUDOLPH, 0.5 AIRMI SSE OF JCT BRIDGE ST & PICO RD (RAMONA EXPRESSWAY).
Detailed Location:
Ecological: IN LAKEVIEW MOUNTAINS, IN CHAMISE CHAPARRAL AND COASTAL SAGE SCRUB ON THIN COBBLY SOIL.
General: ACCORDING TO ROY BUCK (1992) PLANTS AT THIS SITE ARE PROBABLY C. HETEROPHYLLUS. MORE STUDIES NEEDED.
Owner/Manager: PVT

Occurrence No.	2	**Map Index:** 04128	**EO Index:**	20581	**Element Last Seen:**	1982-04-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1982-04-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2007-11-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.81646 / -117.08016	**Accuracy:**	specific area
UTM:	Zone-11 N3741809 E492581	**Elevation (ft):**	2400
PLSS:	T04S, R02W, Sec. 15 (S)	**Acres:**	57.0

Location: LAKEVIEW MTNS, FROM TOP OF MT RUDOLPH TO SOUTHWEST FOR ABOUT 1.5 MI.
Detailed Location: MAPPED AS FIVE COLONIES ALONG IMAGINARY SW-TENDING LINE FROM MT. RUDOLPH FOR ABOUT 1.5 MI.
Ecological: ON GRANITE COBBLES AND BOULDERS IN CHAMISE CHAPARRAL AND COASTAL SAGE SCRUB.
General: SEVERAL POPULATIONS. ACCORDING TO ROY BUCK (1992) PLANTS AT THIS SITE ARE PROBABLY C. HETEROPHYLLUS. MORE STUDIES NEEDED. <50 IN 1981 AT PORTION OF OCCURRENCE; <1000 IN 1982.
Owner/Manager: PVT

Occurrence No.	6	**Map Index:** 04043	**EO Index:**	20580	**Element Last Seen:**	1982-04-26
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1982-04-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2007-11-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.79892 / -117.10324	**Accuracy:**	80 meters
UTM:	Zone-11 N3739865 E490443	**Elevation (ft):**	1940
PLSS:	T04S, R02W, Sec. 28 (S)	**Acres:**	0.0

Location: LAKEVIEW MTNS, APPROX 0.5 AIRMI NW OF BAR V RANCH.
Detailed Location: MAPPED IN NW1/4 OF NW1/4 SEC 28.
Ecological: IN CHAMISE CHAPARRAL AND COASTAL SAGE SCRUB ON THIN COBBLY SOILS.
General: ACCORDING TO ROY BUCK (1992) PLANTS AT THIS SITE ARE PROBABLY C. HETEROPHYLLUS. MORE STUDIES NEEDED.
Owner/Manager: PVT

Occurrence No.	7	**Map Index:**	03987	**EO Index:**	13240	**Element Last Seen:**	1982-04-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1982-04-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-11-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.78533 / -117.11973	**Accuracy:**	specific area
UTM:	Zone-11 N3738361 E488914	**Elevation (ft):**	2300
PLSS:	T04S, R02W, Sec. 32 (S)	**Acres:**	19.0

Location: LAKEVIEW MTNS, WNW OF JUNIPER FLAT.
Detailed Location: 2 POPULATIONS: ONE IN NW1/4 OF NW1/4 SEC 32 AND THE OTHER IN NE1/4 OF NE1/4 SEC 31.
Ecological: IN CHAMISE CHAPARRAL AND COASTAL SAGE SCRUB ON THIN COBBLY SOILS.
General: ACCORDING TO ROY BUCK (1992) PLANTS AT THIS SITE ARE PROBABLY C. HETEROPHYLLUS. MORE STUDIES NEEDED.
Owner/Manager: PVT

Occurrence No.	8	**Map Index:**	03963	**EO Index:**	20579	**Element Last Seen:**	1982-04-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1982-04-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-11-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.77874 / -117.12466	**Accuracy:**	80 meters
UTM:	Zone-11 N3737631 E488457	**Elevation (ft):**	2400
PLSS:	T04S, R02W, Sec. 31 (S)	**Acres:**	0.0

Location: LAKEVIEW MTNS, WEST OF JUNIPER FLAT.
Detailed Location: MAPPED IN NE1/4 OF SE1/4 SEC 31.
Ecological: CHAMISE CHAPARRAL AND COASTAL SAGE SCRUB ON THIN COBBLY SOIL.
General: ACCORDING TO ROY BUCK (1992) PLANTS AT THIS SITE ARE PROBABLY C. HETEROPHYLLUS. MORE STUDIES NEEDED.
Owner/Manager: PVT

Occurrence No.	9	**Map Index:**	03935	**EO Index:**	20578	**Element Last Seen:**	1982-04-26
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1982-04-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-11-21

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.77631 / -117.13093	**Accuracy:**	80 meters
UTM:	Zone-11 N3737362 E487876	**Elevation (ft):**	2300
PLSS:	T04S, R02W, Sec. 31 (S)	**Acres:**	0.0

Location: LAKEVIEW MTNS, 0.4 MI NE OF JCT GUNTHER RD & BRIGGS RD.
Detailed Location: MAPPED IN NE1/4 OF SW1/4 SEC 31.
Ecological: IN CHAMISE CHAPARRAL AND COASTAL SAGE SCRUB ON THIN COBBLY SOIL.
General: ACCORDING TO ROY BUCK (1992) PLANTS AT THIS SITE ARE PROBABLY C. HETEROPHYLLUS.
Owner/Manager: PVT

Lepidium virginicum var. robinsonii **Element Code:** PDBRA1M114

Robinson's pepper-grass

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5T3
	State:	None		**State:** S3
	Other:	Rare Plant Rank - 1B.2		
Habitat:	**General:**	CHAPARRAL, COASTAL SCRUB.		
	Micro:	DRY SOILS, SHRUBLAND. 1-945M.		

Occurrence No.	4 **Map Index:** 35093	**EO Index:**	22090	**Element Last Seen:**	1987-04-16
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1987-04-16
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-06-04

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.09891 / -117.11429	**Accurracy:**	3/5 mile
UTM:	Zone-11 N3773129 E489457	**Elevation (ft):**	1840
PLSS:	T01S, R02W, Sec. 08 (S)	**Acres:**	0.0

Location: 2.8 AIR MILES NNE OF MENTONE, NORTH OF SANTA ANA WASH AND SOUTH OF GREENSPOT RD, BELOW MOUTH OF SANTA ANA CANYON.

Detailed Location: EXACT LOCATION UNKNOWN, MAPPED BY CNDDB AS A BEST GUESS.

Ecological: COARSE, SANDY SOIL. SAGE SCRUB WITH ASSOCIATE SPECIES ENCELIA FARINOSA, ERIODICTYON TRICHOCALYX, SALVIA APIANA, HAPLOPAPPUS LINEARIFOLIUS, ERIOGONUM FASCICULATUM, AND MIRABILIS CALIFORNICA.

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1987 COLLECTION BY PRIGGE. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	9 **Map Index:** 35065	**EO Index:**	196	**Element Last Seen:**	1962-05-08
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1962-05-08
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-02-22

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.93991 / -117.32060	**Accurracy:**	3/5 mile
UTM:	Zone-11 N3755540 E470372	**Elevation (ft):**	1375
PLSS:	T03S, R04W, Sec. 05 (S)	**Acres:**	0.0

Location: SYCAMORE CANYON, BOX SPRINGS.

Detailed Location: MAPPED BY CNDDB TO ENCOMPASS LOCALITIES: "SYCAMORE CYN, 1400 FT" AND "SYCAMORE CYN, ~1.4 MI S ON CANYON CREST DR FROM PENNSYLVANIA AVE, LEFT ON A DIRT RD ~0.3 MI, RIGHT ~0.5 MI TO END OF RD, OVER HILL & UP STREAM ~0.25 MI, 1150 FT ELEV."

Ecological: ROCKY HILLSIDE. SANDY SOILS WITH GRASSES AND HERBS.

General: OCCURRENCE IS BASED ON A 1935 TRUE COLLECTION AND A 1962 IRWIN COLLECTION. PLANTS NOTED AS "OCCASIONAL" IN 1962. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	16	**Map Index:**	13068	**EO Index:**	48299	**Element Last Seen:**	1989-03-30
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1989-03-30
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-02-22

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.98401 / -117.30120	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3760424 E472178	**Elevation (ft):**	1400
PLSS:	T02S, R04W, Sec. 21 (S)	**Acres:**	0.0

Location: CANYONS EAST OF BELVEDERE HEIGHTS, BEYOND TWO TREES ROAD AND BLAINE STREET, BOX SPRINGS MOUNTAINS.

Detailed Location: MAPPED BY CNDDB TO ENCOMPASS TWO LOCALITIES: "100 FT UPHILL BEYOND CANYON RESERVOIR, AT THE EAST END OF BLAINE ST, 1400 FT ELEV" AND "TWO TREES CANYON, W-FACING SLOPE JUST ABOVE CONFLUENCE OF MAIN CANYON & SIDE CANYON, 1400-1520 FT."

Ecological: COASTAL SAGE SCRUB. WIDESPREAD ON HILLSIDE, GENERALLY ON LOW SIDE OF LARGE BUSHES. COARSE SANDY SOIL DERIVED OF GRANITE, BURNED PREVIOUS YEAR. FULL SUNLIGHT, DENSE ANNUALS, SHRUBS SPARSE.

General: OCCURRENCE IS BASED ON A 1969 RYAN COLLECTION AND A 1989 BUCK & SANDERS COLLECTION. PLANTS NOTED AS "WIDESPREAD" IN 1969. NEEDS FIELDWORK.

Owner/Manager: RIV CO-BOX SPRINGS MTN PARK?

Occurrence No.	25	**Map Index:**	51103	**EO Index:**	51103	**Element Last Seen:**	1964-02-23
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1964-02-23
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-02-21

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.99231 / -117.31580	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3761348 E470833	**Elevation (ft):**	1450
PLSS:	T02S, R04W, Sec. 17 (S)	**Acres:**	0.0

Location: SMALL HILL EAST OF SUGARLOAF, BOX SPRINGS MOUNTAINS.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB TO ENCOMPASS HILLS EAST OF SUGARLOAF MOUNTAIN IN VICINITY OF GIVEN ELEVATION OF 1450 FT.

Ecological: CHAPARRAL-COASTAL SAGE SCRUB. ASSOCIATED WITH MIRABILIS, SALVIA MELLIFERA, FILAREE. DECOMPOSED GRANITE 20% SLOPE & SOUTHEAST EXPOSURE. PLANTS ON NORTH SIDE OF BOULDERS.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1964 COLLECTION BY PLUMB. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	26	**Map Index:**	51104	**EO Index:**	51104	**Element Last Seen:**	2004-05-01
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2004-05-01
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2012-02-21

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.96751 / -117.32447	**Accuracy:**	specific area
UTM:	Zone-11 N3758600 E470023	**Elevation (ft):**	1350
PLSS:	T02S, R04W, Sec. 29 (S)	**Acres:**	1.0

Location: SOUTH AND WEST SIDES OF VERSITY HILL (COYOTE HILL), SOUTH OF THE UC RIVERSIDE CAMPUS.

Detailed Location: TWO SITES MAPPED BY CNDDB AS A SINGLE POLYGON ACCORDING TO TWO SETS OF 2004 COORDINATES PROVIDED BY PROVANCE.

Ecological: STEEP SOUTH SIDE OF A GRANITIC KNOLL. COASTAL SAGE SCRUB LARGELY CONVERTED TO ANNUAL GRASSLAND. IN SANDY CRAGS ALONG CLIFFS AND IN DECOMPOSING GRANITE AT THE BASE OF CLIFFS.

General: MAIN SOURCES OF INFORMATION FOR THIS SITE ARE TWO 2004 PROVANCE COLLECTIONS, PLANTS NOTED AS COMMON. A 1997 SANDERS COLLECTION STATES THAT PLANTS WERE "LOCAL AND SCARCE" NEAR HILL SUMMIT, AND A 2001 MONTALVO COLLECTION ALSO ATTRIBUTED HERE.

Owner/Manager: UNKNOWN

Occurrence No.	52	**Map Index:**	51204	**EO Index:**	51204	**Element Last Seen:**	1952-02-29
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1952-02-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2003-05-02

Quad Summary: Sunnymead (3311782), Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside

Lat/Long:	34.00418 / -117.24854	**Accuracy:**	1 mile
UTM:	Zone-11 N3762647 E477048	**Elevation (ft):**	1800
PLSS:	T02S, R04W, Sec. 13 (S)	**Acres:**	0.0

Location: RECHE CANYON.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB IN RECHE CANYON IN VICINITY OF GIVEN ELEVATION OF 1800 FT.

Ecological: ROCKY SLOPE WITH ADENOSTOMA FASCICULATUM, BRICKELIA DESERTORUM, ETC.

General: DESCRIBED AS COMMON AT THIS SITE. ONLY SOURCE OF INFORMATION IS 1952 COLLECTION BY ROOS. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	135	**Map Index:** 85277	**EO Index:**	86298		**Element Last Seen:**	1981-04-29
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1981-04-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2012-03-01

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.76630 / -117.35089	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3736299 E467507	**Elevation (ft):**	2000
PLSS:	T05S, R05W, Sec. 01 (S)	**Acres:**	62.0

Location: ALONG ROAD IN ARROYO DEL TORRO, GAVILAN HILLS REGION.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDB ALONG ROAD THAT RUNS ADJACENT TO ARROYO DEL TORRO (BULL CANYON ROAD) WITHIN GIVEN SECTION 1, THOUGH ARROYO DEL TORRO ENDS BEFORE THE ROAD ENTERS SECTION 1.

Ecological: AREA RECENTLY BURNED.

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1981 COLLECTION BY BOYD. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	139	**Map Index:** 85281	**EO Index:**	86302		**Element Last Seen:**	1952-04-09
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1952-04-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2012-03-02

Quad Summary: Riverside East (3311783), Riverside West (3311784), San Bernardino South (3411713), Fontana (3411714)

County Summary: Riverside

Lat/Long:	33.99614 / -117.38049	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3761793 E464859	**Elevation (ft):**	850
PLSS:	T02S, R05W, Sec. 14 (S)	**Acres:**	0.0

Location: FAIRMOUNT PARK, RIVERSIDE.

Detailed Location: EXACT LOCATION UNKNOWN. COLLECTION LABEL GIVES "FAIRMONT PARK", MAPPED AS BEST GUESS BY CNDDB IN GENERAL VICINITY OF FAIRMOUNT PARK/LAKE EVANS.

Ecological: SEMI-ALKALINE SANDY FLAT WITH DISTICHLIS STRICTA LAXA.

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1952 COLLECTION BY ROOS; PLANTS NOTED AS "LOCALLY COMMON."

Owner/Manager: CITY OF RIVERSIDE

Streptanthus campestris

Element Code: PDBRA2G0B0

southern jewel-flower

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G2
	State:	None		**State:**	S2.3
	Other:	Rare Plant Rank - 1B.3, USFS_S-Sensitive			
Habitat:	**General:**	CHAPARRAL, LOWER MONTANE CONIFEROUS FOREST, PINYON-JUNIPER WOODLAND.			
	Micro:	OPEN, ROCKY AREAS. 600-2790M.			

Occurrence No.	37	**Map Index:** 78803	**EO Index:**	79749	**Element Last Seen:**	1955-05-14
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1955-05-14
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2010-05-05

Quad Summary: Forest Falls (3411618), Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10061 / -117.00404	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3773311 E499626	**Elevation (ft):**	4000
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	0.0

Location: MILL CREEK PUBLIC CAMP, SAN GORGONIO MOUNTAINS.

Detailed Location:

Ecological: CHAPARRAL.

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1955 COLLECTION BY KEMPERS.

Owner/Manager: USFS-SAN BERNARDINO NF

Arenaria paludicola

Element Code: PDCAR040L0

marsh sandwort

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:**	G1
	State:	Endangered		**State:**	S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive			
Habitat:	**General:**	MARSHES AND SWAMPS.			
	Micro:	GROWING UP THROUGH DENSE MATS OF TYPHA, JUNCUS, SCIRPUS, ETC. IN FRESHWATER MARSH. 10-170M.			

Occurrence No.	8	**Map Index:** 40810	**EO Index:**	40810	**Element Last Seen:**	1899-05-01
Occ. Rank:	None		**Presence:**	Extirpated	**Site Last Seen:**	1899-05-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2007-04-27

Quad Summary: Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713), Fontana (3411714), San Bernardino North (3411723)

County Summary: Riverside, San Bernardino

Lat/Long:	34.05389 / -117.31364	**Accuracy:**	5 miles
UTM:	Zone-11 N3768175 E471054	**Elevation (ft):**	1000
PLSS:	T01S, R04W, Sec. 29 (S)	**Acres:**	0.0

Location: VICINITY OF SAN BERNARDINO, SANTA ANA RIVER AT 1000' ELEVATION.

Detailed Location: EXACT LOCATION NOT KNOWN. MAPPED BY CNDDB AS A BEST GUESS. DUE TO THE GENTLE GRADE OF THE RIVER IN THIS VICINITY THE SITE DESCRIPTION FITS A FAIRLY LARGE SECTION OF THE RIVER.

Ecological: IN SWAMPS.

General: SEVEN PARISH COLLECTIONS FROM 1882-1899 ATTRIBUTED TO THIS SITE. MOST HABITAT IN THIS AREA IS DEVELOPED. EXTIRPATED ACCORDING TO ELVIN (2007).

Owner/Manager: UNKNOWN

Atriplex coronata var. notatior

Element Code: PDCHE040C2

San Jacinto Valley crownscale

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:**	G4T1
	State:	None		**State:**	S1
	Other:	Rare Plant Rank - 1B.1			
Habitat:	**General:**	PLAYAS, CHENOPOD SCRUB, VALLEY AND FOOTHILL GRASSLAND, VERNAL POOLS.			
	Micro:	DRY, ALKALINE FLATS IN THE SAN JACINTO RIVER VALLEY. 400-500M.			

Occurrence No.	2 **Map Index:** 03738	**EO Index:**	29412	**Element Last Seen:**	2000-05-05
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-05
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2005-04-01

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.76988 / -117.21223	**Accuracy:**	specific area
UTM:	Zone-11 N3736661 E480348	**Elevation (ft):**	1420
PLSS:	T05S, R03W, Sec. 05 (S)	**Acres:**	40.6

Location: SOUTHEAST OF PERRIS, EAST OF ELLIS AND NORTHEAST OF PERRIS VALLEY AIRPORT.

Detailed Location: THREE COLONIES MAPPED AT CNDDB. ONE ON EITHER SIDE OF CASE ROAD ABOUT 0.5 MILE SE OF ELLIS AND ONE BETWEEN THE NORTH END OF THE RUNWAY AT PERRIS VALLEY AIRPORT AND CASE ROAD.

Ecological: GROWING IN VALLEY SINK SCRUB WITH ATRIPLEX ARGENTEA, SUAEDA TORREYANA, SALICORNIA SUBTERMINALIS, HAPLOPAPPUS PALMERI VAR. PACHYLEPIS, BROMUS DIANDRUS, SALSOLA IBERICA, LEPIDIUM DICTYOCARPUM, ERODIUM, HEMIZONIA LAEVIS, BRODIAEA FILIFOLIA.

General: THE SITE HAS SOME OF THE LAST VALLEY SALTBUSH SCRUB REMAINING OUTSIDE THE SAN JACINTO WILDLIFE AREA (IN THIS AREA). INCLUDES FORMER OCCURRENCE #1. SMALL POP OF BRODIAEA FILIFOLIA NORTH OF CASE RD. PLANTS OBS IN 2000 DURING BRFI SURVEY.

Owner/Manager: PVT

Occurrence No.	3 **Map Index:** 28301	**EO Index:**	29410	**Element Last Seen:**	2000-05-18
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-18
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2006-11-02

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.82567 / -117.14605	**Accuracy:**	specific area
UTM:	Zone-11 N3742836 E486485	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 13 (S)	**Acres:**	213.7

Location: VICINITY OF THE SAN JACINTO RIVER FROM RAMONA EXPRESSWAY SOUTH TO NUEVO.

Detailed Location: MANY COLONIES, ESPECIALLY EAST OF THE EAST LEVEE. MAPPED WITHIN T4S R3W E 1/2 SECTION 12, NE 1/4 SECTION 13, SW 1/4 SECTION 13, SE 1/4 SECTION 14, NE 1/4 SECTION 23, NW 1/4 SECTION 24 & T4S R2W W 1/2 SECTION 7.

Ecological: GROWING IN VALLEY SALTBUSH SCRUB IN ASSOCIATION WITH SUAEDA TORREYANA, SALICORNIA SUBTERMINALIS, ATRIPLEX ARGENTA, CRESSA TRUXILLENSIS, BASSIA HYPOSSIFOLIA, LEPIDIUM DICTYOTUM, ERODIUM CICUTARIUM, LASTHENIA SP., ATRIPLEX SEMIBACCATA, ET AL.

General: SIGNS OF INUNDATION IN THIS AREA. PLANT MAY REQUIRE INUNDATION FOR GERMINATION. SITE SHOULD BE INCLUDED IN PROPOSED MULTI-SPECIES HABITAT CONSERVATION PLAN IN RIVERSIDE COUNTY GENERAL PLAN. INCLUDES FORMER OCCURRENCE #6.

Owner/Manager: PVT

Occurrence No.	5	**Map Index:**	04133	**EO Index:**	7758	**Element Last Seen:**	1995-06-08
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1995-06-08
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-09-20

Quad Summary: Lakeview (3311771), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87156 / -117.10248	**Accuracy:**	specific area
UTM:	Zone-11 N3747919 E490522	**Elevation (ft):**	1420
PLSS:	T03S, R02W, Sec. 33 (S)	**Acres:**	205.1

Location: SAN JACINTO WILDLIFE AREA VICINITY, APPROXIMATELY 4 KM NORTH OF LAKEVIEW.

Detailed Location: SEVERAL COLONIES MAPPED WITHIN THE SOUTH 1/2 OF SECTION 29, NW 1/4 OF SECTION 31, NORTH 1/2 OF SECTION 32, AND WEST 1/2 OF SECTION 33.

Ecological: FOUND AROUND THE DUCK PONDS OR DISTURBED AREAS IN THE VICINITY.

General: APPROXIMATELY 1000 PLANTS SEEN IN 1990. SIGNS OF INUNDATION WERE EVIDENT. SPECIES MAY BENEFIT FROM INUNDATION. 1901 JEPSON COLLECTION FROM "SAN JACINTO LAKE BED" ATTRIBUTED TO SITE.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	7	**Map Index:**	22021	**EO Index:**	8345	**Element Last Seen:**	1990-07-25
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-09-16

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.80313 / -117.16732	**Accuracy:**	specific area
UTM:	Zone-11 N3740340 E484512	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 23 (S)	**Acres:**	23.0

Location: WEST OF NUEVO, ON EITHER SIDE OF SAN JACINTO RIVER LEVEE JUST NORTH OF NUEVO ROAD.

Detailed Location: TWO COLONIES. ONE ABOUT 200 FEET NORTH OF NUEVO ROAD AND 100 FEET WEST OF SAN JACINTO RIVER, SECOND COLONY IS 800 FEET WEST OF PICO AVE ON THE NORTH SIDE OF NUEVO ROAD.

Ecological: GROWING IN VALLEY SINK SCRUB IN ASSOCIATION WITH BASSIA HYSSOPIFOLIA, ATRIPLEX ARGENTA, SISYMBRIUM SP., SIDA LEPROSA, SUAEDA TORREYANA, LEPIDIUM DICTYOTUM, HORDEUM SP., CRESSA TRUXILLENSIS, SALSOLA IBERICA, AND HEMIZONIA FASCICULATA.

General: 4500 PLANTS SEEN IN TWO MAIN AREAS IN 1990. THIS AREA SHOULD BE INCLUDED IN THE PROPOSED RIVERSIDE COUNTY MULTI-SPECIES RESERVE SYSTEM.

Owner/Manager: PVT

Occurrence No.	8	**Map Index:**	22022	**EO Index:**	8344	**Element Last Seen:**	2005-05-24
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-05-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2006-09-21

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77271 / -117.18792	**Accurracy:**	specific area
UTM:	Zone-11 N3736970 E482599	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 34 (S)	**Acres:**	103.6

Location: EAST OF PERRIS, ALONG I-215 AND ELLIS AVENUE.

Detailed Location: MAPPED IN SECTIONS 32, 33, 34 & 4.

Ecological: GROWING IN VALLEY SINK SCRUB ON OPEN SALT PANS. ASSOCIATED WITH ATRIPLEX ARGENTEA, SALSOLA IBERICA, CRESSA TRUXILLENSIS, HORDEUM LEPORINUM, SUAEDA TORREYANA, HAPLOPAPPUS PALMERI, MARRUBIUM VULGARE, BRASSICA GENICULATA, & DISTICHLIS SP.

General: 90 PLANTS SEEN IN 1990, SW PORTION OF POP EXTIRPATED ACCORDING TO BRAMLET. 490 SEEN IN 1997. PORTION OF OCCURRENCE ALONG I-215 MAPPED BASED UPON A COLLECTION BY KIRTLAND, SITE DESCRIBED AS BETWEEN 4TH ST & 1/4 MI SOUTH OF SAN JACINTO RIVER.

Owner/Manager: PVT

Occurrence No.	11	**Map Index:**	28302	**EO Index:**	29411	**Element Last Seen:**	1991-06-19
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1991-06-19
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-07-14

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.83169 / -117.15193	**Accurracy:**	specific area
UTM:	Zone-11 N3743505 E485941	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	11.8

Location: ABOUT 2 MILES WEST OF LAKEVIEW AND 0.5 MILE SOUTHWEST OF LAKEVIEW HOT SPRINGS ALONG THE COLORADO RIVER AQUEDUCT.

Detailed Location: SITE IS ABOUT 810 METERS WEST OF THE SAN JACINTO RIVER, 500 METERS EAST OF POZOS AVE AT THE MWD AQUEDUCT EASEMENT ROAD, AND 4 METERS NORTH OF THE EASEMENT ROAD ALONG THE AQUEDUCT.

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1991 COLLECTION AND 1992 MAP BY BRAMLET.

Owner/Manager: UNKNOWN

Occurrence No.	12	**Map Index:** 23774	**EO Index:**	21768	**Element Last Seen:**	1992-05-06
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-05-06
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1997-03-31

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.88208 / -117.09235	**Accuracy:**	specific area
UTM:	Zone-11 N3749085 E491460	**Elevation (ft):**	1420
PLSS:	T03S, R02W, Sec. 28 (S)	**Acres:**	12.9

Location: JUST EAST OF THE SAN JACINTO WILDLIFE AREA, NORTHERN DUCK CLUB PONDS.

Detailed Location: TWO COLONIES: ONE IS 122 M SOUTH OF THE POND THAT IS ON THE EASTERN BOUNDARY OF THE DUCK CLUB AREA; THE SECOND IS 60 M NORTHEAST OF THE MAIN DUCK POND AREA AND 150 M SOUTHEAST OF LAKE STREET AT WEST CONTOUR ROAD.

Ecological: FOUND IN ALKALI SINK PLAYA WITH PLAGIOBOTHRYS LEPTOCLADUS, PHACELIA CILIATA, LASTHENIA GLABRATA COULTERI, RUMEX PERSICARIOIDES, BASSIA HYSSOPIFOLIA, ATRIPLEX ARGENTEA, SPERGULARIA MARINA, MATRICARIA, MONOLEPIS NUTTALLIANA, CRYPSIS, ET AL.

General: ABOUT 20,400 PLANTS OBSERVED IN 1992.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	13	**Map Index:** 28299	**EO Index:**	21766	**Element Last Seen:**	1992-04-29
Occ. Rank:	Excellent		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-04-29
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1996-09-24

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89702 / -117.08816	**Accuracy:**	80 meters
UTM:	Zone-11 N3750741 E491849	**Elevation (ft):**	1425
PLSS:	T03S, R02W, Sec. 21 (S)	**Acres:**	0.0

Location: NORTH OF SAN JACINTO WILDLIFE AREA AND NORTHWEST OF QUAIL RANCH GOLF COURSE, ABOUT 0.3 MILE WEST OF HIGHWAY 79.

Detailed Location: WITHIN SAN JACINTO NUEVO Y POTRERO. SITE IS 823 M WEST OF GILMAN SPRINGS ROAD (HWY 79) AND 460 M SOUTH OF BOLD STYLE ROAD.

Ecological: IN ALKALI PLAYA (SINK SCRUB) WITH CRESSA TRUXILLENSIS, SUAEDA TORREYANA, FRANKENIA GRANDIFOLIA, LASTHENIA GLABRATA SSP COULTERI, BROMUS MOLLIS, HORDEUM LEPORINUM, JUNCUS BUFONIUS, MICROSERIS DOUGLASII, AND ATRIPLEX ARGENTEA.

General: 47 PLANTS OBSERVED IN 1992. REPORTED TO BE AN EXCELLENT EXAMPLE OF ALKALI PLAYA AND ALKALI GRASSLAND COMMUNITIES. BRAMLET SUGGESTS SITE BE INCLUDED WITHIN THE SAN JACINTO WILDLIFE AREA.

Owner/Manager: UNKNOWN

Occurrence No.	14	**Map Index:**	28318	**EO Index:**	9379	**Element Last Seen:**	1996-05-04
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1996-05-04
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-01-22

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.85240 / -117.12215	**Accuracy:**	specific area
UTM:	Zone-11 N3745797 E488700	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	27.7

Location: BOTH SIDES OF DAVIS ROAD NORTH OF THE SAN JACINTO RIVER, ABOUT 1 MILE NORTH OF LAKEVIEW.

Detailed Location: TWO COLONIES ALONG WEST SIDE OF ROAD AND TWO EAST OF THE ROAD.

Ecological: ALKALI MEADOW ADJACENT TO ANNUAL GRASSLAND. ASSOCIATED WITH PLAGIOBOTHRYS LEPTOCLADUS, SPERGULARIA MARINA, RUMEX MARITIMUS, SUAEDA MOQUINII, HORDEUM INTERCEDENS (?), LASTHENIA CALIFORNICA, MICROSERIS DOUGLASII, BRODIAEA FILIFOLIA, ET AL.

General: MAIN SOURCE OF INFORMATION FOR THIS SITE IS MAP DETAIL PROVIDED BY BRAMLET. 78 PLANTS OBSERVED IN SE-MOST COLONY IN 1996.

Owner/Manager: UNKNOWN

Occurrence No.	15	**Map Index:**	28300	**EO Index:**	21769	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1996-09-24

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.84731 / -117.11780	**Accuracy:**	specific area
UTM:	Zone-11 N3745232 E489102	**Elevation (ft):**	1430
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	8.3

Location: ABOUT 0.2 MILE EAST OF DAVIS ROAD & 0.3 MILE SOUTH OF THE SAN JACINTO RIVER, NORTH OF LAKEVIEW.

Detailed Location:

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS MAP DETAIL PROVIDED BY BRAMLET.

Owner/Manager: UNKNOWN

Occurrence No.	18	**Map Index:** 13191	**EO Index:**	49343	**Element Last Seen:**	2000-05-03
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-03
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2006-09-20

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.78378 / -117.17927	**Accuracy:**	specific area
UTM:	Zone-11 N3738196 E483402	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 34 (S)	**Acres:**	5.8

Location: 3 MILES EAST OF PERRIS, 0.65 AIR MILE WSW OF JUNCTION OF SAN JACINTO RD & SAN JACINTO AVE, NORTHEAST OF I-15.

Detailed Location:

Ecological: IN DISTURBED ALKALI GRASSLAND WITH HORDEUM MURINUM SSP. LEPORINUM, ATRIPLEX ARGENTEA SSP. MOHAVENSIS, HORDEUM INTERCEDENS, MEDICAGO POLYMORPHA, LEPIDIUM DICTYOTUM, HEMIZONIA PUNGENS SSP. LAEVIS, BRODIAEA FILIFOLIA, ET AL.

General: 173 PLANTS OBSERVED IN 1993, 4749 IN 1997. SPECIES OBSERVED DURING 2000 BRODIAEA FILIFOLIA SURVEY. SITE SHOULD BE PROTECTED AS PART OF A SAN JACINTO RIVER CORRIDOR RESERVE.

Owner/Manager: UNKNOWN

Occurrence No.	20	**Map Index:** 60764	**EO Index:**	60800	**Element Last Seen:**	1995-06-08
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1995-06-08
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2005-04-01

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.86197 / -117.10773	**Accuracy:**	80 meters
UTM:	Zone-11 N3746857 E490034	**Elevation (ft):**	1430
PLSS:	T03S, R02W, Sec. 32 (S)	**Acres:**	0.0

Location: 2 AIR MILES NNE OF LAKEVIEW. SAN JACINTO WILDLIFE AREA.

Detailed Location: 1.22 KM EAST OF DAVIS ROAD. 183 METERS SOUTH OF THE EXISTING ACCESS ROAD. 518 METERS NORTH OF THE SAN JACINTO RIVER CHANNEL. MAPPED IN SE1/4 OF SE1/4 SEC 32.

Ecological: ALKALI GRASSLAND.

General: ONLY SOURCE OF INFO FOR THIS OCCURRENCE IS A 1995 COLLECTION BY BRAMLET.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	21	**Map Index:** 60781	**EO Index:** 60817	**Element Last Seen:**	2000-05-09
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	2000-05-09
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2005-04-01

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.79071 / -117.19083	**Accuracy:**	80 meters
UTM:	Zone-11 N3738967 E482333	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 27 (S)	**Acres:**	0.0

Location: 2 MILES EAST OF PERRIS. ALONG DUNLAP DRIVE.

Detailed Location: 610 METERS WEST OF THE SAN JACINTO RIVER, 457 METERS NORTH OF SAN JACINTO AVE, AND 30 METERS EAST OF DUNLAP DRIVE. MAPPED IN THE SW1/4 OF SW1/4 SEC 27.

Ecological: DISTURBED ALKALI GRASSLAND IN DISKED FIELD. ASSOC INCLUDE: HORDEUM MURINUM LEPORINUM, PLAGIOBOTHRYS LEPTOCLADUS, PHALARIS MINOR, ATRIPLEX ARGENTEA, HORDEUM INTERCEDENS, ETC.

General: ONLY SOURCE OF INFO FOR THIS OCCURRENCE IS A 2000 COLLECTION BY BRAMLET.

Owner/Manager: UNKNOWN

Atriplex parishii — **Element Code:** PDCHE041D0

Parish's brittlescale

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G1G2
	State:	None		**State:** S1.1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive		
Habitat:	**General:**	ALKALI MEADOWS, VERNAL POOLS, CHENOPOD SCRUB, PLAYAS.		
	Micro:	USUALLY ON DRYING ALKALI FLATS WITH FINE SOILS. 4-140M.		

Occurrence No.	2 **Map Index:** 03914	**EO Index:**	29409	**Element Last Seen:**	1974-06-19
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1974-06-19
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-08-28

Quad Summary: Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.83645 / -117.12813	**Accurracy:**	1/5 mile
UTM:	Zone-11 N3744029 E488145	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 07 (S)	**Acres:**	0.0

Location: LAKEVIEW, RIVERSIDE COUNTY.

Detailed Location: 1 KM (1/2 MI) NW OF LAKEVIEW AVE, S OF THE RAMONA EXPRESSWAY (AKA MARTIN ST.).

Ecological: GROWS IN THE FINE ALKALINE SOILS OF DRY LAKE BEDS.

General: BRAMLET BELIEVES THAT HABITAT STILL EXISTS FOR A. PARISHII IN THIS AREA. A 1974 CLARKE & DERBY COLLECTION IS ONLY SOURCE OF LOCATION INFORMATION. SPECIES HAS NOT BEEN COLLECTED SINCE. NEEDS ADDITIONAL FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	21 **Map Index:** 76358	**EO Index:**	77331	**Element Last Seen:**	XXXX-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	XXXX-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-08-28

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78910 / -117.18458	**Accurracy:**	1 mile
UTM:	Zone-11 N3738788 E482912	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 27 (S)	**Acres:**	0.0

Location: S OF BERNASCONI HILLS, ALONG THE SAN JACINTO RIVER FLOODPLAIN.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS JUST S OF BERNASCONI HILLS, IN THE VICINITY OF THE SAN JACINTO RIVER.

Ecological:

General: ONLY INFORMATION FOR THIS SITE IS A CITATION IN REISER'S "RARE PLANTS OF SAN DIEGO COUNTY." NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Cuscuta obtusiflora var. glandulosa **Element Code:** PDCUS01111

Peruvian dodder

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T4T5
	State:	None		**State:**	SH
	Other:	Rare Plant Rank - 2.2			
Habitat:	**General:**	MARSHES AND SWAMPS (FRESHWATER).			
	Micro:	FRESHWATER MARSH. 15-280 M.			

Occurrence No.	1 **Map Index:** 83834	**EO Index:**	84862	**Element Last Seen:**	1890-04-XX
Occ. Rank:	None	**Presence:**	Extirpated	**Site Last Seen:**	1890-04-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-10-11

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: San Bernardino

Lat/Long:	34.10558 / -117.28052	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3773899 E474126	**Elevation (ft):**	
PLSS:	T01S, R04W, Sec. 10 (S)	**Acres:**	479.0

Location: WARM CREEK.

Detailed Location: EXACT LOCATION UNKNOWN, MAPPED BY CNDDB ALONG WARM CREEK.

Ecological:

General: MAIN SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1890 COLLECTION BY PARISH. SANDERS STATES THAT WARM CREEK IS NOW THOROUGHLY URBANIZED; THE CREEK IS NOW A BARREN CONCRETE CHANNEL AND THE AREA IS ALL SHOPPING CENTERS, PARKING LOTS, ETC.

Owner/Manager: UNKNOWN

***Astragalus pachypus var. jaeger*i**

Element Code: PDFAB0F6G1

Jaeger's milk-vetch

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G4T1
	State:	None		**State:** S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive		
Habitat:	**General:**	COASTAL SCRUB, CHAPARRAL, VALLEY AND FOOTHILL GRASSLAND, CISMONTANE WOODLAND.		
	Micro:	DRY RIDGES AND VALLEYS AND OPEN SANDY SLOPES; OFTEN IN GRASSLAND AND OAK-CHAPARRAL. 365-915M.		

Occurrence No.	17 **Map Index:** 78682	**EO Index:**	79647	**Element Last Seen:**	1922-04-25
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1922-04-25
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2010-04-27

Quad Summary: San Jacinto (3311678), Beaumont (3311688), Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.87579 / -116.99174	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3748384 E500763	**Elevation (ft):**	2000
PLSS:	T03S, R01W, Sec. 28 (S)	**Acres:**	333.0

Location: LAMB CANYON PASS (SR-79), SAN JACINTO MOUNTAINS REGION.

Detailed Location: MAPPED BY CNDDB AS BEST GUESS ALONG LAMB CANYON ROAD WHICH IS NOW SR-79 FROM SAN JACINTO VALLEY NORTH THROUGH MOUNTAINS TOWARD BEAUMONT.

Ecological:

General: ONLY SOURCE OF OCCURRENCE IS 1922 COLLECTION BY SPENCER. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

California macrophylla
Element Code: PDGER01070

round-leaved filaree

Listing Status: **Federal:** None | **CNDDB Element Ranks:** **Global:** G2
State: None | **State:** S2
Other: Rare Plant Rank - 1B.1, BLM_S-Sensitive

Habitat: **General:** CISMONTANE WOODLAND, VALLEY AND FOOTHILL GRASSLAND.
Micro: CLAY SOILS. 15-1200M.

Occurrence No.	150 **Map Index:** 86193	**EO Index:**	87227	**Element Last Seen:**	1976-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1976-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2012-06-27

Quad Summary: Perris (3311772), Sunnymead (3311782)
County Summary: Riverside

Lat/Long:	33.86805 / -117.16791	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3747539 E484469	**Elevation (ft):**	
PLSS:	T03S, R03W, Sec. 35 (S)	**Acres:**	8332.0

Location: LAKE PERRIS STATE RECREATION AREA.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB TO ENCOMPASS LAKE PERRIS SRA.
Ecological:
General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1976 WERMINSKI OBSERVATION CITED IN CALFLORA. NEEDS FIELDWORK.
Owner/Manager: DPR-LAKE PERRIS SRA

Ribes divaricatum var. parishii
Element Code: PDGRO020F3

Parish's gooseberry

Listing Status: **Federal:** None | **CNDDB Element Ranks:** **Global:** G4TH
State: None | **State:** SH
Other: Rare Plant Rank - 1A

Habitat: **General:** RIPARIAN WOODLAND.
Micro: SALIX SWALES IN RIPARIAN HABITATS. 65-100M.

Occurrence No.	5 **Map Index:** 39016	**EO Index:**	34023	**Element Last Seen:**	1917-05-14
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1917-05-14
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1998-06-19

Quad Summary: Redlands (3411712), San Bernardino South (3411713), Harrison Mtn. (3411722), San Bernardino North (3411723)
County Summary: San Bernardino

Lat/Long:	34.11539 / -117.23856	**Accuracy:**	5 miles
UTM:	Zone-11 N3774976 E477999	**Elevation (ft):**	1000
PLSS:	T01S, R03W, Sec. 06 (S)	**Acres:**	0.0

Location: WARM CREEK, SAN BERNARDINO VALLEY.
Detailed Location: MAPPED AS A GENERAL OCCURRENCE TO INCLUDE ENTIRE LENGTH OF WARM CREEK.
Ecological: ON BANKS OF CREEK IN DAMP LAND, MEADOWS, OR SWAMPS.
General: SEVERAL COLLECTIONS BY S.B. PARISH AND W.F. PARISH FROM THE LATE 1800'S AND EARLY 1900'S ALONG WARM CREEK AND IN VICINITY OF SAN BERNARDINO VALLEY.
Owner/Manager: UNKNOWN

Nama stenocarpum

Element Code: PDHYD0A0H0

mud nama

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4G5
	State:	None		**State:**	S1S2
	Other:	Rare Plant Rank - 2.2			
Habitat:	**General:**	MARSHES AND SWAMPS.			
	Micro:	LAKE SHORES, RIVER BANKS, INTERMITTENTLY WET AREAS. 5-500M.			

Occurrence No.	11 **Map Index:** 48667	**EO Index:**	48667	**Element Last Seen:**	2010-05-04
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2010-05-04
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2010-10-07

Quad Summary: Lakeview (3311771), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.87579 / -117.05417	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3748386 E494989	**Elevation (ft):**	1400
PLSS:	T03S, R02W, Sec. 26 (S)	**Acres:**	0.0

Location: MYSTIC (SAN JACINTO) LAKE, NEAR GILMAN HOT SPRINGS RD, 1.8 KM SW OF EDEN PEAK.

Detailed Location: NE SHORE OF LAKE. MAPPED BY CNDDB AROUND THE LAKE SHORE NEAR GILMAN SPRINGS RD IN THE SE 1/4 SE 1/4 OF SECTION 26.

Ecological: MUD ALONG DRYING LAKE SHORE ON ALKALINE SOIL WITH CRYPSIS VIRGINICA, LEPTOCHLOA UNINERVIA, CYPERUS ERYTHRORHIZOS, PETUNIA PARVIFLORA, AND AMMANNIA COCCINEA. PLANTS WERE TALLER AND DENSER AT HIGH WATER LINE NEAR ROAD.

General: APPROXIMATELY 30 INDIVIDUALS OBSERVED IN 1999. ALSO SEEN IN 2005 AND 2010.

Owner/Manager: UNKNOWN

Monardella macrantha ssp. hallii

Element Code: PDLAM180E1

Hall's monardella

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T3
	State:	None		**State:**	S3
	Other:	Rare Plant Rank - 1B.3, USFS_S-Sensitive			
Habitat:	**General:**	BROADLEAVED UPLAND FOREST, CHAPARRAL, LOWER MONTANE CONIFEROUS FOREST, CISMONTANE WOODLAND, VALLEY & FOOTHILL GRASSLAND.			
	Micro:	DRY SLOPES AND RIDGES IN OPENINGS WITHIN THE ABOVE COMMUNITIES. 695-2195M.			

Occurrence No.	31	**Map Index:** 04397	**EO Index:** 13652	**Element Last Seen:**	1992-11-05
Occ. Rank:	Good		**Presence:** Presumed Extant	**Site Last Seen:**	1992-11-05
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2002-12-12

Quad Summary: Forest Falls (3411618), Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08695 / -116.98578	**Accuracy:**	specific area
UTM:	Zone-11 N3771796 E501311	**Elevation (ft):**	5000
PLSS:	T01S, R01W, Sec. 16 (S)	**Acres:**	136.1

Location: YUCAIPA RIDGE ALONG TRUCK TRAIL AND AQUEDUCT, ABOUT 1 MILE SE OF MOUNTAIN HOME VILLAGE, SAN BERNARDINO MOUNTAINS.

Detailed Location: NUMEROUS COLONIES MAPPED ALONG UNIVERSITY CREEK TRUCK TRAIL & AQUEDUCT; MOSTLY WITHIN THE N 1/2 NE 1/4 SEC 17, NW 1/4 NW 1/4 SEC 16, NE 1/4 SECTION 16, SE 1/4 NE 1/4 SECTION 15, & THE W 1/2 SECTION 15.

Ecological: ON GRANITIC ROCKY SOIL, WITH PINUS COULTERI, PSEUDOTSUGA MACROCARPA, CALOCEDRUS DECURRENS, QUERCUS KELLOGGII AND Q. CHRYSOLEPIS CANOPY; PTERIDIUM AQUILINUM, POLYSTICHUM SCOPULINUM IN UNDERSTORY.

General: LESS THAN 100 PLANTS IN W 1/2 SECTION 15 IN 1981. MANY PLANTS OBSERVED IN 1992. NUMBER OF INDIVIDUALS DIFFICULT TO DETERMINE DUE TO VEGETATIVE PROPAGATION FROM CREEPING ROOTSTOCKS. FORMER EOS 43 & 44 LUMPED HERE.

Owner/Manager: USFS-SAN BERNARDINO NF, PVT

Occurrence No.	32	**Map Index:** 04307	**EO Index:** 17944	**Element Last Seen:**	1992-07-23
Occ. Rank:	Good		**Presence:** Presumed Extant	**Site Last Seen:**	1992-07-23
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	1998-06-04

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10084 / -117.01595	**Accuracy:**	specific area
UTM:	Zone-11 N3773337 E498528	**Elevation (ft):**	3550
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	7.3

Location: AQUEDUCT ALONG SOUTH SIDE OF MILL CREEK CANYON, ABOUT 0.7 MILE EAST OF MOUNTAIN HOME VILLAGE, SAN BERNARDINO MOUNTAINS.

Detailed Location: THREE COLONIES MAPPED ALONG AQUEDUCT ACCESS TRAIL WITHIN THE SE 1/4 NE 1/4 SECTION 7 AND THE SW 1/4 NW 1/4 SECTION 8. COLLECTION FROM "MILL CREEK SOUTH OF MILL CREEK PUBLIC CAMP" ALSO ATTRIBUTED TO THIS SITE.

Ecological: IN FILTERED SUN OR PARTIAL SHADE OF SCRUB OAK CHAPARRAL AND BIGCONE SPRUCE-CANYON LIVE OAK FOREST ON STEEP N-FACING SLOPE.

General: MANY PLANTS OBSERVED IN 1992.

Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	44	**Map Index:** 38879	**EO Index:**	33886		**Element Last Seen:**	1992-07-28
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-07-28
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-06-04

Quad Summary: Forest Falls (3411618), Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.09017 / -116.99954	**Accuracy:**	specific area
UTM:	Zone-11 N3772154 E500042	**Elevation (ft):**	4850
PLSS:	T01S, R01W, Sec. 17 (S)	**Acres:**	10.2

Location: YUCAIPA RIDGE ALONG TRUCK TRAIL AND AQUEDUCT, ABOUT 0.7 MILE SOUTH OF MOUNTAIN HOME VILLAGE, SAN BERNARDINO MOUNTAINS.

Detailed Location: 9 COLONIES MAPPED ALONG ROAD AND AQUEDUCT TRAIL WITHIN THE N 1/2 NE 1/4 SECTION 17 AND THE NW 1/4 NW 1/4 SECTION 16.

Ecological: IN MOSTLY PARTIAL SHADE OR FILTERED SUN OF BIGCONE SPRUCE-CANYON LIVE OAK FOREST, COULTER PINE FOREST, AND SCRUB OAK CHAPARRAL ON RIDGETOP AND STEEP, N-FACING SLOPE.

General: MANY PLANTS OBSERVED IN 1992. INDIVIDUAL PLANTS DIFFICULT TO COUNT DUE TO VEGETATIVE PROPAGATION FROM CREEPING ROOTSTOCK.

Owner/Manager: PVT, USFS-SAN BERNARDINO NF

Occurrence No.	45	**Map Index:** 38880	**EO Index:**	33887		**Element Last Seen:**	1992-07-23
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-07-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1998-06-04

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08958 / -117.03264	**Accuracy:**	80 meters
UTM:	Zone-11 N3772089 E496989	**Elevation (ft):**	3500
PLSS:	T01S, R01W, Sec. 18 (S)	**Acres:**	0.0

Location: AQUEDUCT ON SOUTH SIDE OF MOUTH OF MILL CREEK CANYON, SAN BERNARDINO MOUNTAINS.

Detailed Location: MAPPED ALONG ACCESS TRAIL FOR LOWER (NORTH) AQUEDUCT ABOUT 0.4 MILE ENE OF POWERHOUSE AND ABOUT 200 METERS FROM CONFLUENCE WITH UPPER (SOUTH) AQUEDUCT. WITHIN THE NW 1/4 NW 1/4 SECTION 18.

Ecological: IN FILTERED SUN OR PARTIAL SHADE OF SCRUB OAK CHAPARRAL AND BIGCONE SPRUCE-CANYON LIVE OAK FOREST.

General: MANY PLANTS OBSERVED IN 1992. INDIVIDUAL PLANTS DIFFICULT TO COUNT DUE TO VEGETATIVE PROPAGATION FROM CREEPING ROOTSTOCK.

Owner/Manager: PVT IN USFS-SAN BERNARDINO NF

Occurrence No. 46 **Map Index:** 38881 **EO Index:** 33888 **Element Last Seen:** 1992-07-23
Occ. Rank: Good **Presence:** Presumed Extant **Site Last Seen:** 1992-07-23
Occ. Type: Natural/Native occurrence **Trend:** Unknown **Record Last Updated:** 1998-06-04

Quad Summary: Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long: 34.09405 / -117.02841 **Accuracy:** specific area
UTM: Zone-11 N3772584 E497379 **Elevation (ft):** 3600
PLSS: T01S, R01W, Sec. 07 (S) **Acres:** 9.8

Location: AQUEDUCT ON SOUTH SIDE OF MILL CREEK CANYON, ABOUT 1.5 MI WSW OF MOUNTAIN HOME VILLAGE, SAN BERNARDINO MOUNTAINS.
Detailed Location: MAPPED ALONG ACCESS TRAIL FOR LOWER (NORTH) AQUEDUCT ABOUT 0.7-1.1 MILES NE OF POWERHOUSE WITHIN THE NW 1/4 SE 1/4 SECTION 7 AND THE SE 1/4 SW 1/4 SECTION 7.
Ecological: IN FILTERED SUN OR PARTIAL SHADE OF SCRUB OAK CHAPARRAL AND BIGCONE SPRUCE-CANYON LIVE OAK FOREST.
General: MANY PLANTS OBSERVED IN 1992. INDIVIDUAL PLANTS DIFFICULT TO COUNT DUE TO VEGETATIVE PROPAGATION FROM CREEPING ROOTSTOCK.
Owner/Manager: PVT IN USFS-SAN BERNARDINO NF

Malacothamnus parishii

Element Code: PDMAL0Q0C0

Parish's bush-mallow

Listing Status: **Federal:** None **CNDDB Element Ranks:** **Global:** GHQ
State: None **State:** SH
Other: Rare Plant Rank - 1A
Habitat: **General:** CHAPARRAL, COASTAL SAGE SCRUB.
Micro: IN A WASH. ONE SITE KNOWN: 485M.

Occurrence No. 2 **Map Index:** 03752 **EO Index:** 1255 **Element Last Seen:** 1895-XX-XX
Occ. Rank: Unknown **Presence:** Presumed Extant **Site Last Seen:** 1895-XX-XX
Occ. Type: Natural/Native occurrence **Trend:** Unknown **Record Last Updated:** 1992-12-16

Quad Summary: Yucaipa (3411711), Redlands (3411712)
County Summary: San Bernardino

Lat/Long: 34.09692 / -117.16897 **Accuracy:** nonspecific area
UTM: Zone-11 N3772915 E484413 **Elevation (ft):** 1290
PLSS: T01S, R03W, Sec. 11 (S) **Acres:** 3450.3

Location: VICINITY OF SAN BERNARDINO.
Detailed Location: ALSO MAPPED IN SECS 9, 10, 12, 13, 14, 15 AND R2W SECS 7, 8 AND 18.
Ecological:
General: MAPPED AS NON-SPECIFIC POLYGON IN THE SANTA ANA RIVER WASH. THIS IS THE ONLY KNOWN OCCURRENCE FOR THIS TAXON.
Owner/Manager: UNKNOWN

Sidalcea hickmanii ssp. parishii

Element Code: PDMAL110A3

Parish's checkerbloom

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G3T1
	State:	Rare		**State:** S1.2
	Other:	Rare Plant Rank - 1B.2, BLM_S-Sensitive, USFS_S-Sensitive		
Habitat:	**General:**	CHAPARRAL, LOWER MONTANE CONIFEROUS FOREST.		
	Micro:	DISTURBED BURNED OR CLEARED AREAS ON DRY, ROCKY SLOPES, IN FUEL BREAKS & FIRE ROADS ALONG THE MTN SUMMITS. 1000-2135M.		

Occurrence No.	11	**Map Index:** 73503	**EO Index:**	74464	**Element Last Seen:**	1909-06-25
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1909-06-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2009-01-28

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08902 / -117.01975	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3772026 E498177	**Elevation (ft):**	4600
PLSS:	T01S, R01W, Sec. 18 (S)	**Acres:**	0.0

Location: PIPELINE TRAIL SAN ANTONIO POWER CO, YUCAIPE MTNS.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS WHERE THE 4600 FT ELEVATION LINE CROSSES THE YUCAIPA RIDGE TRUCK TRAIL ON YUCAIPA RIDGE.

Ecological:

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1909 REED COLLECTION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Sidalcea neomexicana				**Element Code:**	PDMAL110J0
Salt Spring checkerbloom					
Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G4?
	State:	None		**State:**	S2S3
	Other:	Rare Plant Rank - 2.2			
Habitat:	**General:**	ALKALI PLAYAS, BRACKISH MARSHES, CHAPARRAL, COASTAL SCRUB, LOWER MONTANE CONIFEROUS FOREST, MOJAVEAN DESERT SCRUB.			
	Micro:	ALKALI SPRINGS AND MARSHES. 0-1500M.			

Occurrence No.	1 **Map Index:** 35238	**EO Index:**	21172	**Element Last Seen:**	1966-05-19
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1966-05-19
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1996-06-28

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.78636 / -117.01892	**Accurracy:**	1 mile
UTM:	Zone-11 N3738468 E498248	**Elevation (ft):**	1500
PLSS:	T04S, R01W, Sec. 31 (S)	**Acres:**	0.0

Location: 3 MILES WEST OF SAN JACINTO, SAN JACINTO VALLEY.

Detailed Location: EXACT LOCATION UNKNOWN. SITE MAPPED BY CNDDB WEST OF SAN JACINTO ALONG COTTONWOOD AVENUE NEAR WARREN ROAD.

Ecological: SEMI-ALKALINE SWAMP WITH ANEMOPSIS AND SPERGULARIA MACROTHECA.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1966 COLLECTION BY ROOS.

Owner/Manager: UNKNOWN

Abronia villosa var. aurita

Element Code: PDNYC010P1

chaparral sand-verbena

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G5T3T4
	State:	None		**State:** S2
	Other:	Rare Plant Rank - 1B.1, BLM_S-Sensitive, USFS_S-Sensitive		
Habitat:	**General:**	CHAPARRAL, COASTAL SCRUB		
	Micro:	SANDY AREAS. 80-1600M.		

Occurrence No.	41 **Map Index:** 60450	**EO Index:**	60486	**Element Last Seen:**	2004-04-07
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2004-04-07
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2008-09-24

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.82194 / -117.17308	**Accuracy:**	specific area
UTM:	Zone-11 N3742427 E483982	**Elevation (ft):**	1600
PLSS:	T04S, R03W, Sec. 14 (S)	**Acres:**	10.9

Location: ROUGHLY 1 AIR MILE SOUTH OF PERRIS RESERVOIR. 1.4 AIR MILES SSW OF BERNASCONI PASS.

Detailed Location: 0.2 TO 0.4 AIR MILES DIRECTLY SOUTH OF SOUTHERN END OF BEND IN RAMONA EXPRESSWAY.

Ecological: STABILIZED SAND FIELD ON CIENEBA SANDY LOAM. 8-15% SLOPES. TOPOGRAPHY AND VEGETATION CAPTURED SAND, WHICH ACCUMULATED AGAINST A SLOPE ABOVE ACTIVE AGRICULTURAL FLATS. ASSOCIATES INCLUDE CROTON CALIFORNICUS AND CAMISSONIA BISTORTA.

General: OTHER ASSOCIATES INCLUDE ERIASTRUM SAPHIRINUM, ERIOGONUM FASCICULATUM, NICOTIANA BIGELOVI, TRIBULUS TERRESTRIS, TETRADYMIA COMOSA, AND EREMOCARPUS SETIGERUS. >16 PLANTS OBSERVED IN 2003. 30 PLANTS OBSERVED IN 2004.

Owner/Manager: PVT

Chorizanthe parryi var. parryi

Element Code: PDPGN040J2

Parry's spineflower

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G2T2
	State:	None		**State:** S2
	Other:	Rare Plant Rank - 1B.1, BLM_S-Sensitive, USFS_S-Sensitive		
Habitat:	**General:**	COASTAL SCRUB, CHAPARRAL.		
	Micro:	DRY SLOPES AND FLATS; SOMETIMES AT INTERFACE OF 2 VEG TYPES, SUCH AS CHAP AND OAK WDLAND; DRY, SANDY SOILS. 40-1705M.		

Occurrence No.	3	**Map Index:** 17762	**EO Index:**	10127		**Element Last Seen:**	1952-05-11
Occ. Rank:	None		**Presence:**	Possibly Extirpated		**Site Last Seen:**	200X-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-10-23

Quad Summary: Redlands (3411712), San Bernardino South (3411713)

County Summary: Riverside, San Bernardino

Lat/Long:	34.02671 / -117.23967	**Accuracy:**	1 mile
UTM:	Zone-11 N3765143 E477873	**Elevation (ft):**	1400
PLSS:	T02S, R03W, Sec. 06 (S)	**Acres:**	0.0

Location: SCOTT CANYON, ABOUT 2.5 MI SE OF LOMA LINDA.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS AROUND SCOTT CANYON. A 1926 SPALDING COLLECTION FROM "SUMMIT OF HILLS S OF SANITARIUM" ALSO ATTRIBUTED TO THIS SITE.

Ecological: ON DRY SOUTH SLOPE WITH ENCELIA FARINOSA, ARISTIDA PARISHII, SALVIA MELLIFERA, RHUS OVATA, ETC.

General: SITE BASED ON A 1952 ROOS & ROOS COLLECTION; MENTIONED AS LOCALLY COMMON IN 1952. SANDERS (2008) MENTIONS THAT HE HAS VISITED THIS AREA MULTIPLE TIMES (DATES UNKNOWN) AND HAS NOT SEEN THE SPECIES. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	6	**Map Index:** 17768	**EO Index:**	10151		**Element Last Seen:**	1980-05-15
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1980-05-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-10-20

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80992 / -117.35561	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3741138 E467086	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 24 (S)	**Acres:**	0.0

Location: HARFORD SPRINGS COUNTY PARK, GAVILAN HILLS.

Detailed Location: MAPPED TO ENCOMPASS INFORMATION FROM TWO 1980 BOYD COLLECTIONS FROM "W SIDE OF GAVILAN RD" AND FROM "E SIDE OF GAVILAN RD, E OF THE TRAILER PARK."

Ecological: CHAMISE CHAPARRAL-COASTAL SAGE SCRUB-JUNIPER SAVANNA MOSAIC. FLAT GRASSY OPENING.

General: SITE BASED ON TWO 1980 BOYD COLLECTIONS. NEEDS FIELDWORK.

Owner/Manager: RIV COUNTY

Occurrence No.	15	**Map Index:**	22516	**EO Index:**	21746	**Element Last Seen:**	1992-05-22
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-05-22
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-10-21

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08061 / -117.05429	**Accuracy:**	specific area
UTM:	Zone-11 N3771096 E494991	**Elevation (ft):**	2600
PLSS:	T01S, R02W, Sec. 14 (S)	**Acres:**	59.0

Location: MILL CREEK WASH, JUST DOWNSTREAM FROM THE MOUTH OF CANYON AND 0.5 MILE WEST OF RANGER STATION, MENTONE.

Detailed Location: MAPPED ALONG UNPAVED ACESS ROAD ALONG WOOD-POLE TRANSMISSION LINE ACCORDING TO A 1992 STONE MAP. AN 1898 HALL COLLECTION & A 1992 REY COLLECTION FROM THE "MOUTH OF MILL CREEK CANYON" ALSO ATTRIBUTED TO THIS SITE.

Ecological: RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB WITH ADENOSTOMA FASCICULATUM, ERIOGONUM FASCICULATUM, OPUNTIA LITTORALIS VASEYI, O. PARRYI, YUCCA WHIPPLEI PARISHII, AND RHUS GLABRA. COLONIES IN DISTURBED AREAS AND NATURAL OPENINGS ON FINE LOAMY SAND.

General: UNKNOWN # SEEN BY BRAMLET IN 1990. 1000+ PLANTS ESTIMATED TO OCCUR IN THIS VICINITY IN 1992. INCLUDES FORMER EO #16.

Owner/Manager: PVT-SCE

Occurrence No.	17	**Map Index:**	22514	**EO Index:**	13771	**Element Last Seen:**	1992-05-29
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-05-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-10-20

Quad Summary: Forest Falls (3411618), Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.03034 / -116.99717	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3765520 E500260	**Elevation (ft):**	3000
PLSS:	T02S, R01W, Sec. 04 (S)	**Acres:**	0.0

Location: BIRMINGHAM RANCH IN WATER CANYON, YUCAIPA.

Detailed Location: EXACT LOCATION UNK. MAPPED AROUND BIRMINGHAM RANCH TO ENCOMPASS MULTIPLE 1992 SANDERS COLLECTIONS. A 1900 PARISH COLL FROM "YUCAIPA" ALSO ATTRIBUTED HERE. SANDERS (2008) SAYS SITE IS NOW WITHIN A STATE PARK; UNK IF ENTIRE EO IS IN PARK.

Ecological: CHAPARRAL AND OAK GROVES ON CANYON AND ON RIDGES. ON OPEN CLEARED RIDGETOP N OF HUBNER HOUSE AT EDGE OF CHAPARRAL IN BARE ZONE & ON OPEN MESA TOP (CLEARED AREA) S OF THE HUBNER HOUSE.

General: SITE BASED ON 3 1992 SANDERS COLLECTIONS FROM S & N OF THE HUBNER HOUSE & FROM THE SW CORNER OF BIRMINGHAM RANCH; MENTIONED AS "LOCALLY COMMON" IN 1992 WITH <1000 PLANTS. NEEDS FIELDWORK. INCLUDES FORMER EO #19.

Owner/Manager: DPR-WILDWOOD CANYON

Occurrence No.	20	**Map Index:**	22519	**EO Index:**	16384	**Element Last Seen:**	1950-05-27
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1950-05-27
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-10-20

Quad Summary: Sunnymead (3311782)

County Summary: Riverside

Lat/Long:	33.98616 / -117.20490	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3760640 E481074	**Elevation (ft):**	2500
PLSS:	T02S, R03W, Sec. 21 (S)	**Acres:**	0.0

Location: HILLS NORTHEAST OF RECHE CANYON SUMMIT.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS NE OF THE HIGHEST ELEVATION ALONG RECHE CANYON.

Ecological: ON SANDY SLOPE WITH ADENOSTOMA FASCICULATUM, BROMUS RUBENS, AND STYLOCLINE SP. ETC.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1950 ROOS COLLECTION. SANDERS (2008) MENTIONS THAT HE HAS NOT SEEN THE SPECIES IN THIS AREA BUT THAT THE HABITAT HAS BEEN DEGRADED BY DEVELOPMENT & WEED INVASION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	21	**Map Index:**	22521	**EO Index:**	9608	**Element Last Seen:**	1969-05-05
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1969-05-05
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-10-22

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.84830 / -117.00475	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3745336 E499559	**Elevation (ft):**	1520
PLSS:	T04S, R01W, Sec. 05 (S)	**Acres:**	0.0

Location: HIGHWAY 79, 1.5 MI NW OF GILMAN HOT SPRINGS.

Detailed Location: 200 YARDS N OF THE ROAD JUNCTION. PLANTS LOCATED ON S-FACING SLOPE 100 YARDS FROM THE ROAD IN SHADE. MAPPED BY CNDDB AS BEST GUESS ABOUT 200 YARDS NW OF ROAD JUNCTION AROUND HWY 79.

Ecological: OPEN GRASSLAND WITH MANY SHRUBS ESPECIALLY ADENOSTOMA FASCICULATUM AND ENCELIA FARINOSA. FAIRLY HARD-PACKED SANDY DRY SOIL.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1969 HOLLIDAY COLLECTION. SANDERS (2008) MENTIONS THAT HE HAS NOT SEEN THE PLANT AT THIS SITE OR ANYWHERE NEARBY; DATE OF SITE VISIT UNKNOWN. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	22	**Map Index:** 22520	**EO Index:** 21742	**Element Last Seen:**	1997-XX-XX
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1997-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2008-10-21

Quad Summary: Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.81794 / -117.07191	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3741972 E493344	**Elevation (ft):**	2600
PLSS:	T04S, R02W, Sec. 15 (S)	**Acres:**	0.0

Location: VICINITY OF MT. RUDOLPH, LAKEVIEW MOUNTAINS.

Detailed Location: EXACT LOCATION UNK. MAPPED BY CNDDB TO ENCOMPASS A 1997 PITZER COLL FROM "~0.75 MI SSE OF MT. RUDOLPH" & A 1981 BOYD COLLECTION FROM "BELOW THE SUMMIT OF MT. RUDOLPH, 2600 FT."

Ecological: ADENOSTOMA CHAPARRAL AND SAGE SCRUB ON ROCKY SLOPES.

General: SITE BASED ON A 1981 COLLECTION & A 1997 COLLECTION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	23	**Map Index:** 22522	**EO Index:** 16571	**Element Last Seen:**	1981-05-09
Occ. Rank:	Unknown		**Presence:** Presumed Extant	**Site Last Seen:**	1981-05-09
Occ. Type:	Natural/Native occurrence		**Trend:** Unknown	**Record Last Updated:**	2008-10-20

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.97458 / -117.29261	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3759376 E472969	**Elevation (ft):**	2450
PLSS:	T02S, R04W, Sec. 27 (S)	**Acres:**	0.0

Location: SW CORNER OF BOX SPRINGS RD INTERSECTION WITH DIRT SIDE ROAD, 1.8 MI S OF PIGEON PASS RD, BOX SPRINGS MTNS.

Detailed Location: 1 M (WE THINK THEY MEAN "METERS" HERE) FROM SW EDGE OF BOX SPRINGS RD, 10 M S FROM SIDE ROAD.

Ecological: GROWING IN RECENTLY BURNED AREA OF COASTAL SAGE SCRUB WITH CHAPARRAL ELEMENTS. ASSOCIATED WITH ADENOSTOMA FASCICULATUM, BRASSICA GENICULATA, CALYPTRIDIUM MANANDRUM, CRYPTANTHA MICROSTACHYS, CRYPTANTHA SP., PHACELIA DISTANS

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1981 GALLAGHER COLLECTION. SANDERS (2008) MENTIONS THAT HE CAN NOT FIND THIS SPECIES ANYWHERE IN THE BOX SPRINGS MTNS; PERHAPS SCARCE DUE TO MASSIVE WEED INVASION. NEEDS FIELDWORK.

Owner/Manager: RIV CO-BOX SPRINGS MTN PARK

Occurrence No.	28	**Map Index:** 42067	**EO Index:**	42067		**Element Last Seen:**	1917-05-25
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1917-05-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-10-20

Quad Summary: Riverside East (3311783)

County Summary: Riverside

Lat/Long:	33.96451 / -117.33629	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3758272 E468930	**Elevation (ft):**	1000
PLSS:	T02S, R04W, Sec. 30 (S)	**Acres:**	0.0

Location: CITRUS EXPERIMENTAL STATION, RIVERSIDE.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS IN VICINITY OF THE UNIVERSITY OF CALIFORNIA EXPERIMENT STATION.

Ecological:

General: ONLY SOURCE OF INFO FOR THIS SITE IS A 1917 SUN COLLECTION. SANDERS (2008) MENTIONS THAT HE HAS NEVER SEEN THIS SPECIES IN THE HILLS AROUND THE CAMPUS AND IT IS LIKELY EXTIRPATED OR SCARCE; DATES OF SITE VISITS UNKNOWN. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	30	**Map Index:** 42069	**EO Index:**	42069		**Element Last Seen:**	1991-09-25
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1991-09-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-10-16

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09434 / -117.12572	**Accuracy:**	specific area
UTM:	Zone-11 N3772623 E488402	**Elevation (ft):**	1650
PLSS:	T01S, R02W, Sec. 07 (S)	**Acres:**	29.0

Location: SANTA ANA WASH, ABOUT 0.9 MILE SOUTH OF GREENSPOT ROAD AND 3 MILES EAST OF ORANGE STREET, EAST HIGHLANDS.

Detailed Location: MAPPED AS 3 POLYGONS ACCORDING TO A 1992 JIGOUR MAP.

Ecological: JUNIPER AND CHAPARRAL PHASES OF RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB. ERIASTRUM DENSIFLORUM SSP. SANCTORUM GROWING NEARBY.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 6 COLONIES (MAPPED AS 3 POLYGONS) IN 1991.

Owner/Manager: UNKNOWN

Occurrence No.	31	**Map Index:** 42070	**EO Index:**	42070	**Element Last Seen:**	1991-09-25
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1991-09-25
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2008-10-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09334 / -117.13763	**Accuracy:**	specific area
UTM:	Zone-11 N3772514 E487303	**Elevation (ft):**	1560
PLSS:	T01S, R02W, Sec. 07 (S)	**Acres:**	10.0

Location: SANTA ANA WASH, ABOUT 1.0 MILE SOUTH OF GREENSPOT ROAD AND 2.5 MILES EAST OF ORANGE STREET, EAST HIGHLANDS.

Detailed Location: MAPPED AS 1 POLYGON ACCORDING TO A 1992 JIGOUR MAP.

Ecological: JUNIPER AND CHAPARRAL PHASES OF RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB. ERIASTRUM DENSIFLORUM SSP. SANCTORUM GROWING NEARBY.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 2 COLONIES (MAPPED AS 1 POLYGON) IN 1991.

Owner/Manager: UNKNOWN

Occurrence No.	32	**Map Index:** 42071	**EO Index:**	42071	**Element Last Seen:**	2006-06-05
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2006-06-05
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2008-10-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09885 / -117.14509	**Accuracy:**	specific area
UTM:	Zone-11 N3773126 E486616	**Elevation (ft):**	1500
PLSS:	T01S, R03W, Sec. 12 (S)	**Acres:**	81.0

Location: SANTA ANA WASH, ABOUT 0.4-1.0 MILE SOUTH OF GREENSPOT ROAD AND 2 MILES EAST OF ORANGE STREET, EAST HIGHLANDS.

Detailed Location: MAPPED AS 5 POLYGONS ACCORDING TO A 1992 JIGOUR MAP (4 SW-MOST POLYS) & COORDINATES FROM THE LABEL OF A 2006 SANDERS COLLECTION (NE-MOST POLY). PLANTS IN MUCH OF S1/2 AND E1/2 SEC 12.

Ecological: JUNIPER AND CHAPARRAL PHASES OF RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB. ERIASTRUM DENSIFLORUM SSP. SANCTORUM & DODECAHEMA LEPTOCERAS GROWING NEARBY. OTHER ASSOCIATES INCL ERIOGONUM FASCICULATUM, ERIODICTYON TRICHOCLAYX, ENCELIA FARINOSA, ETC.

General: 4 SW-MOST POLYS: UNKNOWN NUMBER OF PLANTS OBSERVED IN 17 COLONIES (MAPPED AS 4 POLYGONS), BUT AREA LIKELY HOLDS A MORE EXTENSIVE POPULATION OF THIS SPECIES. NE-MOST POLY: MENTIONED AS "FAIRLY COMMON IN OPEN PLACES BTWN SHRUBS" IN 2006.

Owner/Manager: UNKNOWN

Occurrence No.	33 **Map Index:** 42072	**EO Index:**	42072	**Element Last Seen:**	1991-09-25
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1991-09-25
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2008-10-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09466 / -117.15910	**Accuracy:**	80 meters
UTM:	Zone-11 N3772663 E485323	**Elevation (ft):**	1420
PLSS:	T01S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: SANTA ANA WASH, ABOUT 1.0 MILE SOUTH OF GREENSPOT ROAD AND 1.3 MILES EAST OF ORANGE STREET, EAST HIGHLANDS.

Detailed Location: MAPPED ACCORDING TO A 1992 JIGOUR MAP.

Ecological: JUNIPER AND CHAPARRAL PHASES OF RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB. ERIASTRUM DENSIFLORUM SSP. SANCTORUM AND DODECAHEMA LEPTOCERAS GROWING NEARBY.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 1 COLONY IN 1991.

Owner/Manager: UNKNOWN

Occurrence No.	34 **Map Index:** 42073	**EO Index:**	42073	**Element Last Seen:**	1991-09-25
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1991-09-25
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2008-10-16

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09763 / -117.16592	**Accuracy:**	80 meters
UTM:	Zone-11 N3772993 E484694	**Elevation (ft):**	1650
PLSS:	T01S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: SANTA ANA WASH, ABOUT 0.3 MILE SOUTH OF GREENSPOT ROAD AND 1 MILE EAST OF ORANGE STREET, EAST HIGHLANDS.

Detailed Location: MAPPED ACCORDING TO A 1992 JIGOUR MAP IN NE1/4 OF SW1/4 SEC 11.

Ecological: JUNIPER AND CHAPARRAL PHASES OF RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB. ERIASTRUM DENSIFLORUM SSP. SANCTORUM, DODECAHEMA LEPTOCERAS, AND CHORIZANTHE CALIFORNICA GROWING NEARBY.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 1 COLONY IN 1991.

Owner/Manager: UNKNOWN

Occurrence No.	76 **Map Index:** 72584	**EO Index:**	73481	**Element Last Seen:**	2005-04-21
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	2005-04-21
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2008-10-29

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.79767 / -117.35110	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3739778 E467499	**Elevation (ft):**	2040
PLSS:	T04S, R05W, Sec. 25 (S)	**Acres:**	0.0

Location: S OF HARFORD SPRINGS COUNTY PARK AND IDA LEONA RD, 1.5 MI ESE OF GAVILAN PEAK.

Detailed Location: MAPPED BY CNDDB AS BEST GUESS APPROXIMATELY 1.5 AIR MI ESE OF GAVILAN PEAK.

Ecological: EDGE OF GRASSLAND AND CHAPARRAL; CLAY SOIL ON HILLTOP. IN OPEN AREAS WITH SPARSE VEGETATION.

General: SITE BASED ON A 1991 REISER COLLECTION AND A 2005 SANDERS COLLECTION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	80	**Map Index:** 72588	**EO Index:**	73485	**Element Last Seen:**	2005-05-23
Occ. Rank:	Fair		**Presence:**	Presumed Extant	**Site Last Seen:**	2005-05-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2008-10-17

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.94057 / -117.01321	**Accuracy:**	80 meters
UTM:	Zone-11 N3755567 E498778	**Elevation (ft):**	2458
PLSS:	T03S, R01W, Sec. 05 (S)	**Acres:**	0.0

Location: APPROX 0.65 AIR MI WSW OF THE INTERSECTION OF I-10 AND SAN TIMOTEO CANYON RD, JUST S OF NICKLIN.
Detailed Location: MAPPED ACCORDING TO 2005 GPS COORDINATES PROVIDED BY GALVIN.
Ecological: GRAVELLY, EXPOSED OPEN, N-FACING SLOPE WITH RIPGUT BROME, SPREADING PHACELIA, FIDDLENECK, ETC.
General: 10+ PLANTS SEEN IN 2005.
Owner/Manager: PVT

Occurrence No.	81	**Map Index:** 35065	**EO Index:**	73486	**Element Last Seen:**	1936-04-10
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1936-04-10
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2012-02-22

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.93991 / -117.32060	**Accuracy:**	3/5 mile
UTM:	Zone-11 N3755540 E470372	**Elevation (ft):**	1200
PLSS:	T03S, R04W, Sec. 05 (S)	**Acres:**	0.0

Location: SOUTH SLOPE OF SYCAMORE CANYON, BOX SPRINGS.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS IN SYCAMORE CANYON.
Ecological:
General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1936 TRUE COLLECTION. NEEDS FIELDWORK.
Owner/Manager: PVT

Occurrence No.	82	**Map Index:** 72591	**EO Index:**	73487	**Element Last Seen:**	1993-05-20
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1993-05-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2008-10-22

Quad Summary: Forest Falls (3411618), Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long:	34.06458 / -117.00208	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3769316 E499807	**Elevation (ft):**	3280
PLSS:	T01S, R01W, Sec. 20 (S)	**Acres:**	0.0

Location: NE CORNER OF THE INTERSECTION OF CARTER ST AND SPRIG AVE, AT THE SW FOOT OF YUCAIPA RIDGE.
Detailed Location: MAPPED IN THE NE CORNER OF THE INTERSECTION ACC TO A 1993 SANDERS & LOTT COLL. SANDERS (2008) BELIEVES THIS POP HAS BEEN ELIMINATED AS IT WAS ON A SMALL PVT PARCEL; HOWEVER, HABITAT LOOKS EXTANT BASED ON 2008 AERIAL IMAGERY.
Ecological: OPEN AREA WITH SPARSE LOW VEGETATION, MOSTLY ON S-FACING SLOPES; DRY AND WARM. HIGHLY DISTURBED CHAPARRAL, MOSTLY CLEARED AND USED FOR PASTURE.
General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1993 SANDERS & LOTT COLLECTION. NEEDS FIELDWORK.
Owner/Manager: PVT

Occurrence No.	83	**Map Index:** 72592	**EO Index:**	73488		**Element Last Seen:**	2007-08-02
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-08-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-10-20

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07635 / -117.11496	**Accuracy:**	specific area
UTM:	Zone-11 N3770627 E489392	**Elevation (ft):**	1900
PLSS:	T01S, R02W, Sec. 20 (S)	**Acres:**	10.0

Location: APPROX 0.75 AIR MI NE OF THE INTERSECTION OF MILL CREEK RD AND AGATE AVE, S OF MILL CREEK, REDLANDS.

Detailed Location: MAPPED AS 4 POLYGONS ACCORDING TO A 2007 CHAMBERS GROUP, INC MAP. A 2001 HILL & KRAMER COLLECTION FROM "N SIDE OF MENTONE BLVD, ~1 MI E OF MENTONE" ALSO ATTRIBUTED TO THIS SITE.

Ecological: IN OPEN PATCHES WITHIN RIVERSIDIAN ALLUVIAL FAN SAGE SCRUB (ENCELIA FARINOSA, ERIOGONUM FASCICULATUM, ARTEMISIA CALIFORNICA, ADENOSTOMA FASCICULATUM). SOBOBA SANDY SOIL. 1 CA GNATCATCHER ALSO HEARD.

General: 229 INDIVIDUALS OBSERVED IN 2007.

Owner/Manager: PVT

Occurrence No.	84	**Map Index:** 72593	**EO Index:**	73489		**Element Last Seen:**	2006-06-07
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-06-07
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-10-17

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07511 / -117.09466	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3770488 E491265	**Elevation (ft):**	2100
PLSS:	T01S, R02W, Sec. 21 (S)	**Acres:**	167.0

Location: MOUTH OF MILL CREEK CANYON AT GREENSPOT, E OF REDLANDS.

Detailed Location: N SIDE OF HWY 38 (MILL CREEK RD) FROM GREENSPOT RD TO 1 KM E, S SIDE OF WASH. MAPPED BY CNDDB AS BEST GUESS IN THE N 1/4 OF SEC 21 ACCORDING TO A 2006 SANDERS COLLECTION.

Ecological: ALLUVIAL SLOPE WITH STREAM AND SPREADING PONDS, GRAVELLY SOIL WITH BOULDERS; CHAMISE CHAPARRAL WITH RIPARIAN AND COASTAL SAGE ELEMENTS.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 2006 SANDERS COLLECTION. COLLECTION MENTIONS THAT POPULATIONS ARE SCATTERED FOR AT LEAST A MILE UP THE CANYON WITH THOUSANDS OF PLANTS PRESENT; NEED MAP DETAIL.

Owner/Manager: UNKNOWN

Occurrence No.	85	**Map Index:**	72594	**EO Index:**	73490	**Element Last Seen:**	2003-03-29
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-03-29
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-10-17

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10523 / -117.12905	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3773832 E488096	**Elevation (ft):**	1650
PLSS:	T01S, R02W, Sec. 07 (S)	**Acres:**	0.0

Location: S SIDE OF GREENSPOT RD JUST E OF NEW DEVELOPMENTS, EAST HIGHLANDS.

Detailed Location: IN OPEN AREA AT ROADSIDE. MAPPED BY CNDDB AS BEST GUESS S OF THE INTERSECTION OF GREENSPOT RD AND ALDER CREEK RD WHICH IS JUST SE OF A LARGE DEVELOPMENT.

Ecological: SANDY ALLUVIAL SLOPE AT THE FOOT OF THE MOUNTAINS; ALLUVIAL FAN SAGE SCRUB WITH ADENOSTOMA FASCICULATUM, YUCCA WHIPPLEI, ETC.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 2003 SANDERS COLLECTION; MENTIONED AS "SCARCE" IN 2003. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	87	**Map Index:**	58908	**EO Index:**	73492	**Element Last Seen:**	1919-05-07
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1919-05-07
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-10-17

Quad Summary: Redlands (3411712), Harrison Mtn. (3411722)

County Summary: San Bernardino

Lat/Long:	34.12971 / -117.20520	**Accuracy:**	1 mile
UTM:	Zone-11 N3776557 E481078	**Elevation (ft):**	1000
PLSS:	T01N, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: HIGHLAND.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS IN VICINITY OF HIGHLAND.

Ecological: SANDY WASH.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1919 SPENCER COLLECTION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Chorizanthe polygonoides var. longispina

Element Code: PDPGN040K1

long-spined spineflower

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:**	G5T3
	State:	None		**State:**	S3
	Other:	Rare Plant Rank - 1B.2, USFS_S-Sensitive			
Habitat:	**General:**	CHAPARRAL, COASTAL SCRUB, MEADOWS, VALLEY AND FOOTHILL GRASSLAND.			
	Micro:	GABBROIC CLAY. 30-1450M.			

Occurrence No.	18	**Map Index:** 77848	**EO Index:**	477		**Element Last Seen:**	1980-05-02
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1980-05-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-01-26

Quad Summary: Perris (3311772), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80963 / -117.25070	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3741077 E476796	**Elevation (ft):**	1700
PLSS:	T04S, R04W, Sec. 24 (S)	**Acres:**	0.0

Location: MOTTE RESERVE, HILLS ABOUT 2.5 MILES NORTHWEST OF PERRIS.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB IN SECTION 24 OF MOTTE RESERVE AT ~1700'.

Ecological: ROCKY HILLS; COASTAL SAGE SCRUB COMMUNITY THAT WAS BURNED BY A WILDFIRE IN AUGUST 1979. DOMINATED BY ERIOGONUM FASCICULATUM AND SALVIA MELLIFERA.

General: MENTIONED AS "SCARCE" IN 1980. NEEDS FIELDWORK.

Owner/Manager: UCNR-MOTTE RIMROCK RESERVE

Occurrence No.	19	**Map Index:** 77823	**EO Index:**	480		**Element Last Seen:**	1998-04-02
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1998-04-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-02-03

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.80424 / -117.35099	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3740506 E467512	**Elevation (ft):**	2000
PLSS:	T04S, R05W, Sec. 24 (S)	**Acres:**	226.0

Location: SOUTH END OF HARFORD SPRINGS COUNTY PARK, NORTHWEST CORNER OF GAVILAN PLATEAU.

Detailed Location: MAPPED BY CNDDB AS BEST GUESS IN SOUTHERN HALF OF HARFORD SPRINGS COUNTY PARK.

Ecological: JUNIPER WOODLAND IN SHALLOW VALLEYS WITH COASTAL SAGE SCRUB/CHAPARRAL MOSAIC ON SLOPES. ADOBE SOIL.

General: MENTIONED AS "COMMON" IN 1998. ACCORDING TO REISER (2001), "A LARGE POPULATION OCCURS ON OPEN FLATS NEAR IDALEONA ROAD ON THE GAVILAN PLATEAU."

Owner/Manager: RIV COUNTY

Occurrence No.	20	**Map Index:** 34720	**EO Index:**	475	**Element Last Seen:**	1992-06-04
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-06-04
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1996-02-27

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.83366 / -117.36780	**Accuracy:**	80 meters
UTM:	Zone-11 N3743773 E465968	**Elevation (ft):**	1460
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	0.0

Location: ALONG CAJALCO ROAD ABOUT 0.1 MILE WEST OF EL SOBRANTE ROAD, NORTH OF GAVILAN PLATEAU.

Detailed Location: SINGLE COLONY MAPPED SOUTH OF ROAD WITHIN THE NW 1/4 OF THE SE 1/4 OF SECTION 11.

Ecological: GRAVELLY CLEARING WITHIN GRASSLAND OF BROMUS RUBENS, AVENA BARBATA, ARTEMISIA CALIFORNICA, LOTUS SCOPARIUS, AND ENCELIA.

General: 74 PLANTS OBSERVED IN 1992. SITE IS WITHIN BIOLOGICAL PRESERVE SURROUNDING LAKE MATHEWS AND METROPOLITAN WATER DISTRICT LAND ADJACENT TO THE PRESERVE.

Owner/Manager: MWD

Occurrence No.	21	**Map Index:** 34719	**EO Index:**	476	**Element Last Seen:**	1992-06-04
Occ. Rank:	Good		**Presence:**	Presumed Extant	**Site Last Seen:**	1992-06-04
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1996-03-19

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.83290 / -117.37541	**Accuracy:**	specific area
UTM:	Zone-11 N3743692 E465263	**Elevation (ft):**	1480
PLSS:	T04S, R05W, Sec. 11 (S)	**Acres:**	27.8

Location: ALONG CAJALCO ROAD, ABOUT 0.4 MILE WEST OF EL SOBRANTE ROAD, NORTH OF GAVILAN PLATEAU AND EAST OF LAKE MATHEWS.

Detailed Location: SIX COLONIES MAPPED SOUTH OF THE ROAD WITHIN THE S 1/2 OF THE SW 1/4 OF SECTION 11.

Ecological: GRAVELLY OPENING WITHIN GRASSLAND OF BROMUS RUBENS, AVENA BARBATA, ARTEMISIA CALIFORNICA, LOTUS SCOPARIUS, AND ENCELIA.

General: 196 PLANTS OBSERVED IN 1992. SITE IS WITHIN BIOLOGICAL PRESERVE SURROUNDING LAKE MATHEWS AND ON MWD LAND ADJACENT TO THE PRESERVE.

Owner/Manager: MWD

Occurrence No.	58	**Map Index:** 61259	**EO Index:**	61295	**Element Last Seen:**	2003-04-16
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2003-04-16
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2010-02-03

Quad Summary: Lake Elsinore (3311763), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.74732 / -117.36823	**Accuracy:**	specific area
UTM:	Zone-11 N3734201 E465893	**Elevation (ft):**	2200
PLSS:	T05S, R05W, Sec. 11 (S)	**Acres:**	133.8

Location: ~5.5 AIR MILES NNW OF THE TOWN OF LAKE ELSINORE; ROUGHLY 1 MILE WEST OF STOVEPIPE RD, GAVILAN HILLS.

Detailed Location: MAPPED BY CNDDB BASED ON A 2003 WHITE FIELD SURVEY MAP.

Ecological: BROAD, OPEN, 10 DEGREE, WNW-FACING SLOPE OF HEAVY, FINE, SILTY SOIL INTERSPERSED WITH COBBLES ON MESA SURFACE. ASSOCIATED WITH ALLIUM MUNZII, LASTHENIA CALIFORNICA, BROMUS MADRITENSIS SSP. RUBENS AND ERIOGONUM FASCICULATUM.

General: MENTIONED AS "OCCASIONAL" IN 2003.

Owner/Manager: PVT

Chorizanthe xanti var. leucotheca

Element Code: PDPGN040Z1

white-bracted spineflower

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G4T2
	State:	None	**State:**	S2
	Other:	Rare Plant Rank - 1B.2, BLM_S-Sensitive		
Habitat:	**General:**	MOJAVEAN DESERT SCRUB, PINYON-JUNIPER WOODLAND, COASTAL SCRUB (ALLUVIAL FANS).		
	Micro:	SANDY OR GRAVELLY PLACES. 300-1200M.		

Occurrence No.	34	**Map Index:** 79286	**EO Index:**	80265	**Element Last Seen:**	2011-07-01
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2011-07-01
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2011-12-13

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.08038 / -117.06436	**Accuracy:**	80 meters
UTM:	Zone-11 N3771070 E494062	**Elevation (ft):**	2300
PLSS:	T01S, R02W, Sec. 14 (S)	**Acres:**	0.0

Location: 200 METERS SOUTH OF REDLANDS HEIGHTS RANCH ROAD, NORTH OF MILL CREEK RD, EAST OF NEWPORT RD, MILL CREEK, NE OF MENTONE.

Detailed Location:

Ecological: ALLUVIAL FAN SAGE SCRUB. ASSOCIATED WITH ERIOGONUM FASCICULATUM POLIFOLIUM, SENECIO FLACCIDUS, YUCCA WHIPPLEI, SALVIA COLUMBARIAE, ETC.

General: PRIMARY SOURCE OF INFORMATION FOR THIS SITE IS A 2008 SCHWARTZ COLLECTION. A 2011 LAWREY REPORT NOTES SPECIES AS OCCURRING IN THE VICINITY; SURVEYS PERFORMED JUNE 23-JULY 1, 2011.

Owner/Manager: UNKNOWN

Dodecahema leptoceras

Element Code: PDPGN0V010

slender-horned spineflower

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:** **Global:**	G1
	State:	Endangered	**State:**	S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive		
Habitat:	**General:**	CHAPARRAL, COASTAL SCRUB (ALLUVIAL FAN SAGE SCRUB).		

Micro: FLOOD DEPOSITED TERRACES AND WASHES; ASSOC INCLUDE ENCELIA, DALEA, LEPIDOSPARTUM, ETC. 200-760M.

Occurrence No.	2	**Map Index:**	03747	**EO Index:**	18420	**Element Last Seen:**	1999-04-XX
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-04-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Decreasing	**Record Last Updated:**	2008-07-28

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09515 / -117.18415	**Accuracy:**	specific area
UTM:	Zone-11 N3772721 E483013	**Elevation (ft):**	1280
PLSS:	T01S, R03W, Sec. 10 (S)	**Acres:**	97.0

Location: EAST HIGHLANDS, WHERE HIGHWAY 30 CROSSES WASH OF SANTA ANA RIVER.

Detailed Location: E & W SIDES OF HWY 30 (ORANGE-BOULDER AVE). MAPPED BY CNDDB ACC TO A 1992 VAIL SPECK ASSOC MAP & A 1985 KRANTZ MAP. PORTIONS ACROSS FROM LA CARRERA FIELD ROPING ARENA WERE EXTIRP IN 1983 FROM SAND/GRAVEL GRADING (N-MOST PORTION OF POLY).

Ecological: ON UNDISTURBED GRAVELLY BENCH OF WASH WITH JUNIPERUS CALIFORNICA AND ERIODICTYON TRICHOCALYX. GROWING IN ALLUVIAL FAN SCRUB WITH ERIASTRUM DENSIFOLIUM SANCTORUM. NOT FOUND IN AREAS WITH DUMPING AND GROUND DISTURBANCE.

General: SEV SMALL POCKETS IN 1979. IN 1985: W SIDE W/ 2 SMALL POCKETS OF 100-200 PLANTS AND 14 PLANTS, E SIDE HAD NO MORE THAN SEVERAL HUNDRED SCATTERED POCKETS. UNK # IN 1990 & 1992. 70 PLANTS IN 1998 AND 30 PLANTS IN 1999. INCL FRMR EO #20.

Owner/Manager: BLM-ESCONDIDO RA

Occurrence No.	4	**Map Index:**	40810	**EO Index:**	41051	**Element Last Seen:**	1923-05-01
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	1983-XX-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-07-28

Quad Summary: Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713), Fontana (3411714), San Bernardino North (3411723)

County Summary: Riverside, San Bernardino

Lat/Long:	34.05389 / -117.31364	**Accuracy:**	5 miles
UTM:	Zone-11 N3768175 E471054	**Elevation (ft):**	1100
PLSS:	T01S, R04W, Sec. 29 (S)	**Acres:**	0.0

Location: VICINITY OF SAN BERNARDINO.

Detailed Location: VAGUE LOCALITY; INCLUDES COLLECTIONS FROM COLTON, SAN BERNARDINO, & SAN BERNARDINO VALLEY.

Ecological: MESAS, PLAINS.

General: NUMEROUS COLLECTIONS ATTRIBUTED TO THIS VICINITY. SUITABLE HABITAT NO LONGER PRESENT AT THIS SITE.

Owner/Manager: UNKNOWN

Occurrence No.	11 **Map Index:** 41053	**EO Index:**	41053	**Element Last Seen:**	1923-05-08
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1983-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1999-05-14

Quad Summary: Beaumont (3311688), El Casco (3311781), Sunnymead (3311782), Forest Falls (3411618), Yucaipa (3411711), Redlands (3411712)
County Summary: Riverside, San Bernardino

Lat/Long:	34.01700 / -117.06700	**Accuracy:**	5 miles
UTM:	Zone-11 N3764042 E493813	**Elevation (ft):**	2200
PLSS:	T02S, R02W, Sec. 11 (S)	**Acres:**	0.0

Location: YUCAYPA VALLEY (YUCAIPA VALLEY).
Detailed Location:
Ecological:
General: MAIN SOURCE OF INFORMATION FOR THIS SITE IS 1923 COLLECTION BY LEMMON.
Owner/Manager: UNKNOWN

Occurrence No.	22 **Map Index:** 17850	**EO Index:**	5688	**Element Last Seen:**	1992-07-15
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	1992-07-15
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1997-02-04

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09761 / -117.16752	**Accuracy:**	specific area
UTM:	Zone-11 N3772991 E484547	**Elevation (ft):**	1345
PLSS:	T01S, R03W, Sec. 11 (S)	**Acres:**	11.2

Location: UPPER SANTA ANA WASH; EAST OF CHURCH STREET.
Detailed Location: MAPPED WITHIN THE NE 1/4 OF THE SW 1/4 OF SECTION 11. INCLUDES POPULATIONS DA, DB, DC, AND D2 (JIGOUR 1992).
Ecological: IN OPENINGS WITHIN ALLUVIAL FAN SAGE SCRUB WITH JUNIPERUS CALIFORNICUS, CHORIZANTHE CORIACEA, FILAGO CALIFORNICA. NOT EXCESSIVELY COVERED BY BROMUS RUBENS.
General: 150-200 PLANTS IN 1988. 1100+ PLANTS OBSERVED IN 4 SUB-POPULATIONS IN 1992. EXTENSIVE POTENTIAL HABITAT EXISTS IN SEC 11. SBD VALLEY MUTUAL WATER CO. LEASES THE SITE TO PHARRIS CO (SAND MINING).
Owner/Manager: SBD VALLEY MUTUAL WATER CO

Occurrence No.	30 **Map Index:** 23941	**EO Index:**	11990	**Element Last Seen:**	1992-07-14
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1992-07-14
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1997-01-27

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09492 / -117.15986	**Accuracy:**	80 meters
UTM:	Zone-11 N3772692 E485253	**Elevation (ft):**	1385
PLSS:	T01S, R03W, Sec. 11 (S)	**Acres:**	0.0

Location: SANTA ANA RIVER WASH; APPROX 0.9 MI ESE OF LA CARRERA FIELD, 0.95 MI N OF PIONEER AVE.
Detailed Location: MAPPED WITHIN THE NW 1/4 OF THE SE 1/4 OF SECTION 11. JIGOUR SITE D1 (1992).
Ecological: FLAT DEPRESSION OF COMPACTED FINE SAND ON A TERRACE BETWEEN AND WITHIN TWO FORMER CHANNEL BRAIDS.
General: APPROX 250 PLANTS IN 1990. 102 PLANTS OBSERVED BY JIGOUR IN 1992. SITE IS OWNED BY GRAVEL MINING COMPANY. COMPANY IS AWARE OF THIS SITE.
Owner/Manager: PVT

Occurrence No.	31	**Map Index:**	23942	**EO Index:**	11989	**Element Last Seen:**	1990-07-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1993-08-12

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09636 / -117.15202	**Accuracy:**	80 meters
UTM:	Zone-11 N3772850 E485976	**Elevation (ft):**	1460
PLSS:	T01S, R03W, Sec. 12 (S)	**Acres:**	0.0

Location: 1.3 MI E OF LA CARRERA FIELD, 1.0 MI N OF PIONEER AVE. SANTA ANA RIVER WASH.
Detailed Location:
Ecological: IN WASH WITH ERIASTRUM DENSIFOLIUM SANCTORUM.
General: 95 PLANTS IN 1990.
Owner/Manager: UNKNOWN

Occurrence No.	32	**Map Index:**	23940	**EO Index:**	12154	**Element Last Seen:**	1990-07-XX
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1990-07-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-07-15

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09575 / -117.14274	**Accuracy:**	specific area
UTM:	Zone-11 N3772782 E486832	**Elevation (ft):**	1500
PLSS:	T01S, R03W, Sec. 12 (S)	**Acres:**	18.0

Location: 1.6-2.0 MI E OF LA CARRERA FIELD, 0.85-1.0 MI N OF PIONEER AVE. SANTA ANA RIVER WASH.
Detailed Location: MAPPED AS 2 POLYGONS IN SE1/4 SEC 12 AND SW1/4 ADJACENT SEC 7.
Ecological: IN WASH WITH ERIASTRUM DENSIFOLIUM SANCTORUM.
General: W POLY: OVER 650 PLANTS IN 2 SUBPOPULATIONS IN 1990. E POLY: 350 PLANTS IN 1990. INCLUDES FORMER EO #33.
Owner/Manager: UNKNOWN

Occurrence No.	34	**Map Index:**	23944	**EO Index:**	27236	**Element Last Seen:**	1992-07-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1992-07-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1997-01-27

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09394 / -117.13153	**Accuracy:**	80 meters
UTM:	Zone-11 N3772579 E487866	**Elevation (ft):**	1600
PLSS:	T01S, R02W, Sec. 07 (S)	**Acres:**	0.0

Location: 1.0 MI S OF GREENSPOT RD, 0.5 MI E OF OLD RAILROAD GRADE. SANTA ANA RIVER WASH.
Detailed Location:
Ecological: ASSOCIATED WITH ERIASTRUM DENSIFOLIUM SANCTORUM.
General: OVER 1000 PLANTS IN 1990.
Owner/Manager: UNKNOWN

Eriastrum densifolium ssp. sanctorum **Element Code:** PDPLM03035

Santa Ana River woollystar

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:**	**Global:**	G4T1
	State:	Endangered		**State:**	S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive			
Habitat:	**General:**	COASTAL SCRUB, CHAPARRAL.			
	Micro:	IN SANDY SOILS ON RIVER FLOODPLAINS OR TERRACED FLUVIAL DEPOSITS. 150-610M.			

Occurrence No.	1 **Map Index:** 03730	**EO Index:**	18417	**Element Last Seen:**	1997-10-22
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	1997-10-22
Occ. Type:	Natural/Native occurrence	**Trend:**	Decreasing	**Record Last Updated:**	2008-08-07

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.11565 / -117.19194	**Accuracy:**	specific area
UTM:	Zone-11 N3774995 E482298	**Elevation (ft):**	1250
PLSS:	T01S, R03W, Sec. 04 (S)	**Acres:**	20.0

Location: BOTH SIDES OF BOULDER AVENUE ON THE E SIDE OF PERCOLATION BASIN, SE EDGE OF TOWN OF HIGHLAND, CITY CREEK FLOODPLAIN.

Detailed Location: MAPPED BY CNDDB ACCORDING TO A 1990 CHAMBERS GROUP INC MAP.

Ecological: ON ALLUVIAL BENCH WITH GRAVELLY SOIL. IN ALLUVIAL FAN SCRUB W/ ERIOGONUM FASCICULATUM, PLATANUS RACEMOSA, JUNIPERUS CALIFORNICA, LEPIDOSPARTUM SQUAMATUM, SENECIO FLACCIDUS, SCHISMUS BARBATUS, HETEROTHECA GRANDIFLORA, YUCCA SCHIDIGERA, ETC.

General: ~250 PLANTS IN 1984, ~50 PLANTS SEEN IN 1985. UNKNOWN HOW MANY PLANTS SEEN IN 1988. 110 PLANTS ON EAST SIDE OF BOULDER AVE IN 1994. ~10 PLANTS SEEN ON SW SIDE OF BOULDER AVE IN 1997.

Owner/Manager: PVT

Occurrence No.	5 **Map Index:** 13042	**EO Index:**	1256	**Element Last Seen:**	2010-06-12
Occ. Rank:	Fair	**Presence:**	Presumed Extant	**Site Last Seen:**	2010-06-12
Occ. Type:	Natural/Native occurrence	**Trend:**	Decreasing	**Record Last Updated:**	2011-12-16

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.09588 / -117.16994	**Accuracy:**	specific area
UTM:	Zone-11 N3772800 E484323	**Elevation (ft):**	1290
PLSS:	T01S, R03W, Sec. 11 (S)	**Acres:**	3594.0

Location: SANTA ANA RIVER WASH; FLOODPLAIN OF THE SANTA ANA RIVER, NORTH OF REDLANDS.

Detailed Location: HUGE AREA OF SCATTERED SUBPOPS, FROM NORTON AIR FORCE BASE EAST TO GREENSPOT ROAD. MAP DETAIL FROM A 1990 CHAMBERS GROUP INC MAP. VARIOUS PORTIONS OF THIS OCCURRENCE HAVE BEEN EXTIRPATED. INCL FRMR EO #S 6-9, 11-14, & 16.

Ecological: IN ALLUVIAL FAN SAGE SCRUB, ASSOCIATED W/ ERIOGONUM FASCICULATUM, ERIODICTYON TRICHOCALYX, ENCELIA FARINOSA, BEBBIA JUNCEA, LOTUS SCOPARIUS, LEPIDOSPARTUM SQUAMATUM, CROTON CALIFORNICA, ETC. ALSO FOUND W/ DODECAHEMA LEPTOCERAS.

General: 1000'S IN VARIOUS PORTIONS OF EO IN 1984-1986. SOME PLANTS TRANSPL AS MITIGATION FOR HWY 30 (1987). 20 IN PORTION IN 1987. ~330 IN PORTION IN 1992. UNK # IN 1988 & 1993. >1000 IN 1999. SEEN IN 2005, 2006, 2007. ~5140 IN 2008. SEEN IN 2010.

Owner/Manager: SBD COUNTY FLOOD CONTROL, BLM

Occurrence No.	10 **Map Index:** 04031	**EO Index:**	18412	**Element Last Seen:**	1992-07-31
Occ. Rank:	Poor	**Presence:**	Presumed Extant	**Site Last Seen:**	1992-07-31
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	1997-01-27

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.10906 / -117.09909	**Accurracy:**	specific area
UTM:	Zone-11 N3774252 E490860	**Elevation (ft):**	2000
PLSS:	T01S, R02W, Sec. 04 (S)	**Acres:**	4.7

Location: SANTA ANA RIVER CANYON, 0.6 AIR MILE NORTH OF MOUTH OF MORTON CANYON, BETWEEN GAGING STATION AND POWERHOUSE.

Detailed Location: MAPPED ALONG THE EAST SIDE OF THE CANYON ALONG ROAD JUST SOUTH OF GAGING STATION.

Ecological: RIVERSIDIAN SAGE SCRUB IN SANDY SOILS. ASSOCIATED WITH ERIOGONUM FASCICULATUM, LEPIDOSPARTUM SQUAMATUM, BEBBIA JUNCEA, ENCELIA FARINOSA, AND SENECIO DOUGLASII.

General: ABOUT 30 PLANTS SEEN IN 1984 AND 1987, UNKNOWN HOW MANY SEEN IN 1988, 60 SEEN IN 1992 (30 MATURE, 30 SEEDLINGS). PART OF LAND OWNED BY SO CAL EDISON (?). LIKELY TO BE IMPACTED OR POSSIBLY ELIMINATED BY CONSTRUCTION OF THE SEVEN OAKS DAM.

Owner/Manager: PVT IN USFS-SAN BERNARDINO NF

Occurrence No.	17 **Map Index:** 20052	**EO Index:**	12586	**Element Last Seen:**	2010-07-29
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2010-07-29
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-12-16

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.07906 / -117.10523	**Accurracy:**	specific area
UTM:	Zone-11 N3770927 E490290	**Elevation (ft):**	1920
PLSS:	T01S, R02W, Sec. 17 (S)	**Acres:**	22.0

Location: MILL CREEK, ABOUT 1 AIR MILE NORTHEAST OF MENTONE AND 0.25 MILE WEST OF GARNET SREET BRIDGE.

Detailed Location: MAPPED IN THE EAST HALF OF THE SE 1/4 OF SECTION 17 ACCORDING TO A 1990 MAP PROVIDED BY CHAMBERS GROUP, INC.

Ecological: SANDY FLATS/CHANNEL ON MATURE ALLUVIAL SAGE SCRUB BENCHES.

General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 1988. ~35 PLANTS OBSERVED IN A 2010 WOOD COLLECTION FROM "0.1 MILE DOWNSTREAM OF GARNET STREET BRIDGE." 1876 LEMMON COLLECTION FROM MILL CREEK ALSO ATTRIBUTED TO THIS SITE.

Owner/Manager: UNKNOWN

Occurrence No.	26	**Map Index:** 71668	**EO Index:**	72568		**Element Last Seen:**	2007-07-02
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2007-07-02
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2010-02-17

Quad Summary: Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.10906 / -117.14996	**Accuracy:**	80 meters
UTM:	Zone-11 N3774259 E486169	**Elevation (ft):**	1421
PLSS:	T01S, R03W, Sec. 01 (S)	**Acres:**	0.0

Location: AT PLUNGE CREEK AND GREENSPOT ROAD, S OF GREENSPOT ROAD, APPROX. DUE S OF BRIDGE OVER PLUNGE CREEK.

Detailed Location: MAPPED ACCORDING TO COORDINATE INFORMATION PROVIDED BY DE GROOT 2007.

Ecological: BENCH ABOVE WASH. CHAPARRAL WITH ERIODICTYON TRICHOCALYX, CROTON CALIFORNICA, ERIOGONUM FASCICULATUM, YUCCA WHIPPLEI, BEBBIA JUNCEA, PHACELIA, OPUNTIS, BROMUS RUBENS, STEPHANOMERIA, SALVIA COLUMBARIAE, ERICAMERIA, ETC.

General: 120+ PLANTS IN 2007. PLANTS WERE IN SMALL PATCHES, FREQUENT IN OPEN SPACES BETWEEN SHRUBS.

Owner/Manager: SBD COUNTY FLOOD CONTROL DIST

Occurrence No.	28	**Map Index:** 71676	**EO Index:**	72575		**Element Last Seen:**	1985-05-28
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1985-05-28
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-07-11

Quad Summary: Yucaipa (3411711), Keller Peak (3411721)

County Summary: San Bernardino

Lat/Long:	34.13603 / -117.07333	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3777242 E493238	**Elevation (ft):**	2300
PLSS:	T01N, R02W, Sec. 27 (S)	**Acres:**	474.0

Location: 3-6 MI NNE OF MENTONE, FROM THE MOUTH OF THE SANTA ANA CANYON ~3.2 MI UPSTREAM,

Detailed Location: INCORP THE BROAD FLOODPLAIN OF THE SANTA ANA RIVER & ADJ SLOPES. MAPPED BY CNDDB ACC TO TRS PROVIDED ON SPECIMEN LABEL ALONG THE SANTA ANA RIVER IN SECTIONS 26, 27, 34. ALSO MENTIONED IN SEC. 33 BUT RIVER DOES NOT EXTEND INTO SEC 33.

Ecological: WITH CHAPARRAL AND COASTAL SAGE SCRUB.

General: ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1985 HENRICKSON COLLECTION. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Navarretia fossalis

Element Code: PDPLM0C080

spreading navarretia

Listing Status:	**Federal:**	Threatened	**CNDDB Element Ranks:**	**Global:** G1
	State:	None		**State:** S1
	Other:	Rare Plant Rank - 1B.1		
Habitat:	**General:**	VERNAL POOLS, CHENOPOD SCRUB, MARSHES AND SWAMPS, PLAYAS.		
	Micro:	SAN DIEGO HARDPAN & SAN DIEGO CLAYPAN VERNAL POOLS; IN SWALES & V.P'S, OFTEN SURR. BY OTHER HABITAT TYPES. 30-1300M.		

Occurrence No.	17	**Map Index:** 03716	**EO Index:**	1720		**Element Last Seen:**	1995-07-26
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	1995-07-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-02-25

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.76517 / -117.21192	**Accuracy:**	80 meters
UTM:	Zone-11 N3736139 E480375	**Elevation (ft):**	1410
PLSS:	T05S, R03W, Sec. 05 (S)	**Acres:**	0.0

Location: SOUTH SIDE OF CASE ROAD, 0.2 MILE EAST OF PERRIS VALLEY AIRPORT.

Detailed Location: SW 1/4 OF NE 1/4 OF SECTION 5.

Ecological: MARGINS OF LARGE VERNAL POOL W/ CRYPSIS SCHOENOIDES, EPILOBIUM DENSIFLORUM, PSILOCARPHUS BREVISSIMUS, PLAGIOBOTHRYS LEPTOCLADUS, ATRIPLEX CORONATA NOTATIOR, HORDEUM INTERCEDENS, HEMIZONIA FASCICULATA, JUNCUS BUFONIUS, AND MALVELLA LEPROSA.

General: 1425 PLANTS IN 1995. A 1952 ROOS COLLECTION FROM "1 MILE SE PERRIS" AND A 1968 HOOVER COLLECTION FROM "1 MILE EAST OF PERRIS" ALSO ATTRIBUTED TO THIS SITE.

Owner/Manager: UNKNOWN

Occurrence No.	22	**Map Index:** 22006	**EO Index:**	8349		**Element Last Seen:**	1998-XX-XX
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1998-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-03-05

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.83406 / -117.13962	**Accuracy:**	specific area
UTM:	Zone-11 N3743766 E487080	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 12 (S)	**Acres:**	88.0

Location: ALONG THE SAN JACINTO RIVER FLOOD CONTROL CHANNEL, FROM 0.3 MILE SOUTH OF RAMONA EXPRESSWAY, SOUTH TO 11TH STREET.

Detailed Location: IN DITCHES ON BOTH SIDES OF CHANNEL, EXTENDS 0.5 MILE TO WEST AND 0.1 MILE EAST. ON BOTH SIDES OF MWD AQUEDUCT MAINTENANCE ROAD. MAPPED MOSTLY ACCORDING TO VARIOUS 1991 BRAMLET MAPS AND A 1992 BRAMLET MAP.

Ecological: IN SWALES AND DEPRESSIONS IN ALKALINE SINK SCRUB WITH ATRIPLEX SERENANA, A. ARGENTEA EXPANSA, A. CORONATA NOTATIOR, SUAEDA SP., CRESSA SP., CRYPSIS SCHOENOIDES, PHALARIS PARADOXA, ETC. IN WILLOWS; SILTY CLAY, SALINE-ALKALINE SOILS.

General: 20 PLANTS SEEN IN NW PORTION OF EO IN 1990. ~550 SEEN IN 1991 IN SEVERAL SUBPOPS. MORE INTENSIVE SURVEYS NEEDED SINCE POTENTIAL FOR MORE POPS EXISTS. IN 1998, SEEDS COLLECTED FROM SITE FOR FUTURE MITIGATION PROJECTS. INCL FORMER EO #28.

Owner/Manager: RIV COUNTY FLOOD CONTROL

Occurrence No.	23 **Map Index:** 22007	**EO Index:**	8348	**Element Last Seen:**	2007-05-10
Occ. Rank:	Good	**Presence:**	Presumed Extant	**Site Last Seen:**	2007-05-10
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-12-09

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.81417 / -117.15568	**Accurracy:**	specific area
UTM:	Zone-11 N3741563 E485591	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 24 (S)	**Acres:**	22.0

Location: AT ENDS OF 12TH AND 13TH STREETS; ALONG THE SAN JACINTO RIVER FLOOD CHANNEL.

Detailed Location: MAPPED BY CNDDB AS 4 POLYGONS ACCORDING TO 1991 BRAMLET MAPS, A 2000 GLEN LUKOS & ASSOCIATES MAP, AND COORDINATES FROM A 2007 MENUZ COLLECTION.

Ecological: SWALE AREA WITHIN ALKALINE SINK SCRUB. IN WILLOWS SILTY CLAY ASSOCIATED WITH ATRIPLEX ARGENTEA, A. CORONATA NOTATIOR, BASSIA HYSSOPIFOLIA, CRESSA TRUXILLENSIS, RUMEX SP., CRYPSIS SCHOENOIDES, VERONICA PEREGRINA, ERODIUM CICUTARIUM, ETC.

General: >10,000 PLANTS SEEN IN 1991 EAST OF SAN JACINTO RIVER. 529 PLANTS SEEN IN 2000 WEST OF THE SAN JACINTO RIVER. SEEN IN SOUTH-MOST POLYGON IN 2007.

Owner/Manager: RIV COUNTY FLOOD CONTROL?, PVT

Occurrence No.	27 **Map Index:** 22008	**EO Index:**	9783	**Element Last Seen:**	1995-11-29
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1995-11-29
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-02-19

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.85279 / -117.11947	**Accurracy:**	nonspecific area
UTM:	Zone-11 N3745841 E488947	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	75.0

Location: IN VICINITY OF DAVIS ROAD AND THE SAN JACINTO RIVER, SAN JACINTO WILDLIFE AREA, NORTH OF LAKEVIEW.

Detailed Location: THE TWO POLYGONS EAST OF DAVIS ROAD ARE BASED ON A 1992 BRAMLET MAP. SOUTH-MOST POLYGON ALONG THE ROAD IS BASED ON A 1995 RIEFNER COLLECTION FROM "DAVIS ROAD, SAN JACINTO WILDLIFE SANCTUARY, 0.4 MILE SOUTH OF OLD SAN JACINTO RIVER."

Ecological: IN RIVERBED, ALKALINE MEADOW (?)/VERNAL POOL-LIKE HABITATS. WITH CRESSA TRUXILLENSIS, BASSIA HYSSOPIFOLIA, BERGIA TEXANA, MARSILEA VESTITA, VERONICA PEREGRINA, SUAEDA TORREYANA, ETC. IN WILLOWS SILTY CLAY, & TRAVER LOAMY, FINE SAND SOILS.

General: TOTAL OF 326 PLANTS SEEN IN 1991 IN THE 2 POLYGONS EAST OF DAVIS ROAD. ALSO SEEN IN THIS AREA IN 1993 & 1995. NEED BETTER MAP DETAIL FOR THIS OCCURRENCE. INCLUDES FORMER OCCURRENCE #36.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	33	**Map Index:** 31992	**EO Index:**	23124		**Element Last Seen:**	2006-05-09
Occ. Rank:	Excellent		**Presence:**	Presumed Extant		**Site Last Seen:**	2006-05-09
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-02-19

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.86982 / -117.11958	**Accuracy:**	specific area
UTM:	Zone-11 N3747728 E488939	**Elevation (ft):**	1425
PLSS:	T03S, R02W, Sec. 32 (S)	**Acres:**	16.0

Location: 500 FT EAST OF DAVIS ROAD, 300 FT NORTH OF THE OLD SAN JACINTO RIVER CHANNEL, SAN JACINTO WILDLIFE AREA.

Detailed Location: SITE IS 200-600 FT WEST OF THE EXISTING WATERFOWL POND.

Ecological: ALKALI PLAYA W/ PLAGIOBOTHRYS LEPTOCLADUS, POLYGONUM ARGYROCOLEON, FRANKENIA SALINA, PHALARIS MINOR, VERONICA PEREGRINA, HORDEUM DEPRESSUM, EPILOBIUM DENSIFOLIUM. MAPPED NEAR LASTHENIA GLABRATA COULTERI. WILLOWS SILTY CLAY, SALINE-ALKALINE.

General: UNKNOWN NUMBER OF PLANTS SEEN IN 1993. 100,000 PLANTS ESTIMATED IN 1995. IN 1998 SEEDS COLLECTED FROM THIS SITE FOR GERMINATION STUDIES FOR FUTURE MITIGATION PROJECTS. UNKNOWN NUMBER OF PLANTS SEEN IN 2006.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	37	**Map Index:** 38919	**EO Index:**	33926		**Element Last Seen:**	1992-05-15
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1992-05-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2009-02-19

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84927 / -117.12944	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3745452 E488024	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	36.0

Location: BOTH SIDES OF SAN JACINTO RIVER ABOUT 0.5-0.7 MILE NE OF RAMONA EXPRESSWAY CROSSING, NORTHWEST OF LAKEVIEW.

Detailed Location: NORTH POLY IS ~700 M WEST OF DAVIS ROAD & 60 M EAST OF THE SAN JACINTO RIVER. SOUTH POLYGON IS ~50 M EAST OF RIVER LEVEE. MAPPED ACCORDING TO A 1992 BRAMLET MAP.

Ecological: DRYING BED IN AN ALKALINE PLAYA COMMUNITY. WILLOWS SILTY CLAY SALINE ALKALINE & TRAVER LOAMY FINE SAND ALKALINE SOILS. ASSOC INCL CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, RUMEX PERSICARIODES, LYTHRUM HYSSOPIFOLIA, VERONICA PEREGRINA, ETC.

General: 1331 PLANTS SEEN IN NORTH POLYGON IN 1992. 75 PLANTS OBSERVED IN SOUTH POLYGON IN 1992. NEEDS FIELDWORK. INCLUDES FORMER OCCURRENCE #38.

Owner/Manager: UNKNOWN

Occurrence No.	39	**Map Index:**	38921	**EO Index:**	33928	**Element Last Seen:**	2006-05-25
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2006-05-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-12-07

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.80311 / -117.16555	**Accurracy:**	specific area
UTM:	Zone-11 N3740338 E484675	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 23 (S)	**Acres:**	9.0

Location: NEAR THE INTERSECTION OF NUEVO ROAD WITH THE SAN JACINTO RIVER, EAST OF PERRIS.

Detailed Location: MAPPED BY CNDDB AS 4 POLYGONS ACCORDING TO A 2000 GLEN LUKOS & ASSOCIATES MAP AND 2006 BRAMLET MAPS.

Ecological: VERNAL POOL. ASSOCIATED WITH EPILOBIUM DENSIFLORUM, LYTHRUM HYSSOPIFOLIUM, MALVELLA LEPROSA, SPERGULARIA MARINA, ELEOCHARIS PALUSTRIS, RUMEX MARITIMUS, CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, PSILOCARPHUS BREVISSIMUS, ETC.

General: UNKNOWN NUMBER OF PLANTS SEEN BY KIRTLAND IN 1992. 2 NORTH-MOST POLYGONS HAD 1526 PLANTS IN 2000, SOUTH-MOST POLYGON HAD 30 PLANTS IN 2000. 2 SOUTH-MOST POLYGONS HAD 3609 PLANTS IN 2006.

Owner/Manager: RIV CO FLOOD CONTROL, PVT

Occurrence No.	47	**Map Index:**	55247	**EO Index:**	55247	**Element Last Seen:**	2005-05-25
Occ. Rank:	Fair			**Presence:**	Presumed Extant	**Site Last Seen:**	2005-05-25
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2009-12-09

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77534 / -117.19631	**Accurracy:**	specific area
UTM:	Zone-11 N3737264 E481822	**Elevation (ft):**	1410
PLSS:	T04S, R03W, Sec. 33 (S)	**Acres:**	61.0

Location: SAN JACINTO RIVER; BOTH SIDES OF THE ESCONDIDO FREEWAY NW OF ITS INTERSECTION WITH ELLIS AVENUE, EAST OF PERRIS.

Detailed Location: MAPPED BY CNDDB AS 9 POLYGONS. 5 WEST-MOST POLYGONS MAPPED ACCORDING TO A 1994 KIRTLAND MAP; 4 EAST-MOST POLYGONS MAPPED ACCORDING TO A 1993 ROBERTS MAP AND A 2000 GLEN LUKOS AND ASSOCIATES MAP.

Ecological: FLAT RIVER FLOOD PLAIN, DISTURBED ALKALI VERNAL POOLS WITH SEASONALLY FLOODED ALKAI VERNAL PLAINS. HORDEUM INTERCEDENS, CRYPSIS VIRGINICA, LOLIUM PERENNE, POLYPOGON MONSPELIENSIS, RUMEX SP., AVENA BARBATA, & HELIANTHUS ANNUUS.

General: 5 W-MOST POLYS: SEEN IN 1994. 4 E-MOST POLYS: 50,000+ INDIVIDUALS IN 1993. 5,520 INDIVIDUALS IN 2000. A 2005 ELVIN COLLECTION ALSO ATTRIB HERE; MENTIONED AS SCARCE BUT LOCALIZED IN VERNAL POOL AREAS & DRAINAGES IN 2005. INCL FORMER EO #65.

Owner/Manager: PVT

Occurrence No.	74	**Map Index:** 77453	**EO Index:**	78368	**Element Last Seen:**	2000-XX-XX
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	2000-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	2009-12-02

Quad Summary: Perris (3311772)
County Summary: Riverside

Lat/Long:	33.78470 / -117.18836	**Accuracy:**	specific area
UTM:	Zone-11 N3738300 E482561	**Elevation (ft):**	1400
PLSS:	T04S, R03W, Sec. 34 (S)	**Acres:**	1.0

Location: SAN JACINTO RIVER CHANNEL; CA. 0.25 KM SW OF SAN JACINTO AVENUE BRIDGE, EAST OF PERRIS.
Detailed Location:
Ecological: DISTURBED RIVER CHANNEL ON WILLOWS SOIL.
General: 165 PLANTS SEEN IN 2000 (SURVEYS CONDUCTED IN APRIL-JUNE).
Owner/Manager: PVT

Myosurus minimus ssp. apus

Element Code: PDRAN0H031

little mousetail

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:** **Global:**	G5T2Q
	State:	None	**State:**	S2.2
	Other:	Rare Plant Rank - 3.1		
Habitat:	**General:**	VERNAL POOLS. THIS SUBSPECIES HAS TAXONOMIC PROBLEMS; DISTINGUISHING BETWEEN THIS AND M. SESSILIS IS DIFFICULT. HYBRID?		
	Micro:	ALKALINE SOILS. 20-640M. (NOTE: CENTRAL VALLEY EO'S NOT MAPPED).		

Occurrence No.	10	**Map Index:** 03369	**EO Index:**	21598	**Element Last Seen:**	1980-05-13
Occ. Rank:	Unknown		**Presence:**	Presumed Extant	**Site Last Seen:**	1981-XX-XX
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown	**Record Last Updated:**	1996-04-09

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.80076 / -117.34921	**Accuracy:**	1/5 mile
UTM:	Zone-11 N3740119 E467675	**Elevation (ft):**	2000
PLSS:	T04S, R05W (S)	**Acres:**	0.0

Location: HARFORD SPRINGS COUNTY PARK IN THE GAVILAN HILLS.
Detailed Location:
Ecological: VERNAL POOLS ON BOSANKO CLAY WITH VERONICA PEREGRINA XALAPENSIS.
General: LESS THAN 50 SEEN IN 1980. 1981 RAINS DID NOT FILL POOLS; SO, THERE WAS NO GERMINATION.
Owner/Manager: UNKNOWN

Chloropyron maritimum ssp. maritimum

Element Code: PDSCR0J0C2

salt marsh bird's-beak

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:** **Global:**	G4?T1
	State:	Endangered	**State:**	S1
	Other:	Rare Plant Rank - 1B.2		
Habitat:	**General:**	COASTAL SALT MARSH, COASTAL DUNES.		
	Micro:	LIMITED TO THE HIGHER ZONES OF THE SALT MARSH HABITAT. 0-30M.		

Occurrence No.	16 **Map Index:** 40810	**EO Index:**	34954	**Element Last Seen:**	1888-XX-XX
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1888-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-08-19

Quad Summary: Riverside East (3311783), Redlands (3411712), San Bernardino South (3411713), Fontana (3411714), San Bernardino North (3411723)

County Summary: Riverside, San Bernardino

Lat/Long:	34.05389 / -117.31364	**Accurracy:**	5 miles
UTM:	Zone-11 N3768175 E471054	**Elevation (ft):**	1000
PLSS:	T01S, R04W, Sec. 29 (S)	**Acres:**	0.0

Location: SAN BERNARDINO VALLEY.

Detailed Location: EXACT LOCATION UNKNOWN; MAPPED IN GENERAL VICINITY OF SAN BERNARDINO VALLEY ACCORDING TO NOTE PROVIDED BY SANDERS (2003).

Ecological: ALKALINE MEADOW.

General: SEVERAL COLLECTIONS BY PARISH ATTRIBUTED TO THIS SITE. COLLECTION SITE IS ATYPICAL FOR SPECIES; SPECIMENS MAPPED BY CNDDB DUE TO NOTATION BY CHUANG AND HECKARD (1973) AS BEING INTERMEDIATE TO C. MARITIMUS SSP. CANESCENS.

Owner/Manager: UNKNOWN

Allium munzii

Element Code: PMLIL022Z0

Munz's onion

Listing Status:	**Federal:**	Endangered	**CNDDB Element Ranks:** **Global:**	G1
	State:	Threatened	**State:**	S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive		
Habitat:	**General:**	CHAPARRAL, COASTAL SCRUB, CISMONTANE WOODLAND, PINYON-JUNIPER WOODLAND, VALLEY AND FOOTHILL GRASSLAND.		
	Micro:	HEAVY CLAY SOILS; GROWS IN GRASSLANDS & OPENINGS WITHIN SHRUBLANDS OR WOODLANDS. 300-1035M.		

Occurrence No.	1	**Map Index:**	03317	**EO Index:**	14359	**Element Last Seen:**	1930-XX-XX
Occ. Rank:	None			**Presence:**	Extirpated	**Site Last Seen:**	1998-05-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1998-09-19

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.79338 / -117.37453	**Accuracy:**	specific area
UTM:	Zone-11 N3739309 E465329	**Elevation (ft):**	2100
PLSS:	T04S, R05W, Sec. 26 (S)	**Acres:**	121.4

Location: ALONG LAKE MATTHEWS ROAD, ABOUT 0.5 MILE WEST OF JUNCTION WITH GAVILAN ROAD, GAVILAN PLATEAU.

Detailed Location:

Ecological: IN OPEN GRASSY AREA SURROUNDED BY CHAPARRAL, ON BOSANKO CLAY. ASSOCIATED WITH ZIGADENUS FREMONTII. IN 1998, DICHELOSTEMMA PULCHELLUM WAS PRESENT, BUT NO SIGN OF A. MUNZII.

General: SP SEEN IN 1930. SITE HAD BEEN CONVERTED TO CITRICULTURE WHEN VISITED IN 1981. IN 1998, CITRUS TREES HAD BEEN REMOVED IN PREPARATION FOR A HOUSING AND GOLF DEVELOPMENT PROJECT.

Owner/Manager: PVT

Occurrence No.	2	**Map Index:**	15952	**EO Index:**	17854	**Element Last Seen:**	1998-05-11
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1998-05-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-02-29

Quad Summary: Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.79938 / -117.35021	**Accuracy:**	specific area
UTM:	Zone-11 N3739967 E467582	**Elevation (ft):**	2040
PLSS:	T04S, R05W, Sec. 25 (S)	**Acres:**	59.7

Location: HARFORD SPRINGS COUNTY PARK (ALONG SOUTH BORDER) AND ON HILL ACROSS IDA-LEONA RD, GAVILAN PLATEAU.

Detailed Location: PLANTS N OF IDA-LEONA ROAD ARE ON COUNTY PARK LAND AND ARE SOMEWHAT PROTECTED. PLANTS S OF IDA-LEONA ROAD ARE ON PRIVATE LAND. ENTIRE OCCURRENCE CONSISTED OF 101-1000 PLANTS IN 1981, >5000 PLANTS IN 1986. SEE BELOW FOR MORE YEAR'S DATA.

Ecological: GRASSY OPENING ON CLAY SOIL WITH SCATTERED QUERCUS DUMOSA, JUNIPERUS CALIFORNICA, ERIOGONUM FASCICULATUM, ADENOSTOMA FASCICULATUM, FRITILLARIA BIFLORA, ZIGADENUS FREMONTII, MUILLA MARITIMA, ETC. THE RARE HARPAGONELLA PALMERI ALSO AT SITE.

General: S OF ROAD (PVT PROPERTY): UNK # IN 1987, 1256-6771 IN '90, UNK # IN '91, 4000 IN '92, 6500 IN '93, 5115 IN '94, 2500-5000 IN '98. N OF ROAD (COUNTY PARK): UNK # SEEN IN 1979, < 500 IN '92, 38700 IN '93, 23865 IN '94, 5000-20000 IN '98.

Owner/Manager: RIV COUNTY, PVT

Occurrence No.	16	**Map Index:** 30347	**EO Index:**	4528		**Element Last Seen:**	2003-04-11
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-04-11
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-02-13

Quad Summary: Lake Elsinore (3311763), Alberhill (3311764), Steele Peak (3311773)

County Summary: Riverside

Lat/Long:	33.74596 / -117.37172	**Accurracy:**	specific area
UTM:	Zone-11 N3734051 E465570	**Elevation (ft):**	1800
PLSS:	T05S, R05W, Sec. 11 (S)	**Acres:**	56.0

Location: NORTHEAST OF ALBERHILL, 0.9 MILE NORTH OF CORONA FREEWAY.

Detailed Location: SEVERAL COLONIES MAPPED IN THIS VICINTITY. PLANTS JUST ABOVE POWERLINE ROAD (NOT SHOWN ON TOPO), ABOUT 0.2 MI W OF INTERSECTION WITH MAPPED ROAD. FOUND IN VARIOUS LOCATIONS IN S 1/2 SEC 11 AND NW1/4 SEC 14.

Ecological: OPEN GRASSLAND DOMINATED BY AVENA BARBATA. OTHER ASSOCIATES INCLUDE DELPHINIUM, LASTHENIA CALIFORNICA, BLOOMERIA CALFORNICA, CLARKIA, & BROMUS MOLLIS.

General: UNKNOWN NUMBER OF PLANTS SEEN IN 1989. 300 PLANTS ESTIMATED IN 1993. ABOUT 3000 PLANTS ESTIMATED DURING EXPANDED SURVEY IN 2003.

Owner/Manager: UNKNOWN

Occurrence No.	20	**Map Index:** 49288	**EO Index:**	49288		**Element Last Seen:**	1931-03-23
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1931-03-23
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2008-02-01

Quad Summary: Steele Peak (3311773), Lake Mathews (3311774)

County Summary: Riverside

Lat/Long:	33.80418 / -117.37593	**Accurracy:**	1/5 mile
UTM:	Zone-11 N3740507 E465204	**Elevation (ft):**	1969
PLSS:	T04S, R05W, Sec. 23 (S)	**Acres:**	0.0

Location: GAVILAN PEAK.

Detailed Location: EXACT LOCATION UNKNOWN. SITE MAPPED AT PEAK.

Ecological: HARD, DRY SOIL.

General: ONLY SOURCES OF INFORMATION FOR THIS OCCURRENCE ARE MULTIPLE COLLECTIONS BY TEMPLETON ET AL. AND CLOKEY ET AL. IN 1930 AND 1931. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	23	**Map Index:**	70780	**EO Index:**	71692	**Element Last Seen:**	1999-04-16
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1999-04-16
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2008-02-04

Quad Summary: Steele Peak (3311773)
County Summary: Riverside

Lat/Long:	33.79911 / -117.32676	**Accuracy:**	80 meters
UTM:	Zone-11 N3739930 E469752	**Elevation (ft):**	2223
PLSS:	T04S, R04W, Sec. 29 (S)	**Acres:**	0.0

Location: APPROXIMATELY 0.5 MILE ESE FROM IDA-LEONA MINE AND 0.2 MILE NW OF PEAK 2557.
Detailed Location: MAPPED ACCORDING TO A HAND-DRAWN MAP OF THE AREA. 2 POPULATIONS OF A. MUNZII WERE FOUND IN THIS AREA.
Ecological: ASSOCIATED WITH JUNIPERUS CALIFORNIA, ARTEMISIA CALIFORNICA, LESSINGIA FILAGINIFOLIA, LOTUS SCOPARIUS, ISOMERIS ARBOREA, ERIOPHYLLUM CONFERTIFLORUM, AND NON-NATIVE GRASSES.
General: IN 1999, 10 PLANTS FOUND IN ONE POPULATION & 2 PLANTS IN ANOTHER POPULATION.
Owner/Manager: PVT

Brodiaea filifolia

Element Code: PMLIL0C050

thread-leaved brodiaea

Listing Status:	**Federal:**	Threatened	**CNDDB Element Ranks:**	**Global:** G1
	State:	Endangered		**State:** S1
	Other:	Rare Plant Rank - 1B.1, USFS_S-Sensitive		
Habitat:	**General:**	CHAPARRAL (OPENINGS), CISMONTANE WOODLAND, COASTAL SCRUB, PLAYAS, VALLEY AND FOOTHILL GRASSLAND, VERNAL POOLS.		
	Micro:	USUALLY ASSOCIATED WITH ANNUAL GRASSLAND AND VERNAL POOLS; OFTEN SURR BY SHRUBLAND HABITATS. OCCURS IN OPENINGS ON CLAY SOILS. 25-1120 M.		

Occurrence No.	1	**Map Index:**	03663	**EO Index:**	21809	**Element Last Seen:**	1930-XX-XX
Occ. Rank:	None			**Presence:**	Possibly Extirpated	**Site Last Seen:**	1996-09-XX
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-08

Quad Summary: Romoland (3311762), Perris (3311772)
County Summary: Riverside

Lat/Long:	33.75321 / -117.22350	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3734816 E479300	**Elevation (ft):**	1410
PLSS:	T05S, R03W, Sec. 08 (S)	**Acres:**	0.0

Location: 2 MILES SOUTH OF PERRIS.
Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS.
Ecological: ON CLAY FLATS.
General: LAST SEEN 1930. MAY BE EXTIRPATED AS AREA NOW AGRICULTURAL PER 1983 PRESERVATION PLAN (LARRY LAPRE). ACCORDING TO S. WHITE (1996), SUITABLE HABITAT STILL EXISTS IN THE AREA. MORE SURVEYS ARE NEEDED TO DETERMINE STATUS.
Owner/Manager: PVT

Occurrence No.	2	**Map Index:**	22074	**EO Index:**	15217	**Element Last Seen:**	2000-05-03
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2000-05-03
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-11-08

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.76803 / -117.20909	**Accuracy:**	specific area
UTM:	Zone-11 N3736455 E480638	**Elevation (ft):**	1420
PLSS:	T05S, R03W, Sec. 05 (S)	**Acres:**	45.5

Location: SOUTHEAST OF PERRIS, EAST OF ELLIS AND NORTHEAST OF PERRIS VALLEY AIRPORT.

Detailed Location: ON FLOODPLAIN ON BOTH SIDES OF CASE ROAD, 0.3 TO 0.7 MILE SW OF ELLIS. MAPPED WITHIN THE NW 1/4 OF THE NW 1/4 OF SECTION 4 AND THE NE 1/4 OF SECTION 5.

Ecological: SALTBUSH SCRUB ON SALINE-ALKALINE DOMINO SILTY LOAM/WILLOWS SILTY CLAY SOILS. WITH: SUAEDA SP, HORDEUM SP, SALSOLA IBERICA, ATRIPLEX ARGENTA, ATRIPLEX CORONATA NOTATIOR, AND HEMIZONIA PUNGENS. IN 2000, PLANTS IN DISTURBED ALKALI GRASSLAND.

General: 25 PLANTS SEEN IN 1990, 50 IN 1996, SEARCH WAS EARLY AND NOT THOROUGH. AREA CONTAINS SOME OF THE LAST VALLEY SALTBUSH SCRUB REMAINING IN THE REGION, SHOULD BE PROTECTED AS PRESERVE. 367 PLANTS SOUTH OF ROAD AND 52 NORTH OF ROAD IN 2000.

Owner/Manager: PVT

Occurrence No.	27	**Map Index:**	22073	**EO Index:**	22903	**Element Last Seen:**	1995-05-03
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	1995-05-03
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2007-11-26

Quad Summary: Lakeview (3311771), Perris (3311772)

County Summary: Riverside

Lat/Long:	33.84679 / -117.12783	**Accuracy:**	specific area
UTM:	Zone-11 N3745176 E488173	**Elevation (ft):**	1420
PLSS:	T04S, R02W, Sec. 06 (S)	**Acres:**	35.9

Location: 1 KM NORTH OF LAKEVIEW; SOUTH OF SAN JACINTO WILDLIFE AREA.

Detailed Location: TWO LARGE POPULATION GROUPS; ONE IS 650 FEET WEST OF DAVIS ROAD AND 5-150 FEET NORTH OF MARVIN ROAD, THE OTHER IS 750-1000 FEET NORTH OF MARVIN ROAD AND 100-200 FEET WEST OF DAVIS ROAD.

Ecological: GROWING ON STRONGLY SALINE-ALKALINE WAUKENA LOAM/DOMINO SILT LOAM IN ANNUAL GRASSLAND/ALKALI SINK SCRUB HABITAT. ASSOCIATES INCLUDE HORDEUM DEPRESSUM, PLAGIOBOTHRYS LEPTOCLADUS, LASTHENIA CALIFORNICA, LEPIDIUM DICTYOTUM, AND ATRIPLEX SP.

General: 518 PLANTS SEEN IN 1992. 2580 PLANTS OBSERVED IN 1995. SITE STILL RETAINS A LARGE PORTION OF THE NATIVE FLORA DISTURBED. PART OF THE SAN JACINTO WILDLIFE AREA.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	43	**Map Index:** 31922	**EO Index:**	2132		**Element Last Seen:**	1996-04-22
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1996-04-22
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2007-11-26

Quad Summary: Lakeview (3311771)

County Summary: Riverside

Lat/Long:	33.85597 / -117.11437	**Accuracy:**	specific area
UTM:	Zone-11 N3746192 E489420	**Elevation (ft):**	1400
PLSS:	T04S, R02W, Sec. 05 (S)	**Acres:**	7.0

Location: SAN JACINTO WILDLIFE AREA, 1.2 MILES NORTH OF LAKEVIEW, JUST NORTH OF THE SAN JACINTO RIVER.

Detailed Location: SEVEN COLONIES MAPPED PARALLEL WITH RIVER IN NW1/4 SEC 5. EAST OF DAVIS ROAD AND SOUTH OF THE DIRT ACCESS ROAD.

Ecological: IN ANNUAL GRASSLAND ADJACENT TO ALKALI PLAYA HABITAT. WITH VULPIA MYUROS, BROMUS MADRITENSIS, AVENA BARBATA, HEMIZONIA PUNGENS, AMSINCKIA MENZIESII, SALICORNIA SUBTERMINALIS, AND ISOCOMA MENZIESII. ATRIPLEX CORONATA VAR. NOTATIOR ALSO HERE.

General: 900 PLANTS OBSERVED IN 1995. 45 PLANTS IN FAR WESTERN COLONY IN 1996.

Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	65	**Map Index:** 48071	**EO Index:**	48071		**Element Last Seen:**	2003-04-26
Occ. Rank:	Fair		**Presence:**	Presumed Extant		**Site Last Seen:**	2003-04-26
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2005-04-08

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.78415 / -117.17538	**Accuracy:**	specific area
UTM:	Zone-11 N3738237 E483763	**Elevation (ft):**	1420
PLSS:	T04S, R03W, Sec. 34 (S)	**Acres:**	6.0

Location: 3 MILES EAST OF PERRIS, 0.65 AIR MILE WSW OF JUNCTION OF SAN JACINTO ROAD AND SAN JACINTO AVE, NORTHEAST OF I-15.

Detailed Location: 2 COLONIES, 198 TO 457 METERS SOUTH OF SAN JACINTO AVE AND 853 TO 1100 METERS WEST OF SAN JACINTO ROAD. MAPPED WITHIN THE EAST HALF OF THE NE 1/4 OF SECTION 34.

Ecological: IN DISTURBED ALKALI GRASSLAND WITH HORDEUM MURINUM SSP. LEPORINUM, ATRIPLEX ARGENTEA SSP. MOHAVENSIS, HORDEUM INTERCEDENS, MEDICAGO POLYMORPHA, LEPIDIUM DICTYOTUM, HEMIZONIA PUNGENS SSP. LAEVIS, ATRIPLEX CORONATA VAR. NOTATIOR, ET AL.

General: 115 PLANTS OBSERVED IN 2000, 1 INDIVIDUAL OBSERVED IN 2003. SITE SHOULD BE PROTECTED AS PART OF A SAN JACINTO RIVER CORRIDOR RESERVE.

Owner/Manager: UNKNOWN

Occurrence No.	87	**Map Index:**	78331	**EO Index:**	79249	**Element Last Seen:**	2008-06-26
Occ. Rank:	Poor			**Presence:**	Presumed Extant	**Site Last Seen:**	2008-06-26
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-03-11

Quad Summary: Perris (3311772)

County Summary: Riverside

Lat/Long:	33.77682 / -117.20468	**Accuracy:**	80 meters
UTM:	Zone-11 N3737429 E481048	**Elevation (ft):**	1415
PLSS:	T04S, R03W, Sec. 33 (S)	**Acres:**	0.0

Location: ESCONDIDO FREEWAY (I-215); ~0.4 MI NW OF SAN JACINTO RIVER CROSSING, PERRIS.

Detailed Location: ON N BOUND SIDE OF FREEWAY.

Ecological: DEGRADED VERNAL POOL IN ROADSIDE DITCH.

General: ~25 INDIVIDUALS SEEN IN 2008.

Owner/Manager: UNKNOWN

Calochortus plummerae

Element Code: PMLIL0D150

Plummer's mariposa-lily

Listing Status:
- **Federal:** None
- **State:** None
- **Other:** Rare Plant Rank - 1B.2, USFS_S-Sensitive

CNDDB Element Ranks: **Global:** G3 **State:** S3

Habitat:
- **General:** COASTAL SCRUB, CHAPARRAL, VALLEY AND FOOTHILL GRASSLAND, CISMONTANE WOODLAND, LOWER MONTANE CONIFEROUS FOREST.
- **Micro:** OCCURS ON ROCKY AND SANDY SITES, USUALLY OF GRANITIC OR ALLUVIAL MATERIAL. CAN BE VERY COMMON AFTER FIRE. 90-1610M.

Occurrence No.	5	**Map Index:**	26638	**EO Index:**	1207	**Element Last Seen:**	1978-06-10
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-07-07
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2011-12-07

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.96785 / -117.03576	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3758591 E496695	**Elevation (ft):**	2400
PLSS:	T02S, R02W, Sec. 25 (S)	**Acres:**	0.0

Location: CHERRY VALLEY EXIT OFF I-10; ABOUT 2 MILES SOUTH OF CALIMESA.

Detailed Location:

Ecological: ON SOUTH-FACING SLOPE OF GRASSLAND HILLSIDE.

General: OCCURRENCE KNOWN ONLY FROM A 1978 COLLECTION BY L. BATES. PLANTS COULD NOT BE RELOCATED IN 2003.

Owner/Manager: UNKNOWN

Occurrence No.	6 **Map Index:** 26639	**EO Index:**	17330	**Element Last Seen:**	1932-05-25
Occ. Rank:	None	**Presence:**	Possibly Extirpated	**Site Last Seen:**	1989-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2011-12-01

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.93552 / -117.10816	**Accuracy:**	1 mile
UTM:	Zone-11 N3755012 E490003	**Elevation (ft):**	1800
PLSS:	T03S, R02W, Sec. 05 (S)	**Acres:**	0.0

Location: BADLANDS SOUTHWEST OF BEAUMONT, 1.5 MILES SOUTHWEST OF THE SUMMIT OF MORENO GRADE.
Detailed Location: MAPPED ALONG HIGHWAY 60, ABOUT 1 MILE EAST OF GILMAN SPRINGS ROAD.
Ecological: UPPER SONORAN. DECOMPOSED GRANITE; IN SUN.
General: MAIN SOURCE OF INFORMATION FOR THIS SITE IS 1932 COLLECTION BY WOLF. AREA SEARCHED BETWEEN 1989-1991 BUT NO PLANTS OBSERVED (MCDONALD AND STOKKINK, 1991).
Owner/Manager: UNKNOWN

Occurrence No.	12 **Map Index:** 26646	**EO Index:**	1535	**Element Last Seen:**	1991-XX-XX
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1992-XX-XX
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2009-07-14

Quad Summary: Yucaipa (3411711)
County Summary: San Bernardino

Lat/Long:	34.10391 / -117.01391	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3773677 E498717	**Elevation (ft):**	3400
PLSS:	T01S, R01W, Sec. 08 (S)	**Acres:**	33.6

Location: MILL CREEK CANYON, ALONG HIGHWAY 38 ABOUT 2.8 MILES EAST OF BRYANT STREET.
Detailed Location:
Ecological:
General: 1 PLANT OBSERVED BY MCDONALD AND STOKKINK IN 1991. NONE SEEN IN 1992. AREA FIRST REPORTED IN 1897 COLLECTION BY HALL FROM "LOWER MILL CREEK CANYON".
Owner/Manager: UNKNOWN

Occurrence No.	13	**Map Index:** 26647	**EO Index:**	1533		**Element Last Seen:**	1994-06-15
Occ. Rank:	Good		**Presence:**	Presumed Extant		**Site Last Seen:**	1994-06-15
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	1995-12-07

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.11114 / -117.09350	**Accurracy:**	specific area
UTM:	Zone-11 N3774483 E491376	**Elevation (ft):**	2600
PLSS:	T01S, R02W, Sec. 04 (S)	**Acres:**	4.7

Location: LOWER SANTA ANA RIVER CANYON ABOUT 0.5 MILE NORTHEAST OF THE MOUTH OF DEEP CREEK, SAN BERNARDINO MOUNTAINS.

Detailed Location: JUST ABOVE, AND EAST OF, SEVEN OAKS DAM (UNDER CONSTRUCTION, 1994). ABOVE OLD ACCESS ROAD TO SOUTHERN CALIFORNIA EDISON FLUME LINE. IN THE NW 1/4 OF THE SE 1/4 OF SECTION 4.

Ecological: GRASSY CLEARINGS AND GRANITIC ROCK OUTCROPS IN DIVERSE RIVERSIDEAN SAGE SCRUB/MIXED CHAPARRAL MOSAIC. ASSOCIATED WITH ERIOGONUM FASCICULATUM, YUCCA WHIPPLEI, TOXICODENDRON, SALVIA APIANA, LOTUS SCOPARIUS, BROMUS RUBENS, AND B. TECTORUM.

General: 30 PLANTS OBSERVED IN 1994. PLANTS FOUND ONLY IN CLEARINGS--ABSENT IN AREAS WITH DENSE SHRUB COVER.

Owner/Manager: USFS-SAN BERNARDINO NF

Occurrence No.	14	**Map Index:** 20013	**EO Index:**	1316		**Element Last Seen:**	1991-06-20
Occ. Rank:	Unknown		**Presence:**	Presumed Extant		**Site Last Seen:**	1991-06-20
Occ. Type:	Natural/Native occurrence		**Trend:**	Unknown		**Record Last Updated:**	2004-04-13

Quad Summary: Yucaipa (3411711)

County Summary: San Bernardino

Lat/Long:	34.05836 / -117.09792	**Accurracy:**	3/5 mile
UTM:	Zone-11 N3768631 E490963	**Elevation (ft):**	2200
PLSS:	T01S, R02W, Sec. 28 (S)	**Acres:**	0.0

Location: WEST END OF CRAFTON HILLS, ABOUT 0.5 MILE SOUTHEAST OF CRAFTON RESERVOIR.

Detailed Location: AT EASTERN TERMINUS OF CITRUS AVENUE.

Ecological: GROWING IN BROKEN ROCK OUTCROP IN DRAINAGE ON A NORTH-FACING SLOPE. ASSOCIATED WITH ZAUSCHNERIA CALIFORNICA, ERIOGONUM FASCICULATUM, MIMULUS LONGIFLORUS, ERIGERON FOLIOSUS, ETC.

General: SITE KNOWN FROM 1991 COLLECTION BY WHITE.

Owner/Manager: PVT

Occurrence No.	15	**Map Index:**	35041	**EO Index:**	1260	**Element Last Seen:**	1997-05-13
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1997-05-13
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-18

Quad Summary: Redlands (3411712)
County Summary: San Bernardino

Lat/Long:	34.09897 / -117.14760	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3773139 E486384	**Elevation (ft):**	1500
PLSS:	T01S, R03W, Sec. 12 (S)	**Acres:**	636.3

Location: SANTA ANA RIVER WASH BETWEEN EAST HIGHLANDS AND MENTONE.
Detailed Location: EAST OF ORANGE STREET, SOUTH AND WEST OF GREENSPOT ROAD, NORTH SIDE OF THE RIVER. SUNWEST MATERIALS GRAVEL MINE SITE. EXACT LOCATION UNKNOWN. MAPPED ACCORDING TO T-R-S PROVIDED BY WEAR.
Ecological: ALLUVIAL SLOPE, SETTLING BASINS OF SANDY ROCKY SOIL WITH ERIODICTYON TRICHOCALYLX, RHUS OVATA, ADENOSTOMA FASCICULATA, OPUNTIA PARRYI, AND INTRODUCED GRASSES.
General:
Owner/Manager: PVT

Occurrence No.	56	**Map Index:**	27626	**EO Index:**	944	**Element Last Seen:**	1982-06-24
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	1982-06-24
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	1995-12-01

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.92163 / -117.04756	**Accuracy:**	nonspecific area
UTM:	Zone-11 N3753467 E495603	**Elevation (ft):**	2200
PLSS:	T03S, R02W, Sec. 12 (S)	**Acres:**	22.3

Location: EAST SIDE OF JACKRABBIT TRAIL ABOUT 1.2 MILES SOUTH OF HIGHWAY 60.
Detailed Location: GROWING ON A BANK ON THE EAST SIDE OF THE ROAD THAT IS EXTREMELY STEEP AND DIFFICULT TO ACCESS. WITHIN THE BADLANDS SOUTHWEST OF BEAUMONT.
Ecological:
General: ONLY SOURCE OF INFORMATION IS OBSERVATION BRIEF PROVIDED BY LOWENS.
Owner/Manager: UNKNOWN

Occurrence No.	88	**Map Index:**	60995	**EO Index:**	61031	**Element Last Seen:**	2003-06-11
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-18

Quad Summary: El Casco (3311781)
County Summary: Riverside

Lat/Long:	33.91508 / -117.00970	**Accuracy:**	specific area
UTM:	Zone-11 N3752740 E499102	**Elevation (ft):**	2400
PLSS:	T03S, R01W, Sec. 17 (S)	**Acres:**	9.2

Location: SW OF BEAUMONT. 1.7 AIR MILES SW OF INTERSECTION OF I-10 AND HIGHWAY 60.
Detailed Location:
Ecological: ON CLAY SOILS IN GRASSLAND OPENINGS IN CHAPARRAL. ASSOCIATES INCLUDE: NASSELLA PULCHRA, CHIA, TOYON, SCRUB OAK, BLACK SAGE, CHAMISE, BRASSICA RAPA, BROMUS MADRITENSIS SSP. RUBENS, AND CRYPTANTHA SP.
General: 17 PLANTS OBSERVED IN 2003.
Owner/Manager: PVT

Occurrence No.	89	**Map Index:**	60996	**EO Index:**	61032	**Element Last Seen:**	2003-06-11
Occ. Rank:	Good			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-11
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-18

Quad Summary: Beaumont (3311688), El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.90597 / -117.00093	**Accuracy:**	80 meters
UTM:	Zone-11 N3751730 E499913	**Elevation (ft):**	2548
PLSS:	T03S, R01W, Sec. 17 (S)	**Acres:**	0.0

Location: SW OF BEAUMONT. 0.3 AIR MILE SW OF THE SUMMIT OF MOUNT DAVIS.

Detailed Location: ON BOTH SIDES OF ROAD. IN THE SE 1/4 OF THE SE 1/4 OF SECTION 17.

Ecological: SANDY GRANITE SOILS AMONG IMMATURE COASTAL SCRUB. ASSOCITED INCLUDE: BUCKWHEAT, DEERWEED, FILAGO CALIFORNICA, LESSINGIA FILAGINIFOLIA VAR. FILAGINIFOLIA, RED BROME, ERODIUM CICUTARIUM, EREMOCARPUS SETIGERUS, BROMUS HORDEACEUS, NASSELLA SP.

General: 42 PLANTS OBSERVED IN 2003.

Owner/Manager: PVT

Occurrence No.	90	**Map Index:**	60997	**EO Index:**	61033	**Element Last Seen:**	2002-04-16
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2002-04-16
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2005-04-18

Quad Summary: El Casco (3311781)

County Summary: Riverside

Lat/Long:	33.89068 / -117.02745	**Accuracy:**	2/5 mile
UTM:	Zone-11 N3750036 E497461	**Elevation (ft):**	1900
PLSS:	T03S, R01W, Sec. 19 (S)	**Acres:**	0.0

Location: SW OF BEAUMONT, 1 MILE EAST OF MOUNT EDEN. LABORDE CANYON AND ADJACENT SLOPES AND SIDE CANYONS.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS.

Ecological: CANYON IN STEEP HILLS OF POORLY CONSOLIDATED SILTY SEDIMENTS. CHAPARRAL WITH COASTAL SAGE AND RIPARIAN PATCHES. YUCCA SCHIDIGERA AND OPUNITA LOCALLY COMMON. CHAPARRAL BURNED CIRCA 1999.

General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 2002 COLLECTION BY SANDERS, ET AL. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

Occurrence No.	91	**Map Index:**	60998	**EO Index:**	61034	**Element Last Seen:**	2003-06-17
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-17
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-16

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.97966 / -117.30867	**Accuracy:**	80 meters
UTM:	Zone-11 N3759943 E471487	**Elevation (ft):**	1200
PLSS:	T02S, R04W, Sec. 21 (S)	**Acres:**	0.0

Location: JUST INSIDE BOUNDARY OF BOX SPRINGS MOUNTAIN PARK, IMMEDIATELY NE OF A BEND IN THE RAILROAD, ~1 MILE NE OF UC RIVERSIDE.
Detailed Location:
Ecological: COASTAL SAGE SCRUB, ROCKY SLOPES AND CUTS.
General: 9 PLANTS OBSERVED IN 2003.
Owner/Manager: RIV CO-BOX SPRINGS MTN PARK

Occurrence No.	198	**Map Index:**	80689	**EO Index:**	81704	**Element Last Seen:**	2008-06-18
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2008-06-18
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-16

Quad Summary: San Jacinto (3311678), Lakeview (3311771)
County Summary: Riverside

Lat/Long:	33.85356 / -116.98847	**Accuracy:**	4/5 mile
UTM:	Zone-11 N3745920 E501065	**Elevation (ft):**	2000
PLSS:	T04S, R01W, Sec. 04 (S)	**Acres:**	0.0

Location: SMALL DRAINAGE FLOWING INTO MASSACRE CANYON, WESTERN FOOTHILLS OF THE SAN JACINTO MOUNTAINS.
Detailed Location:
Ecological: FORBLAND DOMINATED BY BRASSICA GENICULATA, DEINANDRA SP, BLOOMERIA CROCEA, ERODIUM CICUTARIUM, AND BROMUS RUBENS.
General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 2008 COLLECTION BY GALVIN.
Owner/Manager: DFG-SAN JACINTO WA

Occurrence No.	202	**Map Index:**	80693	**EO Index:**	81712	**Element Last Seen:**	2003-06-17
Occ. Rank:	Unknown			**Presence:**	Presumed Extant	**Site Last Seen:**	2003-06-17
Occ. Type:	Natural/Native occurrence			**Trend:**	Unknown	**Record Last Updated:**	2010-11-16

Quad Summary: Riverside East (3311783)
County Summary: Riverside

Lat/Long:	33.97410 / -117.29288	**Accuracy:**	80 meters
UTM:	Zone-11 N3759323 E472944	**Elevation (ft):**	2400
PLSS:	T02S, R04W, Sec. 27 (S)	**Acres:**	0.0

Location: 1.1 AIR MILES NW OF BOX SPRINGS LOOKOUT, JUST WEST OF BOX SPRINGS MOUNTAIN ROAD, ABOUT 2 AIR MILES EAST OF UC RIVERSIDE.
Detailed Location: IN THE NW 1/4 OF THE NW 1/4 OF SECTION 27, NEAR A DIRT ROAD.
Ecological:
General: UNKNOWN NUMBER OF PLANTS OBSERVED IN 2003.
Owner/Manager: RIV CO-BOX SPRINGS MTN PARK

Imperata brevifolia **Element Code:** PMPOA3D020

California satintail

Listing Status:	**Federal:**	None	**CNDDB Element Ranks:**	**Global:** G2
	State:	None		**State:** S2.1
	Other:	Rare Plant Rank - 2.1, USFS_S-Sensitive		
Habitat:	**General:**	COASTAL SCRUB, CHAPARRAL, RIPARIAN SCRUB, MOJAVEAN SCRUB, MEADOWS AND SEEPS (ALKALI).		
	Micro:	MESIC SITES, ALKALI SEEPS, RIPARIAN AREAS. 0-500M.		

Occurrence No.	6 **Map Index:** 69056	**EO Index:**	69825	**Element Last Seen:**	1891-07-25
Occ. Rank:	Unknown	**Presence:**	Presumed Extant	**Site Last Seen:**	1891-07-25
Occ. Type:	Natural/Native occurrence	**Trend:**	Unknown	**Record Last Updated:**	2007-04-25

Quad Summary: Yucaipa (3411711), Redlands (3411712)

County Summary: San Bernardino

Lat/Long:	34.07004 / -117.13222	**Accuracy:**	1 mile
UTM:	Zone-11 N3769930 E487799	**Elevation (ft):**	
PLSS:	T01S, R02W, Sec. 19 (S)	**Acres:**	0.0

Location: NEAR MENTONE.

Detailed Location: EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS A BEST GUESS.

Ecological:

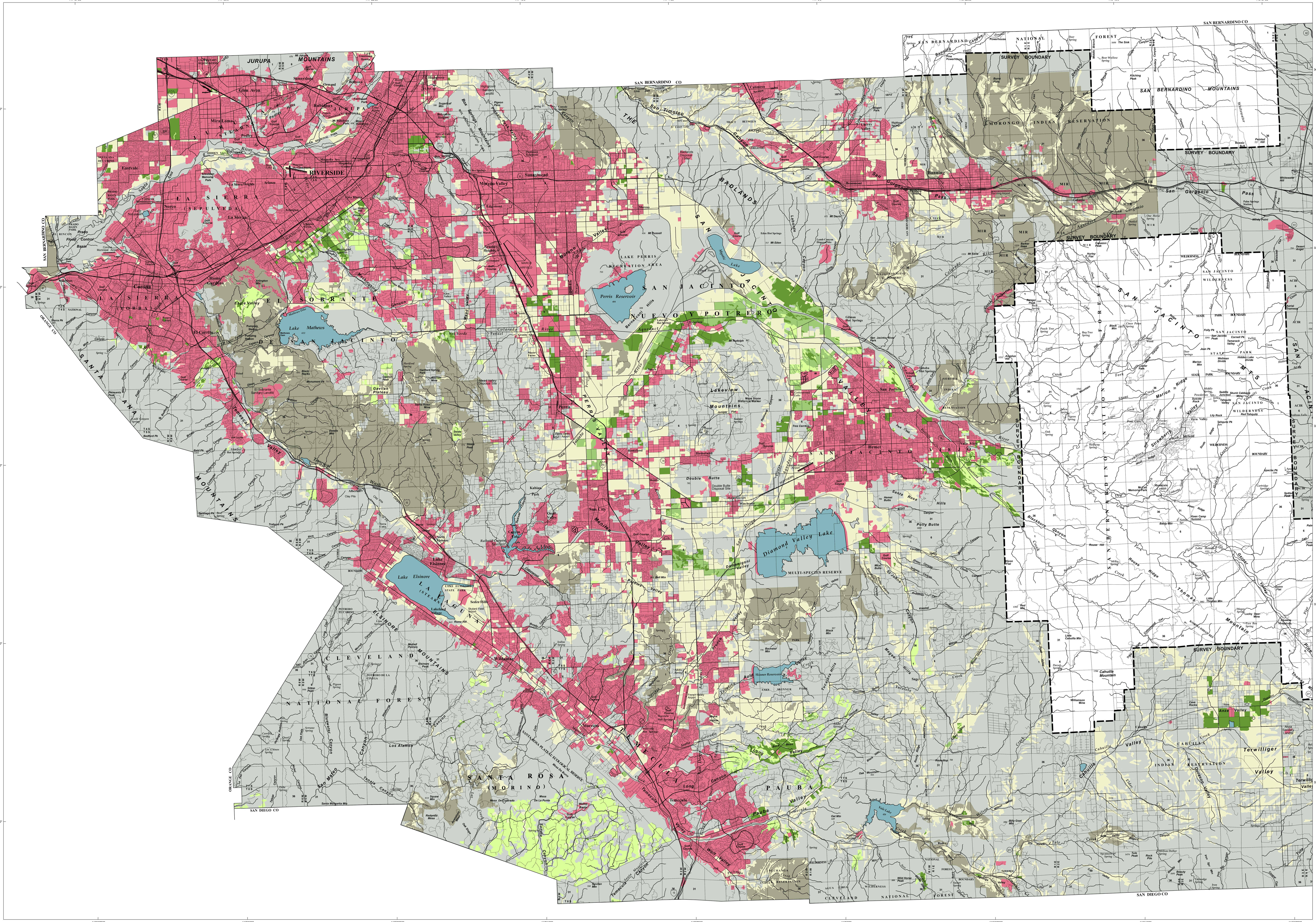
General: ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS AN 1891 COLLECTION BY LEMMON. NEEDS FIELDWORK.

Owner/Manager: UNKNOWN

STATE OF CALIFORNIA
Edmund G. Brown Jr., *Governor*
THE NATURAL RESOURCES AGENCY
John Laird, *Secretary*
DEPARTMENT OF CONSERVATION
Clifford Rechtschaffen, *Interim Director*

RIVERSIDE COUNTY IMPORTANT FARMLAND 2010
SHEET 1 OF 3

CALIFORNIA DEPARTMENT OF CONSERVATION
DIVISION OF LAND RESOURCE PROTECTION
FARMLAND MAPPING AND MONITORING PROGRAM



PRIME FARMLAND - 119,635 acres

PRIME FARMLAND HAS THE BEST COMBINATION OF PHYSICAL AND CHEMICAL FEATURES ABLE TO SUSTAIN LONG-TERM AGRICULTURAL PRODUCTION. THIS LAND HAS THE SOIL QUALITY, GROWING SEASON, AND MOISTURE SUPPLY NEEDED TO PRODUCE SUSTAINED HIGH YIELDS. LAND MUST HAVE BEEN USED FOR IRRIGATED AGRICULTURAL PRODUCTION AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.

FARMLAND OF STATEWIDE IMPORTANCE - 44,086 acres

FARMLAND OF STATEWIDE IMPORTANCE IS SIMILAR TO PRIME FARMLAND BUT WITH MINOR SHORTCOMINGS, SUCH AS GREATER SLOPES OR LESS ABILITY TO STORE SOIL MOISTURE. LAND MUST HAVE BEEN USED FOR IRRIGATED AGRICULTURAL PRODUCTION AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.

UNIQUE FARMLAND - 35,391 acres

UNIQUE FARMLAND CONSISTS OF LESSER QUALITY SOILS USED FOR THE PRODUCTION OF THE STATE'S LEADING AGRICULTURAL CROPS. THIS LAND IS USUALLY IRRIGATED, BUT MAY INCLUDE NONIRRIGATED ORCHARDS OR VINEYARDS AS FOUND IN SOME CLIMATIC ZONES IN CALIFORNIA. LAND MUST HAVE BEEN CROPPED AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.

FARMLAND OF LOCAL IMPORTANCE - 229,877 acres

SOILS THAT WOULD BE CLASSIFIED AS PRIME AND STATEWIDE BUT LACK AVAILABLE IRRIGATION WATER. LANDS PLANTED TO DRYLAND CROPS OF BARLEY, OATS, AND WHEAT.

LANDS PRODUCING MAJOR CROPS FOR RIVERSIDE COUNTY BUT THAT ARE NOT LISTED AS UNIQUE CROPS. THESE CROPS ARE IDENTIFIED AS RETURNING ONE MILLION OR MORE DOLLARS ON THE 1980 RIVERSIDE COUNTY AGRICULTURE CROP REPORT. CROPS IDENTIFIED ARE PERMANENT PASTURE (IRRIGATED), SUMMER SQUASH, OKRA, EGGPLANT, RADISHES, AND WATERMELONS.

DAIRYLANDS, INCLUDING CORRALS, PASTURE, MILKING FACILITIES, HAY AND MANURE STORAGE AREAS IF ACCOMPANIED WITH PERMANENT PASTURE OR HAYLAND OF 10 ACRES OR MORE.

LANDS IDENTIFIED BY CITY OR COUNTY ORDINANCE AS AGRICULTURAL ZONES OR CONTRACTS, WHICH INCLUDES RIVERSIDE CITY "PROPOSITION R" LANDS. LANDS PLANTED TO JOJOBA WHICH ARE UNDER CULTIVATION AND ARE OF PRODUCING AGE.

GRAZING LAND - 110,841 acres

GRAZING LAND IS LAND ON WHICH THE EXISTING VEGETATION IS SUITED TO THE GRAZING OF LIVESTOCK.

URBAN AND BUILT-UP LAND - 321,553 acres

URBAN AND BUILT-UP LAND IS OCCUPIED BY STRUCTURES WITH A BUILDING DENSITY OF AT LEAST 1 UNIT TO 1.5 ACRES, OR APPROXIMATELY 6 STRUCTURES TO A 10-ACRE PARCEL. COMMON EXAMPLES INCLUDE RESIDENTIAL, INDUSTRIAL, COMMERCIAL, INSTITUTIONAL FACILITIES, CEMETERIES, AIRPORTS, GOLF COURSES, SANITARY LANDFILLS, SEWAGE TREATMENT, AND WATER CONTROL STRUCTURES.

OTHER LAND - 1,020,717 acres

OTHER LAND IS LAND NOT INCLUDED IN ANY OTHER MAPPING CATEGORY. COMMON EXAMPLES INCLUDE LOW DENSITY RURAL DEVELOPMENTS, BRUSH, TIMBER, WETLAND, AND RIPARIAN AREAS NOT SUITABLE FOR LIVESTOCK GRAZING, CONFINED LIVESTOCK, POULTRY, OR AQUACULTURE FACILITIES, STRIP MINES, BORROW PITS, AND WATER BODIES SMALLER THAN 40 ACRES. VACANT AND NONAGRICULTURAL LAND SURROUNDED ON ALL SIDES BY URBAN DEVELOPMENT AND GREATER THAN 40 ACRES IS MAPPED AS OTHER LAND.

WATER - 62,361 acres

PERENNIAL WATER BODIES WITH AN EXTENT OF AT LEAST 40 ACRES.

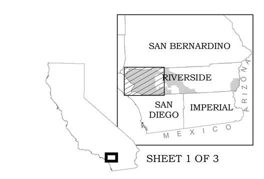
SCALE: 1:100,000
1 inch represents approximately 1.6 miles

Kilometers: 1 0 1 2 3 4 5 6 7 8 9 10
Miles: 1 0 1 2 3 4 5

10 | 40 | 160 | 1 mile

The minimum land use mapping unit is 10 acres, except Water which is mapped to a minimum of 40 acres.

1 square mile = 640 acres



SHEET 1 OF 3

Total County Area - 4,672,901 acres
Mapped Area - 1,944,461 acres

Important Farmland Maps are compiled by the Farmland Mapping and Monitoring Program (FMMP) pursuant to Section 65570 of the California Government Code. To create the maps, FMMP combines current land use information with U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS) soil survey data. Soil units qualifying for Prime Farmland and Farmland of Statewide Importance are determined by the NRCS. Changes to soil profiles subsequent to publication of NRCS soil surveys are not reflected on this map. This map was developed using NRCS digital soil data (SSURGO) and may contain individual soil units as small as one acre.

Land use status is determined using current and historic aerial imagery, supplemental GIS data, and field verification. Imagery sources may include public domain datasets, web-based information, and commercially purchased data, depending on data availability. Supplemental data on land management status is obtained from federal, state, and local governments. Map reviewers at the local level contribute valuable information with their comments and suggestions. Please refer to FMMP field analyst reports for each county to obtain specific citations.

Cultural base information for the Important Farmland Maps was derived from public domain data sets, based upon design of the U.S. Geological Survey, with updates generated by digitizing over current imagery.

This map should be used within the limits of its purpose - as a current inventory of agricultural land resources. This map does not necessarily reflect general plan or zoning designations, city limit lines, changing economic or market conditions, or other factors which may be taken into consideration when land use policies are determined. This map is not designed for parcel-specific planning purposes due to its scale and the ten-acre minimum land use mapping unit. Classification of important farmland and urban areas on this map is based on best available data. The information has been delineated as accurately as possible at 1:24,000-scale, but no claim to meet 1:24,000 National Map Accuracy Standards is made due to variations in the quality of source data.

The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose.

Additional data is available at www.conservation.ca.gov/dlrp/fmmp, including detail on the program, full size PDF maps, map categories, statistics, field summaries, and GIS data for download. Contact the:

Farmland Mapping and Monitoring Program
801 K Street, MS 18-01
Sacramento, CA 95814
Phone: (916) 324-0859
e-mail: fmmp@conservation.ca.gov

Map published January 2012.

Substation
John F Kennedy Drive/Kitching Street
Moreno Valley, CA 92551

Inquiry Number: 03250918.1r
February 01, 2012

The EDR Radius Map™ Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

JOHN F KENNEDY DRIVE/KITCHING STREET
MORENO VALLEY, CA 92551

COORDINATES

Latitude (North):	33.9020000 - 33˚ 54' 7.20''
Longitude (West):	117.2186000 - 117˚ 13' 6.96''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	479789.1
UTM Y (Meters):	3751117.5
Elevation:	1528 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	33117-H2 SUNNYMEAD, CA
Most Recent Revision:	1980

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2009, 2010
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

Proposed NPL - - - - - - - - - - - - - - - - Proposed National Priority List Sites

EXECUTIVE SUMMARY

NPL LIENS - - - - - Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL - - - - - National Priority List Deletions

Federal CERCLIS list

CERCLIS - - - - - Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY - - - - - Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP - - - - - CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS - - - - - Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF - - - - - RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG - - - - - RCRA - Large Quantity Generators
RCRA-CESQG - - - - - RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS - - - - - Engineering Controls Sites List
US INST CONTROL - - - - - Sites with Institutional Controls

State- and tribal - equivalent NPL

RESPONSE - - - - - State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF - - - - - Solid Waste Information System

State and tribal leaking storage tank lists

SLIC - - - - - Statewide SLIC Cases
INDIAN LUST - - - - - Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

INDIAN UST - - - - - Underground Storage Tanks on Indian Land
FEMA UST - - - - - Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP - - - - - Voluntary Cleanup Priority Listing
VCP - - - - - Voluntary Cleanup Program Properties

EXECUTIVE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS.......... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9.......... Torres Martinez Reservation Illegal Dump Site Locations
ODI.......... Open Dump Inventory
WMUDS/SWAT.......... Waste Management Unit Database
INDIAN ODI.......... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL.......... Clandestine Drug Labs
HIST Cal-Sites.......... Historical Calsites Database
Toxic Pits.......... Toxic Pits Cleanup Act Sites
US HIST CDL.......... National Clandestine Laboratory Register

Local Land Records

LIENS 2.......... CERCLA Lien Information
LUCIS.......... Land Use Control Information System
LIENS.......... Environmental Liens Listing
DEED.......... Deed Restriction Listing

Records of Emergency Release Reports

HMIRS.......... Hazardous Materials Information Reporting System
LDS.......... Land Disposal Sites Listing
MCS.......... Military Cleanup Sites Listing

Other Ascertainable Records

DOT OPS.......... Incident and Accident Data
FUDS.......... Formerly Used Defense Sites
CONSENT.......... Superfund (CERCLA) Consent Decrees
UMTRA.......... Uranium Mill Tailings Sites
MINES.......... Mines Master Index File
TRIS.......... Toxic Chemical Release Inventory System
TSCA.......... Toxic Substances Control Act
FTTS.......... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS.......... FIFRA/TSCA Tracking System Administrative Case Listing
SSTS.......... Section 7 Tracking Systems
ICIS.......... Integrated Compliance Information System
PADS.......... PCB Activity Database System
MLTS.......... Material Licensing Tracking System
RADINFO.......... Radiation Information Database
RAATS.......... RCRA Administrative Action Tracking System
CA BOND EXP. PLAN.......... Bond Expenditure Plan
WDS.......... Waste Discharge System

EXECUTIVE SUMMARY

Cortese	"Cortese" Hazardous Waste & Substances Sites List
HIST CORTESE	Hazardous Waste & Substance Site List
Notify 65	Proposition 65 Records
DRYCLEANERS	Cleaner Facilities
WIP	Well Investigation Program Case List
ENF	Enforcement Action Listing
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
FINANCIAL ASSURANCE	Financial Assurance Information Listing
HWP	EnviroStor Permitted Facilities Listing
HWT	Registered Hazardous Waste Transporter Database
PCB TRANSFORMER	PCB Transformer Registration Database
PROC	Certified Processors Database
MWMP	Medical Waste Management Program Listing
COAL ASH DOE	Sleam-Electric Plan Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants
EDR Historical Auto Stations	EDR Proprietary Historic Gas Stations
EDR Historical Cleaners	EDR Proprietary Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.

A review of the NPL list, as provided by EDR, and dated 06/30/2011 has revealed that there is 1 NPL site within approximately 1.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR RESERVE BASE	***610 MEYER DRIVE BLDG 24***	***W 1 - 2 (1.426 mi.)***	***0***	***8***

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 06/15/2011 has revealed that there are 3 RCRA-SQG sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON STATION 2 01457	***15061 PERRIS BLVD***	***W 1/4 - 1/2 (0.363 mi.)***	***L31***	***62***
ARMADA ELEMENTARY	25201 JFK DR	W 1/4 - 1/2 (0.367 mi.)	L35	64

Lower Elevation	Address	Direction / Distance	Map ID	Page
CITY MAINT YARD MORENO VALLEY	***15670 PERRIS BLVD***	***SSW 1/2 - 1 (0.674 mi.)***	***U74***	***94***

Federal ERNS list

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 10/03/2011 has revealed that there are 2 ERNS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
25253 BILLIE DRIVE	25253 BILLIE DRIVE	NNW 1/4 - 1/2 (0.428 mi.)	J49	77

Lower Elevation	Address	Direction / Distance	Map ID	Page
YORLANDA AND SHIELA	YORLANDA AND SHIELA	SW 1/4 - 1/2 (0.476 mi.)	64	89

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 12/13/2011 has revealed that there are 4 ENVIROSTOR sites within approximately 1.5 miles of the target property.

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BADGER SPRINGS MIDDLE SCHOOL E	***24750 DELPHINIUM AVENUE***	***WNW 1/2 - 1 (0.718 mi.)***	***75***	***98***
Status: No Further Action				
PROPOSED ALESSANDRO ADMINISTRA	***ALESSANDRO BOULEVARD/CH***	***NNE 1 - 2 (1.007 mi.)***	***85***	***134***
Status: No Further Action				
BAY AVENUE ELEMENTARY SCHOOL	***24801 BAY AVENUE***	***NNW 1 - 2 (1.360 mi.)***	***87***	***142***
Status: No Further Action				

Lower Elevation	Address	Direction / Distance	Map ID	Page
INDIAN MIDDLE SCHOOL	***INDIAN AVENUE / IRIS AV***	***SW 1 - 2 (1.222 mi.)***	***86***	***137***
Status: Certified				

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 12/19/2011 has revealed that there are 6 LUST sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIVERSIDE CO FIRE STATION	***15111***	***W 1/2 - 1 (0.867 mi.)***	***V77***	***118***
Status: Completed - Case Closed				
RVSD CO FIRE STATION #65	15111 INDIAN ST	W 1/2 - 1 (0.867 mi.)	V78	120
RIVERSIDE CO FIRE STATION #65	15111 INDIAN ST	W 1/2 - 1 (0.867 mi.)	V79	121

Lower Elevation	Address	Direction / Distance	Map ID	Page
SHELL SERVICE STATION	***15980 PERRIS BLVD***	***SSW 1/2 - 1 (0.915 mi.)***	***W82***	***122***
Status: Open - Remediation				
SHELL PERRIS BLVD.	15980 PERRIS BLVD.	SSW 1/2 - 1 (0.915 mi.)	W83	133
SHELL PERRIS BLVD.	15980 PERRIS BLVD.	SSW 1/2 - 1 (0.915 mi.)	W84	134

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 12/19/2011 has revealed that there is 1 UST site within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SEVEN ELEVEN STORE #33157	15020 PERRIS BLVD	W 1/4 - 1/2 (0.359 mi.)	L29	61

AST: The Aboveground Storage Tank database contains registered ASTs. The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the AST list, as provided by EDR, and dated 08/01/2009 has revealed that there is 1 AST site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CORPORATE YARD	15670 PERRIS BLVD	SSW 1/2 - 1 (0.674 mi.)	U73	94

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 12/12/2011 has revealed that there are 3 SWRCY sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MORENO VALLEY RECYCLING 3	14940 PERRIS BLVD	WNW 1/4 - 1/2 (0.371 mi.)	L40	69

Lower Elevation	Address	Direction / Distance	Map ID	Page
WORASING RECYCLING	15928 PERRIS BLVD	SSW 1/2 - 1 (0.877 mi.)	W80	122
EARTHWIZE RECYCLING	25900 IRIS AVE	SE 1/2 - 1 (0.878 mi.)	81	122

HAULERS: A listing of registered waste tire haulers.

A review of the HAULERS list, as provided by EDR, and dated 09/14/2011 has revealed that there is 1 HAULERS site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
GAR-CAST	25942 PASEO PACIFICO	SE 1/4 - 1/2 (0.497 mi.)	S71	92

Local Lists of Hazardous waste / Contaminated Sites

SCH: This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category. depending on the level of threat to public health and safety or the. environment they pose.

A review of the SCH list, as provided by EDR, and dated 12/13/2011 has revealed that there is 1 SCH site within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BADGER SPRINGS MIDDLE SCHOOL E	***24750 DELPHINIUM AVENUE***	***WNW 1/2 - 1 (0.718 mi.)***	***75***	***98***

CDL: A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

A review of the CDL list, as provided by EDR, and dated 06/30/2011 has revealed that there are 5 CDL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	14710 AGAVE ST	NNW 1/4 - 1/2 (0.331 mi.)	J20	56
Not reported	***14740 PERRIS BLVD***	***NW 1/4 - 1/2 (0.472 mi.)***	***P62***	***87***

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	25328 FAY AVE	SSW 1/8 - 1/4 (0.203 mi.)	D11	51
Not reported	***25095 GENTIAN STREET***	***SW 1/4 - 1/2 (0.455 mi.)***	***R58***	***83***
Not reported	25030 GENTIAN ST	SW 1/4 - 1/2 (0.493 mi.)	R70	92

Local Lists of Registered Storage Tanks

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K STORE #531	***15310 PERRIS BLVD***	***WSW 1/4 - 1/2 (0.397 mi.)***	***K45***	***72***

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K STORE #531	***15310 PERRIS BLVD***	***WSW 1/4 - 1/2 (0.397 mi.)***	***K45***	***72***

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K STORE #531	***15310 PERRIS BLVD***	***WSW 1/4 - 1/2 (0.397 mi.)***	***K45***	***72***

EXECUTIVE SUMMARY

Records of Emergency Release Reports

CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CHMIRS list, as provided by EDR, and dated 12/31/2010 has revealed that there are 6 CHMIRS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported Date Completed: 26-APR-91	PERRIS BLVD, AND JOHN K	W 1/4 - 1/2 (0.432 mi.)	L51	78
Not reported	***14740 PERRIS BLVD***	***NW 1/4 - 1/2 (0.472 mi.)***	***P62***	***87***

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	25328 FAY ST	SSW 1/8 - 1/4 (0.205 mi.)	D12	51
Not reported	25164 JUANITA STREET	SW 1/4 - 1/2 (0.374 mi.)	M41	69
Not reported	25991 CORIANDER CT.	E 1/4 - 1/2 (0.443 mi.)	54	80
Not reported	***25095 GENTIAN STREET***	***SW 1/4 - 1/2 (0.455 mi.)***	***R58***	***83***

Other Ascertainable Records

RCRA-NonGen: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA-NonGen list, as provided by EDR, and dated 06/15/2011 has revealed that there are 3 RCRA-NonGen sites within approximately 0.75 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K STORE #531	***15310 PERRIS BLVD***	***WSW 1/4 - 1/2 (0.397 mi.)***	***K45***	***72***
GARCIA TRUCKING	***25121 DANA LN***	***SSW 1/2 - 1 (0.536 mi.)***	***R72***	***93***
ROCAMI TRUCKING	26170 CALLE ALTO	ESE 1/2 - 1 (0.749 mi.)	76	101

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

A review of the DOD list, as provided by EDR, and dated 12/31/2005 has revealed that there is 1 DOD site within approximately 1.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR FORCE BASE (CLOSED)		W 1 - 2 (1.422 mi.)	0	8

EXECUTIVE SUMMARY

ROD: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, and dated 09/28/2011 has revealed that there is 1 ROD site within approximately 1.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MARCH AIR RESERVE BASE	***610 MEYER DRIVE BLDG 24***	***W 1 - 2 (1.426 mi.)***	***0***	***8***

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 08/02/2011 has revealed that there are 4 FINDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON STATION 2 01457	***15061 PERRIS BLVD***	***W 1/4 - 1/2 (0.363 mi.)***	***L31***	***62***
ARMADA ELEMENTARY	25201 JOHN F. KENNEDY D	W 1/4 - 1/2 (0.367 mi.)	L33	64

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K STORE #531	***15310 PERRIS BLVD***	***WSW 1/4 - 1/2 (0.397 mi.)***	***K45***	***72***
VISTA DEL LAGO HIGH	15150 LASSELLE ST	E 1/4 - 1/2 (0.493 mi.)	Q68	90

NPDES: A listing of NPDES permits, including stormwater.

A review of the NPDES list, as provided by EDR, and dated 11/21/2011 has revealed that there are 2 NPDES sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
OAKWOOD APARTMENTS	15168 PERRIS BLVD	W 1/4 - 1/2 (0.369 mi.)	37	66
APN 484 242 016	DELPHINIUM AVE & PERRIS	NW 1/4 - 1/2 (0.441 mi.)	P52	79

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

A review of the HAZNET list, as provided by EDR, and dated 12/31/2010 has revealed that there are 49 HAZNET sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HUD INTOWN PROPERTIES	25487 EL GRECO DR	NNW 0 - 1/8 (0.034 mi.)	2	47
HOUSING URBAN DEV .	14795 MAGELLAN DR	NNE 1/8 - 1/4 (0.126 mi.)	B6	49

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ARMADA ELEMENTARY	25201 JOHN F KENNEDY DR	W 1/8 - 1/4 (0.168 mi.)	C7	49
MORENO VALLEY USD - ARMADA ELE	25201 JOHN F KENNEDY DR	W 1/8 - 1/4 (0.168 mi.)	C8	50
WILLIE WOHLFORD	25554 ERICSON DR	NNE 1/8 - 1/4 (0.183 mi.)	B9	50
HUD INTOWN PROPERTIES	14916 RIO GRANDE DR	ENE 1/8 - 1/4 (0.218 mi.)	E13	53
INTOWN PROPERTIES, INC/HUD	14858 RIO GRANDE	ENE 1/8 - 1/4 (0.245 mi.)	E15	54
HUD/INTOWN	25776 PARSLEY AVE	ENE 1/4 - 1/2 (0.303 mi.)	E16	54
INTOWN PROPERTIES, INC/HUD	25772 DELPHININUM AVE	NE 1/4 - 1/2 (0.326 mi.)	H18	55
INTOWN PROPERTIES INC/HUD	14924 TARRAGON WY	E 1/4 - 1/2 (0.329 mi.)	I19	56
HUD INTOWN PROPERTIES	25760 DELEPHINIUM	NE 1/4 - 1/2 (0.336 mi.)	H21	56
INTOWN PROPERTIES, INC/HUD	25852 PARSLEY AVE	ENE 1/4 - 1/2 (0.354 mi.)	I25	58
INTOWN PROPERTIES INC/HUD	14794 TARRAGON WY	ENE 1/4 - 1/2 (0.356 mi.)	I26	59
HUD INTOWN PROPERTIES	25316 OCONTO CT	NNW 1/4 - 1/2 (0.357 mi.)	27	59
7-ELEVEN #33157	15020 PERRIS BLVD	W 1/4 - 1/2 (0.359 mi.)	L28	60
ARMADA ELEMENTARY SCHOOL	25201 JOHN F KENNEDY DR	W 1/4 - 1/2 (0.367 mi.)	L34	64
CALIFORNIA CLEANERS	14940 PERRIS BLVD	WNW 1/4 - 1/2 (0.371 mi.)	L38	67
INTOWN PROPERTIES, INC/HUD	25871 PARSLEY AVE	ENE 1/4 - 1/2 (0.378 mi.)	I42	70
EXPRESS 1HR PHOTO & MAILING	14910 PERRIS BLVD #K	WNW 1/4 - 1/2 (0.384 mi.)	N43	71
CVS PHARMACY #8439	15025 PERRIS BLVD	W 1/4 - 1/2 (0.389 mi.)	L44	71
COUNTRY WIDE FIELD SERVICES	25273 BILLIE DR	NNW 1/4 - 1/2 (0.424 mi.)	J47	76
HUD	14771 CROFTBORRO RD	WNW 1/4 - 1/2 (0.426 mi.)	N48	76
HUD INTOWN PROPERTIES	14803 ROSEMARY AVE	ENE 1/4 - 1/2 (0.431 mi.)	O50	77
INTOWN PROPERTIES INC	14656 CANDOR CT	NE 1/4 - 1/2 (0.452 mi.)	55	81
INTOWN PROPERTIES INC/HUD	14533 COCHITI DR	NNW 1/4 - 1/2 (0.453 mi.)	57	82
INTOWN PROPERTIES INC/HUD	14955 DOVEHURST ST	W 1/4 - 1/2 (0.463 mi.)	60	86
INTOWN PROPERTIES, INC/HUD	14844 CURRY	ENE 1/4 - 1/2 (0.468 mi.)	O61	86

Lower Elevation	Address	Direction / Distance	Map ID	Page
HUD INTOWN PROPERTIES	25620 SAN LUPE AVE	E 0 - 1/8 (0.033 mi.)	A1	46
INTOWN PROPERTIES, INC/HUD	25572 SAN LUPE AVE	E 0 - 1/8 (0.034 mi.)	A3	47
INTOWN PROPERTIES INC/HUD	25540 SAN LUPE AVE	SE 0 - 1/8 (0.041 mi.)	A4	48
INTOWN PROPERTIES, INC/HUD	15196 CANDICE CT	SSW 0 - 1/8 (0.094 mi.)	5	48
HUD C/O GOLDEN FEATHER REALITY	25625 VISTA FAMOSO	SE 1/8 - 1/4 (0.186 mi.)	10	51
INTOWN PROPERTIES INC/HUD	25237 FILAGREE AVE	SW 1/8 - 1/4 (0.237 mi.)	F14	53
HUD INTOWN PROPERTIES	25387 JUANITA AVE	S 1/4 - 1/2 (0.310 mi.)	G17	54
INTOWN PROPERTIES, INC/HUD	25118 YOLANDA AVE	SW 1/4 - 1/2 (0.340 mi.)	F22	57
INTOWN PROPERTIES INC/HUD	25107 YOLANDA AVE	SW 1/4 - 1/2 (0.346 mi.)	F23	58
CITY OF MORENO VALLEY/REDEV AG	25051 FILAREE AVE	WSW 1/4 - 1/2 (0.353 mi.)	K24	58
HUD INTOWN PROPERTIES	15468 ELEANOR LN	SSW 1/4 - 1/2 (0.363 mi.)	M30	61
INTOWN PROPERTIES, INC/HUD	25402 GENTIAN AVE	S 1/4 - 1/2 (0.367 mi.)	G32	63
MILES PRESERVATION LLC	25605 CATALEJO LN	SSE 1/4 - 1/2 (0.419 mi.)	46	75
INTOWN PROPERTIES INC/HUD	25296 WENDY WY	SSW 1/4 - 1/2 (0.443 mi.)	M53	80
HUD INTOWN PROPERTIES	25969 MARGARET AVE	ESE 1/4 - 1/2 (0.453 mi.)	Q56	82
Not reported	***25095 GENTIAN STREET***	***SW 1/4 - 1/2 (0.455 mi.)***	***R58***	***83***
HUD IN TOWN PROPERTIES	25230 WENDY WAY	SSW 1/4 - 1/2 (0.458 mi.)	M59	85
BANK OF AMERICA FIELD SERVICES	25828 CASA FANTASTICO D	SE 1/4 - 1/2 (0.474 mi.)	S63	88
INTOWN PROPERTIES INC/HUD	15606 PATRICIA ST	S 1/4 - 1/2 (0.481 mi.)	T65	89
HUD INTOWN PROPERTIES	25294 DANA LN	SSW 1/4 - 1/2 (0.487 mi.)	T66	89
INTOWN PROPERTIES, INC/HUD	15327 LOS ESTADOS ST	ESE 1/4 - 1/2 (0.492 mi.)	Q67	90
MVUSD- VISTA DEL LAGO HIGH SCH	15150 LASSELLE ST	E 1/4 - 1/2 (0.493 mi.)	Q69	91

EXECUTIVE SUMMARY

EMI: Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies

A review of the EMI list, as provided by EDR, and dated 12/31/2008 has revealed that there are 2 EMI sites within approximately 0.5 miles of the target property.

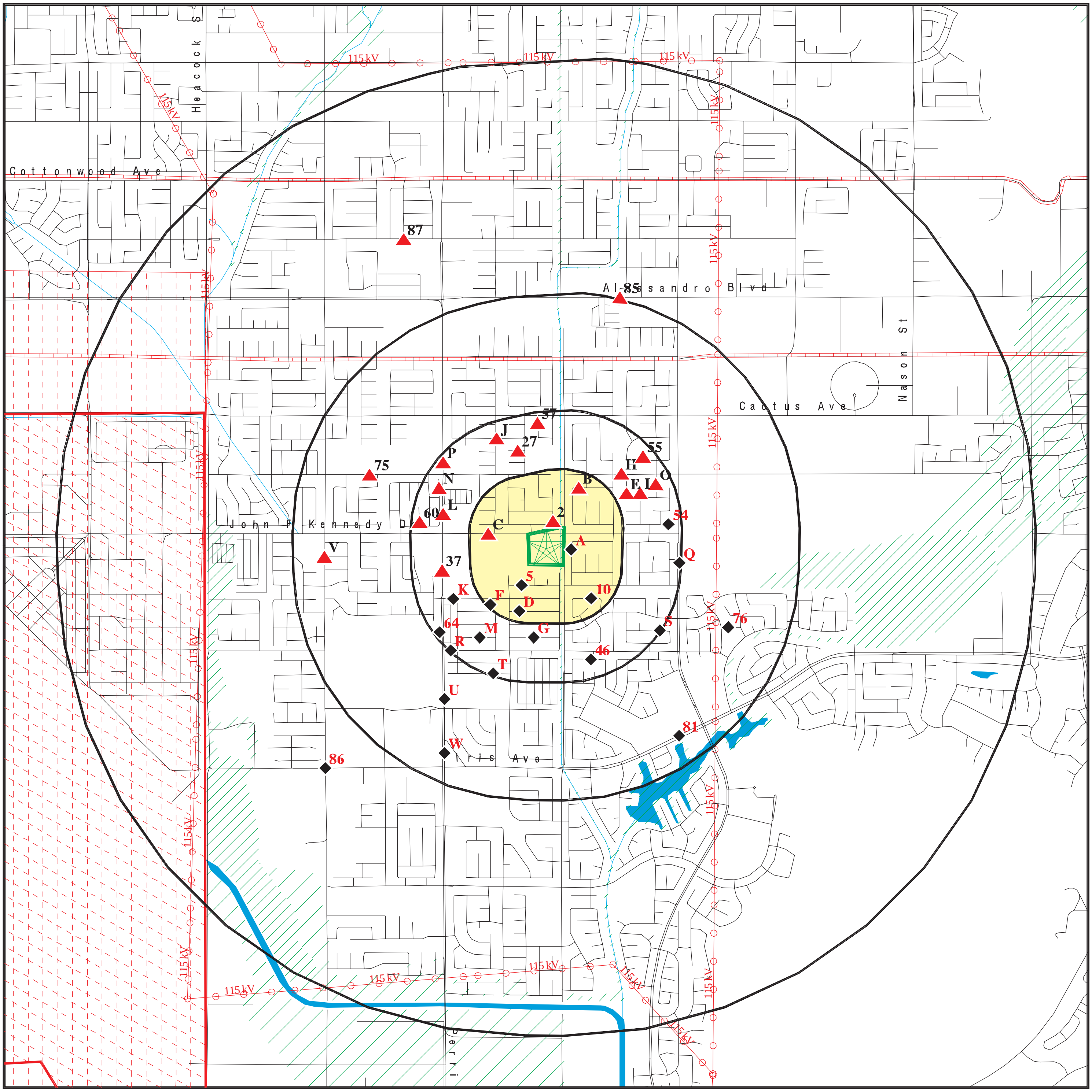
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STEER N’ STEIN MORENO VALLEY	14950 PERRIS BL	WNW 1/4 - 1/2 (0.368 mi.)	L36	66
CALIFORNIA CLEANERS, B & E CON	14940 PERRIS BLVD.	WNW 1/4 - 1/2 (0.371 mi.)	L39	68

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 31 records.

Site Name	Database(s)
INDIAN MIDDLE SCHOOL	NPDES
TRACT NO 31129 CELEBRATION 2	NPDES
26 UNITS	NPDES
CONCOURSE AT CENTERPOINT	NPDES
GLOBAL PREMIER DEVELOPMENT PERRISE	NPDES
MORENO VALLEY REGIONAL EDUCATION C	NPDES
TRACT NO 33256	NPDES
MORENO VALLEY COMMERCIAL CENTER	NPDES
SAN MICHELE ROAD PHASE 2	NPDES
TRACT NO 29920 GRANDE VISTS & IRIS	NPDES
RANCHO DORADO APARTMENTS	NPDES
VIP MORENO VALLEY	NPDES
K 4 SITE	NPDES
EMWD MORENO #1 PUMPING PLANT	SWEEPS UST
HIGHWAY 60 @ GILMAN SPRINGS RD	CDL
1500 BLK. PERRIS BLVD	CDL
BOX SPRINGS RD & HWY 215 (SEE	CDL
HOWARD LEE PROPERTY	LUST SAN MATEO
SHELL MORENO	LUST SAN MATEO
SHELL	HAZNET
ARCO PRODUCTS COMPANY	HAZNET
JETCO UNDERGROUND & UTILITIES	HAZNET
VINCENT A FRIETAS	HAZNET
HUD IN TOWN PROPERTIES	HAZNET
WESTERN CONSTRUCTION AUCTION INC	HAZNET
MICHEAL JAMES BROWNING	HAZNET
LEVEL ONE ENGINEERING YARD	HAZNET
FIVE MILE CAPITAL PARTNERS LLC	HAZNET
URENAS AUTOPART & SVC	RCRA-SQG,FINDS
PROPOSED ALTERNATIVE SCHOOL SITE	SCH,ENVIROSTOR
EASTERN MUNICIPAL WATER DISTRI	EMI

OVERVIEW MAP - 03250918.1r



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 | 1/2 | 1 | 2 Miles

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

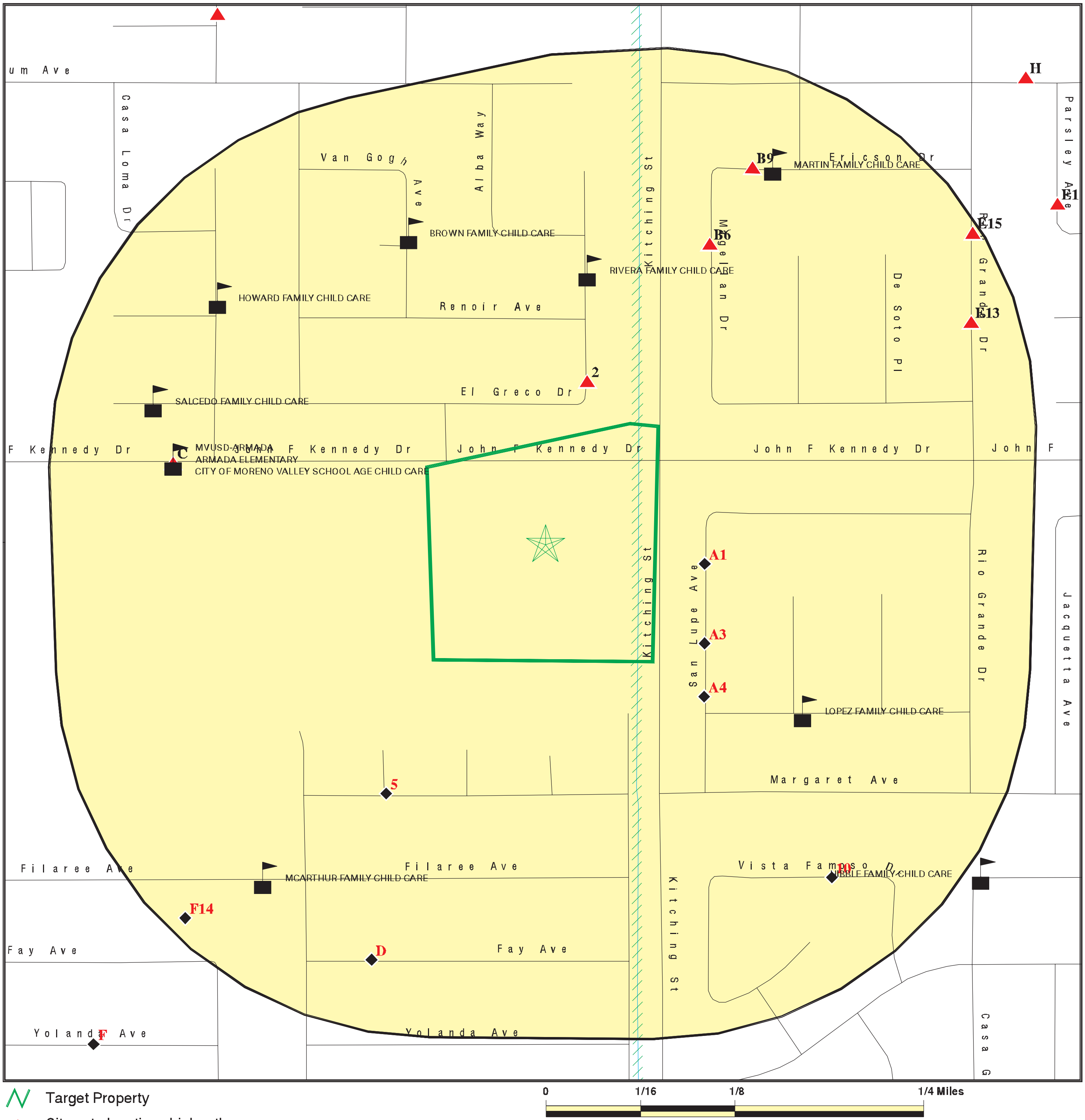
500-year flood zone

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Substation	CLIENT:	AECOM
ADDRESS:	John F Kennedy Drive/Kitching Street	CONTACT:	Cassandra Weir
	Moreno Valley CA 92551	INQUIRY #:	03250918.1r
LAT/LONG:	33.902 / 117.2186	DATE:	February 01, 2012 5:29 pm

DETAIL MAP - 03250918.1r



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Substation	CLIENT:	AECOM
ADDRESS:	John F Kennedy Drive/Kitching Street Moreno Valley CA 92551	CONTACT:	Cassandra Weir
		INQUIRY #:	03250918.1r
LAT/LONG:	33.902 / 117.2186	DATE:	February 01, 2012 5:30 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL		1.500	0	0	0	0	1	1
Proposed NPL		1.500	0	0	0	0	0	0
NPL LIENS		0.500	0	0	0	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL		1.500	0	0	0	0	0	0
Federal CERCLIS list								
CERCLIS		1.000	0	0	0	0	NR	0
FEDERAL FACILITY		1.500	0	0	0	0	0	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP		1.000	0	0	0	0	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS		1.500	0	0	0	0	0	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF		1.000	0	0	0	0	NR	0
Federal RCRA generators list								
RCRA-LQG		0.750	0	0	0	0	NR	0
RCRA-SQG		0.750	0	0	2	1	NR	3
RCRA-CESQG		0.750	0	0	0	0	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS		1.000	0	0	0	0	NR	0
US INST CONTROL		1.000	0	0	0	0	NR	0
Federal ERNS list								
ERNS		0.500	0	0	2	NR	NR	2
State- and tribal - equivalent NPL								
RESPONSE		1.500	0	0	0	0	0	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR		1.500	0	0	0	1	3	4
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF		1.000	0	0	0	0	NR	0
State and tribal leaking storage tank lists								
LUST		1.000	0	0	0	6	NR	6
SLIC		1.000	0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST		1.000	0	0	0	0	NR	0
State and tribal registered storage tank lists								
UST		0.750	0	0	1	0	NR	1
AST		0.750	0	0	0	1	NR	1
INDIAN UST		0.750	0	0	0	0	NR	0
FEMA UST		0.750	0	0	0	0	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP		1.000	0	0	0	0	NR	0
VCP		1.000	0	0	0	0	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS		1.000	0	0	0	0	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9		1.000	0	0	0	0	NR	0
ODI		1.000	0	0	0	0	NR	0
WMUDS/SWAT		1.000	0	0	0	0	NR	0
SWRCY		1.000	0	0	1	2	NR	3
HAULERS		0.500	0	0	1	NR	NR	1
INDIAN ODI		1.000	0	0	0	0	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL		0.500	0	0	0	NR	NR	0
HIST Cal-Sites		1.500	0	0	0	0	0	0
SCH		0.750	0	0	0	1	NR	1
Toxic Pits		1.500	0	0	0	0	0	0
CDL		0.500	0	1	4	NR	NR	5
US HIST CDL		0.500	0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
CA FID UST		0.750	0	0	1	0	NR	1
HIST UST		0.750	0	0	1	0	NR	1
SWEEPS UST		0.750	0	0	1	0	NR	1
Local Land Records								
LIENS 2		0.500	0	0	0	NR	NR	0
LUCIS		1.000	0	0	0	0	NR	0
LIENS		0.500	0	0	0	NR	NR	0
DEED		1.000	0	0	0	0	NR	0
Records of Emergency Release Reports								
HMIRS		0.500	0	0	0	NR	NR	0
CHMIRS		0.500	0	1	5	NR	NR	6
LDS		0.500	0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MCS		0.500	0	0	0	NR	NR	0
Other Ascertainable Records								
RCRA-NonGen		0.750	0	0	1	2	NR	3
DOT OPS		0.500	0	0	0	NR	NR	0
DOD		1.500	0	0	0	0	1	1
FUDS		1.500	0	0	0	0	0	0
CONSENT		1.500	0	0	0	0	0	0
ROD		1.500	0	0	0	0	1	1
UMTRA		1.000	0	0	0	0	NR	0
MINES		0.750	0	0	0	0	NR	0
TRIS		0.500	0	0	0	NR	NR	0
TSCA		0.500	0	0	0	NR	NR	0
FTTS		0.500	0	0	0	NR	NR	0
HIST FTTS		0.500	0	0	0	NR	NR	0
SSTS		0.500	0	0	0	NR	NR	0
ICIS		0.500	0	0	0	NR	NR	0
PADS		0.500	0	0	0	NR	NR	0
MLTS		0.500	0	0	0	NR	NR	0
RADINFO		0.500	0	0	0	NR	NR	0
FINDS		0.500	0	0	4	NR	NR	4
RAATS		0.500	0	0	0	NR	NR	0
CA BOND EXP. PLAN		1.500	0	0	0	0	0	0
NPDES		0.500	0	0	2	NR	NR	2
WDS		0.500	0	0	0	NR	NR	0
Cortese		1.000	0	0	0	0	NR	0
HIST CORTESE		0.500	0	0	0	NR	NR	0
Notify 65		1.500	0	0	0	0	0	0
DRYCLEANERS		0.750	0	0	0	0	NR	0
WIP		0.750	0	0	0	0	NR	0
ENF		0.500	0	0	0	NR	NR	0
HAZNET		0.500	5	8	36	NR	NR	49
EMI		0.500	0	0	2	NR	NR	2
INDIAN RESERV		1.500	0	0	0	0	0	0
SCRD DRYCLEANERS		1.000	0	0	0	0	NR	0
FINANCIAL ASSURANCE		0.500	0	0	0	NR	NR	0
HWP		1.500	0	0	0	0	0	0
HWT		0.750	0	0	0	0	NR	0
PCB TRANSFORMER		0.500	0	0	0	NR	NR	0
PROC		1.000	0	0	0	0	NR	0
MWMP		0.750	0	0	0	0	NR	0
COAL ASH DOE		0.500	0	0	0	NR	NR	0
COAL ASH EPA		1.000	0	0	0	0	NR	0
EDR PROPRIETARY RECORDS								
EDR Proprietary Records								
Manufactured Gas Plants		1.500	0	0	0	0	0	0
EDR Historical Auto Stations		0.750	0	0	0	0	NR	0
EDR Historical Cleaners		0.750	0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
DOD Region West > 1 7507 ft.	**MARCH AIR FORCE BASE (CLOSED)** **MARCH AIR FORCE BASE (CLO (County), CA**	**DOD**	**CUSA143538** **N/A**

DOD:

Feature 1:	Air Force DOD
Feature 2:	Not reported
Feature 3:	Not reported
URL:	Not reported
Name 1:	March Air Force Base (Closed)
Name 2:	Not reported
Name 3:	Not reported
State:	CA
DOD Site:	Yes
Tile name:	CARIVERSIDE

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
NPL Region West > 1 7530 ft.	**MARCH AIR RESERVE BASE** **610 MEYER DRIVE BLDG 2403** **MARCH AIR RESERVE BASE, CA 92518**	**NPL** **CERCLIS** **RCRA-LQG** **US ENG CONTROLS** **US INST CONTROL** **ROD** **FINDS** **MANIFEST**	**1000169261** **CA4570024527**

NPL:

EPA ID:	CA4570024527
EPA Region:	09
Federal:	Y
Final Date:	1989-11-21 00:00:00

Category Details:

NPL Status:	Currently on the Final NPL
Category Description:	Depth To Aquifer-> 50 And <= 100 Feet
Category Value:	65
NPL Status:	Currently on the Final NPL
Category Description:	Distance To Nearest Population-> 0 And <= 1/4 Mile
Category Value:	10

Site Details:

Site Name:	MARCH AIR FORCE BASE
Site Status:	Final
Site Zip:	92518
Site City:	RIVERSIDE
Site State:	CA
Federal Site:	Yes
Site County:	RIVERSIDE
EPA Region:	09
Date Proposed:	07/14/89
Date Deleted:	Not reported
Date Finalized:	11/21/89

Substance Details:

NPL Status:	Currently on the Final NPL
Substance ID:	Not reported

MARCH AIR RESERVE BASE (Continued) **1000169261**

Substance:	Not reported
CAS #:	Not reported
Pathway:	Not reported
Scoring:	Not reported
NPL Status:	Currently on the Final NPL
Substance ID:	A046
Substance:	POLYCHLORINATED BIPHENYLS
CAS #:	1336-36-3
Pathway:	GROUND WATER PATHWAY
Scoring:	3
NPL Status:	Currently on the Final NPL
Substance ID:	U210
Substance:	TETRACHLOROETHENE
CAS #:	127-18-4
Pathway:	GROUND WATER PATHWAY
Scoring:	2
NPL Status:	Currently on the Final NPL
Substance ID:	U228
Substance:	TRICHLOROETHYLENE (TCE)
CAS #:	79-01-6
Pathway:	GROUND WATER PATHWAY
Scoring:	2

Summary Details:

Conditions at proposal July 14, 1989): March Air Force Base MAFB) covers approximately 7,000 acres near Riverside in the Moreno Valley in Riverside County, California. MAFB is adjacent to light industrial, agricultural, and residential areas. Established in 1918 as the Alessandro Aviation Field, MAFB has served as a training base and refueling operations base. Industrial operations including aircraft maintenance and repair) involved use of solvents and disposal of solvent wastes. MAFB is participating in the Installation Restoration Program IRP), established in 1978. Under this program, the Department of Defense seeks to identify, investigate, and clean up contamination from ha ardous materials. As part ofIRP, the Air Force investigated 28 potentially contaminated disposal areas. MAFB Well No. 1 on-base was found to be contaminated with trichloroethylene, tetrachloroethylene, and cis-1,2-dichloroethylene at levels that exceed State drinking water standards. It was taken out of service. Soils on the base are contaminated with toluene and ben ene. An estimated 11,600 people obtain drinking water from municipal wells within 3 miles of ha ardous substances on MAFB. The Air Forceis conducting a remedial investigation/ feasibility study RI/FS) to determine the type and extent of contamination at the base and identify alternatives for remedial action. Status November 21, 1989): Field work continues on the RI/FS.

Site Status Details:

NPL Status:	Final
Proposed Date:	07/14/1989
Final Date:	11/21/1989
Deleted Date:	Not reported

Narratives Details:

NPL Name:	MARCH AIR FORCE BASE
City:	RIVERSIDE

MARCH AIR RESERVE BASE (Continued) **1000169261**

State: CA

CERCLIS:

Site ID:	0902761
EPA ID:	CA4570024527
Facility County:	RIVERSIDE
Short Name:	MARCH AIR FORCE BASE
Congressional District:	43
IFMS ID:	09N6
SMSA Number:	6780
USGC Hydro Unit:	18070202
Federal Facility:	Federal Facility
DMNSN Number:	7000.00000
Site Orphan Flag:	N
RCRA ID:	Not reported
USGS Quadrangle:	Not reported
Site Init By Prog:	Not reported
NFRAP Flag:	Not reported
Parent ID:	Not reported
RST Code:	Not reported
EPA Region:	09
Classification:	Federal Facility
Site Settings Code:	SU
NPL Status:	Currently on the Final NPL
DMNSN Unit Code:	ACRE
RBRAC Code:	Not reported
RResp Fed Agency Code:	USAF
Non NPL Status:	Not reported
Non NPL Status Date:	Not reported
Site Fips Code:	06065
CC Concurrence Date:	Not reported
CC Concurrence FY:	Not reported
Alias EPA ID:	Not reported
Site FUDS Flag:	Not reported

CERCLIS Site Contact Name(s):

Contact ID:	9000102.00000
Contact Name:	John Lucey
Contact Tel:	(415) 972-3145
Contact Title:	Remedial Project Manager (RPM)
Contact Email:	Not reported
Contact ID:	9271184.00000
Contact Name:	Karen Jurist
Contact Tel:	(415) 972-3219
Contact Title:	Site Assessment Manager (SAM)
Contact Email:	Not reported
Contact ID:	9270048.00000
Contact Name:	Jeff Inglis
Contact Tel:	(415) 972-3095
Contact Title:	Site Assessment Manager (SAM)
Contact Email:	Not reported
Contact ID:	13002167.00000

MARCH AIR RESERVE BASE (Continued) **1000169261**

Contact Name: Carl Brickner
Contact Tel: (415) 972-3814
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

Contact ID: 9270438.00000
Contact Name: Dawn Richmond
Contact Tel: (415) 972-3097
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

CERCLIS Site Alias Name(s):
Alias ID: 101
Alias Name: MARCH AFB
Alias Address: Not reported
CA
Alias ID: 102
Alias Name: MARCH AIR FORCE BASE
Alias Address: 22 CSG/CC
MARCH AFB, CA 92518
Alias ID: 103
Alias Name: MARCH AIR FORCE BASE
Alias Address: 22 CSG/CC
RIVERSIDE, CA 92518
Alias ID: 9270150
Alias Name: MARCH USAF BASE
Alias Address: OLDB MARCH 3430 BUNDY AVENUE
MARCH AFB, CA 92311
Alias ID: 101
Alias Comments: PREVIOUS EPA ID# AZD 981 416 977
Site Description: March Air Force Base originally a 640 acres site called Alessandro Aviation Field, was officially opened March 1, 1918. The base was initially used to train "Jenny" pilots during World War I. The base was closed for about four years after the war and was then reopened in 1927. By 1938, the base was considered to be the central location for west coast bombing and gunnery training. In 1949, the Strategic Air Command took control of the base. Since that time, the base has hosted bombers, refuelers, and cargo aircraft. In June 1992, the base became an Air Mobility Command installation. Its primary mission is refueling, but reserve and guard units have cargo and fighter missions as well. In September 1993, March AFB was designated by Congress to realign its forces. The Base will be redesignated "March Air Reserve Base" and is xpected to decrease to about 1/3 of its present size. After realignment, property that is not retained by the base will be available for transfer.
The U.S. Air Force, due to its primary mission in national defense, has long been engaged in a wide variety of operations that involve the use, storage, and disposal of hazardous waste. In 1980, the Installation Restoration Program (IRP) was developed by the Department of Defense (DOD) to locate and cleanup hazardous waste sites. At March AFB, aircraft maintenance, fuel storage operations, fire-training exercises, and base operations have generated a variety of hazardous wastes. Consequently, several areas of soil and groundwater on-base have been contaminated. In September 1983 the IRP process began. The results were records indicating 30 potentially contaminated sites which required further investigation. A second study, completed in March 1987, indicated that 5 of the 30 sites required even further investigation to determine the type and extent of contamination in the soil and groundwater. In June 1987, further investigation was done, indicating that additional work was required to better define the extent of contamination and

MARCH AIR RESERVE BASE (Continued) **1000169261**

to research possible off-base migration of TCE in groundwater. In November 1989, March AFB was add to the National Priorities List (NPL) primarily due to the contamination of groundwater on-base. In September 1990, a Federal Facilities Agreement (FFA) was signed by the Air Force, U.S. Environmental Protection Agency (EPA), and the State of California. Three separate OUs were created based on geographic location of sites, similarity of contaminants, and location of groundwater contaminant plumes. The subject of this ROD (6/20/96) is OU-1, OU-1 includes Sites 4,5,7,9,10,13,14,15,16,18,29,31,34, and 38. Groundwater at Sites 4, 18,31,and the OU-1 Groundwater Plume, and soil at Sites 4,10,15,18,31, and 34 require remedial action. Sites 5,7,9,13,14,6,29, and 38 are considered no further action. Sites 21 and 23 are covered in OU-2 ROD. Site 33, the Panero Aircraft Fueling System is detailed in OU-3. The following are Sites that require Groundwater remediation: OU 1-Groundwater Plume - The OU-1 Groundwater Plume is the most widespread plume at the base, extending from Site 31 south and east through the area of Sites 34, 9, and 5, and extending to a maximum of approximately 1300 feet beyond the eastern boundary and 1500 feet south of Site 5 off-base. Numerous contaminants, including TCE, were detected. Site 4 Groundwater Plume - This plume is localized in the vicinity of Site 4 with the apparent source area near the southern end of Site 4. The contaminants with the highest concentration are TCE and PCE. Site 18 - Groundwater Plume - This plume is localized in the vicinity of Site 18 with the apparent source area west of the engine test cell in the center of Site 18. Fuel has been detected in four of the ten monitoring wells to date. Site 31 - Groundwater Plume - Concentrations of contaminants at Site 31, primarily TCE, are much higher than those in the rest of the OU-1 Plume, and these high concentrations are confined to a relatively small area. These conditions coupled with the history of Site 31 (reported solvent disposal) indicate that Site 31 is a likely source for much of the TCE found in OU-1 groundwater. Therefore, even though the Site 31 plume has the same contaminants and is continuous with the OU-1 plume, it is appropriate to treat Site 31 separately from the remainder of the OU-1 plume, in order to eliminate the source of contamination. Sites That Require Soil Remediation Include: Site 4 - Landfill No.6 - a landfill operating from 1955 to 1969, covering 8.5 acres, and located along the eastern boundary of the base, south of the East Gate. The landfill is up to 25 feet deep, containing primarily sanitary waste, construction rubble, and debris. Small amounts of medical wastes and empty fuel containers are also present. There are low levels of chlorinated solvents in the soil and soil gas, as well as elevated concentrations of trichloroethylene (TCE) and tetrachloroethylene (PCE) in the groundwater. Both TCE and PCE are found in solvents used to clean and degrease military equipment. Vinyl chloride, a breakdown product of TCE and PCE, has also been detected in Site 4 groundwater. The landfill is considered the source of contaminants detected in groundwater downgradient of the Site. Site 10 - Flightline Drainage Channel - This site, installed prior to 1940, is located southeast of the flightline aircraft maintenance areas. The channel is concrete lined (since the 1960s) up to the eastern boundary of the base where it discharges to the Perris Valley Storm Drain (PVSD). The PVSD flows east approximately 2 miles, where it joins another drainage and flows south approximately 6 miles to the San Jacinto River. The channel has reportedly received various waste oils, hydraulic fluids, diesel fuel, jet fuel, waste paints, paint strippers, paint thinners, battery acids and solvents, including TCE. Prior to 1974, wastes may have been discharged directly to the PVSD. Since 1974, the main oil/water separator has pretreated the runoff before its discharge off-base. Site 15 - Fire Protection Training Area No.3- This site is located southeast of the end of runway 12-30 and between Sites 5 and 7. The area was developed in 1978 and was reportedly constructed by placing an underdrain system and gravel over a clay liner.

MARCH AIR RESERVE BASE (Continued) **1000169261**

Firefighting water, solutions of Aqueous Film Forming Foam (AFFF), and residual fuel used during training exercises were drained to a formerly unlined water holding pond located adjacent to Site 15. Approximately 6,000 gallons per year of contaminated JP-4 have been burned in training exercises since the facility was constructed in 1978. This Site is no longer being used as a fire training area. Site 18 - Engine Test Cell - This site is located on the flightline, south of Taxiway No.2, and has been inactive for several years. The test cell was constructed in 1957 for the purpose of testing aircraft engines. An oil/water separator was installed in 1976, water from the seperator was discharged to the base wastewater treatment plant. The oil was collected by a contractor for off-base disposal. Prior to 1976, spills of oil, fuel, and solvents were drained to a nearby ditch. Potential sources of fuel include overflow of tanker trucks and fuel tanks on aircraft that have been parked nearby. Site 31 - Unconfirmed Solvent Disposal - Site 31 is located off Graeber Street on the east side of Building 1211. The practice of discharging solvents on the ground reportedly occurred from about the mid-1950s to the mid-1970s. In addition, floor drains from maintenance shops may have leaked solvents to the subsurface. Groundwater sampling at the site has indicated TCE concentrations which exceed State and Federal drinking water standards. Site 34 - Pritchard Aircraft Fueling System - Site 34 is located next to Building 1245, at the southeast end of Taxiway No, 1. In 1962, six 50,000 gallon tanks were moved to this site from the Pabero Fueling System. In 1990, this system was discontinued, and in 1991, the tanks and system were removed. During a geological investigation stained soils and fuel odors were observed. Sites With No Further Action Planned: Site 5 - Landfill No.3 - This Site covers approximately 5 acres and is located southeast of the present flightline. The landfill was reportedly operated from the late 1940s to approximately 1960. Landfill wastes consist primarily of sanitary waste and construction rubble. Site 7 - Fire Training Area No.2 - This Site is located on the eastern part of the base, north of the Alert Facility. Between 1954 and 1978, fire training exercises were conducted in unlined training pits. Three distinct burn pits were identified in historic aerial photographs of the base. A portion of this Site may have been used for crash rescue training. Wastes used in those exercises reportedly included contaminated fuel, waste solids, and spent solvents. Site 9 - Main Oil/Water Separator - Site 9 is located north of the Site 5 at the southeast end of the flightline apron. The facility was constructed in 1974 and serves the main storm, drainage system for the flightline apron and the flightline shops. The storm drains have reportedly received waste oils, hydraulic fluids, diesel fuel, waste paints, spent solvents, paint strippers, paint thinners, and battery acids. The oil/water separator is of earthen construction with a large baffle that divides the separator into two compartments. The separated oil is picked up by a skimmer and pumped to a holding tank for Off-base disposal. This facility drains into the flightline Drainage Channel (Site 10) and then to the Perris Valley Storm Drain Lateral A. Site 13 - Tank Truck Spill Site - Site 13 is located along the eastern perimeter road of the base, within the northern portion of Site 5. In 1973, approximately 5,000 gallons of JP-4 jet fuel spilled from a tank truck to the ground at this location. The accidental discharge resulted from a mechanical malfunction. There was no reported containment or cleanup activities. Site 14 - Liquid Fuel Pump Station Overflow - Site 14 is located southeast of the flightline apron and about 50 to100 feet west of the East March Sludge Drying Beds (Site 16). In 1973, approximately 1,000 gallons of JP-4 jet fuel spilled onto the ground. The spill occurred due to an overflow of the liquid fuel pump station at Building 1245. The spill was contained in the unpaved area south of the pump station and allowed to percolate into the ground. Site 16 - East March Sludge Drying Beds - Site 16 is located on the eastern part of the base, at the south end of the flight line parking apron,

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and near the former East March Wastewater Treatment Plant. The treatment plant was constructed in 1938 and provided secondary treatment for sanitary and industrial wasterwater. Primary and secondary sludges were digested anaerobically, dewatered on unlined sludge drying beds, and disposed of in an on-base landfill. The sludge may have contained heavy metals and organics resulting from discharges of industrial wastes to the sanitary sewer system. These drying beds ope3rated from 1938 to 1977, when the plant was destroyed in place. Site 29 - Fire Training Area No.1 - Site 29 is located at the eastern part of the base, north of Site 9. The area was used as a fire training pit prior to 1951. Suspected contaminants at the site include contaminated fuel, waste oil, and spent solvents Site 38 (PCB Contamination, Building 1311), Building 1311 is located at the southeast end of the taxiway, northwest of IRP Site 23. In 1984, soils from four areas contaminated with transformer oils were sampled. Soils from two of the areas (Buildings 317 and 1305) were determined to be PCB-contaminated. The soils were excavated and removed from the Base. Records to verify the cleanup have not been located. The RI/FS report and Proposed Plan for OU-1 were released to the public on April 28, 1994. These two documents were made available via the Administrative Record, the information repositories at the Moreno Valley and March AFB libraries, and at the Moreno Valley Chamber of Commerce. A fact sheet, condensed from the Proposed Plan, was sent to everyone on the March AFB mailing list, which includes Restoration Advisory Board (RAB) members. An OU-1 RI/FS subcommittee, formed by the RAB, provided oral comments to the RAB at its April 26, 1994 meeting. The Final RI/FS Report was published in July 1994. A public comment period was held from April 28 to May 28, 1994. In addition, a public meeting was held on May 12, 1994 at 7 p.m. at Best Western Image Suites in Moreno Valley. Representatives of the U.S. Air Force, EPA, Department of Toxic Substances Control, and California Regional Water Quality Control Board, Santa Ana, attended the public meeting to address any questions about the RI/FS and Proposed Plan. March Air Force Base (AFB) is located on 7,123 Acres in the northern end of the Perris Valley, east of the city of Riverside, in Riverside County, California, approximately 60 miles east of Los Angeles and 90 miles north of San Diego. The base lies in sections of Township 3 South, Range 4 West. The population of Riverside County is 1,700,413 and consists primarily of English and Spanish speaking citizens. The climate of the March AFB area is characterized as Mediterranean to semi-arid, varying according to elevation and distance from the Pacific Ocean. The weather generally consists of warm to hot, dry summers and mild winters. Current land use on March AFB is classified as residential and light industrial. Maintenance facilities, warehouses, and administrative centers support the mission. The land surrounding March AFB area includes areas of residences in all directions around the Site, light industry to the north, and agriculture to the east and south. With the exception of small surface water ponds that are used for agricultural purposes, there are two permanent surface water bodies within 3.5 miles of March AFB. Lake Perris, located 4 miles southeast of the base, provides approximately 130,000 acre feet of storage for State Project Water brought in by the California Aqueduct which runs north and east of the base. An east-west portion of the Colorado River Aqueduct is located approximately 3.5 miles south of the base. This aqueduct flows in to Lake Matthews, which is located about 10 miles west of March AFB. A very small recreation lake is located approximately 2 miles east of the base. It is maintained by the Moreno Valley Ranch homeowners association and is located just south of Iris Street and west of Lasselle Street in the City of Moreno Valley. A number of wetlands and riparian areas have been identified on and in the immediate area of the base, most are located on West March, outside OU-1. The U.S. Army Corps of Engineers determined that approximately 2.17 acres of jurisdictional wetlands exist in the Heacock Drain Channel, with .8 acres of wetlands adjacent

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to the Site 4 landfill. The wetlands are not continuous but are localized patches of wetland vegetation that change position each year due to high volume, high velocity storm water flow from the spring rains through these channels which causes scouring of the earthen bottom and sides. Manyindustrial, agricultural and domestic wells exist in the Perris Valley. Four on-base wells and two off-site wells southeast of the base were formerly used for the base water supply. One of these wells was shut down in February 1984 due to trichloroethylene (TCE) contamination, the other 3 on-base wells were shut down due to low yields. The two off-site wells are located southeast of the base in the center of Perris Valley. Although both of these wells are operable only one is occasionally used for emergency service, while the other is dormant. All base water is currently supplied by the Eastern Municipal Water District. OU-1 is made up of Sites 4,5,7,9,10,13,14,15,16,18,29,31,34, and 38. Sites 21 and 23 are included in the OU-2 ROD. Sites that require soil remediation include Sites 4, 10, 15, 18, 31, 34. Sites that require groundwater remediation include OU1 and Sites 4,18, and 31 groundwater plumes. Sites with No Further Action Planned: Site 5,7,9,13,14,16,29,38. OU 2: In 1980, the Installation Restoration Program (IRP) was developed by the Department of Defense as the mechanism for the CERCLA process, incorporating applicable Resource Conservation Recovery Act (RCRA) regulations as well as meeting requirements of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR. Part 300). The Air Force conducted a Phase I records search of 30 potentially contaminated IRP sites on the Base. There are now a total of 44 IRP sites at the former March AFB and current March ARB. The primary contaminants identified in the IRP include chlorinated solvents, fuels, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs). Contamination by PAHs and PCBs appears to be restricted to surface and near-surface soils whereas fuel hydrocarbons and solvents tend to be predominant contaminants in subsurface soils and groundwater. The lead agency for cleanup of the closed portions of March AFB is the Air Force. The EPA, the California Department of Toxic Substances Control (DTSC), and the Santa Ana Regional Water Quality Control Board (RWQCB) are all support agencies for cleanup activities at the Base.
The current land use and adjacent land use for most of the OU 2 Air Force Real Property Agency (AFRPA) sites is vacant land/open space with limited commercial and residential land use adjacent to some of the sites. Site 3 and the adjacent areas are undeveloped land. Site 6 contains an engineered waste cell. There is a residential area to the south and a golf course is to the east of Site 6. Site 12 was the former civil engineering yard with numerous structures. Site 12 is not currently utilized. Residential land use occurs to the east of Site 17. Air Force commercial facilities such as offices are located to the north and west of the Site 17. Site 19 is currently a part of the operating wastewater treatment plant. Structures relating to plant operations are located on-site and to the west and north. Site 20 and 26 and the adjacent areas are undeveloped land. A former water treatment plant is south of Site 26 and west of Site 20. This facility is no longer used. Site 23 is an active agricultural area, surrounded by currently vacant land to the north, south and east. Air Force land consisting of open space is west of Site 23. Site 25 and the adjacent areas is undeveloped land, with nearby residential development to the south. The three Site 35 subareas and Site 42 are former UST locations within landscaped areas adjacent to structures. The areas near Site 35a, 35b and Site 42 are still actively used as office and dormitory areas, but the Site 35c area is no longer used. Sites 30 and 40 are open space with some riparian vegetation. A residential area is located to the north and west of Site 40. The OU 2 sites are located on that portion of March AFB that may be converted to non-Air Force use. Site 23 is on private land. The anticipated land use for most of the OU 2 Air Force Real Property Agency (AFRPA) sites is

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commercial or industrial use. Alternative land uses have also been assessed and areas of West March could remain open space such as the Stephens' Kangaroo Rat (SKR) Conservation Area. March AFB is located in the North Perris Groundwater Basin. Currently, there are no potable groundwater resources extracted at the OU 2 AFRPA sites. The relatively thin water-bearing zone on West March is not anticipated to yield substantial quantities of water. Therefore, the potential for extraction and use of groundwater from the West March AFRPA sites is limited, both now and in the foreseeable future. Water-bearing zones producing sufficient groundwater for use may be present at AFRPA sites on the Main Base and Site 23, and should be considered a potential potable water source. Surface water is not currently used at the OU 2 AFRPA sites. Surface water areas such as at Site 6, 30 and 40 may remain as wetlands depending on future site development. OU2 consists of a number of sites. Each site is described below. Site 3 is a former 23-acre landfill located south of Cactus Avenue and west of Plummer Road. Riparian vegetation is found in the drainage areas. Site 3 is located in the 1,300-acre Stephens' Kangaroo Rat (SKR) reserve. The Site 3 landfill was used from 1954 through 1974. The landfill received household and dumpster waste, construction debris, and military waste from the Base. The military wastes included empty tanks, spent munitions, and miscellaneous wastes such as parachutes, medical waste, and fire hoses. Some of the contaminants found in the wastes included volatile organic compounds, pesticides, PCBs, PAHs, and munitions residues. The Air Force was concerned that the waste in the landfill might contaminate the soil and groundwater. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the landfilled waste. An interim removal action was completed in late 1995 and early 1996. Approximately 223,200 cubic yards of landfilled materials and soil were removed. Excavated materials from Site 3 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 6 is located on West March, north of the Air Force Village West residential development, south of Van Buren Boulevard, east of Plummer Road, and west of Air Force Village West Drive. The landfill comprised three discrete areas: Site 6a (approximately 15 acres) the location of the main former landfill area; Site 6b Quarry (approximately 0.6 acre) the location of a former quarry; and Site 6b Pond (approximately 2.6 acres) the location of a pond. Site 6 was used by March AFB from the early 1950s to the early 1 980s for disposal of household waste and construction debris. Polynuclear aromatic hydrocarbons (PAHs), PCBs, pesticides, herbicides, and dioxins were found in samples of soil and water collected during the OU2 RI. An interim, removal action was conducted in 1995; approximately 63,000 cubic yards of waste were removed from Site 6a and temporarily stockpiled. Waste at Site 6a was removed from the vadose zone and beneath groundwater including soil contaminated with petroleum hydrocarbons. Waste was also removed from the pond, including debris and tar. Two engineered waste cells, over 12 acres in size, were constructed in the Site 6a area. No confirmation samples were taken of soils and bedrock under Site 6a because the bottom of the excavation was below the water table and sample results would not be meaningful. This site was treated as a closure in place rather than a clean closure. Stockpiled waste from Site 6a was landfilled back into the engineered waste cells over Site 6a. Excavated materials from Site 6a to be disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 12, the 20-acre Base Civil Engineering Yard, is located north of MacDill Street, between Lackland Avenue and Travis Avenue. The area is developed with numerous structures and is partially paved with asphalt. From the l950's to 1996, Site 12 was the civil engineering yard for general maintenance operations

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for March AFB. It included a carpentry shop, electrical shop, paint shop, pesticide shop, and storage areas for heavy equipment. These shops used and stored a variety of hazardous materials including paints and paint-related products, pesticides, solvents, acids, and drums labeled hazardous waste. During the OU2 RI, PAHs and hexavalent chromium were found in soil samples. The contaminant 1,1-dichloroethene (1, 1-DCE) was found in soil vapor samples in a small area in deeper soils near Building 2507. Groundwater beneath Site 12 has become impacted by trichloroethene (TCE) and tetrachloroethene (PCE). The groundwater contamination is in a small area and is only slightly above maximum contaminant levels (MCLs). Periodic monitoring of the groundwater to observe changes in contaminant concentrations is being conducted. After discussions with the regulatory agencies and the public, a limited interim removal action was taken in 1996 to ensure that the site could be used for industrial purposes by removing soils contaminated with PAHs and hexavalent chromium at the northwest portion of Site 12. Approximately 2,000 cubic yards of non-hazardous contaminated soil was excavated from a small area in the northwest portion of the site and placed in the engineered waste cells at Site 6. Excavated materials from Site 12 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and prior to excavation activities for the removal action according to approved work plans. Site 17 is a former Base swimming pool located on the Main Base on U Street between DeKay and K Streets. The area is vacant land, adjoining Base housing to the east and south. The former swimming pool at Site 17 was closed in the 1 970s. After it was closed, the pool was used as a disposal site and the wastes were covered with soil. After discussions with the regulatory agencies and the public, a decision was made to clean the site by removing the waste. The pool and its contents were removed during a 1994 interim removal action. The wastes were taken off the Base for disposal. After the interim removal action, low levels of PCBs were still detected in soils at least 8 feet beneath the ground surface. The pool excavation was filled with clean soil, leaving the PCBs in place. No PCB contamination has been found in the groundwater and the PCBs are not expected to migrate to groundwater. Confirmation sampling conducted after the interim removal action demonstrated that PCBs remain at the site at levels of concern to human health Site 19 is about 7 acres in size, located at the southern end of West March, east of the active wastewater treatment plant. The site is generally vacant land with four concrete lined drying beds in the western portion of the site. Site 19 contains the four active lined sludge-drying beds and three inactive, unlined sludge-drying beds associated with the wastewater treatment plant. The plant was constructed in 1941 and used to process the wastewater from Camp Haan and March AFB. A total of 10 sludge-drying beds have historically been used at the site. Three of these beds have been backfilled. In 1990 when the plant was upgraded, four lined drying beds were constructed at the location of previously unlined beds. In the past, wastewater treatment sludge was spread out in the unlined drying beds to dry. When dry, the sludge was removed from the drying beds. Recently, the dried sludge has been removed from the Base for disposal. Past disposal practices are unknown. PAHs, PCBs, hexavalent chromium, and thallium were found in soil samples in the area of the unlined sludge beds at levels above residential PRGs. Site 20 is located adjacent to the southwest portion of March AFB, on the property acquired by the Department of Veterans Affairs from the Air Force in the 1970s. Site 20 is a former landfill about 7 acres in size used between 1958 and 1965 as a disposal site for household waste and construction debris. Some of the chemicals found in the soils at Site 20 included PAHs, dieldrin, PCBs, and 1 ,4-dichlorobenzene. The Air Force was concerned the waste in the landfill could contaminate soil and groundwater. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by

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removing the landfilled waste. The interim removal action at Site 20 was conducted in conjunction with the removal of dried sludge at Site 26a and 26b Dried sludge of Site 26b covered a portion of Site 20. Approximately 116,000 cubic yards of non-hazardous soil, debris, and dried sludge were removed from Sites 20 and 26 in 1996 and placed in the engineered waste cells at Site. Excavated materials from Site 20 to be transported to and disposed of in he engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans According to the As-Built Construction Report OU2, Site 6a, all materials from Site 20 placed in the Site 6 engineered waste cells met the requirements of CCR Title 23, Section 2523 (currently CCR Title 27, Section 20220) for a non-hazardous solid waste landfill. After the waste was removed from Site 20, confirmation samples from beneath the former landfill were tested. The results confirmed that the site had been cleaned to levels protective of human health and the environment. No restriction on future use of the land is required. Site 22 is a suspected former landfill east of and adjacent to Interstate 215. The original 7-acre area of Site 22 was expanded to 15 acres by extending the northern site boundary to ensure all potential areas of concern were investigated. The location of the landfill was based on limited evidence. Investigations could not locate any landfllled materials or debris. Geophysical surveys were used to fmd buried metal or disturbed soils. Soil gas sampling was also conducted at this site. Finally, soil and groundwater were sampled. No contaminants were found in any of the samples and the geophysical surveys found no buried waste. This evidence showed that a landfill did not exist in this area. This site was investigated during the OU2 remedial investigation and levels of contamination requiring remedial action were not identified. There was no risk assessment completed on Site 22 because no contaminants were found and the site poses no risk to human health or the environment. No restriction on future use of the land is required. Site 23 is located off-Base to the east, near the intersection of Nandina Avenue andHeacock Street in the City of Moreno Valley. Between 1938 and 1977, Site 23 was a 1-acre holding pond for wastewater that had been treated and used for irrigation of agricultural crops. In 1991, the pond was filled in, and it and the surrounding areas were leveled. The land is now used as a commercial sod farm and irrigated with reclaimed water from the Moreno Valley wastewater treatment plant. This site was investigated during the OU1 remedial investigation and no contamination requiring remedial action was identified. There was no risk assessment completed on Site 23 because no contaminants were found and the site poses no risk to human health or the environment. No restriction on future use of the land is required. Site 24 is a former 3-acre landfill, west of Site 19. Site 24 was reportedly used between 1941 and 1965 to dispose of household waste and military waste. A small amount of soil from bullet backstop berms may have been placed in the landfill as well as some ash from an incinerator. Some of the contaminants found in the waste included PAHs, PCBs, antimony, barium, and cadmium. The Air Force was concerned that the waste in the landfill could contaminate groundwater. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the landfilled waste. In December 1996, approximately 19,300 cubic yards of non-hazardous, landfilled waste was removed and placed in the engineered waste cells at Site 6. Excavated materials from Site 24 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 25 covers approximately 33 acres and is located south of Cactus Avenue. Site 25 was used in the past for open air detonation and burning of munitions. Three areas with shallow trenches were used to bury munitions residue after destruction. Some of the contaminants found in the soils at this

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site included nickel, l,3,5-trinitrobenzene, nitroglycerin, benzo(a)pyrene, and RDX, all of which are munition residues. Additionally, 1,1 -dichloroethene was also found. The Air Force was concerned that the contaminants in soil would cause groundwater contamination. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the debris and contaminated soils. Approximately 3,000 cubic yards of non-hazardous waste from the trenches and contaminated soils were removed and disposed of in the engineered waste cells at Site 6. Excavated materials from Site 25 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents at a rate of about 1 sample for every 200 cubic yards of excavated materials during the removal action. Testing was also performed as part of the remedial investigation. Site 26 covers approximately 3 acres and is located in the southwest portion of March AFB. Site 26 is subdivided into two areas, Site 26a and 26b. Site 26b is located over a portion of the Site 20 landfill. Site 26a is located on property controlled by the AFRPA and Site 26b is on the property of the Department of Veterans Affairs. Site 26 was used for disposal of lime sludge that was a waste from the treatment of drinking water for March AFB. From 1941 to 1984, the water treatment plant treated Colorado River water used to supplement the drinking water supply for the Base. Arsenic from the treated Colorado River water was found in the lime sludge at low levels. After discussions with the regulatory agencies and the public, a decision was made to clean up the site by removing the sludge. As mentioned in the description of the landfill at Site 20, approximately 116,000 cubic yards of non-hazardous soil and dried sludge were removed from Sites 20 and 26 in 1996 and disposed of in the engineered waste cells at Site 6. Excavated materials from Site 26 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents during the remedial investigation and monitored during the removal action according to approved work plans. Site 30 covered approximately 40 acres, south of Alessandro Boulevard and west of Interstate 215. Site 30 is located in the 1,300 acre SKR reserve. There is no evidence that Site 30 ever operated as a March AFB-controlled landfill, but illegal dumping of domestic waste from the surrounding community has occurred and some minor amounts of construction debris were found. Soil and groundwater samples taken at the site did not detect contaminants at levels not protective of human health. After discussions with the regulators and the public, a decision was made to clean up the site by removing the domestic and construction debris. Domestic and construction debris was, removed from the site in April 1997 and disposed of off the Base. The Air Force has installed gates on access roads to prevent vehicular traffic to the site. Warning signs were placed in several areas, and gates remain padlocked to help prevent access by unauthorized persons. Site 35 consisted of three subareas (Sites 35a, 35b, and 35c) located in the former 15th Air Force Headquarter complex on West March. The subareas were locations of former underground storage tanks (USTs) associated with. Buildings 3409 (Site 35a), 3417/34 18 (Site 35b), and 3406 (Site 35c). Site 35a, a former 8,000-gallon fuel oil tank, was located west of Allen Avenue and south of 11th street, east of Building 3409. Site 35b, two former diesel tanks of 6,650-gallon and 3,500-gallon, was located between Building 3417 and 3418, west of Allen Avenue and Bundy Avenue. Site 35c, a former 1,000-gallon diesel tank, was located north of 5th Street and west of Dalla Avenue, east of Building 3406. All tanks have been removed and the locations closed without restrictions in accordance with state and county regulations. Fuel leaks have been associated with the tanks at Site 35. Sites 35a and 35b were investigated during the OU2 remedial investigation and other studies and levels of contamination requiring remedial action were not identified. After discussions with the regulatory agencies, the Air Force decided to clean up the soil by bioventing at Site 35c where fuel had leaked. Bioventing has reduced

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diesel fuel contamination to levels protective of human health and the environment at Site 35c. No restriction on future use of the land is required. Site 40 covers approximately 49 acres on West March, north of Van Buren Boulevard and west of Plummer Road. The most prominent feature at the site is the abandoned quarry, containing a pond with riparian vegetation. The pond is replenished by groundwater and by surface flow from an intermittent stream channel entering the pond from the west. Site 40 is located in the 1,300 acre SKR reserve. Site 40 was used as a disposal location for drums, construction debris, battery casings, and motor vehicle parts. After discussions with the regulatory agencies, a decision was made to complete an expedited cleanup of the area exposed by the erosion and other debris at the site. The time-critical removal action completed in 1994 included removal of the drums, miscellaneous waste, and contaminated soil. Hazardous waste from the site was taken off the Base for proper disposal. Approximately 6,800 cubic, yards of non-hazardous materials were disposed of at the Site 6 engineered waste cells. Excavated materials from Site 40 to be transported to and disposed of in the engineered waste cells at Site 6 were tested for organic and inorganic constituents at a rate of about one sample for every 100 cubic yards of excavated materials during the removal action. Testing was also performed as part of the remedial investigation. Building 3404 is located on less than one acre near the intersections of 1 1th Street and Davis Avenue on West March. Transformers located in Building 3404 reportedly leaked oils containing PCBs onto the floor of the transformer room. These oils were also spilled onto the soil surrounding the building. After discussions with the regulatory agencies and the public, a decision was made to clean up the area outside of Building 3404 by removing the contaminated soil. In the interim removal action, the contaminated soils were excavated and taken offsite for proper disposal. A total of 330 tons of contaminated soils were removed from the site. The PCB concentrations were low enough to allow disposal of 292 tons of contaminated soils as non-hazardous waste. An additional 38 tons was disposed of off the Base as hazardous waste. Clean fill was placed in the excavation to grade and a gravel cover was placed on top of the previously excavated area. Confirmation sampling conducted after the interim removal action confirmed that the site had been cleaned to levels protective of human health and the environment. No restriction on future use of the land is required. Transformer oils may be present in the concrete floor of Building 3404. The Air Force attempted to remove the PCBs from the concrete. Minimal levels of PCBs were left and have been encapsulated. The concrete is not addressed in this AFRPA OU2 ROD because building interiors are not regulated under CERCLA. The current landowner, the County of Riverside, has entered into a land use covenant with the State that restricts use of the building to industrial activities and contains other measures to prevent exposure to residual contamination. The current land use and adjacent land use for most of the OU2 AFRPA sites is vacant land/open space with limited commercial and residential land use adjacent to some of the sites as discussed below. Site 3 and the adjacent areas are undeveloped land. Site 6 contains an engineered waste cell. There is a residential area to the south and a golf course is to the east of Site 6. Site 12 was the former civil engineering yard with numerous structures. Site 12 is not currently utilized. Residential land use occurs to the east of Site 17. Air Force commercial facilities such as offices are located to the north and west of the Site 17. Site 19 is currently a part of the operating wastewater treatment plant. Structures relating to plant operations are located on-site and to the west and north. Site 20 and 26 and the adjacent areas are undeveloped land. A former water treatment plant is south of Site 26 and west of Site 20. This facility is no longer used. Site 23 is an active agricultural area, surrounded by currently vacant land to the north, south and east. Air Force land consisting of open space is west of Site 23. Site 25 and the adjacent areas is undeveloped land, with nearby residential

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development to the south. The three Site 35 subareas and Site 42 are former UST locations within landscaped areas adjacent to structures. The areas near Site 35a, 35b and Site 42 are still actively used as office and dormitory areas, but the Site 35c area is no longer used. Sites 30 and 40 are open space with some riparian vegetation. A residential area is located to the north and west of Site 40. The OU2 sites other than site 23 discussed in this AFRPA OU2 ROD are located on that portion of March AFB that may be converted to non-Air Force use. Site 23 is on private land. The anticipated land use for most of the OU2 AFRPA sites is commercial or industrial use. Alternative land uses have also been assessed and areas of West March could remain open space such as the SKR Conservation Area. March AFB is located in the North Perris Groundwater Basin. Currently, there are no potable groundwater resources extracted at the OU2 AFRPA sites. The relatively thin water-bearing zone on West March is not anticipated to yield substantial quantities of water. Therefore, the potential for extraction and use of groundwater from the West March AFRPA sites is limited, both now and in the foreseeable future. Water-bearing zones producing sufficient groundwater for use may be present at AFRPA sites on the Main Base and Site 23, and should be considered a potential potable water source. Surface water is not currently used at the OU2 AFRPA sites. Surface water areas such as at Site 6, 30 and 40 may remain as wetlands depending on future site development. A Record of Decision (ROD) for OU2 was completed May 11, 2004. Operable Unit (OU) 4: A total of three IRP sites (IRP Sites 21, 41, and 44), three AOCs (Water Tower 3410, Water Tank 6601, and the former Base Hospital and Dental Clinic), and one RFA site (Site L) are addressed in this OU4. Site 21 is off base approximately 1.5 miles south of the southern extension of the active March ARB runway. Although never physically part of March AFB, the site is considered to be part of the former base for purposes of the IRP because treated wastewater produced on base was held in this off-base pond. John Cordures, property owner until his death, used the water for irrigation of surrounding agricultural land from 1941 to 1946 and again from 1955 to 1984. The estate was sold to Ross Department Stores in 2001. The site is near the intersection of Morgan Street and Webster Avenue, in the City of Perris. Site 21 encompasses 1.5 acres and is part of a landscaped berm and below-grade parking area for warehouse trucks associated with a Ross warehouse distribution facility. The general surface-water drainage in the area is to the east following the gently sloping terrain (surface gradient at the site is approximately 20 to 40 feet per mile). Bedrock was not encountered during the investigation phases at Site 21. Groundwater at Site 21 is at a depth of more than 150 feet below ground surface (bgs) and the general groundwater flow direction is to the south and southeast. Site 21 was used from 1941 to 1946, and again from 1955 to 1984, to hold treated wastewater from the base. Sanitary and industrial wastewater received primary and secondary treatment on the base prior to discharge into this holding pond. The treated effluent was held in the pond and used for irrigation of the surrounding agricultural land. The boundaries of the effluent pond were physically well defined by the pond's berm during the 1993 OU1 Remedial Investigation/Feasibility Study (RI/FS). At that time the site covered an area of approximately 2.2 acres and was being used by private parties as an illegal dump. In approximately 1998, the berm was removed, and the site was incorporated into the surrounding sod farm. In 2001, the land was sold and the former pond area now consists of a landscaped berm on the west side of the site and a truck parking area that lies approximately 8 feet below grade on the east side. Based on historic use, the primary contaminants of concern at Site 21 include metals, volatile organic compounds (VOCs), and pesticides. Site 21 is part of a Ross warehouse distribution facility in the city of Perris. Adjacent and surrounding land uses consist of commercial/industrial development, and some land is in agricultural production. Although much of the surrounding property is currently agriculture, other

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properties are zoned for light industrial/commercial. As development occurs, agriculture zoning will likely change to general industrial. Site 41 is approximately 1 mile south of State Highway 58 and 11 miles east of Kramer Junction (the intersection of U.S. Highway 395 and State Highway 58) in San Bernardino County, California. Structures currently remaining at the site include a concrete bunker no longer in use. The general surface water drainage is to the northeast following the very gently sloping terrain (surface gradient at the site is approximately 20 to 40 feet per mile). Depth to beneficial groundwater is approximately 300 feet bgs. However, perched zone water is found between 100 and 150 feet bgs at nearby sites. A regional hardpan soil, approximately 3 to 4 feet thick at a depth of approximately 34 feet bgs, is reported in the area. The Air Force obtained right of entry for an approximate 315-acre parcel from the Bureau of Land Management (BLM) in the late 1950s for construction and operation of a radio relay station for use by George AFB. The parcel was transferred to Edwards AFB in 1963 and to March AFB in February 1968. The Radio Relay Annex was declared excess and was scheduled for deactivation in October 1968. The station facilities included a septic system, storage tanks for water and petroleum products, 4 miles of runway, a radio tower, a water well, an aboveground bunker, and several support buildings. The Air Force closed the station in the mid-1980s. Investigations and cleanup actions were conducted between February 1995 and May 1996 and included identification and removal of asbestos-containing material and lead-based paint, destruction of the water-supply well, removal of underground storage tanks (USTs) (oil, water, and septic) and contaminated soil, and confirmation sampling. Small amounts of diesel fuel leaked from the USTs. Based on historic use, the primary contaminant of concern at the site is total petroleum hydrocarbons (TPH) diesel fuel. Site 41 is in a remote area of the Mojave Desert. The Hawes site extends across 315 acres of desert land. The site is in the process of being transferred from the DOD back to the BLM, and the site will likely remain vacant due to its remote location and reversion to BLM control. Site 44 is in the central portion of the March ARB, east of the intersection of Graeber Street and Meyer Drive. Site 44 includes a 110-foot-tall, 200,000-gallon water tower, two large water storage tanks, and several buildings used by March ARB water system maintenance personnel. The area is characterized by relatively flat topography. A concrete-lined drainage ditch, just north of the site, flows eastward to the Heacock Storm Drain that drains south along the eastern perimeter of the former base. Groundwater at Site 44 is estimated to be approximately 30 feet bgs. Groundwater flow direction in this area is generally to the south and southeast. The water tower at Site 44 utilized a valve controller with a 6-inch mercury pot for water flow control. Past spills from the mercury pot caused mercury contamination of soils beneath and surrounding the valve controller. The flow controller at the water tower was in a subsurface valve box, 12 feet below grade. During a construction project to place a concrete floor in the below-grade box, approximately 80 cubic feet of soil were removed and stockpiled south and east of the valve box. In November 1995, the Air Force contracted to characterize the valve box and surrounding area for elemental mercury contamination. Based on the results of initial investigations at Site 44, the Air Force initiated a removal action. Soil was excavated in several discrete areas around the water tower. The primary soil removal areas were the valve box and surface soils in areas adjacent to the borings that identified "hot spots" of contamination. The excavated soil was segregated and packaged for off-site disposal. Once excavation of the valve pit was completed, the site was restored by filling the excavated area with sand to approximately 3 feet below the valve. A 6-inch-thick concrete floor was installed in the bottom of the valve pit. Land uses on adjacent and surrounding properties are exclusively industrial and commercial. As Site 44 will remain Air Force

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property, Site 44 is expected to stay industrial/commercial in the foreseeable future. Water Tower 3410 is an aboveground water storage tank on Former March AFB at the intersection of Plummer Road and 11th Street. Water Tower 3410 is in an area characterized by relatively flat topography, with a gentle slope to the east/northeast. No surface water bodies or major surface water drainages are associated with the site. Groundwater levels underlying Water Tower 3410 are between approximately 33 and 48 feet bgs. The groundwater flow direction is to the east. Although Water Tower 3410 was not specifically included in the Basewide RI/FS Work Plan, due to the presence of mercury pot water flow controllers at other March water storage facilities and the similarity of Water Tower 3410 with Water Tower 407 (Site 44), it was suspected that Water Tower 3410 might also have mercury-contaminated soils. March ARB Department of Public Works was contacted to determine if a mercury vault ever existed at the site. Interviews with Department personnel indicated that the building never contained a mercury vault. The only mercury controls at Water Tower 3410 are those that control associated pumps. Four aboveground controls are attached to the water tower rather than in a vault and contain only small amounts of elemental mercury. Water Tower 3410 is in an area characterized by industrial/commercial land use intermixed with vacant parcels. Adjacent and surrounding land use is also a mix of industrial/commercial use and vacant parcels. March Joint Powers Authority (MJPA) plans for the area, including Water Tower 3410, are for an industrial/business park. Water Tank 6601 is an aboveground storage tank north of Van Buren Boulevard and west of Plummer Road, west of 1-215. Water Tank 6601 is at an elevation of approximately 1,660 feet above mean sea level. The site is characterized by highly dissected upland topography and consists of highly eroded gullies and exposures of weathered bedrock. The primary flow of surface water in the vicinity of Water Tank 6601 is to the east. One primary intermittent stream channel drains to the east near the facility. The site is underlain by shallow surface soils, with a maximum thickness of soil only tens of feet thick. Based on information presented by Tetra Tech in the OU2 RI/FS, just south of the water tank, groundwater is encountered in weathered bedrock at depths ranging from 10 to 40 feet bgs. Groundwater flow is generally to the east. Water Tank 6601 is an active, 200,000-gallon water tank constructed in approximately 1942, with valves, piping, and electronic controls inside a fenced area with a concrete floor and a metal roof. The enclosure was constructed in the mid 1980s, in response to repeated vandalism at the site. Each incidence of vandalism resulted in releases of elemental mercury at the site due to breakage of a reservoir or "mercury pot." Some of the elemental mercury was recovered after each incident; however, no formal cleanup actions were performed. A cage was constructed to protect the controls from additional vandalism. The mercury control was removed and replaced with controls without mercury prior to the OU4 RI/FS investigation. Water Tank 6601 is in an undeveloped area, which is fenced. Adjacent and surrounding land use is mixed industrial/ vacant. Water Tank 6601 is expected to remain industrial. MJPA plans for the adjacent and surrounding land are for industrial/commercial development. The former base Hospital and Dental Clinics are in the northeast corner of the former base, near the intersection of Cactus Avenue and Heacock Street. The main Hospital building is five stories and the Dental Clinic is a one-story structure. The surface topography in and around the site is relatively flat with a gentle slope (surface gradient at the site is approximately 20 to 30 feet per mile). Major drainage features lie north and east of the site and consist of intermittent drainage channels (Cactus Channel Storm Drain and Heacock Storm Drain). There are no major drainages across the site, and there are no perennial water bodies near the site. While groundwater was not part of the investigation, groundwater is reported to be 25 to 30 feet bgs in the area of the former hospital and dental clinic. Groundwater flow direction is to the south and

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east. Construction of the Hospital was completed in 1966 and modified in subsequent years. The latest addition was completed in 1974. The original construction of the Dental Clinic was completed in 1985. A sewer main extends from the Hospital/Dental Clinic complex, south along the eastern base boundary to the last manhole before the connection of the hospital lines with the "old trunk line" from western portions of the March ARB. The sewer line, which services both the Hospital and Dental Clinic, was first brought on line with completion of the original hospital building. Two primary lines collect effluent from the complex. The two lines ultimately empty into the old sewer main that flows directly south to the current lifting station, from which sewage is transferred around the south end of the active runway to the current wastewater treatment plant. The former base Hospital and Dental Clinic are in an area characterized by institutional (i.e., medical) land use. Adjacent and surrounding land use is a mix of residential, commercial, a small amount of vacant property and land in agricultural use, and a small corridor of public facilities to the east of the Hospital for an electrical transmission line easement. MJPA plans for the Hospital/Dental Clinic site are for similar reuse. Site L, formerly a swimming pool at the Non-Commissioned Officer (NCO) Club, is east of Riverside Drive and north of Meyer Drive. The site is outside the boundary of March ARB that was established as a result of the realignment of March AFB in May 1996. It is part of the land identified as available for transfer by the AFRPA. Site L is in an area characterized by relatively flat topography. No major drainages are associated with the site. Groundwater levels at the site are approximately 26 feet bgs. The groundwater flow direction is to the southeast. The swimming pool at Site L was reportedly constructed in 1953 along with the NCO Club. After decommissioning at an unspecified time, it was used as a repository for a variety of wastes, some potentially hazardous. The pool and wastes were covered with soil, and the area was allowed to become overgrown with grass and weeds. The facility was abandoned and a chain-link fence restricted access to the former pool. In 1993, the pool was identified as an AOC during a comprehensive RFA/Expanded Source Investigation (ESI), which concluded that the pool was filled with a variety of wastes, including waste soils, solvents, and PCBs. In 1994, as part of the RFA investigation, a soil gas survey was conducted to screen for the presence of VOCs. No VOCs were detected above the laboratory reporting limits. Site L is currently open space (parking lot) with no structures, and is bordered on the north by vacant land and on the south by a parking area adjacent to Meyer Drive. The NCO Club is to the east of Site L, and the U.S. Army Reserve Center, with associated landscaping and parking is to the west. Surrounding land uses include institutional/medical, commercial, public facilities/recreation, and vacant land. The MJPA plans for Site L and the surrounding land are commercial in nature. A portion of the parcel in which Site L is located is currently leased to a catering business. A Record of Decision addressing OU4 was completed in September of 2005.

CERCLIS Assessment History:

Action Code:	001
Action:	DISCOVERY
Date Started:	Not reported
Date Completed:	02/01/1985
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

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For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	PRELIMINARY ASSESSMENT
Date Started:	Not reported
Date Completed:	02/01/1987
Priority Level:	Low priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	HAZARD RANKING SYSTEM PACKAGE
Date Started:	Not reported
Date Completed:	06/01/1987
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	SITE INSPECTION
Date Started:	Not reported
Date Completed:	06/01/1987
Priority Level:	Low priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	PROPOSAL TO NATIONAL PRIORITIES LIST
Date Started:	Not reported
Date Completed:	07/14/1989
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

MARCH AIR RESERVE BASE (Continued) **1000169261**

Action Code:	001
Action:	FINAL LISTING ON NATIONAL PRIORITIES LIST
Date Started:	Not reported
Date Completed:	11/21/1989
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	Notice Letters Issued
Date Started:	Not reported
Date Completed:	02/07/1990
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	FEDERAL INTERAGENCY AGREEMENT
Date Started:	09/27/1990
Date Completed:	09/27/1990
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Enforcement
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	INTERAGENCY AGREEMENT NEGOTIATIONS
Date Started:	02/07/1990
Date Completed:	09/27/1990
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Enforcement
Planning Status:	Alternate
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	Restoration Advisory Board
Date Started:	01/01/1993

MARCH AIR RESERVE BASE (Continued) **1000169261**

Date Completed:	Not reported
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	004
Action:	FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started:	01/24/1992
Date Completed:	04/30/1995
Priority Level:	Not reported
Operable Unit:	WEST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	FEDERAL FACILITY REMEDIAL ACTION
Date Started:	03/05/1996
Date Completed:	Not reported
Priority Level:	Not reported
Operable Unit:	EAST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	FEDERAL FACILITY REMEDIAL DESIGN
Date Started:	04/07/1996
Date Completed:	04/18/1996
Priority Level:	Not reported
Operable Unit:	EAST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	RECORD OF DECISION
Date Started:	Not reported
Date Completed:	06/20/1996
Priority Level:	Not reported
Operable Unit:	EAST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities

MARCH AIR RESERVE BASE (Continued) **1000169261**

Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started: 09/27/1990
Date Completed: 06/20/1996
Priority Level: Not reported
Operable Unit: EAST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: Explanation Of Significant Differences
Date Started: Not reported
Date Completed: 08/24/2000
Priority Level: Not reported
Operable Unit: EAST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: FEDERAL FACILITY FIVE YEAR REVIEW
Date Started: 09/30/2003
Date Completed: 11/19/2003
Priority Level: Not reported
Operable Unit: EAST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 004
Action: RECORD OF DECISION
Date Started: Not reported
Date Completed: 05/11/2004
Priority Level: Not reported
Operable Unit: WEST MARCH - SOILS/GW
Primary Responsibility: Federal Facilities
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

MARCH AIR RESERVE BASE (Continued) **1000169261**

For detailed financial records, contact EDR for a Site Report.:

Action Code:	002
Action:	FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started:	09/27/1990
Date Completed:	09/29/2005
Priority Level:	Not reported
Operable Unit:	BASEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	003
Action:	RECORD OF DECISION
Date Started:	Not reported
Date Completed:	09/29/2005
Priority Level:	Not reported
Operable Unit:	BASEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	005
Action:	RECORD OF DECISION
Date Started:	Not reported
Date Completed:	09/30/2005
Priority Level:	Not reported
Operable Unit:	WEST MARCH - SOILS/GW
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	005
Action:	FEDERAL FACILITY REMEDIAL INVESTIGATION/FEASIBILITY STUDY
Date Started:	10/30/2005
Date Completed:	Not reported
Priority Level:	Not reported
Operable Unit:	SITE 8 & 36
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	003

MARCH AIR RESERVE BASE (Continued) **1000169261**

Action:	FEDERAL FACILITY FIVE YEAR REVIEW
Date Started:	Not reported
Date Completed:	09/30/2009
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Facilities
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Federal Register Details:

Fed Register Date:	11/21/1989
Fed Register Volume:	54
Page Number:	48184
Fed Register Date:	07/14/1989
Fed Register Volume:	54
Page Number:	29820

Click this hyperlink while viewing on your computer to access
90 additional US CERCLIS Financial: record(s) in the EDR Site Report.

RCRA-LQG:

Date form received by agency:	07/15/2010
Facility name:	MARCH AIR RESERVE BASE
Facility address:	610 MEYER DRIVE BLDG 2403 MARCH AIR RESERVE BASE, CA 92518
EPA ID:	CA4570024527
Mailing address:	MEYER DRIVE BLDG 2403 MARCH AIR RESERVE BASE, CA 92518
Contact:	CARROLL B HALE
Contact address:	MEYER DRIVE BLDG 2403 MARCH AIR RESERVE BASE, CA 92518
Contact country:	Not reported
Contact telephone:	(951) 655-5852
Contact email:	CARROLL.HALE@US.AF.MIL
EPA Region:	09
Land type:	Federal
Classification:	Large Quantity Generator
Description:	Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Owner/Operator Summary:

MARCH AIR RESERVE BASE (Continued) **1000169261**

Owner/operator name:	USAF
Owner/operator address:	452 SPTG CEV MARCH ARB, CA 92518
Owner/operator country:	Not reported
Owner/operator telephone:	(909) 655-5069
Legal status:	Federal
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	USAF RESERVE COMMAND
Owner/operator address:	GRAEBER STREET, ST 117 MARCH AIR RESERVE BASE, CA 92518
Owner/operator country:	Not reported
Owner/operator telephone:	(951) 655-4520
Legal status:	Federal
Owner/Operator Type:	Owner
Owner/Op start date:	07/23/2006
Owner/Op end date:	Not reported

Owner/operator name:	GENERAL JAMES L. MELIN
Owner/operator address:	Not reported 92518
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Federal
Owner/Operator Type:	Operator
Owner/Op start date:	07/23/2006
Owner/Op end date:	Not reported

Owner/operator name:	MULTIPLE OPS - ALL USAF COMMANDS
Owner/operator address:	22 CSG/CC CITY NOT REPORTED, CA 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(714) 655-4735
Legal status:	Federal
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

MARCH AIR RESERVE BASE (Continued) **1000169261**

Historical Generators:

Date form received by agency:	03/26/2008
Facility name:	MARCH AIR RESERVE BASE
Classification:	Large Quantity Generator
Date form received by agency:	02/08/2006
Facility name:	MARCH AIR RESERVE BASE
Classification:	Large Quantity Generator
Date form received by agency:	02/25/2004
Facility name:	MARCH AIR RESERVE BASE
Classification:	Large Quantity Generator
Date form received by agency:	04/10/2002
Facility name:	MARCH AIR RESERVE BASE
Classification:	Large Quantity Generator
Date form received by agency:	10/12/2000
Facility name:	MARCH AIR RESERVE BASE
Site name:	MARCH ARB CA
Classification:	Large Quantity Generator
Date form received by agency:	07/14/2000
Facility name:	MARCH AIR RESERVE BASE
Classification:	Large Quantity Generator
Date form received by agency:	03/04/1999
Facility name:	MARCH AIR RESERVE BASE
Site name:	MARCH ARB, CA
Classification:	Large Quantity Generator
Date form received by agency:	09/01/1996
Facility name:	MARCH AIR RESERVE BASE
Classification:	Large Quantity Generator
Date form received by agency:	03/26/1996
Facility name:	MARCH AIR RESERVE BASE
Site name:	MARCH AFB, CA
Classification:	Large Quantity Generator
Date form received by agency:	03/31/1994
Facility name:	MARCH AIR RESERVE BASE
Site name:	MARCH AIR FORCE BASE, CA
Classification:	Large Quantity Generator
Date form received by agency:	03/30/1992
Facility name:	MARCH AIR RESERVE BASE
Site name:	MARCH AIR FORCE BASE
Classification:	Large Quantity Generator

Hazardous Waste Summary:

Waste code:	181
Waste name:	181
Waste code:	214
Waste name:	214

MARCH AIR RESERVE BASE (Continued) **1000169261**

Waste code: 223
Waste name: 223

Waste code: 281
Waste name: 281

Waste code: 342
Waste name: 342

Waste code: 343
Waste name: 343

Waste code: 352
Waste name: 352

Waste code: 461
Waste name: 461

Waste code: 541
Waste name: 541

Waste code: 792
Waste name: 792

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D006
Waste name: CADMIUM

Waste code: D007
Waste name: CHROMIUM

Waste code: D008
Waste name: LEAD

Waste code: D011
Waste name: SILVER

Waste code: D018
Waste name: BENZENE

MARCH AIR RESERVE BASE (Continued) **1000169261**

Waste code: F002
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F005
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D008
Waste name: LEAD

Waste code: D009
Waste name: MERCURY

Waste code: F001

MARCH AIR RESERVE BASE (Continued) **1000169261**

Waste name:	THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F002
Waste name:	THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F003
Waste name:	THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F005
Waste name:	THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Biennial Reports:

Last Biennial Reporting Year: 2011

Annual Waste Handled:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs):	30911
Waste code:	D002
Waste name:	A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS

MARCH AIR RESERVE BASE (Continued) **1000169261**

CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 1571

Waste code: D006
Waste name: CADMIUM
Amount (Lbs): 2449

Waste code: D007
Waste name: CHROMIUM
Amount (Lbs): 3944

Waste code: D008
Waste name: LEAD
Amount (Lbs): 4044

Waste code: D011
Waste name: SILVER
Amount (Lbs): 3825

Waste code: D018
Waste name: BENZENE
Amount (Lbs): 26938

Waste code: F002
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Amount (Lbs): 7

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Amount (Lbs): 1296

Waste code: F005
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS

MARCH AIR RESERVE BASE (Continued) **1000169261**

CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Amount (Lbs): 5121

Facility Has Received Notices of Violations:

Regulation violated: FR - 262.30-34.C
Area of violation: Generators - General
Date violation determined: 04/27/1995
Date achieved compliance: 04/27/2000
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/28/1995
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: 0
Final penalty amount: 0
Paid penalty amount: 0

Regulation violated: FR - 262.10-12.A
Area of violation: Generators - General
Date violation determined: 03/05/1984
Date achieved compliance: 04/04/1995
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/18/1984
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: 0
Final penalty amount: 0
Paid penalty amount: 0

Evaluation Action Summary:

Evaluation date: 11/02/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/06/1996
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 04/04/1995
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 04/27/2000
Evaluation lead agency: EPA

Evaluation date: 03/05/1984

MARCH AIR RESERVE BASE (Continued) **1000169261**

Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 04/04/1995
Evaluation lead agency: EPA

US ENG CONTROLS:
EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Actual Date: Not reported

Action ID: 001
Action Name: Explanation Of Significant Differences
Action Completion date: 20000824
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Bioremediation (Ex-Situ)

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Discharge

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Extraction

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Liquid Phase Carbon Adsorption

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Monitoring

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Groundwater
Engineering Control: Other, (N.O.S.)

MARCH AIR RESERVE BASE (Continued) **1000169261**

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Cap

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Disposal

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Excavation

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Impermeable Barrier

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Low Temperature Thermal Desorption

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Monitoring

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Operations & Maintenance (O&M)

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Recycling

Action ID: 001

MARCH AIR RESERVE BASE (Continued) **1000169261**

Action Name: RECORD OF DECISION
Action Completion date: 19960620
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Soil Vapor Extraction (in-situ)

Action ID: 003
Action Name: RECORD OF DECISION
Action Completion date: 20050929
Operable Unit: 04
Contaminated Media : Groundwater
Engineering Control: No Action

Action ID: 003
Action Name: RECORD OF DECISION
Action Completion date: 20050929
Operable Unit: 04
Contaminated Media : Soil
Engineering Control: Monitoring

Action ID: 003
Action Name: RECORD OF DECISION
Action Completion date: 20050929
Operable Unit: 04
Contaminated Media : Soil
Engineering Control: No Action

Action ID: 005
Action Name: RECORD OF DECISION
Action Completion date: 20050930
Operable Unit: 02
Contaminated Media : Groundwater
Engineering Control: No Action

Action ID: 005
Action Name: RECORD OF DECISION
Action Completion date: 20050930
Operable Unit: 02
Contaminated Media : Soil
Engineering Control: No Action

US INST CONTROL:
EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Building, demolition, or excavation regulation
Actual Date: Not reported
Complet. Date: 09/30/2005
Operable Unit: 02
Contaminated Media : Soil

MARCH AIR RESERVE BASE (Continued) **1000169261**

EPA ID:	CA4570024527
Site ID:	0902761
Name:	MARCH AIR FORCE BASE
Action Name:	RECORD OF DECISION
Address:	22 CSG/CC RIVERSIDE, CA 92518
EPA Region:	09
County:	RIVERSIDE
Event Code:	Not reported
Inst. Control:	Covenant
Actual Date:	Not reported
Complet. Date:	09/29/2005
Operable Unit:	04
Contaminated Media :	Soil

EPA ID:	CA4570024527
Site ID:	0902761
Name:	MARCH AIR FORCE BASE
Action Name:	RECORD OF DECISION
Address:	22 CSG/CC RIVERSIDE, CA 92518
EPA Region:	09
County:	RIVERSIDE
Event Code:	Not reported
Inst. Control:	Deed Notices
Actual Date:	Not reported
Complet. Date:	09/29/2005
Operable Unit:	04
Contaminated Media :	Soil

EPA ID:	CA4570024527
Site ID:	0902761
Name:	MARCH AIR FORCE BASE
Action Name:	RECORD OF DECISION
Address:	22 CSG/CC RIVERSIDE, CA 92518
EPA Region:	09
County:	RIVERSIDE
Event Code:	Not reported
Inst. Control:	Subdivision regulation
Actual Date:	Not reported
Complet. Date:	09/29/2005
Operable Unit:	04
Contaminated Media :	Soil

EPA ID:	CA4570024527
Site ID:	0902761
Name:	MARCH AIR FORCE BASE
Action Name:	RECORD OF DECISION
Address:	22 CSG/CC RIVERSIDE, CA 92518
EPA Region:	09
County:	RIVERSIDE
Event Code:	Not reported
Inst. Control:	Zoning regulation
Actual Date:	Not reported
Complet. Date:	09/29/2005

MARCH AIR RESERVE BASE (Continued) **1000169261**

Operable Unit: 04
Contaminated Media : Soil

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Covenant
Actual Date: Not reported
Complet. Date: 05/11/2004
Operable Unit: 02
Contaminated Media : Groundwater

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Covenant
Actual Date: Not reported
Complet. Date: 05/11/2004
Operable Unit: 02
Contaminated Media : Soil

EPA ID: CA4570024527
Site ID: 0902761
Name: MARCH AIR FORCE BASE
Action Name: RECORD OF DECISION
Address: 22 CSG/CC
RIVERSIDE, CA 92518
EPA Region: 09
County: RIVERSIDE
Event Code: Not reported
Inst. Control: Base use plan change
Actual Date: Not reported
Complet. Date: 09/30/2005
Operable Unit: 02
Contaminated Media : Soil

ROD:

Full-text of USEPA Record of Decision(s) is available from EDR.

FINDS:

Registry ID: 110001137396

Environmental Interest/Information System

MARCH AIR RESERVE BASE (Continued) **1000169261**

NCDB (National Compliance Data Base) supports implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). The system tracks inspections in regions and states with cooperative agreements, enforcement actions, and settlements.

The NEI (National Emissions Inventory) database contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAPs).

California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

US National Pollutant Discharge Elimination System (NPDES) module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

HAZARDOUS WASTE BIENNIAL REPORTER

CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) is the Superfund database that is used to support management in all phases of the Superfund program. The system contains information on all aspects of hazardous waste sites, including an inventory of sites, planned and actual site activities, and financial information.

US EPA Risk Management Plan (RMP) database stores the risk management plans reported by companies that handle, manufacture, use, or store certain flammable or toxic substances, as required under section 112(r) of the Clean Air Act (CAA).

PCS (Permit Compliance System) is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

NY MANIFEST:

EPA ID:	CA4570024527
Country:	USA
Mailing Name:	UNITED STATES MILITARY - MARCH AIR FORCE
Mailing Contact:	UNITED STATES MILITARY - MARCH AIR FORCE
Mailing Address:	BASE - 22 CSG/DEEV

MARCH AIR RESERVE BASE (Continued) **1000169261**

Mailing Address 2:	Not reported
Mailing City:	MARCH AIR FORCE BASE
Mailing State:	CA
Mailing Zip:	92518
Mailing Zip4:	Not reported
Mailing Country:	USA
Mailing Phone:	714-655-4858

Document ID:	NYA2651571
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	54068
Trans2 State ID:	GATX43254
Generator Ship Date:	850530
Trans1 Recv Date:	850530
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	850906
Part A Recv Date:	850625
Part B Recv Date:	850916
Generator EPA ID:	CA4570024527
Trans1 EPA ID:	CAD006913206
Trans2 EPA ID:	CAD006913206
TSDF ID:	NY7890008975
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	01560
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	85

Document ID:	NYA2651598
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	54068
Trans2 State ID:	ACFX88990
Generator Ship Date:	850528
Trans1 Recv Date:	850528
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	850710
Part A Recv Date:	850605
Part B Recv Date:	850723
Generator EPA ID:	CA4570024527
Trans1 EPA ID:	CAD006913206
Trans2 EPA ID:	CAD006913206
TSDF ID:	NY7890008975
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	05100
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	85

MARCH AIR RESERVE BASE (Continued) **1000169261**

Document ID:	NYA2651589
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	Not reported
Trans2 State ID:	ACFX88990
Generator Ship Date:	850524
Trans1 Recv Date:	850524
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	850710
Part A Recv Date:	850605
Part B Recv Date:	850723
Generator EPA ID:	CA4570024527
Trans1 EPA ID:	CAD006913206
Trans2 EPA ID:	CAD006913206
TSDF ID:	NY7890008975
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	06000
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	85

Document ID:	NYA3077741
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	ACFX88331
Trans2 State ID:	ACFX88331
Generator Ship Date:	860127
Trans1 Recv Date:	860127
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	860417
Part A Recv Date:	860131
Part B Recv Date:	860423
Generator EPA ID:	CA4570024527
Trans1 EPA ID:	CAD006913206
Trans2 EPA ID:	CAD006913206
TSDF ID:	NY7890008975
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	03500
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	TT - Cargo tank, tank trucks
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	100
Year:	86

Document ID:	NYA3918835
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	64661
Trans2 State ID:	Not reported
Generator Ship Date:	860214
Trans1 Recv Date:	860214
Trans2 Recv Date:	860219
TSD Site Recv Date:	860321
Part A Recv Date:	860225

MARCH AIR RESERVE BASE (Continued) **1000169261**

Part B Recv Date:	860327
Generator EPA ID:	CA4570024527
Trans1 EPA ID:	GAD042097261
Trans2 EPA ID:	Not reported
TSDF ID:	NYD000632372
Waste Code:	D003 - NON-LISTED REACTIVE WASTES
Quantity:	00043
Units:	P - Pounds
Number of Containers:	001
Container Type:	DM - Metal drums, barrels
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	86

A1
East
< 1/8
0.033 mi.
175 ft.

HUD INTOWN PROPERTIES
25620 SAN LUPE AVE
MORENO VALLEY, CA 92551

HAZNET **S103968997**
N/A

Site 1 of 3 in cluster A

Relative:
Lower

Actual:
1526 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001497696
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0041
Facility County:	Riverside

Year:	1998
Gepaid:	CAC001497696
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0650
Facility County:	Riverside

Year:	1998
Gepaid:	CAC001497696
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000

HUD INTOWN PROPERTIES (Continued) **S103968997**

Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	T01
Tons:	.0150
Facility County:	Riverside

2
NNW
< 1/8
0.034 mi.
177 ft.

HUD INTOWN PROPERTIES
25487 EL GRECO DR
MORENO VALLEY, CA 92555

HAZNET **S103968996**
N/A

Relative:
Higher

Actual:
1532 ft.

HAZNET:

Year:	1998
Gepaid:	CAC002119952
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAT080022148
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.4587
Facility County:	Riverside

A3
East
< 1/8
0.034 mi.
180 ft.

INTOWN PROPERTIES, INC/HUD
25572 SAN LUPE AVE
MORENO VALLEY, CA 92551

Site 2 of 3 in cluster A

HAZNET **S103646954**
N/A

Relative:
Lower

Actual:
1525 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001078376
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925510000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0250
Facility County:	Riverside

A4 **INTOWN PROPERTIES INC/HUD** **HAZNET** **S103970505**
SE **25540 SAN LUPE AVE** **N/A**
< 1/8 **MORENO VALLEY, CA 92553**
0.041 mi.
218 ft. **Site 3 of 3 in cluster A**

Relative:
Lower

Actual:
1524 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001390712
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0375
Facility County:	Riverside

Year:	1998
Gepaid:	CAC001390712
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	T01
Tons:	.0125
Facility County:	Riverside

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5 **INTOWN PROPERTIES, INC/HUD** **HAZNET** **S103632316**
SSW **15196 CANDICE CT** **N/A**
< 1/8 **MORENO VALLEY, CA 92551**
0.094 mi.
496 ft.

Relative:
Lower

Actual:
1522 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001078384
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925080000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0175
Facility County:	Riverside

Year:	1997

INTOWN PROPERTIES, INC/HUD (Continued) **S103632316**

Gepaid:	CAC001078384
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925080000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	T01
Tons:	.0500
Facility County:	Riverside

B6 **HOUSING URBAN DEV .** **HAZNET** **S103631346**
NNE **14795 MAGELLAN DR** **N/A**
1/8-1/4 **MORENO VALLEY, CA 92523**
0.126 mi.
664 ft. **Site 1 of 2 in cluster B**

Relative:
Higher

Actual:
1534 ft.

HAZNET:

Year:	1996
Gepaid:	CAC001058472
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	32643 HWY 74
Mailing City,St,Zip:	HEMET, CA 925450000
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.3336
Facility County:	Riverside

C7 **ARMADA ELEMENTARY** **HAZNET** **S108741304**
West **25201 JOHN F KENNEDY DR** **N/A**
1/8-1/4 **MORENO VALLEY, CA 92551**
0.168 mi.
887 ft. **Site 1 of 2 in cluster C**

Relative:
Higher

Actual:
1534 ft.

HAZNET:

Year:	2005
Gepaid:	CAR000155192
Contact:	BILL DEEGAN
Telephone:	9095717500
Mailing Name:	Not reported
Mailing Address:	25634 ALASSANDRO
Mailing City,St,Zip:	MORENO VALLEY, CA 925530000
Gen County:	Riverside
TSD EPA ID:	CAT080033681
TSD County:	Los Angeles
Waste Category:	Other organic solids
Disposal Method:	Not reported
Tons:	0.84

ARMADA ELEMENTARY (Continued) **S108741304**

Facility County: Not reported

C8
West
1/8-1/4
0.168 mi.
887 ft.

MORENO VALLEY USD - ARMADA ELEM
25201 JOHN F KENNEDY DR
MORENO VALLEY, CA 92551

HAZNET **S108214331**
N/A

Site 2 of 2 in cluster C

Relative:
Higher

Actual:
1534 ft.

HAZNET:

Year:	2004
Gepaid:	CAC002578881
Contact:	PATRICIA BAIRD
Telephone:	9095717500
Mailing Name:	Not reported
Mailing Address:	25634 ALASSANDRO
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Other inorganic solid waste
Disposal Method:	H01
Tons:	1.5
Facility County:	Not reported

B9
NNE
1/8-1/4
0.183 mi.
964 ft.

WILLIE WOHLFORD
25554 ERICSON DR
MORENO VALLEY, CA 92553

HAZNET **S109433695**
N/A

Site 2 of 2 in cluster B

Relative:
Higher

Actual:
1535 ft.

HAZNET:

Year:	2007
Gepaid:	CAC002614587
Contact:	WILLIE WOHLFORD
Telephone:	9519244772
Mailing Name:	Not reported
Mailing Address:	25554 ERICSON DR
Mailing City,St,Zip:	MORENO VALLEY, CA 925535054
Gen County:	Riverside
TSD EPA ID:	CAD088504881
TSD County:	Orange
Waste Category:	Liquids with pH <= 2 with metals
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.05
Facility County:	Riverside

Year:	2007
Gepaid:	CAC002614587
Contact:	WILLIE WOHLFORD
Telephone:	9519244772
Mailing Name:	Not reported
Mailing Address:	25554 ERICSON DR
Mailing City,St,Zip:	MORENO VALLEY, CA 925535054
Gen County:	Riverside
TSD EPA ID:	CAD982444481

WILLIE WOHLFORD (Continued) **S109433695**

TSD County:	San Bernardino
Waste Category:	Unspecified oil-containing waste
Disposal Method:	OTHER TREATMENT
Tons:	0.31
Facility County:	Riverside

10
SE
1/8-1/4
0.186 mi.
981 ft.

HUD C/O GOLDEN FEATHER REALITY INC
25625 VISTA FAMOSO
MORENO VALLEY, CA 92553

HAZNET **S104573106**
N/A

Relative:
Lower

Actual:
1517 ft.

HAZNET:

Year:	1999
Gepaid:	CAC002231369
Contact:	HUD C/O GOLDEN FEATHER REALITY
Telephone:	9494776300
Mailing Name:	Not reported
Mailing Address:	2500 MICHELSON ST STE 100
Mailing City,St,Zip:	IRVINE, CA 926120000
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	R01
Tons:	0.0331
Facility County:	Riverside

D11
SSW
1/8-1/4
0.203 mi.
1071 ft.

25328 FAY AVE
MORENO VALLEY, CA 92551

Site 1 of 2 in cluster D

CDL **S107531802**
N/A

Relative:
Lower

Actual:
1518 ft.

CDL:

Facility ID:	200008078
Lab Type:	Illegal Drug Lab (L) - location where an illegal drug lab was operated or drug lab equipment and/or materials were stored.

D12
SSW
1/8-1/4
0.205 mi.
1081 ft.

25328 FAY ST
MORENO VALLEY, CA

Site 2 of 2 in cluster D

CHMIRS **S105666192**
N/A

Relative:
Lower

Actual:
1518 ft.

CHMIRS:

OES Incident Number:	00-3622
OES notification:	8/12/200003:12:58 PM
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported

(Continued) **S105666192**

Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Contractor
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2000
Agency:	Riverside Co Fire
Incident Date:	8/12/200012:00:00 AM
Admin Agency:	Not reported
Amount:	Not reported
Contained:	Yes
Site Type:	Residence
E Date:	Not reported
Substance:	drug lab waste
Quantity Released:	Not reported
BBLS:	0
Cups:	0
CUFT:	0
Gallons:	55
Grams:	0
Pounds:	0
Liters:	0
Ounces:	0
Pints:	0

(Continued) **S105666192**

Quarts:	0
Sheen:	0
Tons:	0
Unknown:	0
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
Description:	no spillage to ground. All substances including trash were in a 55 gallon drum

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E13
ENE
1/8-1/4
0.218 mi.
1153 ft.

HUD INTOWN PROPERTIES
14916 RIO GRANDE DR
MORENO VALLEY, CA 92551

HAZNET **S104570745**
N/A

Site 1 of 3 in cluster E

Relative:
Higher

Actual:
1530 ft.

HAZNET:

Year:	1999
Gepaid:	CAC002170625
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	H01
Tons:	0.0208
Facility County:	Riverside

F14
SW
1/8-1/4
0.237 mi.
1253 ft.

INTOWN PROPERTIES INC/HUD
25237 FILAGREE AVE
MORENO VALLEY, CA 92551

HAZNET **S103970497**
N/A

Site 1 of 3 in cluster F

Relative:
Lower

Actual:
1520 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001399152
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.2343
Facility County:	Riverside

E15 | **INTOWN PROPERTIES, INC/HUD** | **HAZNET** | **S103970870**
ENE | **14858 RIO GRANDE** | | **N/A**
1/8-1/4 | **MORENO VALLEY, CA 92553**
0.245 mi.
1292 ft. | **Site 2 of 3 in cluster E**

Relative:
Higher

Actual:
1532 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001081456
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	MORENO VALLEY, CA 925530000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0125
Facility County:	Riverside

E16 | **HUD/INTOWN** | **HAZNET** | **S103647125**
ENE | **25776 PARSLEY AVE** | | **N/A**
1/4-1/2 | **MORENO VALLEY, CA 92553**
0.303 mi.
1599 ft. | **Site 3 of 3 in cluster E**

Relative:
Higher

Actual:
1532 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001230784
Contact:	HUD/INTOWN
Telephone:	9092740143
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0283
Facility County:	Riverside

G17 | **HUD INTOWN PROPERTIES** | **HAZNET** | **S103968993**
South | **25387 JUANITA AVE** | | **N/A**
1/4-1/2 | **MORENO VALLEY, CA 92551**
0.310 mi.
1639 ft. | **Site 1 of 2 in cluster G**

Relative:
Lower

Actual:
1513 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001363232
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000

HUD INTOWN PROPERTIES (Continued) **S103968993**

Gen County: Riverside
TSD EPA ID: CAD000088252
TSD County: Los Angeles
Waste Category: Household waste
Disposal Method: H01
Tons: .0650
Facility County: Riverside

Year: 1998
Gepaid: CAC001363232
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE # 215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: CAD028409019
TSD County: Los Angeles
Waste Category: Household waste
Disposal Method: H01
Tons: .0125
Facility County: Riverside

H18 **INTOWN PROPERTIES, INC/HUD** **HAZNET** **S103970944**
NE **25772 DELPHININUM AVE** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92553**
0.326 mi.
1720 ft. **Site 1 of 2 in cluster H**

Relative:
Higher

Actual:
1536 ft.

HAZNET:
Year: 1998
Gepaid: CAC001081448
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE, STE 215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: CAD028409019
TSD County: Los Angeles
Waste Category: Household waste
Disposal Method: H01
Tons: .0050
Facility County: Riverside

Year: 1998
Gepaid: CAC001081448
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE, STE 215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: CAD028409019
TSD County: Los Angeles
Waste Category: Household waste
Disposal Method: T01
Tons: .0050

INTOWN PROPERTIES, INC/HUD (Continued) **S103970944**

Facility County: Riverside

I19
East
1/4-1/2
0.329 mi.
1735 ft.

INTOWN PROPERTIES INC/HUD
14924 TARRAGON WY
MORENO VALLEY, CA 92553

HAZNET **S103970325**
N/A

Site 1 of 4 in cluster I

Relative:
Higher

Actual:
1529 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001506979
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.2501
Facility County:	Riverside

J20
NNW
1/4-1/2
0.331 mi.
1746 ft.

14710 AGAVE ST
MORENO VALLEY, CA 92388

CDL **S107528768**
N/A

Site 1 of 3 in cluster J

Relative:
Higher

Actual:
1547 ft.

CDL:

Facility ID:	200009129
Lab Type:	Illegal Drug Lab (L) - location where an illegal drug lab was operated or drug lab equipment and/or materials were stored.

H21
NE
1/4-1/2
0.336 mi.
1772 ft.

HUD INTOWN PROPERTIES
25760 DELEPHINIUM
MORENO VALLEY, CA 92553

HAZNET **S103969000**
N/A

Site 2 of 2 in cluster H

Relative:
Higher

Actual:
1535 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001503872
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0675

HUD INTOWN PROPERTIES (Continued) **S103969000**

Facility County: Riverside

Year: 1998
Gepaid: CAC001503872
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE # 215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: CAD028409019
TSD County: Los Angeles
Waste Category: Household waste
Disposal Method: T01
Tons: .0300
Facility County: Riverside

F22
SW
1/4-1/2
0.340 mi.
1793 ft.

INTOWN PROPERTIES, INC/HUD
25118 YOLANDA AVE
MORENO VALLEY, CA 92551

HAZNET **S103646492**
N/A

Site 2 of 3 in cluster F

Relative:
Lower

Actual:
1517 ft.

HAZNET:
Year: 1997
Gepaid: CAC001077328
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE #215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: Not reported
TSD County: 0
Waste Category: Household waste
Disposal Method: H01
Tons: .1350
Facility County: Riverside

Year: 1997
Gepaid: CAC001077328
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE #215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: Not reported
TSD County: 0
Waste Category: Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method: H01
Tons: .0250
Facility County: Riverside

F23	**INTOWN PROPERTIES INC/HUD**	**HAZNET**	**S103970491**
SW	**25107 YOLANDA AVE**		**N/A**
1/4-1/2	**MORENO VALLEY, CA 92551**		
0.346 mi.			
1827 ft.	**Site 3 of 3 in cluster F**		

Relative: **Lower**

Actual: **1517 ft.**

HAZNET:

Year:	1998
Gepaid:	CAC001505432
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0208
Facility County:	Riverside

K24	**CITY OF MORENO VALLEY/REDEV AGENCY**	**HAZNET**	**S108202200**
WSW	**25051 FILAREE AVE**		**N/A**
1/4-1/2	**MORENO VALLEY, CA 92553**		
0.353 mi.			
1866 ft.	**Site 1 of 2 in cluster K**		

Relative: **Lower**

Actual: **1522 ft.**

HAZNET:

Year:	2004
Gepaid:	CAC002583727
Contact:	GLENN WAGGONER
Telephone:	9514133342
Mailing Name:	Not reported
Mailing Address:	14177 FEDERICK ST
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Not reported
Tons:	7.5
Facility County:	Not reported

I25	**INTOWN PROPERTIES, INC/HUD**	**HAZNET**	**S103970948**
ENE	**25852 PARSLEY AVE**		**N/A**
1/4-1/2	**MORENO VALLEY, CA 92553**		
0.354 mi.			
1869 ft.	**Site 2 of 4 in cluster I**		

Relative: **Higher**

Actual: **1531 ft.**

HAZNET:

Year:	1998
Gepaid:	CAC001082576
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000

INTOWN PROPERTIES, INC/HUD (Continued) **S103970948**

Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	T01
Tons:	.0083
Facility County:	Riverside

I26
ENE
1/4-1/2
0.356 mi.
1879 ft.

INTOWN PROPERTIES INC/HUD
14794 TARRAGON WY
MORENO VALLEY, CA 92553

HAZNET **S104567064**
N/A

Site 3 of 4 in cluster I

Relative:
Higher

Actual:
1532 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001397680
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0283
Facility County:	Riverside

27
NNW
1/4-1/2
0.357 mi.
1884 ft.

HUD INTOWN PROPERTIES
25316 OCONTO CT
MORENO VALLEY, CA 92553

HAZNET **S103968988**
N/A

Relative:
Higher

Actual:
1545 ft.

HAZNET:

Year:	1998
Gepaid:	CAC002121312
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0115
Facility County:	Riverside

L28 **7-ELEVEN #33157** **HAZNET** **S106093006**
West **15020 PERRIS BLVD** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92553**
0.359 mi.
1897 ft. **Site 1 of 12 in cluster L**

Relative:
Higher

Actual:
1534 ft.

HAZNET:

Year:	2010
Gepaid:	CAL000244918
Contact:	KEN HILLIARD, ENVT'L MANAGER
Telephone:	9728286592
Mailing Name:	Not reported
Mailing Address:	PO BOX 711
Mailing City,St,Zip:	DALLAS, TX 752210711
Gen County:	Not reported
TSD EPA ID:	NVT330010000
TSD County:	Not reported
Waste Category:	Other organic solids
Disposal Method:	LANDFILL OR SURFACE IMPOUNDMENT THAT WILL BE CLOSED AS LANDFILL(TO INCLUDE ON-SITE TREATMENT AND/OR STABILIZATION)
Tons:	0.032
Facility County:	Riverside

Year:	2008
Gepaid:	CAL000244918
Contact:	KEN HILLIARD, ENVT'L MANAGER
Telephone:	9728286592
Mailing Name:	Not reported
Mailing Address:	PO BOX 711
Mailing City,St,Zip:	DALLAS, TX 752210711
Gen County:	Riverside
TSD EPA ID:	NVT330010000
TSD County:	99
Waste Category:	Other organic solids
Disposal Method:	LANDFILL OR SURFACE IMPOUNDMENT THAT WILL BE CLOSED AS LANDFILL(TO INCLUDE ON-SITE TREATMENT AND/OR STABILIZATION)
Tons:	0.1525
Facility County:	Riverside

Year:	2008
Gepaid:	CAL000244918
Contact:	KEN HILLIARD, ENVT'L MANAGER
Telephone:	9728286592
Mailing Name:	Not reported
Mailing Address:	PO BOX 711
Mailing City,St,Zip:	DALLAS, TX 752210711
Gen County:	Riverside
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Aqueous solution with total organic residues less than 10 percent
Disposal Method:	OTHER RECOVERY OF RECLAMATION FOR REUSE INCLUDING ACID REGENERATION, ORGANICS RECOVERY ECT
Tons:	4.263
Facility County:	Riverside

Year:	2007
Gepaid:	CAL000244918
Contact:	KEN HILLIARD, ENVT'L MANAGER
Telephone:	9728286592

7-ELEVEN #33157 (Continued) **S106093006**

Mailing Name:	Not reported
Mailing Address:	PO BOX 711
Mailing City,St,Zip:	DALLAS, TX 752210711
Gen County:	Riverside
TSD EPA ID:	NVT330010000
TSD County:	99
Waste Category:	Other organic solids
Disposal Method:	LANDFILL OR SURFACE IMPOUNDMENT THAT WILL BE CLOSED AS LANDFILL(TO INCLUDE ON-SITE TREATMENT AND/OR STABILIZATION)
Tons:	0.02
Facility County:	Riverside

Year:	2006
Gepaid:	CAL000244918
Contact:	RANDY MARTIN-ENVIRONMENTAL MGR
Telephone:	2537967170
Mailing Name:	Not reported
Mailing Address:	PO BOX 711
Mailing City,St,Zip:	DALLAS, TX 752210711
Gen County:	Riverside
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Aqueous solution with total organic residues less than 10 percent
Disposal Method:	R01
Tons:	0.08
Facility County:	Riverside

Click this hyperlink while viewing on your computer to access
6 additional CA_HAZNET: record(s) in the EDR Site Report.

L29
West
1/4-1/2
0.359 mi.
1897 ft.

SEVEN ELEVEN STORE #33157
15020 PERRIS BLVD
MORENO VALLEY, CA 92553

Site 2 of 12 in cluster L

UST **U003839039**
N/A

Relative:
Higher

Actual:
1534 ft.

RIVERSIDE CO. UST:

Region:	RIVERSIDE
Total Tanks:	2

M30
SSW
1/4-1/2
0.363 mi.
1915 ft.

HUD INTOWN PROPERTIES
15468 ELEANOR LN
MORENO VALLEY, CA 92551

Site 1 of 4 in cluster M

HAZNET **S104570783**
N/A

Relative:
Lower

Actual:
1515 ft.

HAZNET:

Year:	1999
Gepaid:	CAC002171009
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028209109

HUD INTOWN PROPERTIES (Continued) **S104570783**

TSD County: 0
Waste Category: Household waste
Disposal Method: T01
Tons: 0.0083
Facility County: Riverside

Year: 1999
Gepaid: CAC002171009
Contact: HUD
Telephone: 0000000000
Mailing Name: Not reported
Mailing Address: 6850 BROCKTON AVE # 215
Mailing City,St,Zip: RIVERSIDE, CA 925060000
Gen County: Riverside
TSD EPA ID: CAD028209109
TSD County: 0
Waste Category: Household waste
Disposal Method: H01
Tons: 0.055
Facility County: Riverside

L31	**CHEVRON STATION 2 01457**	**RCRA-SQG**	**1000819888**
West	**15061 PERRIS BLVD**	**FINDS**	**CAD983659012**
1/4-1/2	**MORENO VALLEY, CA 92551**		
0.363 mi.			
1915 ft.	**Site 3 of 12 in cluster L**		

Relative: Higher

Actual: 1535 ft.

RCRA-SQG:
Date form received by agency: 02/04/1993
Facility name: CHEVRON STATION 2 01457
Facility address: 15061 PERRIS BLVD
MORENO VALLEY, CA 92553
EPA ID: CAD983659012
Contact: MARK KANITRA
Contact address: P O BOX 2833
LA HABRA, CA 90632
Contact country: US
Contact telephone: (310) 694-7452
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: CHEVRON USA PRODUCTS CO
Owner/operator address: P O BOX 2833
LA HABRA, CA 90632
Owner/operator country: Not reported
Owner/operator telephone: (310) 694-7452
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

CHEVRON STATION 2 01457 (Continued) **1000819888**

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110006484312

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

G32 **INTOWN PROPERTIES, INC/HUD** **HAZNET** **S103646756**
South **25402 GENTIAN AVE** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92555**
0.367 mi.
1938 ft. **Site 2 of 2 in cluster G**

Relative:
Lower

Actual:
1511 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001078328
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE
Mailing City,St,Zip:	RIVERSIDE, CA 925010000
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	0
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0091
Facility County:	Riverside

L33 **West** **1/4-1/2** **0.367 mi.** **1939 ft.**

ARMADA ELEMENTARY
25201 JOHN F. KENNEDY DR.
MORENO VALLEY, CA 92551

FINDS **1008303258**
N/A

Site 4 of 12 in cluster L

Relative: **Higher**

Actual: **1535 ft.**

FINDS:

Registry ID: 110021979698

Environmental Interest/Information System

US Geographic Names Information System (GNIS) is the official vehicle for geographic names used by the federal government and the source for applying geographic names to federal maps and other printed and electronic documents.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

L34 **West** **1/4-1/2** **0.367 mi.** **1939 ft.**

ARMADA ELEMENTARY SCHOOL
25201 JOHN F KENNEDY DR
MORENO VALLEY, CA 92553

HAZNET **S106090878**
N/A

Site 5 of 12 in cluster L

Relative: **Higher**

Actual: **1535 ft.**

HAZNET:

Year:	2002
Gepaid:	CAL000067806
Contact:	RICK LEWIS\\ DIRECTOR OF TRANS
Telephone:	9094855600
Mailing Name:	Not reported
Mailing Address:	13911 PERRIS BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 925530000
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Unspecified solvent mixture
Disposal Method:	H01
Tons:	0.35
Facility County:	Not reported

L35 **West** **1/4-1/2** **0.367 mi.** **1939 ft.**

ARMADA ELEMENTARY
25201 JFK DR
MORENO VALLEY, CA 92553

RCRA-SQG **1007447324**
CAR000155192

Site 6 of 12 in cluster L

Relative: **Higher**

Actual: **1535 ft.**

RCRA-SQG:

Date form received by agency:	06/30/2004
Facility name:	ARMADA ELEMENTARY
Facility address:	25201 JFK DR MORENO VALLEY, CA 92553
EPA ID:	CAR000155192

ARMADA ELEMENTARY (Continued) **1007447324**

Mailing address:	25634 ALASSANDRO MORENO VALLEY, CA 92553
Contact:	BILL DEEGAN
Contact address:	25634 ALASSANDRO MORENO VALLEY, CA 92553
Contact country:	US
Contact telephone:	909-571-7500
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	MORENO VALLEY UNIFIED SCHOOL DISTRICT
Owner/operator address:	25634 ALASSANDRO MORENO VALLEY, CA 92553
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	District
Owner/Operator Type:	Owner
Owner/Op start date:	09/01/1970
Owner/Op end date:	Not reported

Owner/operator name:	BILL DEEGAN
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	District
Owner/Operator Type:	Operator
Owner/Op start date:	06/30/1998
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency: 06/30/2004

ARMADA ELEMENTARY (Continued) **1007447324**

Facility name: ARMADA ELEMENTARY
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D008
Waste name: LEAD

Violation Status: No violations found

L36
WNW
1/4-1/2
0.368 mi.
1943 ft.

STEER N' STEIN MORENO VALLEY
14950 PERRIS BL
MORENO VALLEY, CA 92388

Site 7 of 12 in cluster L

EMI **S106840080**
N/A

Relative:
Higher

Actual:
1539 ft.

EMI:

Year:	1990
County Code:	33
Air Basin:	SC
Facility ID:	71132
Air District Name:	SC
SIC Code:	5812
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

37
West
1/4-1/2
0.369 mi.
1950 ft.

OAKWOOD APARTMENTS
15168 PERRIS BLVD
MORENO VALLEY, CA 92552

NPDES **S109452557**
N/A

Relative:
Higher

Actual:
1528 ft.

NPDES:

Npdes Number:	CAS000002
Facility Status:	Terminated
Agency Id:	Not reported
Region:	8
Regulatory Measure Id:	285129
Order No:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	8 33C337427
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	10/27/2005
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	06/30/2010
Discharge Name:	One Moreno Valley 240 LP
Discharge Address:	330 W Victoria St
Discharge City:	Gardena

OAKWOOD APARTMENTS (Continued) **S109452557**

Discharge State:	California
Discharge Zip:	90248

L38
WNW
1/4-1/2
0.371 mi.
1960 ft.

CALIFORNIA CLEANERS
14940 PERRIS BLVD
MORENO VALLEY, CA 90000

HAZNET **S100931560**
N/A

Site 8 of 12 in cluster L

Relative:
Higher

Actual:
1539 ft.

HAZNET:

Year:	2001
Gepaid:	CAL000073005
Contact:	INACTIVE PER FEE FORM 4-94
Telephone:	--
Mailing Name:	Not reported
Mailing Address:	14420 ELSWORTH AVE
Mailing City,St,Zip:	MORENO VALLEY, CA 925530000
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	Santa Cruz
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	R01
Tons:	0
Facility County:	Not reported

Year:	2000
Gepaid:	CAL000073005
Contact:	Not reported
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	14940 PERRIS BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 900000000
Gen County:	Riverside
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Not reported
Tons:	.2085
Facility County:	Riverside

Year:	1999
Gepaid:	CAL000073005
Contact:	Not reported
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	14940 PERRIS BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 900000000
Gen County:	Riverside
TSD EPA ID:	CAT080013352
TSD County:	Los Angeles
Waste Category:	Unspecified oil-containing waste
Disposal Method:	R01
Tons:	0.1876
Facility County:	Riverside

Year:	1995
Gepaid:	CAL000073005
Contact:	Not reported

CALIFORNIA CLEANERS (Continued) **S100931560**

Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	14940 PERRIS BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 900000000
Gen County:	Riverside
TSD EPA ID:	CAT000613927
TSD County:	San Bernardino
Waste Category:	Liquids with halogenated organic compounds >= 1,000 Mg./L
Disposal Method:	H01
Tons:	.0975
Facility County:	Riverside

Year:	1994
Gepaid:	CAL000073005
Contact:	Not reported
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	14940 PERRIS BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 900000000
Gen County:	Riverside
TSD EPA ID:	CAT000613927
TSD County:	San Bernardino
Waste Category:	Liquids with halogenated organic compounds >= 1,000 Mg./L
Disposal Method:	H01
Tons:	.0975
Facility County:	Riverside

Click this hyperlink while viewing on your computer to access
3 additional CA_HAZNET: record(s) in the EDR Site Report.

L39 **CALIFORNIA CLEANERS, B & E CON** **EMI** **S106827790**
WNW **14940 PERRIS BLVD.** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92388**
0.371 mi.
1960 ft. **Site 9 of 12 in cluster L**

Relative:
Higher

Actual:
1539 ft.

EMI:

Year:	1990
County Code:	33
Air Basin:	SC
Facility ID:	72333
Air District Name:	SC
SIC Code:	7216
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	2
Reactive Organic Gases Tons/Yr:	1
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

L40
WNW
1/4-1/2
0.371 mi.
1960 ft.

MORENO VALLEY RECYCLING 3
14940 PERRIS BLVD
MORENO VALLEY, CA 92553

Site 10 of 12 in cluster L

SWRCY **S107616257** **N/A**

Relative: **Higher**

Actual: **1539 ft.**

SWRCY:

Facility Phone Number:	(310) 978-9900
Whether The Facility Is Grandfathered:	N
Effective Date:	03/31/2006
Rural:	N
As Of:	12/12/2011
Party Number:	26222

M41
SW
1/4-1/2
0.374 mi.
1976 ft.

25164 JUANITA STREET
PERRIS, CA 91770

Site 2 of 4 in cluster M

CHMIRS **S108405601** **N/A**

Relative: **Lower**

Actual: **1514 ft.**

CHMIRS:

OES Incident Number:	05-5975
OES notification:	10/17/200504:14:46 PM
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	Not reported
Waterway:	Not reported

(Continued) **S108405601**

Spill Site:	Not reported
Cleanup By:	Reporting Party
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2005
Agency:	So CA Edison
Incident Date:	10/17/200512:00:00 AM
Admin Agency:	Not reported
Amount:	Not reported
Contained:	Yes
Site Type:	Residence
E Date:	Not reported
Substance:	mineral oil, unk PCB
Quantity Released:	Not reported
BBLS:	0
Cups:	0
CUFT:	0
Gallons:	2
Grams:	0
Pounds:	0
Liters:	0
Ounces:	0
Pints:	0
Quarts:	0
Sheen:	0
Tons:	0
Unknown:	0
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
Description:	Released due to storm damage to a transformer.

I42 **INTOWN PROPERTIES, INC/HUD** **HAZNET** **S103970949**
ENE **25871 PARSLEY AVE** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92553**
0.378 mi.
1996 ft. **Site 4 of 4 in cluster I**

Relative:
Higher

Actual:
1531 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001082688
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	T01
Tons:	.0200
Facility County:	Riverside

N43 **EXPRESS 1HR PHOTO & MAILING** **HAZNET** **S103631503**
WNW **14910 PERRIS BLVD #K** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92388**
0.384 mi.
2028 ft. **Site 1 of 2 in cluster N**

Relative:
Higher

Actual:
1542 ft.

HAZNET:

Year:	1994
Gepaid:	CAL000047038
Contact:	KAUFMAN STEVE & KELLY
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	14910 PERRIS BLVD #K
Mailing City,St,Zip:	MORENO VALLEY, CA 923880000
Gen County:	Riverside
TSD EPA ID:	CAD003963592
TSD County:	Santa Clara
Waste Category:	Metal sludge (Alkaline solution (pH >= 12.5) with metals)
Disposal Method:	Not reported
Tons:	.0300
Facility County:	Riverside

Year:	1993
Gepaid:	CAL000047038
Contact:	KAUFMAN STEVE & KELLY
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	14910 PERRIS BLVD #K
Mailing City,St,Zip:	MORENO VALLEY, CA 923880000
Gen County:	Riverside
TSD EPA ID:	CAD982524613
TSD County:	Orange
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	R01
Tons:	.2293
Facility County:	Riverside

L44 **CVS PHARMACY #8439** **HAZNET** **S111083054**
West **15025 PERRIS BLVD** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92551**
0.389 mi.
2054 ft. **Site 11 of 12 in cluster L**

Relative:
Higher

Actual:
1532 ft.

HAZNET:

Year:	2010
Gepaid:	CAL000327222
Contact:	Charles Savage
Telephone:	7606028736
Mailing Name:	Not reported
Mailing Address:	1905 ASTON AVE
Mailing City,St,Zip:	CARLSBAD, CA 920087392
Gen County:	Not reported
TSD EPA ID:	OHD083377010
TSD County:	Not reported
Waste Category:	Unspecified solvent mixture
Disposal Method:	FUEL BLENDING PRIOR TO ENERGY RECOVERY AT ANOTHER SITE
Tons:	0.002
Facility County:	Riverside

Year:	2010

CVS PHARMACY #8439 (Continued) **S111083054**

Gepaid:	CAL000327222
Contact:	Charles Savage
Telephone:	7606028736
Mailing Name:	Not reported
Mailing Address:	1905 ASTON AVE
Mailing City,St,Zip:	CARLSBAD, CA 920087392
Gen County:	Not reported
TSD EPA ID:	OHD083377010
TSD County:	Not reported
Waste Category:	Pharmaceutical waste
Disposal Method:	Not reported
Tons:	0.0005
Facility County:	Riverside

Year:	2010
Gepaid:	CAL000327222
Contact:	Charles Savage
Telephone:	7606028736
Mailing Name:	Not reported
Mailing Address:	1905 ASTON AVE
Mailing City,St,Zip:	CARLSBAD, CA 920087392
Gen County:	Not reported
TSD EPA ID:	OHD083377010
TSD County:	Not reported
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.0015
Facility County:	Riverside

Year:	2010
Gepaid:	CAL000327222
Contact:	Charles Savage
Telephone:	7606028736
Mailing Name:	Not reported
Mailing Address:	1905 ASTON AVE
Mailing City,St,Zip:	CARLSBAD, CA 920087392
Gen County:	Not reported
TSD EPA ID:	OHD083377010
TSD County:	Not reported
Waste Category:	Pharmaceutical waste
Disposal Method:	Not reported
Tons:	0.016
Facility County:	Riverside

K45 **CIRCLE K STORE #531** **RCRA-NonGen** **1000174051**
WSW **15310 PERRIS BLVD** **FINDS** **CAD981680275**
1/4-1/2 **MORENO VALLEY, CA 92551** **CA FID UST**
0.397 mi. **HIST UST**
2095 ft. **Site 2 of 2 in cluster K** **SWEEPS UST**

Relative:
Lower

Actual:
1522 ft.

RCRA-NonGen:

Date form received by agency:	06/10/1993
Facility name:	CIRCLE K STORE #531
Facility address:	15310 PERRIS BLVD MORENO VALLEY, CA 92553
EPA ID:	CAD981680275
Mailing address:	5811 MANZANITA AVE

CIRCLE K STORE #531 (Continued) **1000174051**

	CARMICHAEL, CA 95608
Contact:	ENVIRONMENTAL MANAGER
Contact address:	15310 PERIS BLVD
	SUNNYMEAD, CA 92388
Contact country:	US
Contact telephone:	(916) 334-2445
Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	PAT WRIGHT
Owner/operator address:	NOT REQUIRED
	NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED
	NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110006473761

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource

CIRCLE K STORE #531 (Continued) **1000174051**

Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

CA FID UST:

Facility ID:	33002843
Regulated By:	UTNKA
Regulated ID:	00013640
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	7146538785
Mail To:	Not reported
Mailing Address:	P O BOX 52084
Mailing Address 2:	Not reported
Mailing City,St,Zip:	MORENO VALLEY 92388
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

HIST UST:

Region:	STATE
Facility ID:	00000013640
Facility Type:	Gas Station
Other Type:	Not reported
Total Tanks:	0002
Contact Name:	KEN ZIMMERMAN
Telephone:	7146538785
Owner Name:	CIRCLE K CORPORATION
Owner Address:	4500 SOUTH 40TH STREET
Owner City,St,Zip:	PHOENIX, AZ 85040

Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00009940
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Tank Construction:	Not reported
Leak Detection:	Stock Inventor

Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00009940
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Tank Construction:	Not reported
Leak Detection:	Stock Inventor

CIRCLE K STORE #531 (Continued) **1000174051**

SWEEPS UST:

Status:	A
Comp Number:	13640
Number:	1
Board Of Equalization:	44-017981
Ref Date:	10-28-92
Act Date:	10-28-92
Created Date:	02-29-88
Tank Status:	A
Owner Tank Id:	000302
Swrcb Tank Id:	33-000-013640-000001
Actv Date:	10-28-92
Capacity:	9940
Tank Use:	M.V. FUEL
Stg:	P
Content:	LEADED
Number Of Tanks:	2

Status:	A
Comp Number:	13640
Number:	1
Board Of Equalization:	44-017981
Ref Date:	10-28-92
Act Date:	10-28-92
Created Date:	02-29-88
Tank Status:	A
Owner Tank Id:	000302
Swrcb Tank Id:	33-000-013640-000002
Actv Date:	10-28-92
Capacity:	9940
Tank Use:	M.V. FUEL
Stg:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

46
SSE
1/4-1/2
0.419 mi.
2213 ft.

MILES PRESERVATION LLC
25605 CATALEJO LN
MORENO VALLEY, CA 92551

HAZNET **S109931912**
N/A

Relative:
Lower

Actual:
1507 ft.

HAZNET:

Year:	2008
Gepaid:	CAC002636358
Contact:	JOSH BIGELOW
Telephone:	9518083346
Mailing Name:	Not reported
Mailing Address:	PO BOX 1162
Mailing City,St,Zip:	NUEVO, CA 92567
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.025
Facility County:	Riverside

J47 **COUNTRY WIDE FIELD SERVICES** **HAZNET** **S110369168**
NNW **25273 BILLIE DR** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92553**
0.424 mi.
2237 ft. **Site 2 of 3 in cluster J**

Relative:
Higher

Actual:
1550 ft.

HAZNET:

Year:	2009
Gepaid:	CAC002640768
Contact:	KATE ASBURY
Telephone:	9098052509
Mailing Name:	Not reported
Mailing Address:	301 E VANDERBILT WAY
Mailing City,St,Zip:	SAN BERNARDINO, CA 924083520
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.11676
Facility County:	Riverside

Year:	2009
Gepaid:	CAC002640768
Contact:	KATE ASBURY
Telephone:	9098052509
Mailing Name:	Not reported
Mailing Address:	301 E VANDERBILT WAY
Mailing City,St,Zip:	SAN BERNARDINO, CA 924083520
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	OTHER TREATMENT
Tons:	0.03768
Facility County:	Riverside

N48 **HUD** **HAZNET** **S103968436**
WNW **14771 CROFTBORRO RD** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92551**
0.426 mi.
2247 ft. **Site 2 of 2 in cluster N**

Relative:
Higher

Actual:
1545 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001301856
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925010000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Unspecified solvent mixture
Disposal Method:	H01
Tons:	.0025
Facility County:	Riverside

HUD (Continued) **S103968436**

Year:	1997
Gepaid:	CAC001301856
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925010000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	H01
Tons:	.0250
Facility County:	Riverside

J49
NNW
1/4-1/2
0.428 mi.
2262 ft.

25253 BILLIE DRIVE
25253 BILLIE DRIVE
MORENO VALLEY, CA 92553

Site 3 of 3 in cluster J

ERNS **97411754**
N/A

Relative:
Higher

Actual:
1550 ft.

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

O50
ENE
1/4-1/2
0.431 mi.
2278 ft.

HUD INTOWN PROPERTIES
14803 ROSEMARY AVE
MORENO VALLEY, CA 92551

Site 1 of 2 in cluster O

HAZNET **S103968772**
N/A

Relative:
Higher

Actual:
1533 ft.

HAZNET:

Year:	1998
Gepaid:	CAC002125936
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0208
Facility County:	Riverside

L51 **CHMIRS** **S100277524**
West **PERRIS BLVD, AND JOHN KENNEDY** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92388**
0.432 mi.
2283 ft. **Site 12 of 12 in cluster L**

Relative:
Higher

Actual:
1536 ft.

CHMIRS:

OES Incident Number:	9116594
OES notification:	Not reported
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	26-APR-91
Date Completed:	**26-APR-91**
Property Use:	962
Agency Id Number:	33090
Agency Incident Number:	17104
Time Notified:	1925
Time Completed:	2200
Surrounding Area:	400
Estimated Temperature:	64
Property Management:	C
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	N
Resp Agncy Personel # Of Decontaminated:	0
Responding Agency Personel # Of Injuries:	0
Responding Agency Personel # Of Fatalities:	0
Others Number Of Decontaminated:	0
Others Number Of Injuries:	0
Others Number Of Fatalities:	0
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	LARRRY KATULS F.C.
Report Date:	27-APR-91
Comments:	Y
Facility Telephone:	714 657-3183
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Not reported
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	88-92
Agency:	Not reported
Incident Date:	Not reported
Admin Agency:	Not reported
Amount:	Not reported

(Continued) **S100277524**

Contained:	Not reported
Site Type:	Not reported
E Date:	30-JUN-92
Substance:	Not reported
Quantity Released:	Not reported
BBLS:	Not reported
Cups:	Not reported
CUFT:	Not reported
Gallons:	Not reported
Grams:	Not reported
Pounds:	Not reported
Liters:	Not reported
Ounces:	Not reported
Pints:	Not reported
Quarts:	Not reported
Sheen:	Not reported
Tons:	Not reported
Unknown:	Not reported
Evacuations:	Not reported
Number of Injuries:	Not reported
Number of Fatalities:	Not reported
Description:	Not reported

P52 **APN 484 242 016** **NPDES** **S109436278**
NW **DELPHINIUM AVE & PERRIS BLVD** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92553**
0.441 mi.
2329 ft. **Site 1 of 2 in cluster P**

Relative:
Higher

Actual:
1548 ft.

NPDES:

Npdes Number:	CAS000002
Facility Status:	Terminated
Agency Id:	Not reported
Region:	8
Regulatory Measure Id:	284125
Order No:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	8 33C335639
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	07/25/2005
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	05/27/2010
Discharge Name:	Imad Michael
Discharge Address:	7682 Coatbridge Dr
Discharge City:	Riverside
Discharge State:	California
Discharge Zip:	92508

M53 **INTOWN PROPERTIES INC/HUD** **HAZNET** **S104569327**
SSW **25296 WENDY WY** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92551**
0.443 mi.
2339 ft. **Site 3 of 4 in cluster M**

Relative:
Lower

Actual:
1512 ft.

HAZNET:

Year:	1999
Gepaid:	CAC002108112
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	0.0625
Facility County:	Riverside

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54 **CHMIRS** **S105671095**
East **25991 CORIANDER CT.** **N/A**
1/4-1/2 **MORENO VALLEY, CA**
0.443 mi.
2341 ft.

Relative:
Lower

Actual:
1526 ft.

CHMIRS:

OES Incident Number:	01-6134
OES notification:	10/24/200109:46:23 AM
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported

(Continued) **S105671095**

CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Responsible Party
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2001
Agency:	Riverside County Fire Dept.
Incident Date:	10/23/200112:00:00 AM
Admin Agency:	Riverside County Environmental Health
Amount:	Not reported
Contained:	Yes
Site Type:	Residence
E Date:	Not reported
Substance:	Unknown Granular Substance
Quantity Released:	Not reported
BBLS:	0
Cups:	0
CUFT:	0
Gallons:	0
Grams:	0
Pounds:	0
Liters:	0
Ounces:	0
Pints:	0
Quarts:	0
Sheen:	0
Tons:	0
Unknown:	unk
Evacuations:	3
Number of Injuries:	0
Number of Fatalities:	0
Description:	Suspicious envelope with unknown granular substance inside. The field test was negative and the envelope was decontaminated and deposed of.

55
NE
1/4-1/2
0.452 mi.
2384 ft.

INTOWN PROPERTIES INC
14656 CANDOR CT
MORENO VALLEY, CA 92551

HAZNET **S103631188**
N/A

Relative:
Higher

Actual:
1537 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001265712
Contact:	HUD C/O INTOWN PROPERTIES
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215

INTOWN PROPERTIES INC (Continued) **S103631188**

Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	0
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	H01
Tons:	.0375
Facility County:	Riverside
Year:	1997
Gepaid:	CAC001265712
Contact:	HUD C/O INTOWN PROPERTIES
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method:	Not reported
Tons:	.0375
Facility County:	Riverside

Q56
ESE
1/4-1/2
0.453 mi.
2392 ft.

HUD INTOWN PROPERTIES
25969 MARGARET AVE
MORENO VALLEY, CA 92551

HAZNET **S103969005**
N/A

Site 1 of 4 in cluster Q

Relative:
Lower

Actual:
1516 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001504672
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0060
Facility County:	Riverside

57
NNW
1/4-1/2
0.453 mi.
2393 ft.

INTOWN PROPERTIES INC/HUD
14533 COCHITI DR
MORENO VALLEY, CA 92553

HAZNET **S103970313**
N/A

Relative:
Higher

Actual:
1545 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001387272
Contact:	HUD

INTOWN PROPERTIES INC/HUD (Continued) **S103970313**

Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0650
Facility County:	Riverside

R58
SW **25095 GENTIAN STREET** **CHMIRS** **S103989461**
1/4-1/2 **MORENO VALLEY, CA 92551** **CDL** **N/A**
0.455 mi. **HAZNET**
2405 ft. **Site 1 of 3 in cluster R**

Relative: **Lower**

Actual: **1515 ft.**

CHMIRS:

OES Incident Number:	016696
OES notification:	Not reported
OES Date:	11/27/1996
OES Time:	10:36:56 AM
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	YES
Waterway:	Not reported

(Continued) **S103989461**

Spill Site:	Not reported
Cleanup By:	Riverside Co Sheriff
Containment:	Not reported
What Happened:	Not reported
Type:	CHEMICAL
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	1996
Agency:	Riverside Co Fire
Incident Date:	0155 27Nov96
Admin Agency:	Not reported
Amount:	55 gals
Contained:	NO
Site Type:	RESIDENCE
E Date:	Not reported
Substance:	drug lab waste
Quantity Released:	Not reported
BBLS:	Not reported
Cups:	Not reported
CUFT:	Not reported
Gallons:	Not reported
Grams:	Not reported
Pounds:	Not reported
Liters:	Not reported
Ounces:	Not reported
Pints:	Not reported
Quarts:	Not reported
Sheen:	Not reported
Tons:	Not reported
Unknown:	Not reported
Evacuations:	NO
Number of Injuries:	NO
Number of Fatalities:	NO
Description:	sheriff drug raid collect approx 55 gals of waste.

CDL:

Facility ID:	199611123
Lab Type:	Illegal Drug Lab (L) - location where an illegal drug lab was operated or drug lab equipment and/or materials were stored.

HAZNET:

Year:	1996
Gepaid:	CLU960011767
Contact:	Not reported
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	PO BOX 806
Mailing City,St,Zip:	SACRAMENTO, CA 958120806
Gen County:	Riverside
TSD EPA ID:	CAD008302903
TSD County:	Los Angeles
Waste Category:	Liquids with pH <= 2
Disposal Method:	H01
Tons:	.0225
Facility County:	Riverside

(Continued) **S103989461**

Year:	1996
Gepaid:	CLU960011767
Contact:	Not reported
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	PO BOX 806
Mailing City,St,Zip:	SACRAMENTO, CA 958120806
Gen County:	Riverside
TSD EPA ID:	CAD008302903
TSD County:	Los Angeles
Waste Category:	Other inorganic solid waste
Disposal Method:	H01
Tons:	.0750
Facility County:	Riverside

Year:	1996
Gepaid:	CLU960011767
Contact:	Not reported
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	PO BOX 806
Mailing City,St,Zip:	SACRAMENTO, CA 958120806
Gen County:	Riverside
TSD EPA ID:	CAD008302903
TSD County:	Los Angeles
Waste Category:	Off-specification, aged or surplus organics
Disposal Method:	R01
Tons:	.0225
Facility County:	Riverside

M59 **HUD IN TOWN PROPERTIES** **HAZNET** **S103646610**
SSW **25230 WENDY WAY** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92551**
0.458 mi.
2417 ft. **Site 4 of 4 in cluster M**

Relative:
Lower

Actual:
1513 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001246016
Contact:	HUD IN TOWN PROPERTIES
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE #215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.1250
Facility County:	Riverside

60 **West** **1/4-1/2** **0.463 mi.** **2443 ft.**	**INTOWN PROPERTIES INC/HUD** **14955 DOVEHURST ST** **MORENO VALLEY, CA 92553**	**HAZNET**	**S103970327** **N/A**

Relative:
Higher

Actual:
1539 ft.

HAZNET:

Year:	1998
Gepaid:	CAC001397424
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0416
Facility County:	Riverside

O61 **ENE** **1/4-1/2** **0.468 mi.** **2473 ft.**	**INTOWN PROPERTIES, INC/HUD** **14844 CURRY** **MORENO VALLEY, CA 92553** **Site 2 of 2 in cluster O**	**HAZNET**	**S103631414** **N/A**

Relative:
Higher

Actual:
1530 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001078872
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	2086 S "E" ST, STE 204
Mailing City,St,Zip:	SAN BERNARDINO, CA 924080000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0635
Facility County:	Riverside

Year:	1997
Gepaid:	CAC001078872
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	2086 S "E" ST, STE 204
Mailing City,St,Zip:	SAN BERNARDINO, CA 924080000
Gen County:	Riverside
TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	T01
Tons:	.0075
Facility County:	Riverside

P62
NW **14740 PERRIS BLVD** **CHMIRS S105652119**
1/4-1/2 **MORENO VALLEY, CA 92223** **CDL N/A**
0.472 mi.
2494 ft. **Site 2 of 2 in cluster P**

Relative: Higher

Actual: 1550 ft.

CHMIRS:

OES Incident Number:	97-0781
OES notification:	2/23/199705:12:46 AM
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
Special Studies 1:	Not reported
Special Studies 2:	Not reported
Special Studies 3:	Not reported
Special Studies 4:	Not reported
Special Studies 5:	Not reported
Special Studies 6:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Co. SO/Contractor
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	1997
Agency:	Riverside Co FD
Incident Date:	2/23/199712:00:00 AM
Admin Agency:	Riverside County Environmental Health
Amount:	Not reported

(Continued) **S105652119**

Contained:	Yes
Site Type:	Residence
E Date:	Not reported
Substance:	Drug lab waste
Quantity Released:	Not reported
BBLS:	0
Cups:	0
CUFT:	0
Gallons:	0.000000
Grams:	0
Pounds:	50
Liters:	0
Ounces:	0
Pints:	0
Quarts:	0
Sheen:	0
Tons:	0
Unknown:	0
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
Description:	Found during drug bust

CDL:

Facility ID:	199702128
Lab Type:	Illegal Drug Lab (L) - location where an illegal drug lab was operated or drug lab equipment and/or materials were stored.

S63 **BANK OF AMERICA FIELD SERVICES INC** **HAZNET** **S110371268**
SE **25828 CASA FANTASTICO DR** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92551**
0.474 mi.
2503 ft. **Site 1 of 2 in cluster S**

Relative: Lower

Actual: 1506 ft.

HAZNET:

Year:	2009
Gepaid:	CAC002645513
Contact:	JOSH ALCORN
Telephone:	9098052509
Mailing Name:	Not reported
Mailing Address:	301 E VANDERBILT WAY STE 330
Mailing City,St,Zip:	SAN BERNARDINO, CA 924083557
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.05754
Facility County:	Riverside

Year:	2009
Gepaid:	CAC002645513
Contact:	JOSH ALCORN
Telephone:	9098052509
Mailing Name:	Not reported
Mailing Address:	301 E VANDERBILT WAY STE 330

BANK OF AMERICA FIELD SERVICES INC (Continued) **S110371268**

Mailing City,St,Zip:	SAN BERNARDINO, CA 924083557
Gen County:	Riverside
TSD EPA ID:	CAD982444481
TSD County:	San Bernardino
Waste Category:	Household waste
Disposal Method:	OTHER TREATMENT
Tons:	0.03336
Facility County:	Riverside

64
SW
1/4-1/2
0.476 mi.
2511 ft.

YORLANDA AND SHIELA
YORLANDA AND SHIELA
MARINO VALLEY, CA 92388

ERNS **92273527** **N/A**

Relative: **Lower**

Actual: **1520 ft.**

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

T65
South
1/4-1/2
0.481 mi.
2539 ft.

INTOWN PROPERTIES INC/HUD
15606 PATRICIA ST
MORENO VALLEY, CA 92551

HAZNET **S103970343** **N/A**

Site 1 of 2 in cluster T

Relative: **Lower**

Actual: **1508 ft.**

HAZNET:

Year:	1998
Gepaid:	CAC001505384
Contact:	HUD
Telephone:	7149577333
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	CAD000088252
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.1250
Facility County:	Riverside

T66
SSW
1/4-1/2
0.487 mi.
2570 ft.

HUD INTOWN PROPERTIES
25294 DANA LN
MORENO VALLEY, CA 92551

HAZNET **S103968986** **N/A**

Site 2 of 2 in cluster T

Relative: **Lower**

Actual: **1511 ft.**

HAZNET:

Year:	1998
Gepaid:	CAC001358704
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE # 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside

HUD INTOWN PROPERTIES (Continued) **S103968986**

TSD EPA ID:	CAD028409019
TSD County:	Los Angeles
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.1175
Facility County:	Riverside

Q67
ESE
1/4-1/2
0.492 mi.
2596 ft.

INTOWN PROPERTIES, INC/HUD
15327 LOS ESTADOS ST
MORENO VALLEY, CA 92551

HAZNET **S103632605**
N/A

Site 2 of 4 in cluster Q

Relative:
Lower

Actual:
1512 ft.

HAZNET:

Year:	1997
Gepaid:	CAC001078336
Contact:	HUD
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	6850 BROCKTON AVE, STE 215
Mailing City,St,Zip:	RIVERSIDE, CA 925060000
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	0
Waste Category:	Household waste
Disposal Method:	H01
Tons:	.0291
Facility County:	Riverside

Q68
East
1/4-1/2
0.493 mi.
2601 ft.

VISTA DEL LAGO HIGH
15150 LASSELLE ST
MORENO VALLEY, CA 92551

FINDS **1008305537**
N/A

Site 3 of 4 in cluster Q

Relative:
Lower

Actual:
1520 ft.

FINDS:

Registry ID: 110036979589

Environmental Interest/Information System

NCES (National Center for Education Statistics) is the primary federal entity for collecting and analyzing data related to education in the United States and other nations and the institute of education sciences.

Q69 **MVUSD- VISTA DEL LAGO HIGH SCHOOL** **HAZNET** **S108214557**
East **15150 LASSELLE ST** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92551**
0.493 mi.
2601 ft. **Site 4 of 4 in cluster Q**

Relative: **Lower**

Actual: **1520 ft.**

HAZNET:

Year:	2007
Gepaid:	CAL000285249
Contact:	NANCY ANDERSON
Telephone:	9515717520
Mailing Name:	Not reported
Mailing Address:	25634 ALESSANDRO BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	WAD991281767
TSD County:	99
Waste Category:	Laboratory waste chemicals
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0
Facility County:	Riverside

Year:	2007
Gepaid:	CAL000285249
Contact:	NANCY ANDERSON
Telephone:	9515717520
Mailing Name:	Not reported
Mailing Address:	25634 ALESSANDRO BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	CAD008364432
TSD County:	Los Angeles
Waste Category:	Laboratory waste chemicals
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.07
Facility County:	Riverside

Year:	2006
Gepaid:	CAL000285249
Contact:	NANCY ANDERSON
Telephone:	9515717520
Mailing Name:	Not reported
Mailing Address:	25634 ALESSANDRO BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	CAD008364432
TSD County:	Los Angeles
Waste Category:	Laboratory waste chemicals
Disposal Method:	H01
Tons:	0.06
Facility County:	Riverside

Year:	2005
Gepaid:	CAL000285249
Contact:	NANCY ANDERSON
Telephone:	9515717520
Mailing Name:	Not reported

MVUSD- VISTA DEL LAGO HIGH SCHOOL (Continued) **S108214557**

Mailing Address:	25634 ALESSANDRO BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	CAD008364432
TSD County:	Los Angeles
Waste Category:	Unspecified solvent mixture
Disposal Method:	H01
Tons:	0.22
Facility County:	Not reported

Year:	2004
Gepaid:	CAL000285249
Contact:	NANCY ANDERSON
Telephone:	9515717520
Mailing Name:	Not reported
Mailing Address:	25634 ALESSANDRO BLVD
Mailing City,St,Zip:	MORENO VALLEY, CA 92553
Gen County:	Riverside
TSD EPA ID:	CAD008364432
TSD County:	Los Angeles
Waste Category:	Unspecified solvent mixture
Disposal Method:	H01
Tons:	0.22
Facility County:	Not reported

Click this hyperlink while viewing on your computer to access additional CA_HAZNET: detail in the EDR Site Report.

R70
SW
1/4-1/2
0.493 mi.
2604 ft.

25030 GENTIAN ST
MORENO VALLEY, CA 92553

Site 2 of 3 in cluster R

CDL **S107531755**
N/A

Relative: **Lower**

Actual: **1517 ft.**

CDL:

Facility ID:	200011012
Lab Type:	Illegal Drug Lab (L) - location where an illegal drug lab was operated or drug lab equipment and/or materials were stored.

S71
SE
1/4-1/2
0.497 mi.
2623 ft.

GAR-CAST
25942 PASEO PACIFICO
MORENO VALLEY, CA 92551

Site 2 of 2 in cluster S

HAULERS **S110986734**
N/A

Relative: **Lower**

Actual: **1508 ft.**

HAULERS:

Facility ID:	1661551
Facility Phone:	(951) 258-7775

R72 **GARCIA TRUCKING** **RCRA-NonGen** **1001959799**
SSW **25121 DANA LN** **FINDS** **CAR000064451**
1/2-1 **MORENO VALLEY, CA 92551**
0.536 mi.
2830 ft. **Site 3 of 3 in cluster R**

Relative:
Lower

Actual:
1515 ft.

RCRA-NonGen:

Date form received by agency:	12/13/2007
Facility name:	GARCIA TRUCKING
Facility address:	10592 ELM ST
	BLOOMINGTON, CA 92316
EPA ID:	CAR000064451
Contact:	ROBERTO GARCIA
Contact address:	10592 ELM ST
	BLOOMINGTON, CA 92316
Contact country:	US
Contact telephone:	909-884-6529
Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	GARCIA TRUCKING
Owner/operator address:	10592 ELM ST
	BLOOMINGTON, CA 92316
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	12/15/1998
Owner/Op end date:	Not reported
Owner/operator name:	ROBERTO GARCIA
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	12/14/1998
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	Yes
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No

GARCIA TRUCKING (Continued) **1001959799**

Used oil transporter: No

Historical Generators:

Date form received by agency: 04/29/2005
Facility name: GARCIA TRUCKING
Classification: Not a generator, verified

Date form received by agency: 01/18/2000
Facility name: GARCIA TRUCKING
Classification: Not a generator, verified

Violation Status: No violations found

FINDS:

Registry ID: 110002932015

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

U73 **CORPORATE YARD** **AST** **A100271575**
SSW **15670 PERRIS BLVD** **N/A**
1/2-1 **MORENO VALLEY, CA 92552**
0.674 mi.
3561 ft. **Site 1 of 2 in cluster U**

Relative:
Lower

Actual:
1513 ft.

AST:

Owner: CITY OF MORENO VALLEY
Total Gallons: 4,710
Certified Unified Program Agencies: Riverside

U74 **CITY MAINT YARD MORENO VALLEY** **RCRA-SQG** **1000440225**
SSW **15670 PERRIS BLVD** **FINDS** **CAD982463630**
1/2-1 **MORENO VALLEY, CA 92551** **HAZNET**
0.674 mi.
3561 ft. **Site 2 of 2 in cluster U**

Relative:
Lower

Actual:
1513 ft.

RCRA-SQG:

Date form received by agency: 11/16/2005
Facility name: CITY OF MORENO VALLEY CORPORATION YARD
Facility address: 15670 PERRIS BLVD
MORENO VALLEY, CA 92551
EPA ID: CAD982463630
Mailing address: PO BOX 88005
MORENO VALLEY, CA 82552 0805
Contact: GREG A CAIN
Contact address: PO BOX 88005
MORENO VALLEY, CA 82552 0805
Contact country: US
Contact telephone: 951-413-3160

CITY MAINT YARD MORENO VALLEY (Continued) **1000440225**

Contact email:	GREGC@MOVAL.ORG
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	CITY OF MORENO VALLEY
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Municipal
Owner/Operator Type:	Operator
Owner/Op start date:	12/03/1984
Owner/Op end date:	Not reported

Owner/operator name:	CITY OF MORENO VALLEY
Owner/operator address:	PO BOX 88005 MORENO VALLEY, CA 92552
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Municipal
Owner/Operator Type:	Owner
Owner/Op start date:	12/07/1987
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	Yes
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	09/01/1996
Facility name:	CITY OF MORENO VALLEY CORPORATION YARD
Site name:	CITY MAINT YARD MORENO VALLEY
Classification:	Small Quantity Generator

Date form received by agency:	01/24/1989
Facility name:	CITY OF MORENO VALLEY CORPORATION YARD
Site name:	CITY MAINT YARD MORENO VALLEY

CITY MAINT YARD MORENO VALLEY (Continued) **1000440225**

Classification: Large Quantity Generator

Hazardous Waste Summary:
Waste code: D039
Waste name: TETRACHLOROETHYLENE

Violation Status: No violations found

FINDS:

Registry ID: 110006479015

Environmental Interest/Information System
California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:
Year: 2010
Gepaid: CAD982463630
Contact: R. LEMON MAINT & OPTNS MGR
Telephone: 9514133160
Mailing Name: Not reported
Mailing Address: PO BOX 88005
Mailing City,St,Zip: MORENO VALLEY, CA 925520805
Gen County: Not reported
TSD EPA ID: CAD982444481
TSD County: Not reported
Waste Category: Unspecified oil-containing waste
Disposal Method: STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons: 0.417
Facility County: Riverside

Year: 2010
Gepaid: CAD982463630
Contact: R. LEMON MAINT & OPTNS MGR
Telephone: 9514133160
Mailing Name: Not reported
Mailing Address: PO BOX 88005
Mailing City,St,Zip: MORENO VALLEY, CA 925520805
Gen County: Not reported
TSD EPA ID: CAD982444481
TSD County: Not reported
Waste Category: Latex waste
Disposal Method: STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons: 2.7105

CITY MAINT YARD MORENO VALLEY (Continued) **1000440225**

Facility County:	Riverside
Year:	2010
Gepaid:	CAD982463630
Contact:	R. LEMON MAINT & OPTNS MGR
Telephone:	9514133160
Mailing Name:	Not reported
Mailing Address:	PO BOX 88005
Mailing City,St,Zip:	MORENO VALLEY, CA 925520805
Gen County:	Not reported
TSD EPA ID:	CAD982444481
TSD County:	Not reported
Waste Category:	Off-specification, aged or surplus organics
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.165
Facility County:	Riverside
Year:	2010
Gepaid:	CAD982463630
Contact:	R. LEMON MAINT & OPTNS MGR
Telephone:	9514133160
Mailing Name:	Not reported
Mailing Address:	PO BOX 88005
Mailing City,St,Zip:	MORENO VALLEY, CA 925520805
Gen County:	Not reported
TSD EPA ID:	CAD982444481
TSD County:	Not reported
Waste Category:	Waste oil and mixed oil
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.874
Facility County:	Riverside
Year:	2009
Gepaid:	CAD982463630
Contact:	R LEMON ACTING MAINTENANCE & OPS
Telephone:	9514133160
Mailing Name:	Not reported
Mailing Address:	PO BOX 88005
Mailing City,St,Zip:	MORENO VALLEY, CA 925520805
Gen County:	Riverside
TSD EPA ID:	CAD044429835
TSD County:	Los Angeles
Waste Category:	Off-specification, aged or surplus organics
Disposal Method:	STORAGE, BULKING, AND/OR TRANSFER OFF SITE--NO TREATMENT/REOVERY (H010-H129) OR (H131-H135)
Tons:	0.3135
Facility County:	Riverside

Click this hyperlink while viewing on your computer to access
50 additional CA_HAZNET: record(s) in the EDR Site Report.

75 **WNW** **1/2-1** **0.718 mi.** **3792 ft.**	**BADGER SPRINGS MIDDLE SCHOOL EXPANSION** **24750 DELPHINIUM AVENUE** **MORENO VALLEY, CA 92553**	**SCH** **HAZNET** **ENVIROSTOR**	**S105089230** **N/A**

Relative:
Higher

Actual:
1548 ft.

SCH:

Facility ID:	60000826
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	0.21
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Mitigation And Brownfield Reuse Program
Project Manager:	JUAN OSORNIO
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404778
Assembly:	64, 65
Senate:	37
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	06/24/2008
Restricted Use:	NO
Funding:	School District
Latitude:	33.90641
Longitude:	-117.2318
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS, SCHOOL - ELEMENTARY
Potential COC:	30001, 30004, 30006, 30007, 30008, 30010, 30023, 30001, 30004, 30006, 30007, 30008, 30023
Confirmed COC:	,
Potential Description:	SOIL, SOIL
Alias Name:	404778
Alias Type:	Project Code (Site Code)
Alias Name:	60000826
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Workplan
Completed Date:	03/20/2008
Comments:	DTSC concurred with the proposed sampling approach.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	06/24/2008
Comments:	PEA Report approved with No Further Action determination.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	03/04/2008
Comments:	Agreement signed by Branch Chief, Sharon Fair . Copy sent to District.

BADGER SPRINGS MIDDLE SCHOOL EXPANSION (Continued) **S105089230**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 06/27/2008
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

HAZNET:
Year: 2002
Gepaid: CAL000032297
Contact: --
Telephone: 9094855600
Mailing Name: Not reported
Mailing Address: 13911 PERRIS BLVD
Mailing City,St,Zip: MORENO VALLEY, CA 925530000
Gen County: Riverside
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Unspecified aqueous solution
Disposal Method: H01
Tons: 0.00
Facility County: Not reported

Year: 2002
Gepaid: CAL000032297
Contact: --
Telephone: 9094855600
Mailing Name: Not reported
Mailing Address: 13911 PERRIS BLVD
Mailing City,St,Zip: MORENO VALLEY, CA 925530000
Gen County: Riverside
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Other inorganic solid waste
Disposal Method: H01
Tons: 0.00
Facility County: Not reported

Year: 2000
Gepaid: CAL000032297
Contact: MORENO VALLEY UNIFIED
Telephone: 9094855600
Mailing Name: Not reported
Mailing Address: 13911 PERRIS BLVD
Mailing City,St,Zip: MORENO VALLEY, CA 925530000
Gen County: Riverside
TSD EPA ID: CAD044429835
TSD County: Los Angeles

BADGER SPRINGS MIDDLE SCHOOL EXPANSION (Continued) **S105089230**

Waste Category: Unspecified solvent mixture
Disposal Method: D99
Tons: .0750
Facility County: Riverside

Year: 2000
Gepaid: CAL000032297
Contact: MORENO VALLEY UNIFIED
Telephone: 9094855600
Mailing Name: Not reported
Mailing Address: 13911 PERRIS BLVD
Mailing City,St,Zip: MORENO VALLEY, CA 925530000
Gen County: Riverside
TSD EPA ID: CAT080022148
TSD County: San Bernardino
Waste Category: Metal sludge (Alkaline solution (pH >= 12.5) with metals)
Disposal Method: H01
Tons: .0025
Facility County: Riverside

ENVIROSTOR:
Site Type: School Investigation
Site Type Detailed: School
Acres: 0.21
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: JUAN OSORNIO
Supervisor: Shahir Haddad
Division Branch: Southern California Schools & Brownfields Outreach
Facility ID: 60000826
Site Code: 404778
Assembly: 64, 65
Senate: 37
Special Program: Not reported
Status: No Further Action
Status Date: 06/24/2008
Restricted Use: NO
Site Mgmt. Req.: NONE SPECIFIED
Funding: School District
Latitude: 33.90641
Longitude: -117.2318
APN: NONE SPECIFIED
Past Use: AGRICULTURAL - ROW CROPS, SCHOOL - ELEMENTARY
Potential COC: 30001, 30004, 30006, 30007, 30008, 30010, 30023, 30001, 30004, 30006, 30007, 30008, 30023
Confirmed COC: ,
Potential Description: SOIL, SOIL
Alias Name: 404778
Alias Type: Project Code (Site Code)
Alias Name: 60000826
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan

BADGER SPRINGS MIDDLE SCHOOL EXPANSION (Continued) **S105089230**

Completed Date: 03/20/2008
Comments: DTSC concurred with the proposed sampling approach.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 06/24/2008
Comments: PEA Report approved with No Further Action determination.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 03/04/2008
Comments: Agreement signed by Branch Chief, Sharon Fair . Copy sent to District.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 06/27/2008
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

76
ESE
1/2-1
0.749 mi.
3953 ft.

ROCAMI TRUCKING
26170 CALLE ALTO
MORENO VALLEY, CA 92555

RCRA-NonGen **1010783754** **CAR000191015**

Relative:
Lower

Actual:
1505 ft.

RCRA-NonGen:
Date form received by agency: 03/21/2008
Facility name: ROCAMI TRUCKING
Facility address: 26170 CALLE ALTO
MORENO VALLEY, CA 92555
EPA ID: CAR000191015
Contact: IGNACIO MARTIN DELCAMPO
Contact address: 26170 CALLE ALTO
MORENO VALLEY, CA 92555
Contact country: US
Contact telephone: 951-543-7428
Contact email: Not reported
EPA Region: 09
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: ROCAMI TRUCKING
Owner/operator address: Not reported

ROCAMI TRUCKING (Continued) **1010783754**

Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/07/2008
Owner/Op end date: Not reported

Owner/operator name: IGNACIO
Owner/operator address: 26170 CALLE ALTO
MORENO VALLEY, CA 92555
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 03/01/2007
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS

ROCAMI TRUCKING (Continued) **1010783754**

NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Waste code: D004
Waste name: ARSENIC

Waste code: D005
Waste name: BARIUM

Waste code: D006
Waste name: CADMIUM

Waste code: D007
Waste name: CHROMIUM

Waste code: D008
Waste name: LEAD

Waste code: D009
Waste name: MERCURY

Waste code: D010
Waste name: SELENIUM

Waste code: D011
Waste name: SILVER

Waste code: D012
Waste name: ENDRIN

Waste code: D013
Waste name: LINDANE

Waste code: D014
Waste name: METHOXYCHLOR

Waste code: D015
Waste name: TOXAPHENE

Waste code: D016
Waste name: 2,4-D

Waste code: D017
Waste name: 2,4,5-TP (SILVEX)

Waste code: D018
Waste name: BENZENE

Waste code: D019
Waste name: CARBON TETRACHLORIDE

Waste code: D020
Waste name: CHLORDANE

Waste code: D021

ROCAMI TRUCKING (Continued) **1010783754**

Waste name: CHLOROBENZENE

Waste code: D022
Waste name: CHLOROFORM

Waste code: D023
Waste name: O-CRESOL

Waste code: D024
Waste name: M-CRESOL

Waste code: D025
Waste name: P-CRESOL

Waste code: D026
Waste name: CRESOL

Waste code: D027
Waste name: 1,4-DICHLOROBENZENE

Waste code: D028
Waste name: 1,2-DICHLOROETHANE

Waste code: D029
Waste name: 1,1-DICHLOROETHYLENE

Waste code: D030
Waste name: 2,4-DINITROTOLUENE

Waste code: D031
Waste name: HEPTACHLOR (AND ITS EPOXIDE).

Waste code: D032
Waste name: HEXACHLOROBENZENE

Waste code: D033
Waste name: HEXACHLOROBUTADIENE

Waste code: D034
Waste name: HEXACHLOROETHANE

Waste code: D035
Waste name: METHYL ETHYL KETONE

Waste code: D036
Waste name: NITROBENZENE

Waste code: D037
Waste name: PENTRACHLOROPHENOL

Waste code: D038
Waste name: PYRIDINE

Waste code: D039
Waste name: TETRACHLOROETHYLENE

Waste code: D040

ROCAMI TRUCKING (Continued) **1010783754**

Waste name:	TRICHLOROETHYLENE
Waste code:	D041
Waste name:	2,4,5-TRICHLOROPHENOL
Waste code:	D042
Waste name:	2,4,6-TRICHLOROPHENOL
Waste code:	D043
Waste name:	VINYL CHLORIDE
Waste code:	F001
Waste name:	THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F002
Waste name:	THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F003
Waste name:	THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F004
Waste name:	THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: CRESOLS AND CRESYLIC ACID, AND NITROBENZENE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	F005
Waste name:	THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF

ROCAMI TRUCKING (Continued) **1010783754**

ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F006
Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

Waste code: F007
Waste name: SPENT CYANIDE PLATING BATH SOLUTIONS FROM ELECTROPLATING OPERATIONS

Waste code: F008
Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

Waste code: F009
Waste name: SPENT STRIPPING AND CLEANING BATH SOLUTIONS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

Waste code: F010
Waste name: QUENCHING BATH RESIDUES FROM OIL BATHS FROM METAL HEAT TREATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

Waste code: F011
Waste name: SPENT CYANIDE SOLUTIONS FROM SALT BATH POT CLEANING FROM METAL HEAT TREATING OPERATIONS.

Waste code: F012
Waste name: QUENCHING WASTE WATER TREATMENT SLUDGES FROM METAL HEAT TREATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

Waste code: F019
Waste name: WASTEWATER TREATMENT SLUDGES FROM THE CHEMICAL CONVERSION COATING OF ALUMINUM EXCEPT FROM ZIRCONIUM PHOSPHATING IN ALUMINUM CAN WASHING WHEN SUCH PHOSPHATING IS AN EXCLUSIVE CONVERSION COATING PROCESS.

Waste code: F020
Waste name: WASTES (EXCEPT WASTEWATER AND SPENT CARBON FROM HYDROGEN CHLORIDE PURIFICATION) FROM THE PRODUCTION OR MANUFACTURING USE (AS A REACTANT, CHEMICAL INTERMEDIATE, OR COMPONENT IN A FORMULATING PROCESS) OF TRI- OR TETRACHLOROPHENOL, OR OF INTERMEDIATES USED TO PRODUCE THEIR PESTICIDE DERIVATIVES. (THIS LISTING DOES NOT INCLUDE WASTES FROM THE PRODUCTION OF HEXACHLOROPHENE FROM HIGHLY PURIFIED 2,4,5-TRICHLOROPHENOL).

Waste code: F021
Waste name: WASTES (EXCEPT WASTEWATER AND SPENT CARBON FROM HYDROGEN CHLORIDE PURIFICATION) FROM THE PRODUCTION OR MANUFACTURING USE (AS A REACTANT, CHEMICAL INTERMEDIATE, OR COMPONENT IN A FORMULATING PROCESS) OF PENTACHLOROPHENOL, OR OF INTERMEDIATES USED TO PRODUCE ITS DERIVATIVES.

ROCAMI TRUCKING (Continued) **1010783754**

Waste code: F022
Waste name: WASTES (EXCEPT WASTEWATER AND SPENT CARBON FROM HYDROGEN CHLORIDE PURIFICATION) FROM THE MANUFACTURING USE (AS A REACTANT, CHEMICAL INTERMEDIATE, OR COMPONENT IN A FORMULATING PROCESS) OF TETRA-, PENTA-, OR HEXACHLOROBENZENES UNDER ALKALINE CONDITIONS.

Waste code: F023
Waste name: WASTES (EXCEPT WASTEWATER AND SPENT CARBON FROM HYDROGEN CHLORIDE PURIFICATION) FROM THE PRODUCTION OF MATERIALS ON EQUIPMENT PREVIOUSLY USED FOR THE PRODUCTION OR MANUFACTURING USE (AS A REACTANT, CHEMICAL INTERMEDIATE, OR COMPONENT IN A FORMULATING PROCESS) OF TRI- AND TETRACHLOROPHENOLS. (THIS LISTING DOES NOT INCLUDE WASTES FROM EQUIPMENT USED ONLY FOR THE PRODUCTION OR USE OF HEXACHLOROPHENE FROM HIGHLY PURIFIED 2,4,5-TRICHLOROPHENOL).

Waste code: F024
Waste name: PROCESS WASTES, INCLUDING BUT NOT LIMITED TO, DISTILLATION RESIDUES, HEAVY ENDS, TARS, AND REACTOR CLEAN-OUT WASTES, FROM THE PRODUCTION OF CERTAIN CHLORINATED ALIPHATIC HYDROCARBONS BY FREE RADICAL CATALYZED PROCESSES. THESE CHLORINATED ALIPHATIC HYDROCARBONS ARE THOSE HAVING CARBON CHAIN LENGTHS RANGING FROM ONE TO AND INCLUDING FIVE, WITH VARYING AMOUNTS AND POSITIONS OF CHLORINE SUBSTITUTION. (THIS LISTING DOES NOT INCLUDE WASTEWATERS, WASTEWATER TREATMENT SLUDGES, SPENT CATALYSTS, AND WASTES LISTED IN SECTION 261.31 OR SECTION 261.32).

Waste code: F025
Waste name: CONDENSED LIGHT ENDS, SPENT FILTERS AND FILTER AIDS, AND SPENT DESICCANT WASTES FROM THE PRODUCTION OF CERTAIN CHLORINATED ALIPHATIC HYDROCARBONS, BY FREE RADICAL CATALYZED PROCESSES. THESE CHLORINATED ALIPHATIC HYDROCARBONS ARE THOSE HAVING CARBON CHAIN LENGTHS RANGING FROM ONE TO AND INCLUDING FIVE, WITH VARYING AMOUNTS AND POSITIONS OF CHLORINE SUBSTITUTION.

Waste code: F026
Waste name: WASTES (EXCEPT WASTEWATER AND SPENT CARBON FROM HYDROGEN CHLORIDE PURIFICATION) FROM THE PRODUCTION OF MATERIALS ON EQUIPMENT PREVIOUSLY USED FOR THE MANUFACTURING USE (AS A REACTANT, CHEMICAL INTERMEDIATE, OR COMPONENT IN A FORMULATING PROCESS) OF TETRA-, PENTA-, OR HEXACHLOROBENZENE UNDER ALKALINE CONDITIONS.

Waste code: F027
Waste name: DISCARDED UNUSED FORMULATIONS CONTAINING TRI-, TETRA-, OR PENTACHLOROPHENOL OR DISCARDED UNUSED FORMULATIONS CONTAINING COMPOUNDS DERIVED FROM THESE CHLOROPHENOLS. (THIS LISTING DOES NOT INCLUDE FORMULATIONS CONTAINING HEXACHLOROPHENE SYTHESIZED FROM PREPURIFIED 2,4,5-TRICHLOROPHENOL AS THE SOLE COMPONENT).

Waste code: F028
Waste name: RESIDUES RESULTING FROM THE INCINERATION OR THERMAL TREATMENT OF SOIL CONTAMINATED WITH EPA HAZARDOUS WASTE NOS. F020, F021, F022, F023, F026, AND F027.

Waste code: F032
Waste name: WASTEWATERS, PROCESS RESIDUALS, PRESERVATIVE DRIPPAGE, AND SPENT FORMULATIONS FROM WOOD PRESERVING PROCESSES GENERATED AT PLANTS THAT CURRENTLY USE OR HAVE PREVIOUSLY USED CHLOROPHENOLIC FORMULATIONS (EXCEPT POTENTIALLY CROSS-CONTAMINATED WASTES THAT HAVE HAD THE F032

ROCAMI TRUCKING (Continued) **1010783754**

WASTE CODE DELETED IN ACCORDANCE WITH SECTION 261.35 OF THIS CHAPTER AND WHERE THE GENERATOR DOES NOT RESUME OR INITIATE USE OF CHLOROPHENOLIC FORMULATIONS). THIS LISTING DOES NOT INCLUDE K001 BOTTOM SEDIMENT SLUDGE FROM THE TREATMENT OF WASTEWATER FROM WOOD PRESERVING PROCESSES THAT USE CREOSOTE AND/OR PENTACHLOROPHENOL. (NOTE: THE LISTING OF WASTEWATERS THAT HAVE NOT COME INTO CONTACT WITH PROCESS CONTAMINANTS IS STAYED ADMINISTRATIVELY. THE LISTING FOR PLANTS THAT HAVE PREVIOUSLY USED CHLOROPHENOLIC FORMULATIONS IS ADMINISTRATIVELY STAYED WHENEVER THESE WASTES ARE COVERED BY THE F034 OR F035 LISTINGS. THESE STAYS WILL REMAIN IN EFFECT UNTIL FURTHER ADMINISTRATIVE ACTION IS TAKEN.)

Waste code: F034
Waste name: WASTEWATERS, PROCESS RESIDUALS, PRESERVATIVE DRIPPAGE, AND SPENT FORMULATIONS FROM WOOD PRESERVING PROCESS GENERATED AT PLANTS THAT USE CREOSOTE FORMULATIONS. THIS LISTING DOES NOT INCLUDE K001 BOTTOM SEDIMENT SLUDGE FROM THE TREATMENT OF WASTEWATER FROM WOOD PRESERVING PROCESSES THAT USE CREOSOTE AND/OR PENTACHLOROPHENOL. (NOTE: THE LISTING OF WASTEWATERS THAT HAVE NOT COME INTO CONTACT WITH PROCESS CONTAMINANTS IS STAYED ADMINISTRATIVELY. THE STAY WILL REMAIN IN EFFECT UNTIL FURTHER ADMINISTRATIVE ACTION IS TAKEN.)

Waste code: F035
Waste name: WASTEWATERS, PROCESS RESIDUALS, PRESERVATIVE DRIPPAGE, AND SPENT FORMULATIONS FROM WOOD PRESERVING PROCESS GENERATED AT PLANTS THAT USE INORGANIC PRESERVATIVES CONTAINING ARSENIC OR CHROMIUM. THIS LISTING DOES NOT INCLUDE K001 BOTTOM SEDIMENT SLUDGE FROM THE TREATMENT OF WASTEWATER FROM WOOD PRESERVING PROCESSES THAT USE CREOSOTE AND/OR PENTACHLOROPHENOL (NOTE: THE LISTING OF WASTEWATERS THAT HAVE NOT COME INTO CONTACT WITH PROCESS CONTAMINANTS IS STAYED ADMINISTRATIVELY. THE STAY WILL REMAIN IN EFFECT UNTIL FURTHER ADMINISTRATIVE ACTION IS TAKEN.).

Waste code: F037
Waste name: PETROLEUM REFINERY PRIMARY OIL/WATER/SOLIDS SEPARATION SLUDGE-ANY SLUDGE GENERATED FROM THE GRAVITATIONAL SEPARATION OF OIL/WATER/SOLIDS DURING THE STORAGE OR TREATMENT OF PROCESS WASTEWATERS AND OILY COOLING WASTEWATERS FROM PETROLEUM REFINERIES. SUCH SLUDGES INCLUDE, BUT ARE NOT LIMITED TO, THOSE GENERATED IN: OIL/WATER/SOLIDS SEPARATORS; TANKS AND IMPOUNDMENTS; DITCHES AND OTHER CONVEYANCES; SUMPS; AND STORMWATER UNITS RECEIVING DRY WEATHER FLOW. SLUDGE GENERATED IN STORMWATER UNITS THAT DO NOT RECEIVE DRY WEATHER FLOW, SLUDGES GENERATED FROM NON-CONTACT ONCE-THROUGH COOLING WATERS SEGREGATED FOR TREATMENT FROM OTHER PROCESS OR OILY COOLING WATERS, SLUDGES GENERATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS AS DEFINED IN SECTION 261.31(B)(2) (INCLUDING SLUDGES GENERATED IN ONE OR MORE ADDITIONAL UNITS AFTER WASTEWATERS HAVE BEEN TREATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS) AND K051 WASTES ARE NOT INCLUDED IN THIS LISTING.

Waste code: F038
Waste name: PETROLEUM REFINERY SECONDARY (EMULSIFIED) OIL/WATER/SOLIDS SEPARATION SLUDGE-ANY SLUDGE AND/OR FLOAT GENERATED FROM THE PHYSICAL AND/OR CHEMICAL SEPARATION OF OIL/WATER/SOLIDS IN PROCESS WASTEWATERS AND OILY COOLING WASTEWATERS FROM PETROLEUM REFINERIES. SUCH WASTES INCLUDE, BUT ARE NOT LIMITED TO, ALL SLUDGES AND FLOATS GENERATED IN: INDUCED AIR FLOTATION (IAF) UNITS, TANKS AND IMPOUNDMENTS, AND ALL

ROCAMI TRUCKING (Continued) **1010783754**

SLUDGES GENERATED IN DAF UNITS. SLUDGES GENERATED IN STORMWATER UNITS THAT DO NOT RECEIVE DRY WEATHER FLOW, SLUDGES GENERATED FROM NON-CONTACT ONCE-THROUGH COOLING WATERS SEGREGATED FOR TREATMENT FROM OTHER PROCESS OR OILY COOLING WATERS, SLUDGES AND FLOATS GENERATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS AS DEFINED IN SECTION 261.31(B)(2) (INCLUDING SLUDGES AND FLOATS GENERATED IN ONE OR MORE ADDITIONAL UNITS AFTER WASTEWATERS HAVE BEEN TREATED IN AGGRESSIVE BIOLOGICAL TREATMENT UNITS) AND F037, K048, AND K051 WASTES ARE NOT INCLUDED IN THIS LISTING.

Waste code: F039
Waste name: LEACHATE (LIQUIDS THAT HAVE PERCOLATED THROUGH LAND DISPOSED WASTES) RESULTING FROM THE DISPOSAL OF MORE THAN ONE RESTRICTED WASTE CLASSIFIED AS HAZARDOUS UNDER SUBPART D OF THIS PART. (LEACHATE RESULTING FROM THE DISPOSAL OF ONE OR MORE OF THE FOLLOWING EPA HAZARDOUS WASTES AND NO OTHER HAZARDOUS WASTES RETAINS ITS EPA HAZARDOUS WASTES NUMBER(S): F020, F021, F022, F026, F027, AND/OR F028).

Waste code: K001
Waste name: BOTTOM SEDIMENT SLUDGE FROM THE TREATMENT OF WASTEWATERS FROM WOOD PRESERVING PROCESSES THAT USE CREOSOTE AND/OR PENTACHLOROPHENOL.

Waste code: K002
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF CHROME YELLOW AND ORANGE PIGMENTS.

Waste code: K003
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF MOLYBDATE ORANGE PIGMENTS

Waste code: K004
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF ZINC YELLOW PIGMENTS

Waste code: K005
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF CHROME GREEN PIGMENTS

Waste code: K006
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF CHROME OXIDE GREEN PIGMENTS (ANHYDROUS AND HYDRATED).

Waste code: K007
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF IRON BLUE PIGMENTS

Waste code: K008
Waste name: OVEN RESIDUE FROM THE PRODUCTION OF CHROME OXIDE GREEN PIGMENTS

Waste code: K009
Waste name: DISTILLATION BOTTOMS FROM THE PRODUCTION OF ACETALDEHYDE FROM ETHYLENE

Waste code: K010
Waste name: DISTILLATION SIDE CUTS FROM THE PRODUCTION OF ACETAIDEHYDE FROM ETHYLENE

Waste code: K011

ROCAMI TRUCKING (Continued) **1010783754**

Waste name:	BOTTOM STREAM FROM THE WASTEWATER STRIPPER IN THE PRODUCTION OF ACRYLONITRILE
Waste code:	K013
Waste name:	BOTTOM STREAM FROM THE ACETONITRILE COLUMN IN THE PRODUCTION OF ACRYLONITRILE
Waste code:	K014
Waste name:	BOTTOMS FROM THE ACETONITRILE PURIFICATION COLUMN IN THE PRODUCTION OF ACRYLONITRILE
Waste code:	K015
Waste name:	STILL BOTTOMS FROM THE DISTILLATION OF BENZYL CHLORIDE
Waste code:	K016
Waste name:	HEAVY ENDS OR DISTILLATION RESIDUES FROM THE PRODUCTION OF CARBON TETRACHLORIDE
Waste code:	K017
Waste name:	HEAVY ENDS (STILL BOTTOMS) FROM THE PURIFICATION COLUMN IN THE PRODUCTION OF EPICHLOROHYDRIN.
Waste code:	K018
Waste name:	HEAVY ENDS FROM THE FRACTIONATION COLUMN IN ETHYL CHLORIDE PRODUCTION
Waste code:	K019
Waste name:	HEAVY ENDS FROM THE DISTILLATION OF ETHYLENE DICHLORIDE IN ETHYLENE DICHLORIDE PRODUCTION.
Waste code:	K020
Waste name:	HEAVY ENDS FROM THE DISTILLATION OF VINYL CHLORIDE IN VINYL CHLORIDE MONOMER PRODUCTION.
Waste code:	K021
Waste name:	AQUEOUS SPENT ANTIMONY CATALYST WASTE FROM FLUOROMETHANES PRODUCTION
Waste code:	K022
Waste name:	DISTILLATION BOTTOM TARS FROM THE PRODUCTION OF PHENOL/ACETONE FROM CUMENE
Waste code:	K023
Waste name:	DISTILLATION LIGHT ENDS FROM THE PRODUCTION OF PHTHALIC ANHYDRIDE FROM NAPHTHALENE
Waste code:	K024
Waste name:	DISTILLATION BOTTOMS FROM THE PRODUCTION OF PHTHALIC ANHYDRIDE FROM NAPHTHALENE
Waste code:	K025
Waste name:	DISTILLATION BOTTOMS FROM THE PRODUCTION OF NITROBENZENE BY THE NITRATION OF BENZENE
Waste code:	K026
Waste name:	STRIPPING STILL TAILS FROM THE PRODUCTION OF METHY ETHYL PYRIDINES
Waste code:	K027
Waste name:	CENTRIFUGE AND DISTILLATION RESIDUES FROM TOLUENE DIISOCYANATE

ROCAMI TRUCKING (Continued) **1010783754**

PRODUCTION

Waste code: K028
Waste name: SPENT CATALYST FROM THE HYDROCHLORINATOR REACTOR IN THE PRODUCTION OF 1,1,1-TRICHLOROETHANE.

Waste code: K029
Waste name: WASTE FROM THE PRODUCT STEAM STRIPPER IN THE PRODUCTION OF 1,1,1-TRICHLOROETHANE

Waste code: K030
Waste name: COLUMN BOTTOMS OR HEAVY ENDS FROM THE COMBINED PRODUCTION OF TRICHLOROETHYLENE AND PERCHLOROETHYLENE.

Waste code: K031
Waste name: BY-PRODUCT SALTS GENERATED IN THE PRODUCTION OF MSMA AND CACODYLIC ACID

Waste code: K032
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF CHLORDANE

Waste code: K033
Waste name: WASTEWATER AND SCRUB WATER FROM THE CHLORINATION OF CYCLOPENTADIENE IN THE PRODUCTION OF CHLORDANE.

Waste code: K034
Waste name: FILTER SOLIDS FROM THE FILTRATION OF HEXACHLOROCYCLOPENTADIENE IN THE PRODUCTION OF CHLORDANE.

Waste code: K035
Waste name: WASTEWATER TREATMENT SLUDGES GENERATED IN THE PRODUCTION OF CREOSOTE

Waste code: K036
Waste name: STILL BOTTOMS FROM TOLUENE RECLAMATION DISTILLATION IN THE PRODUCTION OF DISULFOTON

Waste code: K037
Waste name: WASTEWATER TREATMENT SLUDGES FROM THE PRODUCTION OF DISULFOTON

Waste code: K038
Waste name: WASTEWATER FROM THE WASHING AND STRIPPING OF PHORATE PRODUCTION

Waste code: K039
Waste name: FILTER CAKE FROM THE FILTRATION OF DIETHYLPHOSPHORODITHIOIC ACID IN THE PRODUCTION OF PHORATE.

Waste code: K040
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF PHORATE

Waste code: K041
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF TOXAPHENE

Waste code: K042
Waste name: HEAVY ENDS OR DISTILLATION RESIDUES FROM THE DISTILLATION OF TETRACHLOROBENZENE IN THE PRODUCTION OF 2,4,5-T.

Waste code: K043

ROCAMI TRUCKING (Continued) **1010783754**

Waste name:	2,6-DICHLOROPHENOL WASTE FROM THE PRODUCTION OF 2,4-D
Waste code:	K044
Waste name:	WASTEWATER TREATMENT SLUDGES FROM THE MANUFACTURING AND PROCESSING OF EXPLOSIVES
Waste code:	K045
Waste name:	SPENT CARBON FROM THE TREATMENT OF WASTEWATER CONTAINING EXPLOSIVES
Waste code:	K046
Waste name:	WASTEWATER TREATMENT SLUDGES FROM THE MANUFACTURING, FORMULATION AND LOADING OF LEAD-BASED INITIATING COMPOUNDS.
Waste code:	K047
Waste name:	PINK/RED WATER FROM TNT OPERATIONS
Waste code:	K048
Waste name:	DISSOLVED AIR FLOTATION (DAF) FLOAT FROM THE PETROLEUM REFINING INDUSTRY
Waste code:	K049
Waste name:	SLOP OIL EMULSION SOLIDS FROM THE PETROLEUM REFINING INDUSTRY
Waste code:	K050
Waste name:	HEAT EXCHANGER BUNDLE CLEANING SLUDGE FROM THE PETROLEUM REFINING INDUSTRY
Waste code:	K051
Waste name:	API SEPARATOR SLUDGE FROM THE PETROLEUM REFINING INDUSTRY
Waste code:	K052
Waste name:	TANK BOTTOMS (LEADED) FROM THE PETROLEUM REFINING INDUSTRY
Waste code:	K060
Waste name:	AMMONIA STILL LIME SLUDGE FROM COKING OPERATIONS
Waste code:	K061
Waste name:	EMISSION CONTROL DUST/SLUDGE FROM THE PRIMARY PRODUCTION OF STEEL IN ELECTRIC FURNACES.
Waste code:	K062
Waste name:	SPENT PICKLE LIQUOR GENERATED BY STEEL FINISHING OPERATIONS OF FACILITIES WITHIN THE IRON AND STEEL INDUSTRY (SIC CODES 331 AND 332).
Waste code:	K064
Waste name:	ACID PLANT BLOWDOWN SLURRY/SLUDGE RESULTING FROM THE THICKENING OF BLOWDOWN SLURRY FROM PRIMARY COPPER PRODUCTION.
Waste code:	K065
Waste name:	SURFACE IMPOUNDMENT SOLIDS CONTAINED IN AND DREDGED FROM SURFACE IMPOUNDMENTS AT PRIMARY LEAD SMELTING FACILITIES.
Waste code:	K066
Waste name:	SLUDGE FROM TREATMENT OF PROCESS WASTEWATER AND OR ACID PLANT BLOWDOWN FROM PRIMARY ZINC PRODUCTION.
Waste code:	K069

ROCAMI TRUCKING (Continued) **1010783754**

Waste name:	EMISSION CONTROL DUST/SLUDGE FROM SECONDARY LEAD SMELTING. (NOTE: THIS LISTING IS STAYED ADMINISTRATIVELY FOR SLUDGE GENERATED FROM SECONDARY ACID SCRUBBER SYSTEMS. THE STAY WILL REMAIN IN EFFECT UNTIL FURTHER ADMINISTRATIVE ACTION IS TAKEN. IF EPA TAKES FURTHER ACTION EFFECTING THIS STAY, EPA WILL PUBLISH A NOTICE OF THE ACTION IN THE FEDERAL REGISTER.
Waste code:	K071
Waste name:	BRINE PURIFICATION MUDS FROM THE MERCURY CELL PROCESS IN CHLORINE PRODUCTION, WHERE SEPARATELY PREPURIFIED BRINE IS NOT USED.
Waste code:	K073
Waste name:	CHLORINATED HYDROCARBON WASTE FROM THE PURIFICATION STEP OF THE DIAPHRAGM CELL PROCESS USING GRAPHITE ANODES IN CHLORINE PRODUCTION.
Waste code:	K083
Waste name:	DISTILLATION BOTTOMS FROM ANILINE PRODUCTION
Waste code:	K084
Waste name:	WASTEWATER TREATMENT SLUDGES GENERATED DURING THE PRODUCTION OF VETERINARY PHARMACEUTICALS FROM ARSENIC OR ORGANO-ARSENIC COMPOUNDS.
Waste code:	K085
Waste name:	DISTILLATION OR FRACTIONATION COLUMN BOTTOMS FROM THE PRODUCTION OF CHLOROBENZENES
Waste code:	K086
Waste name:	SOLVENT WASHES AND SLUDGES, CAUSTIC WASHES AND SLUDGES, OR WATER WASHES AND SLUDGES FROM CLEANING TUBS AND EQUIPMENT USED IN THE FORMULATION OF INK FROM PIGMENTS, DRIERS, SOAPS, AND STABILIZERS CONTAINING CHROMIUM AND LEAD.
Waste code:	K087
Waste name:	DECANTER TANK TAR SLUDGE FROM COKING OPERATIONS
Waste code:	K088
Waste name:	SPENT POTLINERS FROM PRIMARY ALUMINUM REDUCTION
Waste code:	K090
Waste name:	EMISSION CONTROL DUST OR SLUDGE FROM FERROCHROMIUMSILICON PRODUCTION
Waste code:	K091
Waste name:	EMISSION CONTROL DUST OR SLUDGE FROM FERROCHROMIUM PRODUCTION
Waste code:	K093
Waste name:	DISTILLATION LIGHT ENDS FROM THE PRODUCTION OF PHTHALIC ANHYDRIDE FROM ORTHO-XYLENE
Waste code:	K094
Waste name:	DISTILLATION BOTTOMS FROM THE PRODUCTION OF PHTHALIC ANHYDRIDE FROM ORTHO-XYLENE
Waste code:	K095
Waste name:	DISTILLATION BOTTOMS FROM THE PRODUCTION OF 1,1,1-TRICHLOROETHANE
Waste code:	K096
Waste name:	HEAVY ENDS FROM THE HEAVY ENDS COLUMN FROM THE PRODUCTION OF

ROCAMI TRUCKING (Continued) **1010783754**

1,1,1-TRICHLOROETHANE.

Waste code: K097
Waste name: VACUUM STRIPPER DISCHARGE FROM THE CHLORDANE CHLORINATOR IN THE PRODUCTION OF CHLORDANE.

Waste code: K098
Waste name: UNTREATED PROCESS WASTEWATER FROM THE PRODUCTION OF TOXAPHENE

Waste code: K099
Waste name: UNTREATED WASTEWATER FROM THE PRODUCTION OF 2,4-D

Waste code: K100
Waste name: WASTE LEACHING SOLUTION FROM ACID LEACHING OF EMISSION CONTROL DUST/SLUDGE FROM SECONDARY LEAD SMELTING.

Waste code: K101
Waste name: DISTILLATION TAR RESIDUES FROM THE DISTILLATION OF ANILINE-BASED COMPOUNDS IN THE PRODUCTION OF VETERINARY PHARMACEUTICALS FROM ARSENIC OR ORGANO-ARSENIC COMPOUNDS.

Waste code: K102
Waste name: RESIDUE FROM THE USE OF ACTIVATED CARBON FOR DECOLORIZATION IN THE PRODUCTION OF VETERINARY PHARMACEUTICALS FROM ARSENIC OR ORGANO-ARSENIC COMPOUNDS.

Waste code: K103
Waste name: PROCESS RESIDUES FROM ANILINE EXTRACTION FROM THE PRODUCTION OF ANILINE

Waste code: K104
Waste name: COMBINED WASTEWATER STREAMS GENERATED FROM NITROBENZENE/ANILINE PRODUCTION

Waste code: K105
Waste name: SEPARATED AQUEOUS STREAM FROM THE REACTOR PRODUCT WASHING STEP IN THE PRODUCTION OF CHLOROBENZENES.

Waste code: K106
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE MERCURY CELL PROCESS IN CHLORINE PRODUCTION

Waste code: K107
Waste name: COLUMN BOTTOMS FROM PRODUCT SEPARATION FROM THE PRODUCTION OF 1,1-DIMETHYLHYDRAZINE (UDMH) FROM CARBOXYLIC ACID HYDRAZINES.

Waste code: K108
Waste name: CONDENSED COLUMN OVERHEADS FROM PRODUCT SEPARATION AND CONDENSED REACTOR VENT GASES FROM THE PRODUCTION OF 1,1-DIMETHYLHYDRAZINE (UDMH) FROM CARBOXYLIC ACID HYDRAZIDES.

Waste code: K109
Waste name: SPENT FILTER CARTRIDGES FROM PRODUCT PURIFICATION FROM THE PRODUCTION OF 1,1-DIMETHYLHYDRAZINE (UDMH) FROM CARBOXYLIC ACID HYDRAZIDES.

Waste code: K110
Waste name: CONDENSED COLUMN OVERHEADS FROM INTERMEDIATE SEPARATION FROM THE

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PRODUCTION OF 1,1-DIMETHYLHYDRAZINE (UDMH) FROM CARBOXYLIC ACID HYDRAZIDES.

Waste code: K111
Waste name: PRODUCT WASHWATERS FROM THE PRODUCTION OF DINITROTOLUENE VIA NITRATION OF TOLUENE

Waste code: K112
Waste name: REACTION BY-PRODUCT WATER FROM THE DRYING COLUMN IN THE PRODUCTION OF TOLUENEDIAMINE VIA HYDROGENATION OF DINITROTOLUENE.

Waste code: K113
Waste name: CONDENSED LIQUID LIGHT ENDS FROM THE PURIFICATION OF TOLUENEDIAMINE IN THE PRODUCTION OF TOLUENEDIAMINE VIA HYDROGENATION OF DINITROTOLUENE.

Waste code: K114
Waste name: VICINALS FROM THE PURIFICATION OF TOLUENEDIAMINE IN THE PRODUCTION OF TOLUENEDIAMINE VIA HYDROGENATION OF DINITROTOLUENE.

Waste code: K115
Waste name: HEAVY ENDS FROM THE PURIFICATION OF TOLUENEDIAMINE IN THE PRODUCTION OF TOLUENEDIAMINE VIA HYDROGENATION OF DINITROTOLUENE.

Waste code: K116
Waste name: ORGANIC CONDENSATE FROM THE SOLVENT RECOVERY COLUMN IN THE PRODUCTION OF TOLUENE DIISOCYANATE VIA PHOSGENATION OF TOLUENEDIAMINE.

Waste code: K117
Waste name: WASTEWATER FROM THE REACTOR VENT GAS SCRUBBER IN THE PRODUCTION OF ETHYLENE DIBROMIDE VIA BROMINATION OF ETHENE.

Waste code: K118
Waste name: SPENT ADSORBENT SOLIDS FROM PURIFICATION OF ETHYLENE DIBROMIDE IN THE PRODUCTION OF ETHYLENE DIBROMIDE VIA BROMINATION OF ETHENE.

Waste code: K123
Waste name: PROCESS WASTEWATER (INCLUDING SUPERNATES, FILTRATES, AND WASHWATERS) FROM THE PRODUCTION OF ETHYLENEBISDITHIOCARBAMIC ACID AND ITS SALT.

Waste code: K124
Waste name: REACTOR VENT SCRUBBER WATER FROM THE PRODUCTION OF ETHYLENEBISDITHIOCARBAMIC ACID AND ITS SALTS.

Waste code: K125
Waste name: FILTRATION, EVAPORATION, AND CENTRIFUGATION SOLIDS FROM THE PRODUCTION OF ETHYLENEBISDITHIOCARBAMIC ACID AND ITS SALTS.

Waste code: K126
Waste name: BAGHOUSE DUST AND FLOOR SWEEPINGS IN MILLING AND PACKAGING OPERATIONS FROM THE PRODUCTION OR FORMULATION OF ETHYLENEBISDITHIOCARBAMIC ACID AND ITS SALTS.

Waste code: K131
Waste name: WASTEWATER FROM THE REACTOR AND SPENT SULFURIC ACID FROM THE ACID DRYER FROM THE PRODUCTION OF METHYL BROMIDE.

Waste code: K132

ROCAMI TRUCKING (Continued) **1010783754**

Waste name:	SPENT ABSORBENT AND WASTEWATER SEPARATOR SOLIDS FROM THE PRODUCTION OF METHYL BROMIDE.
Waste code:	K136
Waste name:	STILL BOTTOMS FROM THE PURIFICATION OF ETHYLENE DIBROMIDE IN THE PRODUCTION OF ETHYLENE DIBROMIDE VIA BROMINATION OF ETHENE.
Waste code:	K140
Waste name:	DESCRIPTION
Waste code:	K141
Waste name:	Not Defined
Waste code:	K142
Waste name:	Not Defined
Waste code:	K143
Waste name:	Not Defined
Waste code:	K144
Waste name:	Not Defined
Waste code:	K145
Waste name:	Not Defined
Waste code:	K147
Waste name:	Not Defined
Waste code:	K148
Waste name:	Not Defined
Waste code:	K149
Waste name:	Not Defined
Waste code:	K150
Waste name:	Not Defined
Waste code:	K151
Waste name:	Not Defined
Waste code:	K156
Waste name:	ORGANIC WASTE (INCLUDING HEAVY ENDS, STILL BOTTOMS, LIGHT ENDS, SPENT SOLVENTS, FILTRATES, AND DECAN
Waste code:	K157
Waste name:	WASTEWATERS (INCLUDING SCRUBBER WATERS, CONDENSER WATERS, WASHWATERS, AND SEPARATION WATERS) FROM TH
Waste code:	K158
Waste name:	BAG HOUSE DUSTS AND FILTER/SEPARATION SOLIDS FROM THE PRODUCTION OF CARBAMATES AND CARBAMOYL OXIMES.
Waste code:	K159
Waste name:	ORGANICS FROM THE TREATMENT OF THIOCARBAMATE WASTES.
Waste code:	K160
Waste name:	SOLIDS (INCLUDING FILTER WASTES, SEPARATION SOLIDS, AND SPENT

ROCAMI TRUCKING (Continued) **1010783754**

CATALYSTS) FROM THE PRODUCTION OF THIOCARBAMATES AND SOLIDS FROM THE TREATMENT OF THIOCARBAMATE WASTES.

Waste code: K161
Waste name: PURIFICATION SOLIDS (INCLUDING FILTRATION, EVAPORATION, AND CENTRIFUGATION SOLIDS), BAG HOUSE DUST A

Waste code: K169
Waste name: Crude oil storage tank sediment from petroleum refining operations.

Waste code: K170
Waste name: Clarified slurry oil storage tank sediment and/or in-line filter/separation solids from petroleum refining operations.

Waste code: K171
Waste name: Spent hydrotreating catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (excludes inert support media)

Waste code: K172
Waste name: Spent hydro refining catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (excludes inert support media).

Waste code: K174
Waste name: WASTEWATER TREATMENT SLUDGES FROM THE PRODUCTION OF ETHLYENE DICHLORIDE OR VINYL CHLORIDE

Waste code: K175
Waste name: WASTEWATER TREATMENT SLUDGE FROM THE PRODUCTION OF VINYL CHLORIDE MONOMER..

Waste code: K176
Waste name: BAGHOUSE FILTERS FROM THE PRODUCTION OF ANTIMONY OXIDE, INCLUDING FILTERS FROM THE PRODUCTION OF INTERMEDIATES (E.G.,ANTIMONY METAL OR CRUDE ANTIMONY OXIDE)

Waste code: K177
Waste name: SLAG FROM THE PRODUCTION OF ANTIMONY OXIDE THAT IS SPECULATIVELY ACCUMULATED OR DISPOSED,INCLUDING SLAG FROM THE PRODUCTION OF INTERMEDIATES (E.G.,ANTIMONY METAL OR CRUDE ANTIMONY OXIDE)

Waste code: K178
Waste name: RESIDUES FROM MANUFACTURING AND MANUFACTURING-SITE STORAGE OF FERRIC CHLORIDE FROM ACIDS FORMED DURING THE PRODUCTION OF TITANIUM DIOXIDE USING THE CHLORIDE-ILMENITE PROCESS.

Waste code: K181
Waste name: Nonwastewaters from the production of dyes and/or pigments.

Violation Status: No violations found

V77 **RIVERSIDE CO FIRE STATION** **HIST CORTESE** **S103984769**
West **15111** **LUST** **N/A**
1/2-1 **MORENO VALLEY, CA 92551** **HAZNET**
0.867 mi.
4576 ft. **Site 1 of 3 in cluster V**

Relative:
Higher

Actual:
1535 ft.

CORTESE:

Region:	CORTESE
Facility County Code:	33
Reg By:	LTNKA
Reg Id:	083303359T

LUST:

Region:	STATE
Global Id:	T0606500565
Latitude:	33.9023375
Longitude:	-117.2349987
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	01/27/2000
Lead Agency:	RIVERSIDE COUNTY LOP
Case Worker:	SCB
Local Agency:	RIVERSIDE COUNTY LOP
RB Case Number:	083303359T
LOC Case Number:	9814793
File Location:	Local Agency Warehouse
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

LUST:

Global Id:	T0606500565
Contact Type:	Local Agency Caseworker
Contact Name:	SHARON BOLTINGHOUSE
Organization Name:	RIVERSIDE COUNTY LOP
Address:	PO BOX 1280
City:	RIVERSIDE
Email:	sbolting@rivcocha.org
Phone Number:	9519558982

Global Id:	T0606500565
Contact Type:	Regional Board Caseworker
Contact Name:	TOM E. MBEKE-EKANEM
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	tmbeke-ekanem@waterboards.ca.gov
Phone Number:	9513202007

LUST:

Global Id:	T0606500565
Action Type:	ENFORCEMENT
Date:	03/31/2009
Action:	Closure/No Further Action Letter - #Site Closure

Global Id:	T0606500565
Action Type:	ENFORCEMENT

RIVERSIDE CO FIRE STATION (Continued) **S103984769**

Date:	03/30/2009
Action:	File review - #RCDEH Upload Site File 8/12/2010
Global Id:	T0606500565
Action Type:	Other
Date:	01/01/1950
Action:	Leak Stopped
Global Id:	T0606500565
Action Type:	Other
Date:	01/01/1950
Action:	Leak Discovery
Global Id:	T0606500565
Action Type:	Other
Date:	01/01/1950
Action:	Leak Reported

HAZNET:

Year:	2002
Gepaid:	CAL000036384
Contact:	KEVIN GAINES
Telephone:	9099554700
Mailing Name:	Not reported
Mailing Address:	4080 LEMON ST STE 8
Mailing City,St,Zip:	RIVERSIDE, CA 92501
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Off-specification, aged or surplus organics
Disposal Method:	H01
Tons:	Not reported
Facility County:	Not reported
Year:	2002
Gepaid:	CAL000036384
Contact:	KEVIN GAINES
Telephone:	9099554700
Mailing Name:	Not reported
Mailing Address:	4080 LEMON ST STE 8
Mailing City,St,Zip:	RIVERSIDE, CA 92501
Gen County:	Riverside
TSD EPA ID:	Not reported
TSD County:	Los Angeles
Waste Category:	Unspecified organic liquid mixture
Disposal Method:	R01
Tons:	0.68
Facility County:	Not reported
Year:	2002
Gepaid:	CAL000036384
Contact:	KEVIN GAINES
Telephone:	9099554700
Mailing Name:	Not reported
Mailing Address:	4080 LEMON ST STE 8
Mailing City,St,Zip:	RIVERSIDE, CA 92501

RIVERSIDE CO FIRE STATION (Continued) **S103984769**

Gen County: Riverside
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Alkaline solution without metals pH >= 12.5
Disposal Method: Not reported
Tons: 0.12
Facility County: Not reported

Year: 2002
Gepaid: CAL000036384
Contact: KEVIN GAINES
Telephone: 9099554700
Mailing Name: Not reported
Mailing Address: 4080 LEMON ST STE 8
Mailing City,St,Zip: RIVERSIDE, CA 92501
Gen County: Riverside
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Liquids with pH <= 2
Disposal Method: Not reported
Tons: 0.02
Facility County: Not reported

Year: 2002
Gepaid: CAL000036384
Contact: KEVIN GAINES
Telephone: 9099554700
Mailing Name: Not reported
Mailing Address: 4080 LEMON ST STE 8
Mailing City,St,Zip: RIVERSIDE, CA 92501
Gen County: Riverside
TSD EPA ID: Not reported
TSD County: Los Angeles
Waste Category: Off-specification, aged or surplus organics
Disposal Method: D80
Tons: 0.04
Facility County: Not reported

Click this hyperlink while viewing on your computer to access
1 additional CA_HAZNET: record(s) in the EDR Site Report.

V78 **RVSD CO FIRE STATION #65** **LUST** **S104970910**
West **15111 INDIAN ST** **N/A**
1/2-1 **MORENO VALLEY, CA**
0.867 mi.
4576 ft. **Site 2 of 3 in cluster V**

Relative:
Higher

Actual:
1535 ft.

RIVERSIDE CO. LUST:
Region: RIVERSIDE
Facility ID: 9814793
Site Closed: Yes
Date Closed: 1/27/2000
Case Type: Soil only

V79 **West** **1/2-1** **0.867 mi.** **4576 ft.**	**RIVERSIDE CO FIRE STATION #65** **15111 INDIAN ST** **MORENO VALLEY, CA 92551** **Site 3 of 3 in cluster V**	**LUST**	**S103771163** **N/A**

Relative:
Higher

Actual:
1535 ft.

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Leak being confirmed
Case Number:	083303359T
Local Case Num:	9814793
Case Type:	Soil only
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	JOHN F. KENNEDY
Enf Type:	Not reported
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	UNK
Global ID:	T0606500565
How Stopped Date:	6/29/1998
Enter Date:	3/19/1999
Review Date:	12/17/1998
Prelim Assess:	Not reported
Discover Date:	12/17/1998
Enforcement Date:	Not reported
Close Date:	Not reported
Workplan:	Not reported
Pollution Char:	Not reported
Remed Plan:	Not reported
Remed Action:	Not reported
Monitoring:	Not reported
Enter Date:	3/19/1999
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.9026355
Longitude:	-117.235134
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	TME
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	SAN JACINTO (8-5)
Beneficial:	Not reported

RIVERSIDE CO FIRE STATION #65 (Continued) **S103771163**

Priority: Not reported
Cleanup Fund Id: Not reported
Work Suspended: Not reported
Summary: Not reported

W80
SSW
1/2-1
0.877 mi.
4631 ft.

WORASING RECYCLING
15928 PERRIS BLVD
MORENO VALLEY, CA 92551

Site 1 of 4 in cluster W

SWRCY **S107138356** **N/A**

Relative: Lower

Actual: 1508 ft.

SWRCY:
Facility Phone Number: Not reported
Whether The Facility Is Grandfathered: N
Effective Date: 04/30/2007
Rural: N
As Of: 12/12/2011
Party Number: 25444

81
SE
1/2-1
0.878 mi.
4635 ft.

EARTHWIZE RECYCLING
25900 IRIS AVE
MORENO VALLEY, CA 92551

SWRCY **S107136967** **N/A**

Relative: Lower

Actual: 1490 ft.

SWRCY:
Facility Phone Number: Not reported
Whether The Facility Is Grandfathered: N
Effective Date: 10/01/2005
Rural: N
As Of: 12/12/2011
Party Number: 25930

W82
SSW
1/2-1
0.915 mi.
4830 ft.

SHELL SERVICE STATION
15980 PERRIS BLVD
MORENO VALLEY, CA 92388

Site 2 of 4 in cluster W

RCRA-SQG
FINDS
LUST
SWEEPS UST
HAZNET

1005904292
CAR000120600

Relative: Lower

Actual: 1507 ft.

RCRA-SQG:
Date form received by agency: 07/18/2002
Facility name: SHELL SERVICE STATION
Facility address: 15980 PERRIS BLVD
S A P 135626
MORENO VALLEY, CA 92388
EPA ID: CAR000120600
Mailing address: P O BOX 2648
HOUSTON, TX 772522648
Contact: SONDRA BIENVENU
Contact address: P O BOX 2648
HOUSTON, TX 772522648
Contact country: US
Contact telephone: (713) 241-5036
Contact email: Not reported
EPA Region: 09

SHELL SERVICE STATION (Continued) **1005904292**

Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	EQUILON ENT LLC DBA S O P US
Owner/operator address:	P O BOX 2648 HOUSTON, TX 77252
Owner/operator country:	Not reported
Owner/operator telephone:	(713) 241-5036
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110012538511

Environmental Interest/Information System

California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

SHELL SERVICE STATION (Continued) **1005904292**

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:

Region:	STATE
Global Id:	T0606517323
Latitude:	33.888806364
Longitude:	-117.22591758
Case Type:	LUST Cleanup Site
Status:	Open - Remediation
Status Date:	09/21/2007
Lead Agency:	RIVERSIDE COUNTY LOP
Case Worker:	SCB
Local Agency:	RIVERSIDE COUNTY LOP
RB Case Number:	Not reported
LOC Case Number:	200420313
File Location:	Local Agency
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	***Data prior to 2005 does not appear in GeoTracker. Consult agency file for all site data*** Soil samples were taken during dispenser and piping upgrades in July 2003. Results showed that petroleum constituents had been released to soil near piping P4 and dispenser D4. Up to 116 ppm xylenes and 72 ppm TBA were detected in the soil. The site was entered into the program 2/11/2004. 4 wells (MW-1 through MW-4) were installed in February 2005. Up to 78 ppm MTBE and 57 ppm TBA detected in the soil. The contamination was heaviest near the tank pit. One monitoring well (MW-6) and 2 observation wells (OBS-1 and OBS-2) were installed in April 2006. Up to 29 ppm MTBE and 0.97 ppm TBA were detected in the soil. One CPT (CPT-1) was completed Dec. 4, 2006 and 2 monitoring wells (MW-10, MW-11) were drilled on Dec. 6 and 7, 2006. Up to 27 ppm MTBE and 52 ppm TBA were detected in the soil. 4 dual nested SVE wells (SVE-1 through SVE-4) were installed on 5/14-17/07. Up to 42 ppm MTBE and 56 ppm TBA was detected in the soil. SVE pilot testing was conducted on 5/30-31/07, and gw extraction pilot testing was conducted on 5/22-23/07 using OBS-1 for extraction. The ROI was calculated to be ~55-60?. SVE with AS was selected as the best active remedial action for the site. 11 Air Sparge wells (AS-1, AS-3 through AS-11, AS-13) were installed in October 2007. Up to 47 ppm MTBE and 120 ppm TBA were detected in the soil. Three off site monitoring wells (MW-5, MW-8, and MW-12) were installed in December 2007. Up to 1.6 ppm MTBE and 0.041 ppm TBA was detected in the soil. SVE was started in December 2007. Air sparge was started in January 2008. Nine vacuum truck extraction events were conducted on wells MW-1, MW-4, MW-6, MW-10, and MW-11 during the third quarter 2008. 2207 gallons of groundwater was extracted. Four on-site (MW-13 through MW-16) and one off-site (MW-19) gw mon wells were installed in November 2008. Up to 2.5 ppm MTBE and 0.62 ppm TBA was detected in the soil. Two groundwater extraction (GWE) wells (EW-1 and OBS-4) and one observation well (OBS-3) were installed in November 2008 to further define impacts near MW-10. Up

SHELL SERVICE STATION (Continued) **1005904292**

to 5.4 ppm MTBE and 0.52 ppm TBA was detected in the soil. MW-17 and MW-18 were installed in January 2009. No oxygenates were detected in any of the soil samples collected. Due to an obstruction in EW-1, the well was destroyed and reinstalled in February, 2009. On March 10-12, 2009, a series of g.w. pumping tests were conducted at the site. The capture zone was estimated to be 17.4?. It was recommended that groundwater extraction be implemented. Three re-injection wells (RI-1 through RI-3) were installed in June 2009 and screened from 22-42?, 25-55?, and 75-85?. Up to 10 ppm MTBE and 0.075 ppm TBA were detected in the soil. Re-injection pilot testing was conducted in October, 2009. Based on the test results, it was concluded that re-injection is a feasible remedial technology for this site in the deeper zone RI-3.

Click here to access the California GeoTracker records for this facility:

LUST:

Global Id:	T0606517323
Contact Type:	Local Agency Caseworker
Contact Name:	LINDA SHURLOW
Organization Name:	RIVERSIDE COUNTY LOP
Address:	47950 Arabia Street, Suite A
City:	Indio
Email:	lshurlow@rivcocha.org
Phone Number:	7608637570
Global Id:	T0606517323
Contact Type:	Regional Board Caseworker
Contact Name:	CARL BERNHARDT
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	cbernhardt@waterboards.ca.gov
Phone Number:	9517824495

LUST:

Global Id:	T0606517323
Action Type:	REMEDIATION
Date:	01/01/1950
Action:	Soil Vapor Extraction w/Other
Global Id:	T0606517323
Action Type:	Other
Date:	01/01/1950
Action:	Leak Reported
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	11/16/2007
Action:	Other Report / Document
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	12/21/2007
Action:	Other Report / Document
Global Id:	T0606517323

SHELL SERVICE STATION (Continued) **1005904292**

Action Type:	RESPONSE
Date:	12/20/2010
Action:	Soil and Water Investigation Report
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	02/22/2011
Action:	Technical Correspondence / Assistance / Other - #RCDEH 022211
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/15/2011
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	06/27/2008
Action:	Other Workplan
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	01/09/2009
Action:	Access Agreement - #RCDEH010909
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	10/17/2008
Action:	File review
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	04/09/2007
Action:	Technical Correspondence / Assistance / Other - #040807
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	02/13/2009
Action:	File review
Global Id:	T0606517323
Action Type:	REMEDIATION
Date:	01/01/1950
Action:	Pump and Treat Groundwater
Global Id:	T0606517323
Action Type:	REMEDIATION
Date:	01/01/1950
Action:	Excavate and Dispose
Global Id:	T0606517323
Action Type:	REMEDIATION
Date:	01/01/1950
Action:	Air sparging
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	01/15/2008

SHELL SERVICE STATION (Continued) **1005904292**

Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	04/15/2008
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/15/2007
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	12/12/2008
Action:	Well Installation Report
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/30/2008
Action:	Other Workplan
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	01/15/2009
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	06/29/2007
Action:	CAP/RAP - Final Remediation / Design Plan
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	04/15/2011
Action:	Monitoring Report - Annually
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	07/15/2011
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	06/08/2007
Action:	Notice of Responsibility
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	09/17/2007
Action:	Staff Letter - #RCDEH 091707
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	10/24/2008
Action:	Staff Letter - #RCDEH102408

SHELL SERVICE STATION (Continued) **1005904292**

Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	08/26/2010
Action:	Technical Correspondence / Assistance / Other - #RCDEH 082610
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	07/15/2008
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	04/15/2009
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	05/21/2009
Action:	Other Workplan
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/30/2009
Action:	Pilot Study/ Treatability Report
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	11/10/2008
Action:	Staff Letter - #RCDEH 11-10-08
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	01/07/2009
Action:	NPDES Permit
Global Id:	T0606517323
Action Type:	Other
Date:	01/01/1950
Action:	Leak Stopped
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	05/25/2010
Action:	Staff Letter - #RCDEH 052510
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	10/18/2010
Action:	Staff Letter - #RCDEH 101810
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/15/2009
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE

SHELL SERVICE STATION (Continued) **1005904292**

Date:	01/15/2010
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	04/15/2010
Action:	Monitoring Report - Annually
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	07/15/2010
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/15/2010
Action:	Monitoring Report - Quarterly
Global Id:	T0606517323
Action Type:	Other
Date:	01/01/1950
Action:	Leak Discovery
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	12/23/2007
Action:	File review
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	05/27/2008
Action:	Staff Letter - #RCDEH052708
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	01/30/2008
Action:	Staff Letter - #RCDEH013008
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	01/09/2009
Action:	Staff Letter - #RCDEH010909
Global Id:	T0606517323
Action Type:	RESPONSE
Date:	08/13/2010
Action:	Other Report / Document
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	08/13/2009
Action:	Staff Letter - #Riv Co 081309
Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	09/01/2009
Action:	Staff Letter - #Riv Co 090109

SHELL SERVICE STATION (Continued) **1005904292**

Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	09/16/2009
Action:	Technical Correspondence / Assistance / Other - #Riv Co 091609

Global Id:	T0606517323
Action Type:	ENFORCEMENT
Date:	03/28/2011
Action:	Technical Correspondence / Assistance / Other - #RCDEH 032/11

Global Id:	T0606517323
Action Type:	RESPONSE
Date:	10/15/2008
Action:	Monitoring Report - Quarterly

Global Id:	T0606517323
Action Type:	RESPONSE
Date:	01/09/2009
Action:	Well Installation Report

Global Id:	T0606517323
Action Type:	RESPONSE
Date:	04/13/2009
Action:	Well Installation Report

SWEEPS UST:

Status:	A
Comp Number:	1985
Number:	1
Board Of Equalization:	44-000074
Ref Date:	05-18-93
Act Date:	05-18-93
Created Date:	05-18-93
Tank Status:	A
Owner Tank Id:	1
Swrcb Tank Id:	33-000-001985-000001
Actv Date:	05-18-93
Capacity:	12000
Tank Use:	M.V. FUEL
Stg:	P
Content:	REG UNLEADED
Number Of Tanks:	3

Status:	A
Comp Number:	1985
Number:	1
Board Of Equalization:	44-000074
Ref Date:	05-18-93
Act Date:	05-18-93
Created Date:	05-18-93
Tank Status:	A
Owner Tank Id:	2
Swrcb Tank Id:	33-000-001985-000002
Actv Date:	05-18-93
Capacity:	12000
Tank Use:	M.V. FUEL

SHELL SERVICE STATION (Continued) **1005904292**

Stg: P
Content: PRM UNLEADED
Number Of Tanks: Not reported

Status: A
Comp Number: 1985
Number: 1
Board Of Equalization: 44-000074
Ref Date: 05-18-93
Act Date: 05-18-93
Created Date: 05-18-93
Tank Status: A
Owner Tank Id: 3
Swrcb Tank Id: 33-000-001985-000003
Actv Date: 05-18-93
Capacity: 12000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: Not reported

HAZNET:

Year: 2010
Gepaid: CAL000322036
Contact: ROB DONOVAN
Telephone: 2538968700
Mailing Name: Not reported
Mailing Address: 19100 RIDGEWOOD PARKWAY
Mailing City,St,Zip: SAN ANTONIO, TX 782590000
Gen County: Not reported
TSD EPA ID: NVT330010000
TSD County: Not reported
Waste Category: Other organic solids
Disposal Method: LANDFILL OR SURFACE IMPOUNDMENT THAT WILL BE CLOSED AS LANDFILL(TO INCLUDE ON-SITE TREATMENT AND/OR STABILIZATION)
Tons: 0.01
Facility County: Riverside

Year: 2010
Gepaid: CAL000322036
Contact: ROB DONOVAN
Telephone: 2538968700
Mailing Name: Not reported
Mailing Address: 19100 RIDGEWOOD PARKWAY
Mailing City,St,Zip: SAN ANTONIO, TX 782590000
Gen County: Not reported
TSD EPA ID: CAD099452708
TSD County: Not reported
Waste Category: Waste oil and mixed oil
Disposal Method: OTHER RECOVERY OF RECLAMATION FOR REUSE INCLUDING ACID REGENERATION, ORGANICS RECOVERY ECT
Tons: 0.76
Facility County: Riverside

Year: 2010
Gepaid: CAL000322036
Contact: ROB DONOVAN

SHELL SERVICE STATION (Continued) **1005904292**

Telephone:	2538968700
Mailing Name:	Not reported
Mailing Address:	19100 RIDGEWOOD PARKWAY
Mailing City,St,Zip:	SAN ANTONIO, TX 782590000
Gen County:	Not reported
TSD EPA ID:	NVT330010000
TSD County:	Not reported
Waste Category:	Other organic solids
Disposal Method:	LANDFILL OR SURFACE IMPOUNDMENT THAT WILL BE CLOSED AS LANDFILL(TO INCLUDE ON-SITE TREATMENT AND/OR STABILIZATION)
Tons:	0.025
Facility County:	Riverside

Year:	2010
Gepaid:	CAL000322036
Contact:	ROB DONOVAN
Telephone:	2538968700
Mailing Name:	Not reported
Mailing Address:	19100 RIDGEWOOD PARKWAY
Mailing City,St,Zip:	SAN ANTONIO, TX 782590000
Gen County:	Not reported
TSD EPA ID:	CAT080013352
TSD County:	Not reported
Waste Category:	Aqueous solution with total organic residues less than 10 percent
Disposal Method:	OTHER RECOVERY OF RECLAMATION FOR REUSE INCLUDING ACID REGENERATION, ORGANICS RECOVERY ECT
Tons:	0.2604
Facility County:	Riverside

Year:	2009
Gepaid:	CAL000322036
Contact:	JOCK STREIDL
Telephone:	2538968818
Mailing Name:	Not reported
Mailing Address:	3450 S 344TH WAY STE 201
Mailing City,St,Zip:	FEDERAL WAY, WA 980019540
Gen County:	Riverside
TSD EPA ID:	NVT330010000
TSD County:	99
Waste Category:	Other organic solids
Disposal Method:	LANDFILL OR SURFACE IMPOUNDMENT THAT WILL BE CLOSED AS LANDFILL(TO INCLUDE ON-SITE TREATMENT AND/OR STABILIZATION)
Tons:	0.1025
Facility County:	Riverside

Click this hyperlink while viewing on your computer to access
14 additional CA_HAZNET: record(s) in the EDR Site Report.

W83 **SHELL PERRIS BLVD.** **LUST** **S106162092**
SSW **15980 PERRIS BLVD.** **N/A**
1/2-1 **MORENO VALLEY, CA 92551**
0.915 mi.
4830 ft. **Site 3 of 4 in cluster W**

Relative:
Lower

Actual:
1507 ft.

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Leak being confirmed
Case Number:	Not reported
Local Case Num:	200420313
Case Type:	Soil only
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	IRIS
Enf Type:	Not reported
Funding:	Not reported
How Discovered:	OM
How Stopped:	Other Means
Leak Cause:	UNK
Leak Source:	UNK
Global ID:	T0606517323
How Stopped Date:	7/24/2003
Enter Date:	Not reported
Review Date:	2/9/2004
Prelim Assess:	Not reported
Discover Date:	2/9/2004
Enforcement Date:	Not reported
Close Date:	Not reported
Workplan:	Not reported
Pollution Char:	Not reported
Remed Plan:	Not reported
Remed Action:	Not reported
Monitoring:	Not reported
Enter Date:	Not reported
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	Not reported
Latitude:	0
Longitude:	0
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	CAB
Staff Initials:	SCB
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	Not reported
Beneficial:	Not reported

SHELL PERRIS BLVD. (Continued) **S106162092**

Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported
Summary:	Not reported

W84	**SHELL PERRIS BLVD.**	**LUST**	**S106410443**
SSW	**15980 PERRIS BLVD.**		**N/A**
1/2-1	**MORENO VALLEY, CA**		
0.915 mi.			
4830 ft.	**Site 4 of 4 in cluster W**		

Relative: Lower

Actual: 1507 ft.

RIVERSIDE CO. LUST:

Region:	RIVERSIDE
Facility ID:	200420313
Site Closed:	Not Closed
Date Closed:	Not reported
Case Type:	Drinking Water Aquifer affected

85	**PROPOSED ALESSANDRO ADMINISTRATION BLDG. EXPANSION - EAST PR**	**SCH**	**S109149568**
NNE	**ALESSANDRO BOULEVARD/CHARA STREET**	**ENVIROSTOR**	**N/A**
> 1	**MORENO VALLEY, CA 92553**		
1.007 mi.			
5315 ft.			

Relative: Higher

Actual: 1576 ft.

SCH:

Facility ID:	60000944
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	5.1
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Mitigation And Brownfield Reuse Program
Project Manager:	JUAN OSORNIO
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404810
Assembly:	65
Senate:	37
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	11/06/2008
Restricted Use:	NO
Funding:	School District
Latitude:	33.918
Longitude:	-117.2131
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	30004, 30006, 30007, 30008, 30010, 30023
Confirmed COC:	30004-NO,30023-NO,30006-NO,30007-NO,30008-NO,30010-NO
Potential Description:	SOIL
Alias Name:	Alternative High School
Alias Type:	Alternate Name
Alias Name:	404810

PROPOSED ALESSANDRO ADMINISTRATION BLDG. EXPANSION - EAST PR (Continued) **S109149568**

Alias Type:	Project Code (Site Code)
Alias Name:	60000944
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	09/10/2008
Comments:	DTSC approved the PEA with a Further Action determination
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Supplemental Site Investigation Report
Completed Date:	11/06/2008
Comments:	DTSC concurs with the SSI that No Further Action is required.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	08/18/2008
Comments:	Signed agreement sent (FedEx) to District.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	11/13/2008
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

ENVIROSTOR:

Site Type:	School Investigation
Site Type Detailed:	School
Acres:	5.1
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	JUAN OSORNIO
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Facility ID:	60000944
Site Code:	404810
Assembly:	65
Senate:	37
Special Program:	Not reported
Status:	No Further Action
Status Date:	11/06/2008
Restricted Use:	NO

PROPOSED ALESSANDRO ADMINISTRATION BLDG. EXPANSION - EAST PR (Continued) **S109149568**

Site Mgmt. Req.: NONE SPECIFIED
Funding: School District
Latitude: 33.918
Longitude: -117.2131
APN: NONE SPECIFIED
Past Use: AGRICULTURAL - ROW CROPS
Potential COC: 30004, 30006, 30007, 30008, 30010, 30023
Confirmed COC: 30004-NO,30023-NO,30006-NO,30007-NO,30008-NO,30010-NO
Potential Description: SOIL
Alias Name: Alternative High School
Alias Type: Alternate Name
Alias Name: 404810
Alias Type: Project Code (Site Code)
Alias Name: 60000944
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 09/10/2008
Comments: DTSC approved the PEA with a Further Action determination

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Report
Completed Date: 11/06/2008
Comments: DTSC concurs with the SSI that No Further Action is required.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 08/18/2008
Comments: Signed agreement sent (FedEx) to District.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 11/13/2008
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

86 SW > 1 1.222 mi. 6453 ft.

INDIAN MIDDLE SCHOOL
INDIAN AVENUE / IRIS AVENUE
MORENO VALLEY, CA 92551

SCH ENVIROSTOR **S106568096 N/A**

Relative: Lower

Actual: 1506 ft.

SCH:

Facility ID:	33000006
Site Type:	School Cleanup
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	29
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Mitigation And Brownfield Reuse Program
Project Manager:	AMIT PATHAK
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404555
Assembly:	65
Senate:	37
Special Program Status:	Not reported
Status:	Certified
Status Date:	03/10/2006
Restricted Use:	NO
Funding:	School District
Latitude:	33.8911
Longitude:	-117.2342
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	30008, 30023
Confirmed COC:	30008,30023
Potential Description:	SOIL
Alias Name:	INDIAN MIDDLE SCHOOL
Alias Type:	Alternate Name
Alias Name:	VAL VERDE UNIFIED
Alias Type:	Alternate Name
Alias Name:	VAL VERDE USD-PRPSD INDIAN MID SCL
Alias Type:	Alternate Name
Alias Name:	110033615112
Alias Type:	EPA (FRS #)
Alias Name:	404555
Alias Type:	Project Code (Site Code)
Alias Name:	33000006
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	02/09/2005
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Phase 1
Completed Date:	06/30/2004
Comments:	Not reported

INDIAN MIDDLE SCHOOL (Continued) **S106568096**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 11/09/2004
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Workplan
Completed Date: 04/28/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Workplan
Completed Date: 07/06/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Report
Completed Date: 11/01/2005
Comments: Further Action with RAW for Toxaphene and DDT

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 12/28/2005
Comments: Approved along with NOE/Public Comment Response Letter

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 12/20/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 12/20/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 03/06/2006
Comments: DTSC issued a No Further Action determination based on a Removal Action Completion Report

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: 4.15 Request
Completed Date: 03/01/2005
Comments: Approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

INDIAN MIDDLE SCHOOL (Continued) **S106568096**

Completed Document Type:	Certification
Completed Date:	03/10/2006
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Notice of Exemption
Completed Date:	01/03/2006
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	06/02/2006
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Inspections/Visit (Non LUR)
Completed Date:	07/13/2005
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	11/18/2004
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	08/09/2004
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	School Cleanup Agreement
Completed Date:	03/01/2005
Comments:	Not reported

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

ENVIROSTOR:

Site Type:	School Cleanup
Site Type Detailed:	School
Acres:	29
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP

INDIAN MIDDLE SCHOOL (Continued) **S106568096**

Program Manager: AMIT PATHAK
Supervisor: Shahir Haddad
Division Branch: Southern California Schools & Brownfields Outreach
Facility ID: 33000006
Site Code: 404555
Assembly: 65
Senate: 37
Special Program: Not reported
Status: Certified
Status Date: 03/10/2006
Restricted Use: NO
Site Mgmt. Req.: NONE SPECIFIED
Funding: School District
Latitude: 33.8911
Longitude: -117.2342
APN: NONE SPECIFIED
Past Use: AGRICULTURAL - ROW CROPS
Potential COC: 30008, 30023
Confirmed COC: 30008,30023
Potential Description: SOIL
Alias Name: INDIAN MIDDLE SCHOOL
Alias Type: Alternate Name
Alias Name: VAL VERDE UNIFIED
Alias Type: Alternate Name
Alias Name: VAL VERDE USD-PRPSD INDIAN MID SCL
Alias Type: Alternate Name
Alias Name: 110033615112
Alias Type: EPA (FRS #)
Alias Name: 404555
Alias Type: Project Code (Site Code)
Alias Name: 33000006
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 02/09/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/30/2004
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 11/09/2004
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Workplan
Completed Date: 04/28/2005
Comments: Not reported

INDIAN MIDDLE SCHOOL (Continued) **S106568096**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Workplan
Completed Date: 07/06/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Supplemental Site Investigation Report
Completed Date: 11/01/2005
Comments: Further Action with RAW for Toxaphene and DDT

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 12/28/2005
Comments: Approved along with NOE/Public Comment Response Letter

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 12/20/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 12/20/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 03/06/2006
Comments: DTSC issued a No Further Action determination based on a Removal Action Completion Report

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: 4.15 Request
Completed Date: 03/01/2005
Comments: Approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 03/10/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 01/03/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

INDIAN MIDDLE SCHOOL (Continued) **S106568096**

Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 06/02/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Inspections/Visit (Non LUR)
Completed Date: 07/13/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 11/18/2004
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 08/09/2004
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: School Cleanup Agreement
Completed Date: 03/01/2005
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

87
NNW
> 1
1.360 mi.
7181 ft.

BAY AVENUE ELEMENTARY SCHOOL **SCH** **S105628794**
24801 BAY AVENUE **ENVIROSTOR** **N/A**
MORENO VALLEY, CA 92553

Relative:
Higher

Actual:
1582 ft.

SCH:

Facility ID: 33820010
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 8
National Priorities List: NO
Cleanup Oversight Agencies: DTSC
Lead Agency: NONE SPECIFIED
Lead Agency Description: Not reported
Project Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach

BAY AVENUE ELEMENTARY SCHOOL (Continued) **S105628794**

Site Code: 404308
Assembly: 64
Senate: 37
Special Program Status: Not reported
Status: No Further Action
Status Date: 08/19/2003
Restricted Use: NO
Funding: School District
Latitude: 33.91837
Longitude: -117.2151
APN: NONE SPECIFIED
Past Use: * EDUCATIONAL SERVICES, AGRICULTURAL - ROW CROPS
Potential COC: 30006, 30007, 30008
Confirmed COC: 30006-NO,30007-NO,30008-NO
Potential Description: SOIL
Alias Name: AKA: RAMONA ELEM SCHOOL
Alias Type: Alternate Name
Alias Name: BAY AVENUE ELEMENTARY SCHOOL
Alias Type: Alternate Name
Alias Name: MORENO VALLEY UNIFIED SCHOOL DISTRICT
Alias Type: Alternate Name
Alias Name: MORENO VALLEY USD-BAY AVENUE ELEM SCHOOL
Alias Type: Alternate Name
Alias Name: 404308
Alias Type: Project Code (Site Code)
Alias Name: 33820010
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 08/19/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 05/10/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Workplan
Completed Date: 12/24/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 01/31/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Inspections/Visit (Non LUR)
Completed Date: 03/14/2002
Comments: Not reported

BAY AVENUE ELEMENTARY SCHOOL (Continued) **S105628794**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	09/08/2003
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

ENVIROSTOR:

Site Type:	School Investigation
Site Type Detailed:	School
Acres:	8
NPL:	NO
Regulatory Agencies:	DTSC
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Javier Hinojosa
Division Branch:	Southern California Schools & Brownfields Outreach
Facility ID:	33820010
Site Code:	404308
Assembly:	64
Senate:	37
Special Program:	Not reported
Status:	No Further Action
Status Date:	08/19/2003
Restricted Use:	NO
Site Mgmt. Req.:	NONE SPECIFIED
Funding:	School District
Latitude:	33.91837
Longitude:	-117.2151
APN:	NONE SPECIFIED
Past Use:	* EDUCATIONAL SERVICES, AGRICULTURAL - ROW CROPS
Potential COC:	30006, 30007, 30008
Confirmed COC:	30006-NO,30007-NO,30008-NO
Potential Description:	SOIL
Alias Name:	AKA: RAMONA ELEM SCHOOL
Alias Type:	Alternate Name
Alias Name:	BAY AVENUE ELEMENTARY SCHOOL
Alias Type:	Alternate Name
Alias Name:	MORENO VALLEY UNIFIED SCHOOL DISTRICT
Alias Type:	Alternate Name
Alias Name:	MORENO VALLEY USD-BAY AVENUE ELEM SCHOOL
Alias Type:	Alternate Name
Alias Name:	404308
Alias Type:	Project Code (Site Code)
Alias Name:	33820010
Alias Type:	Envirostor ID Number

Completed Info:

BAY AVENUE ELEMENTARY SCHOOL (Continued) **S105628794**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	08/19/2003
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Report
Completed Date:	05/10/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Workplan
Completed Date:	12/24/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	01/31/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Inspections/Visit (Non LUR)
Completed Date:	03/14/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	09/08/2003
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Count: 31 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MORENO VALLEY	1004677425	URENAS AUTOPART & SVC	13718 HWY 215	92553	RCRA-SQG,FINDS
MORENO VALLEY	S102811302	JETCO UNDERGROUND & UTILITIES	13260 HWY 215	00000	HAZNET
MORENO VALLEY	S103629510	MICHEAL JAMES BROWNING	13810 OLD HWY 215	92360	HAZNET
MORENO VALLEY	S103646797	HUD IN TOWN PROPERTIES	2546 GENTIAN AVE	92551	HAZNET
MORENO VALLEY	S103649743	VINCENT A FRIETAS	28900 HWY 60	92360	HAZNET
MORENO VALLEY	S103820953	HOWARD LEE PROPERTY	13390 HWY 215		LUST SAN MATEO
MORENO VALLEY	S105126535	SHELL	12301 HEACOCK/HIGHWAY 60	92388	HAZNET
MORENO VALLEY	S105723087	ARCO PRODUCTS COMPANY	16466 PERRIS BLVD/KRAMERIA	92388	HAZNET
MORENO VALLEY	S106666544	SHELL MORENO	13260 HWY 215		LUST SAN MATEO
MORENO VALLEY	S106830452	EASTERN MUNICIPAL WATER DISTRI	26790 HWY 60		EMI
MORENO VALLEY	S106925833	EMWD MORENO #1 PUMPING PLANT	16015 PERRIS BLVD	92343	SWEEPS UST
MORENO VALLEY	S107528854		1500 BLK. PERRIS BLVD	92553	CDL
	S107537885		BOX SPRINGS RD & HWY 215 (SEE		CDL
MORENO VALLEY	S107539888		HIGHWAY 60 @ GILMAN SPRINGS RD	92553	CDL
MORENO VALLEY	S108212226	LEVEL ONE ENGINEERING YARD	7175 OLD HIGHWAY 215	92551	HAZNET
MORENO VALLEY	S108407566	PROPOSED ALTERNATIVE SCHOOL SITE	SEC CACTUS AVENUE AND INDIAN S	92553	SCH,ENVIROSTOR
MORENO VALLEY	S109434442	26 UNITS	550 FT W OF PERRIS BLVD S SIDE	92555	NPDES
MORENO VALLEY	S109444579	GLOBAL PREMIER DEVELOPMENT PERRISE	NWC OF PERRIS BLVD & EUCALYPTU		NPDES
MORENO VALLEY	S109446569	INDIAN MIDDLE SCHOOL	15800 INDIAN AVE & SANTIAGO DR	92551	NPDES
RIVERSIDE	S109447255	K 4 SITE	SO CACTUS AVE & WO FREDERICK S	92518	NPDES
MORENO VALLEY	S109451080	MORENO VALLEY COMMERCIAL CENTER	PERRIS BLVD		NPDES
MORENO VALLEY	S109451089	MORENO VALLEY REGIONAL EDUCATION C	NWC BAY AVE & PERRIS BLVD		NPDES
MORENO VALLEY	S109455348	RANCHO DORADO APARTMENTS	SEC OF PERRIS BLVD & JOHN F KE	92553	NPDES
MORENO VALLEY	S109457220	SAN MICHELE ROAD PHASE 2	SAN MICHELE RD E INDIAN ST	92551	NPDES
MORENO VALLEY	S109462679	TRACT NO 29920 GRANDE VISTS & IRIS	SEC GRANDE VISTA DR & IRIS AVE	92553	NPDES
MORENO VALLEY	S110367691	FIVE MILE CAPITAL PARTNERS LLC	7177 OLD 215 FRONTAGE ROAD HWY	92553	HAZNET
MORENO VALLEY	S110367856	WESTERN CONSTRUCTION AUCTION INC	14150 OLD HIGHWAY 215	92553	HAZNET
MORENO VALLEY	S111291355	CONCOURSE AT CENTERPOINT	NWC CACTUS AVE AND FREDERICK S	92553	NPDES
MORENO VALLEY	S111293018	TRACT NO 31129 CELEBRATION 2	CACTUS AVE	92555	NPDES
MORENO VALLEY	S111293019	TRACT NO 33256	S OF STATE ROUTE 60, N SIDE OF	92555	NPDES
MORENO VALLEY	S111293120	VIP MORENO VALLEY	SWC PERRIS BLVD AND GROVE VIEW	92551	NPDES

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 06/30/2011
Date Data Arrived at EDR: 07/12/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 79

Source: EPA
Telephone: N/A
Last EDR Contact: 01/11/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 06/30/2011
Date Data Arrived at EDR: 07/12/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 79

Source: EPA
Telephone: N/A
Last EDR Contact: 01/11/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 06/30/2011	Source: EPA
Date Data Arrived at EDR: 07/12/2011	Telephone: N/A
Date Made Active in Reports: 09/29/2011	Last EDR Contact: 01/10/2012
Number of Days to Update: 79	Next Scheduled EDR Contact: 04/23/2012
	Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/25/2011	Source: EPA
Date Data Arrived at EDR: 03/01/2011	Telephone: 703-412-9810
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 11/29/2011
Number of Days to Update: 62	Next Scheduled EDR Contact: 03/12/2012
	Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/10/2010	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/11/2011	Telephone: 703-603-8704
Date Made Active in Reports: 02/16/2011	Last EDR Contact: 01/13/2012
Number of Days to Update: 36	Next Scheduled EDR Contact: 04/23/2012
	Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA’s knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/25/2011	Source: EPA
Date Data Arrived at EDR: 03/01/2011	Telephone: 703-412-9810
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 11/29/2011
Number of Days to Update: 62	Next Scheduled EDR Contact: 03/12/2012
	Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 08/19/2011
Date Data Arrived at EDR: 08/31/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 132

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/15/2011
Date Data Arrived at EDR: 07/07/2011
Date Made Active in Reports: 08/08/2011
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/05/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/15/2011
Date Data Arrived at EDR: 07/07/2011
Date Made Active in Reports: 08/08/2011
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/05/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/15/2011
Date Data Arrived at EDR: 07/07/2011
Date Made Active in Reports: 08/08/2011
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/05/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/15/2011
Date Data Arrived at EDR: 07/07/2011
Date Made Active in Reports: 08/08/2011
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/05/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/30/2011
Date Data Arrived at EDR: 12/30/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/09/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/30/2011
Date Data Arrived at EDR: 12/30/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/09/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 10/03/2011
Date Data Arrived at EDR: 10/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 38

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/18/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 12/13/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 36

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control’s (DTSC’s) Site Mitigation and Brownfields Reuse Program’s (SMBRP’s) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 12/13/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 36

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/21/2011
Date Data Arrived at EDR: 11/22/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 21

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/22/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board’s LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board’s LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 12/19/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 31

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 12/19/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 31

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/02/2011	Source: EPA Region 10
Date Data Arrived at EDR: 11/04/2011	Telephone: 206-553-2857
Date Made Active in Reports: 11/11/2011	Last EDR Contact: 01/30/2012
Number of Days to Update: 7	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2011	Source: EPA Region 1
Date Data Arrived at EDR: 11/01/2011	Telephone: 617-918-1313
Date Made Active in Reports: 11/11/2011	Last EDR Contact: 11/01/2011
Number of Days to Update: 10	Next Scheduled EDR Contact: 02/13/2012
	Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/18/2011	Source: EPA Region 8
Date Data Arrived at EDR: 08/19/2011	Telephone: 303-312-6271
Date Made Active in Reports: 09/13/2011	Last EDR Contact: 01/30/2012
Number of Days to Update: 25	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011	Source: EPA Region 6
Date Data Arrived at EDR: 09/13/2011	Telephone: 214-665-6597
Date Made Active in Reports: 11/11/2011	Last EDR Contact: 01/30/2012
Number of Days to Update: 59	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/14/2011	Source: EPA Region 4
Date Data Arrived at EDR: 12/15/2011	Telephone: 404-562-8677
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 01/30/2012
Number of Days to Update: 26	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Semi-Annually

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 12/05/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/07/2011	Telephone: 415-972-3372
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 01/30/2012
Number of Days to Update: 34	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 11/01/2011	Source: EPA Region 7
Date Data Arrived at EDR: 11/21/2011	Telephone: 913-551-7003
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 01/30/2012
Number of Days to Update: 50	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Varies

State and tribal registered storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 12/19/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/17/2012
Number of Days to Update: 29

Source: SWRCB
Telephone: 916-480-1028
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
Registered Aboveground Storage Tanks.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 916-341-5712
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/02/2011
Date Data Arrived at EDR: 11/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 7

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 11/28/2011
Date Data Arrived at EDR: 11/29/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 42

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 08/19/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 25

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 11/01/2011
Date Data Arrived at EDR: 11/21/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 50

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 07/01/2011
Date Data Arrived at EDR: 08/26/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 18

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2011
Date Data Arrived at EDR: 11/01/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 10

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/31/2011
Next Scheduled EDR Contact: 02/13/2012
Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/16/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC’s costs.

Date of Government Version: 12/13/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 36

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 08/04/2011
Date Data Arrived at EDR: 10/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 38

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/06/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/27/2011
Date Data Arrived at EDR: 06/27/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/27/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 12/21/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: No Update Planned

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 12/12/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 31

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/19/2011
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 09/14/2011
Date Data Arrived at EDR: 09/15/2011
Date Made Active in Reports: 10/24/2011
Number of Days to Update: 39

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 12/27/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/07/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 10/07/2011
Date Data Arrived at EDR: 12/09/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 32

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 12/05/2011
Next Scheduled EDR Contact: 03/19/2012
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 12/13/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 36

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2011
Date Data Arrived at EDR: 08/11/2011
Date Made Active in Reports: 09/09/2011
Number of Days to Update: 29

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009	Source: Department of Public Health
Date Data Arrived at EDR: 09/23/2009	Telephone: 707-463-4466
Date Made Active in Reports: 10/01/2009	Last EDR Contact: 12/05/2012
Number of Days to Update: 8	Next Scheduled EDR Contact: 03/19/2012
	Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990	Source: State Water Resources Control Board
Date Data Arrived at EDR: 01/25/1991	Telephone: 916-341-5851
Date Made Active in Reports: 02/12/1991	Last EDR Contact: 07/26/2001
Number of Days to Update: 18	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994	Source: State Water Resources Control Board
Date Data Arrived at EDR: 07/07/2005	Telephone: N/A
Date Made Active in Reports: 08/11/2005	Last EDR Contact: 06/03/2005
Number of Days to Update: 35	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 09/09/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/16/2011	Telephone: 202-564-6023
Date Made Active in Reports: 09/29/2011	Last EDR Contact: 01/30/2012
Number of Days to Update: 13	Next Scheduled EDR Contact: 05/14/2012
	Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005	Source: Department of the Navy
Date Data Arrived at EDR: 12/11/2006	Telephone: 843-820-7326
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 11/22/2011
Number of Days to Update: 31	Next Scheduled EDR Contact: 03/05/2012
	Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 12/16/2011	Source: Department of Toxic Substances Control
Date Data Arrived at EDR: 12/16/2011	Telephone: 916-323-3400
Date Made Active in Reports: 01/19/2012	Last EDR Contact: 12/09/2011
Number of Days to Update: 34	Next Scheduled EDR Contact: 03/26/2012
	Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 12/12/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 37

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/13/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 10/04/2011
Date Data Arrived at EDR: 10/04/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 38

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/03/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 05/03/2011
Date Made Active in Reports: 06/15/2011
Number of Days to Update: 43

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 12/19/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 31

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 12/19/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 31

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/15/2011
Date Data Arrived at EDR: 07/07/2011
Date Made Active in Reports: 08/08/2011
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 01/05/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/29/2011
Date Data Arrived at EDR: 08/09/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 94

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/08/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/09/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/01/2011
Date Data Arrived at EDR: 11/18/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 53

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/27/2011
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/28/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 27

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010	Source: Department of Energy
Date Data Arrived at EDR: 10/21/2010	Telephone: 505-845-0011
Date Made Active in Reports: 01/28/2011	Last EDR Contact: 11/29/2011
Number of Days to Update: 99	Next Scheduled EDR Contact: 03/12/2012
	Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2011	Source: Department of Labor, Mine Safety and Health Administration
Date Data Arrived at EDR: 09/08/2011	Telephone: 303-231-5959
Date Made Active in Reports: 09/29/2011	Last EDR Contact: 12/07/2011
Number of Days to Update: 21	Next Scheduled EDR Contact: 03/19/2012
	Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 09/01/2011	Telephone: 202-566-0250
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 12/02/2011
Number of Days to Update: 131	Next Scheduled EDR Contact: 03/12/2012
	Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006	Source: EPA
Date Data Arrived at EDR: 09/29/2010	Telephone: 202-260-5521
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 12/27/2011
Number of Days to Update: 64	Next Scheduled EDR Contact: 04/09/2012
	Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009	Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 11/28/2011
Number of Days to Update: 25	Next Scheduled EDR Contact: 03/12/2012
	Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009	Source: EPA
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 11/28/2011
Number of Days to Update: 25	Next Scheduled EDR Contact: 03/12/2012
	Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 12/21/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011
Date Data Arrived at EDR: 07/15/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 60

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/12/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/11/2011
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/12/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 08/02/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 119

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/13/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/30/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Quarterly

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 11/21/2011
Date Data Arrived at EDR: 11/22/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/22/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites). This listing is no longer updated by the state agency.

Date of Government Version: 01/03/2012
Date Data Arrived at EDR: 01/03/2012
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 16

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 01/03/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES].

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/20/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/28/2011
Date Data Arrived at EDR: 07/21/2011
Date Made Active in Reports: 08/11/2011
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 12/21/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 08/15/2011
Date Data Arrived at EDR: 08/23/2011
Date Made Active in Reports: 10/03/2011
Number of Days to Update: 41

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 07/19/2011
Date Made Active in Reports: 08/16/2011
Number of Days to Update: 28

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 10/18/2010
Number of Days to Update: 19

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/30/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Varies

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 12/12/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 31

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/19/2011
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 12/07/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 35

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/12/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/18/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/08/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Varies

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/20/2011
Date Data Arrived at EDR: 10/21/2011
Date Made Active in Reports: 11/08/2011
Number of Days to Update: 18

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 01/18/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Quarterly

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/09/2010
Date Data Arrived at EDR: 08/11/2010
Date Made Active in Reports: 08/20/2010
Number of Days to Update: 9

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/02/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Quarterly

FINANCIAL ASSURANCE 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/29/2011
Date Data Arrived at EDR: 11/30/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 13

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/21/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Varies

FINANCIAL ASSURANCE 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 03/01/2007
Date Data Arrived at EDR: 06/01/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 11/04/2011
Next Scheduled EDR Contact: 02/13/2012
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: N/A

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/04/2011
Next Scheduled EDR Contact: 02/13/2012
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR’s researchers. Manufactured gas sites were used in the United States from the 1800’s to 1950’s to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

EDR Historical Auto Stations: EDR Proprietary Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

EDR Historical Cleaners: EDR Proprietary Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 10/10/2011	Source: Alameda County Environmental Health Services
Date Data Arrived at EDR: 10/11/2011	Telephone: 510-567-6700
Date Made Active in Reports: 11/09/2011	Last EDR Contact: 12/30/2011
Number of Days to Update: 29	Next Scheduled EDR Contact: 04/16/2012
	Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/10/2011	Source: Alameda County Environmental Health Services
Date Data Arrived at EDR: 10/11/2011	Telephone: 510-567-6700
Date Made Active in Reports: 11/14/2011	Last EDR Contact: 12/30/2011
Number of Days to Update: 34	Next Scheduled EDR Contact: 04/16/2012
	Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 11/28/2011
Date Data Arrived at EDR: 11/29/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 14

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 11/07/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Semi-Annually

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 12/16/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 12/20/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 09/29/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 35

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/17/2011
Next Scheduled EDR Contact: 01/30/2012
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/24/2011
Date Data Arrived at EDR: 10/25/2011
Date Made Active in Reports: 11/22/2011
Number of Days to Update: 28

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/24/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 11/17/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 02/09/2011
Date Data Arrived at EDR: 02/09/2011
Date Made Active in Reports: 03/04/2011
Number of Days to Update: 23

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 02/03/2011
Date Data Arrived at EDR: 02/08/2011
Date Made Active in Reports: 03/03/2011
Number of Days to Update: 23

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 04/06/2012
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 02/01/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/17/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 11/14/2011
Number of Days to Update: 26

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/16/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Semi-Annually

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 10/17/2011
Date Data Arrived at EDR: 10/25/2011
Date Made Active in Reports: 11/14/2011
Number of Days to Update: 20

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 01/09/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Semi-Annually

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 07/09/2008
Date Data Arrived at EDR: 07/09/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 22

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 12/05/2011
Next Scheduled EDR Contact: 03/19/2012
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 12/05/2012
Next Scheduled EDR Contact: 03/19/2012
Data Release Frequency: No Update Planned

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/01/2011
Date Data Arrived at EDR: 11/17/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 26

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/02/2011
Date Data Arrived at EDR: 11/18/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 25

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/02/2011
Date Data Arrived at EDR: 11/18/2011
Date Made Active in Reports: 12/14/2011
Number of Days to Update: 26

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 12/12/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 37

Source: Placer County Health and Human Services
Telephone: 530-889-7312
Last EDR Contact: 12/09/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/20/2011
Date Data Arrived at EDR: 10/21/2011
Date Made Active in Reports: 11/08/2011
Number of Days to Update: 18

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/21/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/20/2011
Date Data Arrived at EDR: 10/21/2011
Date Made Active in Reports: 11/14/2011
Number of Days to Update: 24

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/21/2011
Next Scheduled EDR Contact: 04/26/2012
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 08/02/2011
Date Data Arrived at EDR: 10/12/2011
Date Made Active in Reports: 11/08/2011
Number of Days to Update: 27

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/13/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 08/02/2011
Date Data Arrived at EDR: 10/14/2011
Date Made Active in Reports: 11/08/2011
Number of Days to Update: 25

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/13/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/30/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 12/16/2011
Number of Days to Update: 15

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/09/2010
Date Data Arrived at EDR: 09/15/2010
Date Made Active in Reports: 09/29/2010
Number of Days to Update: 14

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/16/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2011
Date Data Arrived at EDR: 11/04/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 39

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 12/12/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 11/14/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 09/27/2011
Date Data Arrived at EDR: 09/28/2011
Date Made Active in Reports: 10/19/2011
Number of Days to Update: 21

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 01/09/2012
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: Semi-Annually

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 10/17/2011
Date Data Arrived at EDR: 11/29/2011
Date Made Active in Reports: 12/05/2011
Number of Days to Update: 6

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 12/15/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 35

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/14/2011
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Semi-Annually

SANTA CLARA COUNTY:

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/09/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 41

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 12/05/2011
Next Scheduled EDR Contact: 03/19/2012
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 12/13/2011
Date Data Arrived at EDR: 12/14/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 36

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 12/12/2011
Next Scheduled EDR Contact: 02/27/2012
Data Release Frequency: Annually

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 12/19/2011
Date Data Arrived at EDR: 01/06/2012
Date Made Active in Reports: 01/27/2012
Number of Days to Update: 21

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 01/03/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 09/20/2011
Date Data Arrived at EDR: 09/28/2011
Date Made Active in Reports: 10/19/2011
Number of Days to Update: 21

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 01/03/2012
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/05/2011
Date Data Arrived at EDR: 04/06/2011
Date Made Active in Reports: 05/12/2011
Number of Days to Update: 36

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/27/2011
Next Scheduled EDR Contact: 04/16/2012
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 12/12/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 01/17/2012
Number of Days to Update: 35

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/09/2011
Next Scheduled EDR Contact: 03/26/2012
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 10/27/2011
Date Data Arrived at EDR: 11/23/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 20

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/17/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/09/2012
Next Scheduled EDR Contact: 04/23/2012
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/17/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 10/27/2011
Date Data Arrived at EDR: 11/07/2011
Date Made Active in Reports: 12/13/2011
Number of Days to Update: 36

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/30/2012
Next Scheduled EDR Contact: 05/14/2012
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/19/2011
Date Made Active in Reports: 01/17/2012
Number of Days to Update: 29

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/19/2011
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 12/28/2011
Date Data Arrived at EDR: 01/06/2012
Date Made Active in Reports: 01/17/2012
Number of Days to Update: 11

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 12/21/2011
Next Scheduled EDR Contact: 04/09/2012
Data Release Frequency: Annually

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/21/2011
Date Data Arrived at EDR: 11/22/2011
Date Made Active in Reports: 12/22/2011
Number of Days to Update: 30

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/22/2011
Next Scheduled EDR Contact: 03/05/2012
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 07/20/2011
Date Made Active in Reports: 08/11/2011
Number of Days to Update: 22

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/20/2012
Next Scheduled EDR Contact: 04/30/2012
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2011
Date Data Arrived at EDR: 11/08/2011
Date Made Active in Reports: 12/22/2011
Number of Days to Update: 44

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/08/2011
Next Scheduled EDR Contact: 02/20/2012
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 12/14/2009
Number of Days to Update: 13

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/23/2012
Next Scheduled EDR Contact: 05/07/2012
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 06/24/2011
Date Made Active in Reports: 06/30/2011
Number of Days to Update: 6

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 08/19/2011
Date Made Active in Reports: 09/15/2011
Number of Days to Update: 27

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/19/2011
Next Scheduled EDR Contact: 04/02/2012
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT

FTA-VA-90-1003-06 **May 2006**

Office of Planning and Environment
Federal Transit Administration

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Harris Miller Miller & Hanson Inc. 77 South Bedford Street Burlington, MA 01803	8. PERFORMING ORGANIZATION REPORT NUMBER 299600
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11. SUPPLEMENTARY NOTES

Contract management and final production performed by:

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12a. DISTRIBUTION/AVAILABILITY STATEMENT This document is available from the National Technical Information Service, Springfield VA 22161. Phone: 1-888-584-8332 or 703-605-6050; Web site: www.ntis.gov.	12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This report is the second edition of a guidance manual originally issued in 1995 which presents procedures for predicting and assessing noise and vibration impacts of proposed mass transit projects. All types of bus and rail projects are covered. Procedures for assessing noise and vibration impacts are provided for different stages of project development, from early planning before mode and alignment have been selected through preliminary engineering and final design. Both for noise and vibration, there are three levels of analysis described. The framework acts as a screening process, reserving detailed analysis for projects with the greatest potential for impacts while allowing a simpler process for projects with little or no effects.

This updated guidance contains noise and vibration impact criteria that are used to assess the magnitude of predicted impacts. A range of mitigation measures are described for dealing with adverse noise and vibration impacts. There is a discussion of noise and vibration during the construction stage and also discussion of how the technical information should be presented in the Federal Transit Administration's environmental documents. This guidance will be of interest not only to technical specialists who conduct the analyses but also to transit agency staff, federal agency reviewers, and members of the general public who may be affected by the projects.

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TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT

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PREFACE

This guidance manual on transit noise and vibration impact assessment is an updated edition of a document originally published in 1995. The manual details the procedures for producing accurate impact assessments for proposed federally-funded mass transit projects and discusses ways of reducing excessive noise and vibration caused by projects. While the manual is intended primarily for acoustics professionals who conduct the analyses as part of the environmental review process, it is written for a broader audience. Sections on noise and vibration fundamentals and a glossary of terms allow lay readers to gain a better understanding of one of the more technical subjects covered in the Federal Transit Administration's environmental documents.

The revisions in this manual are based on practitioners' experience in using the procedures and on developments that have occurred in this field over the past decade. The basic procedures for prediction and impact assessment remain the same; however, changes have been made throughout the document to clarify the procedures and to add new content. Some of the more significant changes involve: inclusion of noise reference levels for several new transit modes; fuller explanation of how to handle multimodal highway/transit projects; methods for assessing locomotive horn noise at grade crossings; expanded discussion of noise and vibration mitigation measures including costs; refined vibration impact criteria expressed in one-third octave bands for Detailed Analysis; and more examples on how to use the General Noise Assessment procedures for different types of transit projects.

This updated guidance manual supersedes the original document and should be used for addressing noise and vibration impacts for all construction projects seeking funding from FTA. For the great majority of projects, the results obtained from application of the methods described in this manual will not depart significantly from results obtained from the old manual. This document is also available in the Planning and Environment section of FTA's Web site (www.fta.dot.gov).

1. INTRODUCTION

1.1 PURPOSE

Noise and vibration assessments are key elements of the environmental impact assessment process for mass transit projects. Experience has shown that noise and vibration are among the major concerns with regard to the effects of a transit project on the surrounding community. A transit system is of necessity placed near population centers and often causes significant noise and vibration at nearby residences and other sensitive types of land use.

This manual provides guidance for preparing and reviewing the noise and vibration sections of environmental documents. In the interest of promoting quality and uniformity in assessments, the manual will be used by project sponsors and consultants in performing noise and vibration analyses for inclusion in environmental documents. The manual sets forth the methods and procedures for determining the level of noise and vibration impact resulting from most federally-funded transit projects and for determining what can be done to mitigate such impact. Since the methods have been developed to assess typical transit projects, there will be some situations not explicitly covered in this manual. The exercise of professional judgment may be required to extend the basic methods in these cases.

1.2 THE ENVIRONMENTAL REVIEW PROCESS

The Federal Transit Administration (FTA) provides capital assistance for a wide range of mass transit projects – from completely new rail rapid transit systems to bus maintenance facilities and vehicle purchases. The extent of environmental analysis and review will depend on the scope and complexity of the proposed project and the associated environmental impacts. FTA's environmental impact regulation classifies the most common projects according to the different levels of environmental analysis required, ranging from an environmental impact statement (EIS) to little or no environmental documentation (categorical exclusion). FTA's environmental impact regulation is codified in Title 23, Code of Federal Regulations, Part 771.[(1)*]

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[*]References are located at the end of each chapter.

Environmental Impact Statements. Large fixed-guideway projects, such as heavy rail, light rail, commuter rail and automated guideway transit systems, normally require environmental impact statements, including an in-depth noise and vibration assessment. While there may be exceptions to the EIS requirement, in the great majority of cases new rail starts or extensions to existing systems involve significant environmental effects in the context of the National Environmental Policy Act (NEPA). Because they are located in dense urban areas, noise and vibration impacts are a frequent concern; thus it is likely that for the major infrastructure projects requiring an EIS, the most detailed treatment of noise and/or vibration impacts will also be required.

There are other projects as well which may require a detailed analysis of noise and vibration impacts even if an EIS is not required to comply with NEPA. These could be bus/high-occupancy-vehicle (HOV) lanes built on existing highways or construction of certain bus or rail terminals and storage and maintenance facilities. If the project is proposed to be located in or very close to a sensitive area or site, it is prudent to use the most detailed procedures contained in the manual to predict noise and/or vibration levels since this will provide the most reliable basis for considering measures to mitigate excessive noise/vibration at a specific site.

Categorical Exclusions. At the other extreme is a host of smaller transit projects which normally do not cause significant environmental impacts and do not require noise and vibration assessment. These projects are listed as "categorical exclusions" in FTA's environmental regulation, meaning that FTA has determined that there are no significant environmental impacts for those types of projects and no environmental document is required. Examples are: vehicle purchases; track and railbed maintenance; installation of maintenance equipment within the facility, etc. Section 771.117(c) contains a list of transit projects predetermined to be categorical exclusions.

Other types of projects may also qualify as categorical exclusions, for example, certain transit terminals, transfer facilities, bus and rail storage and maintenance facilities (see 23 CFR 771.117(d)). These projects usually involve more construction and a greater potential for off-site impacts. They are presented in the regulation with conditions or criteria which must be met in order to qualify for categorical exclusion. The projects are reviewed individually by FTA to assure that any off-site impacts are properly mitigated. Depending on the proposed project site and the surrounding land use, a noise and vibration assessment may be needed even though the project may ultimately qualify as a categorical exclusion. The screening process in Chapters 4 and 9 will be helpful in pointing out potential noise and vibration concerns and the general assessment procedures may then be used to define the level of impact.

Environmental Assessments. When a proposed project is presented to FTA, if it is uncertain whether the project requires an EIS or qualifies as a categorical exclusion, FTA will direct the project sponsor to prepare an environmental assessment (EA). Generally, an EA is selected (rather than trying to process the project as a categorical exclusion) if the FTA reviewer feels that several types of impacts need further investigation, for example, air quality, noise, wetlands, historic sites, traffic, etc. An EA is a relatively brief environmental study which helps determine the magnitude of the impacts that will likely be caused by the project. If, during the analysis, it appears that any impacts are significant, an EIS will be prepared. If the analysis shows that none of the impacts is significant or if mitigation measures are incorporated in the project to adequately deal with adverse impact, the EA will fully document this and serve as the basis for a Finding of No Significant Impact issued by FTA. It is important to note that when mitigation measures are relied on, they must be described in detail in the EA since FTA's finding is based on the inclusion of these measures in the project.

FTA's environmental regulation does not list typical projects that require EA’s. An EA may be prepared for any type of project if uncertainty exists about the magnitude or extent of the impacts. Experience has shown that most of the EA's prepared for transit projects require an assessment of noise impacts.

1.3 NOISE AND VIBRATION ANALYSIS IN PLANNING AND PROJECT DEVELOPMENT

Major capital investment projects are developed initially from a comprehensive transportation planning process conducted in metropolitan areas (see 23 CFR 450.300). The metropolitan planning process includes the consideration of social, economic, and environmental effects of proposed major infrastructure improvements. However, at this stage, environmental effects are usually considered on a broad scale, for example, overall development patterns, impact on greenspace, and regional air quality. Noise and vibration assessments are not typically done at the systems planning stage since the proposed infrastructure improvements lack the necessary detail.

Once the need for a major capital investment in a corridor is established in the metropolitan transportation plan, the task then becomes identifying the transit mode and alignment best suited for the corridor. If FTA capital investment funds will be pursued, the project sponsor must perform an “alternatives analysis.”(2) Often combined with a Draft EIS, the alternatives analysis presents information on benefits, costs, and impacts of alternative strategies for meeting the need for new capacity. Usually, several alternatives ranging in cost will be evaluated. If environmental impacts of the alternatives will be assessed, noise and, to a lesser extent, vibration are primary issues. The screening and general assessment procedures described in this manual are well-suited to compare and contrast noise/vibration effects among different modes and alignments. In fact, the general assessment procedures were developed partly to respond to this need. In addition, they can be used for any specific project where the screening procedure indicates potential for impact and the project sponsor wants a relatively quick assessment of the level of impact.

If the results of the alternatives analysis justify further development of a major capital investment, FTA will approve entry of the proposed project into preliminary engineering. During preliminary engineering, the environmental review process is completed. With the mode and alignment determined, the impact assessment at this stage focuses on the locally preferred alternative for a major capital investment. The detailed analysis procedures for noise can be used to produce the most accurate estimates of noise impact for the proposed project. The detailed procedures should be used as the basis for reaching any decisions on the need for noise reduction measures and the types of measures that are appropriate for the project.

After the NEPA process is completed for a major project, federal funding for final design may be granted. If vibration impacts were identified during preliminary engineering, a detailed analysis of vibration impact may be conducted during final design. Final design activities will produce the geotechnical information needed to refine the impact assessment and allow the most detailed consideration of vibration control measures, if needed. Even for smaller transit projects, if vibration impact is predicted in a general assessment, vibration mitigation measures should only be specified after a detailed analysis has been done. Detailed vibration analysis is best accomplished during final design of the project.

Once the project enters construction, there may still be a need for noise or vibration analysis in some circumstances. Large construction projects in densely populated residential areas may require noise monitoring to make sure that agreed-upon noise limits are not exceeded. Vibration testing may be needed in the final stages of construction to determine whether vibration control measures are having the predicted effect.

Considering that transit projects must be located amid or very close to concentrations of people, noise and vibration impacts can be a concern throughout the planning and project development phases. This manual offers the flexibility to address noise and vibration at different stages in the development of a project and in different levels of detail depending on the types of decisions that need to be made.

There are three levels of analysis which may be employed, depending on the type and scale of the project, the stage of project development, and the environmental setting. The technical content of each of the three levels is specified in the body of this document, but a summary of each level is given in the following paragraphs:

- **Screening Procedure:** Identifies noise- and vibration-sensitive land uses in the vicinity of a project and whether there is likely to be impact. It also serves to determine the noise and vibration study areas for further analysis when sensitive locations are present. The screening process may be all that is required for many of the smaller transit projects which qualify as categorical exclusions. When noise/vibration-sensitive receivers are found to be present, there are two levels of quantitative analysis available to predict impact and assess the need for mitigation measures.

- **General Assessment:** Identifies location and estimated severity of noise and vibration impacts in the noise and vibration study areas identified in the screening procedure. For major capital investments, the General Assessment provides the appropriate level of detail to compare alternative modes and alignments in alternatives analysis. It can be used in conjunction with established highway noise prediction procedures to compare and contrast highway, transit and multimodal alternatives. Before basic decisions have been reached on mode and alignment in a corridor, it is not prudent to conduct the most detailed level of noise and vibration analysis. For smaller transit projects, this level is used for a closer examination of projects which show possible impacts as a result of screening. For many smaller projects, this level may be sufficient to define impacts and determine whether mitigation is necessary.

- **Detailed Analysis:** Quantifies impacts through an in-depth analysis usually only performed for a single alternative. Delineates site-specific impacts and mitigation measures for the preferred alternative in major investment projects during preliminary engineering. For other smaller projects, Detailed Analysis may be warranted as part of the initial environmental assessment if there are potentially severe impacts due to close proximity of sensitive land uses.

The three levels of noise and vibration assessment are described in the chapters which follow.

1.4 ORGANIZATION OF THE MANUAL

The guidance manual is divided into two parts, noise and vibration. Each part has parallel organization according to the following subjects:

Noise/Vibration

- Basic Concepts
- Criteria
- Screening Procedure
- General Assessment
- Detailed Analysis

Construction Noise/Vibration

Documentation

Appendices

- Glossary
- Background for Transit Noise Impact Criteria
- Receiver Selection
- Existing Noise Determination
- Noise Source Level Determination
- Maximum Noise Level Computation

REFERENCES

1. U.S. Department of Transportation, Federal Transit Administration and Federal Highway Administration, "Environmental Impact and Related Procedures," Final Rule, 52 Federal Register 32646 -32669; August 28, 1987 (23 Code of Federal Regulations 771).

2. U.S. Department of Transportation, Federal Transit Administration, “Major Capital Investment Projects,” Final Rule, 65 Federal Register 76863-76884; December 7, 2000 (49 CFR Part 611).

2. BASIC NOISE CONCEPTS

This chapter discusses the basic concepts of transit noise which provide background for Chapters 3 through 6, where transit noise is computed and assessed. The Source-Path-Receiver framework sketched in Figure 2-1 is central to all environmental noise studies. Each transit **source** generates close-by noise levels which depend upon the type of source and its operating characteristics. Then, along the propagation **path** between all sources and receivers, noise levels are reduced (attenuated) by distance, intervening obstacles and other factors. And finally at each **receiver**, noise combines from all sources to interfere, perhaps, with receiver activities. This chapter contains an overview of this Source-Path-Receiver framework. Following this overview is a primer on the fundamentals of noise characteristics.

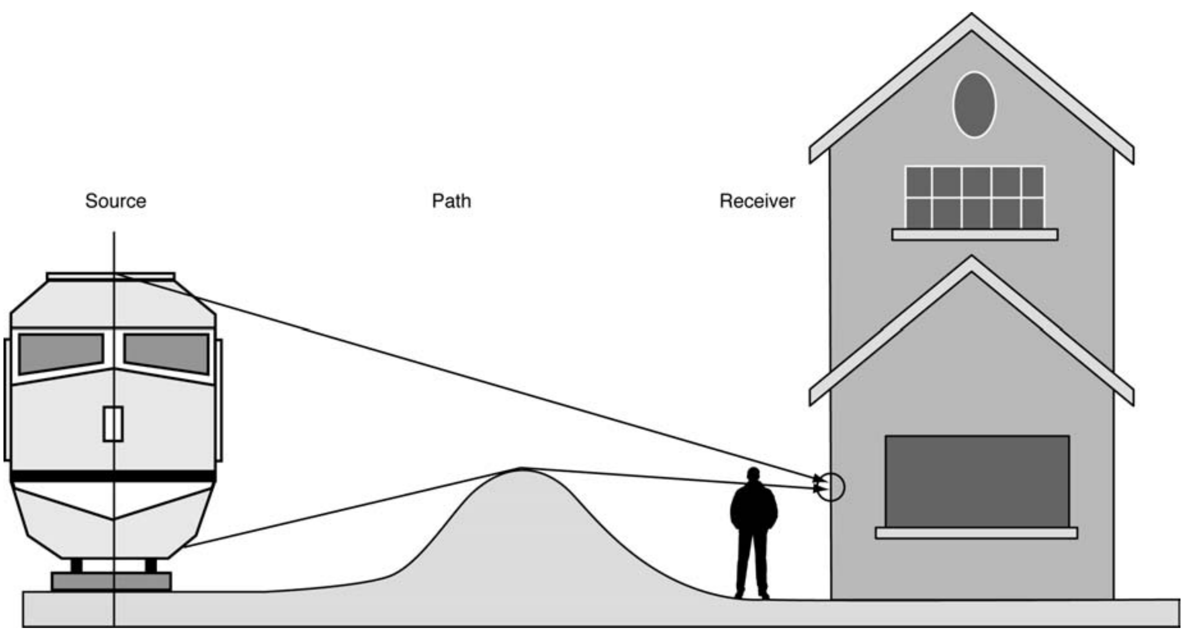


Figure 2-1. The Source-Path-Receiver Framework

In brief, this chapter contains:

- A primer on the fundamentals of noise characteristics (Section 2.1)
- An overview of transit **sources**: a listing of major sources, plus some discussion of noise-generation mechanisms (Section 2.2)
- An overview of noise **paths**: a discussion of the various attenuating mechanisms on the path between source and receiver (Section 2.3)
- An overview of **receiver** response to transit noise: a discussion of the technical background for transit-noise criteria and the distinction between absolute and relative noise impact (Section 2.4)
- A discussion of the **noise descriptors** used in this manual for transit noise (Section 2.5)

2.1 FUNDAMENTALS OF NOISE

Noise is generally considered to be unwanted sound. Sound is what we hear when our ears are exposed to small pressure fluctuations in the air. There are many ways in which pressure fluctuations are generated, but typically they are caused by vibrating movement of a solid object. This manual uses the terms ‘noise’ and ‘sound’ interchangeably since there is no physical difference between them. Noise can be described in terms of three variables: amplitude (loud or soft); frequency (pitch); and time pattern (variability).

Amplitude. Loudness of a sound depends on the amplitude of the fluctuations above and below atmospheric pressure associated with a particular sound wave. The mean value of the alternating positive and negative pressure fluctuations is the static atmospheric pressure, not a useful descriptor of sound. However, the effective magnitude of the sound pressure in a sound wave can be expressed by the “root-mean-square” (rms) of the oscillating pressure measured in Pascals, a unit named after Blaise Pascal a 17th century French mathematician. In calculation of the ‘rms’, the values of sound pressure are squared to make them all positive and time-averaged to smooth out variations. The ‘rms’ pressure is the square root of this time-averaged value.

The quietest sound that can be heard by most humans, the “threshold of hearing," is a sound pressure of about 20 microPascals, and the loudest sounds typically found in our environment range up to 20 million microPascals. Because of the difficulty in dealing with such an extreme range of numbers, acousticians use a compressed scale based on logarithms of the ratios of the sound energy contained in the wave related to the square of sound pressures instead of the sound pressures themselves, resulting in the “sound pressure level” in decibels (dB). The ‘B’ in dB is always capitalized because the unit is named after Alexander Graham Bell, a leading 19th century innovator in communication. Sound pressure level (L_p) is defined as:

$$L_p = 10 \log_{10} (p^2_{rms} / p^2_{ref}) = 20 \log_{10} (p_{rms} / p_{ref}) \text{ dB}, \text{ where } p_{ref} = 20 \text{ microPascals.}$$

Inserting the range of sound pressure values mentioned above results in the threshold of hearing at 20 microPascals at 0 dB and a typical loudest sound of 20 million microPascals is 120 dB.

Decibel Addition. The combination of two or more sound pressure levels at a single location involves 'decibel addition' or the addition of logarithmic quantities. The quantities that are added are the sound energies (p^2_{rms}). For example, a doubling of identical sound sources results in a 3 dB increase, since:

$$10 \log_{10}(2\, p^2_{rms} / p^2_{ref}) = 10 \log_{10}(p^2_{rms} / p^2_{ref}) + 10 \log_{10}(2) = 10 \log_{10}(p^2_{rms} / p^2_{ref}) + 3.$$

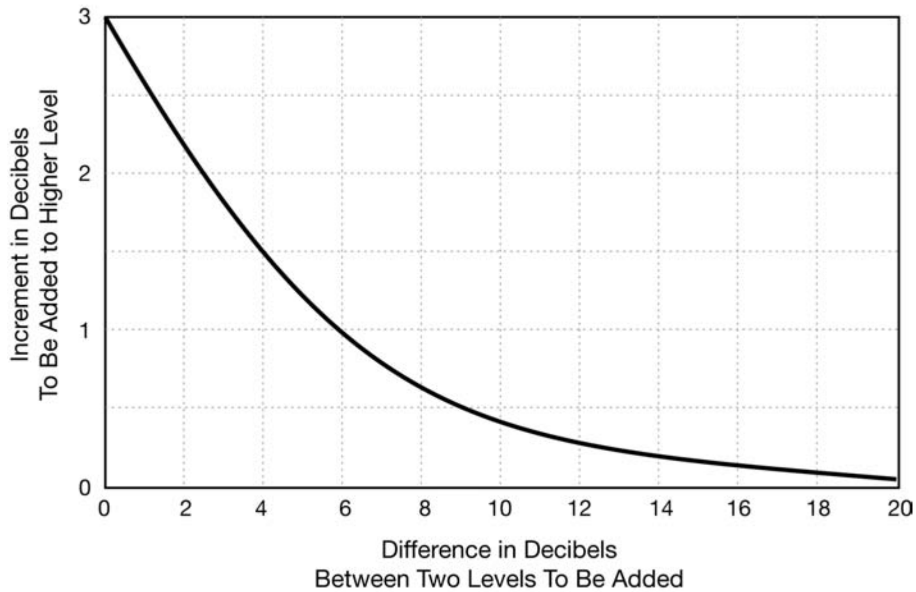


Figure 2-2. Graph for Approximate Decibel Addition

For example, if the noise from one bus resulted in a sound pressure level of 70 dB, the noise from two buses would be 73 dB. Figure 2.2 provides a handy graph that can be used to add sound levels in decibels. For example, if two sound levels of 64 dB and 60 dB are to be added, the difference in decibels between the two levels to be added is 4 dB. The curve intersects the "4" where the increment to be added to the higher level is "1.5." Therefore the sum of the two levels is 65.5 dB.

Frequency. Sound is a fluctuation of air pressure. The number of times the fluctuation occurs in one second is called its frequency. In acoustics, frequency is quantified in cycles per second, or Hertz (abbreviated Hz), named after Heinrich Hertz, a famous 19th century German physicist. Some sounds, like whistles, are associated with a single frequency; this type of sound is called a "pure tone." Most often, however, noise is made up of many frequencies, all blended together in a spectrum. Human hearing covers the frequency range of 20 Hz to 20,000 Hz. If the spectrum is dominated by many low frequency components, the noise will have a characteristic like the rumble of thunder. The spectrum in Figure 2-3 illustrates the full range of acoustical frequencies that can occur near a transit system. In this example, the noise spectrum was measured near a train on a steel elevated structure with a sharp curve. This spectrum has a major low frequency peak centered around 80 Hz. Although not dominant in this example, frequencies in the range of 500 Hz to 2000 Hz are associated with the roar of wheel /rail noise. However a strong peak above 2000 Hz is associated with the wheel squeal of the train on the curve.

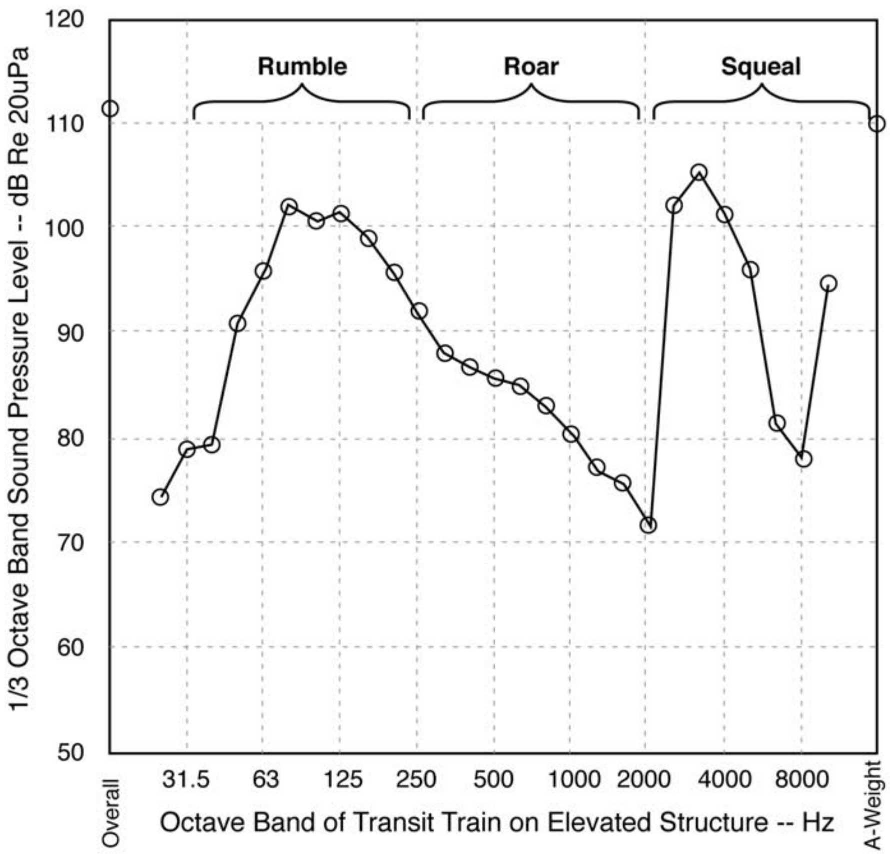


Figure 2-3. Noise Spectrum of Transit Train on Curve on Elevated Structure

Our human hearing system does not respond equally to all frequencies of sound. For sounds normally heard in our environment, low frequencies below 250 Hz and very high frequencies above 10,000 Hz are less audible than the frequencies in between. Acoustical scientists measured and developed frequency response functions that characterize the way people respond to different frequencies. These are the so-called A-, B- and C-weighted curves, representing the way people respond to sounds of normal, very loud and extremely loud sounds, respectively. Environmental noise generally falls into the “normal” category so that the A-weighted sound level is considered best to represent the human response. The A-weighted curve is shown in

Figure 2-4. This curve shows that sounds at 50 Hz would have to be amplified by 30 dB to be perceived equally as loud as a sound at 1000 Hz at normal sound levels.

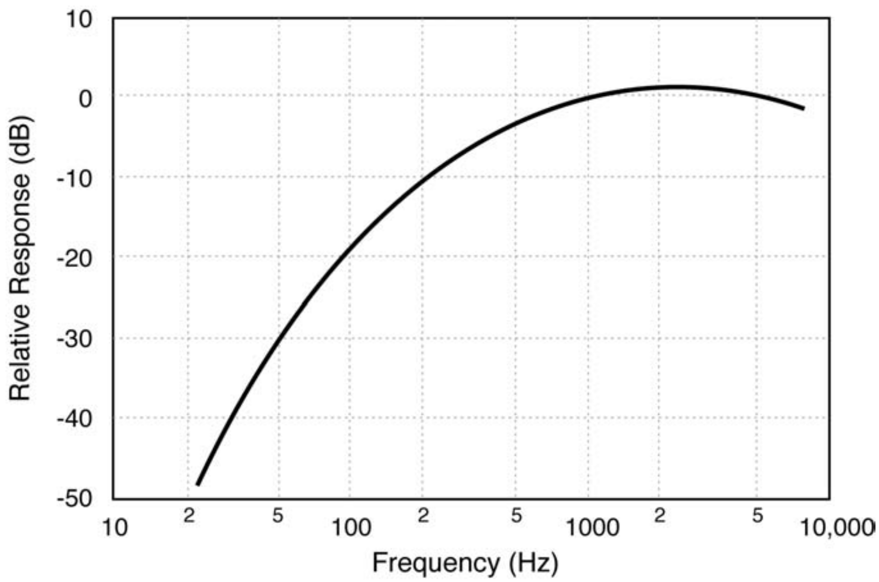


Figure 2-4. A-weighting Curve

Low frequencies are associated with long wavelengths of sound. Conversely, high frequencies are the result of short wavelengths. The way in which frequency and wavelength of sound waves are related is the speed of sound. The relationship is:

$$f\lambda = c, \text{ where}$$

f = frequency in cycles per second (Hz)
λ = wavelength in feet, and
c = speed of sound in feet per second.

The speed of sound in air varies with temperature, but at standard conditions is approximately 1000 feet per second. Therefore, according to the equation, a frequency of 1000 Hz has a wavelength of 1 foot and a frequency of 50 Hz has a wavelength of 20 feet.

The scale of these waves explains in part the reason humans perceive sounds of 1000 Hz better than those of 50 Hz – the wavelengths are similar to the size of the receiver's head. Waves of 20 feet in length at 50 Hz are house-sized, which is why low-frequency sounds, such as those from idling locomotives, are not deterred by walls and windows of a home. These sounds transmit indoors with relatively little reduction in strength.

Time pattern. The third important characteristic of noise is its variation in time. Environmental noise generally derives, in part, from a conglomeration of distant noise sources. Such sources may include distant traffic, wind in trees, and distant industrial or farming activities, all part of our daily lives. These distant sources create a low-level "background noise" in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment, but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle. Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include single-vehicle passbys, aircraft flyovers, screeching of brakes, and other short-term events, all causing the noise level to fluctuate significantly from moment to moment.

It is possible to describe these fluctuating noises in the environment using single-number descriptors. To do this allows manageable measurements, computations, and impact assessment. The search for adequate single-number noise descriptors has encompassed hundreds of attitudinal surveys and laboratory experiments, plus decades of practical experience with many alternative descriptors.

2.2 SOURCES OF TRANSIT VEHICLE NOISE

This section discusses major characteristics of the sources of transit noise. Transit noise is generated by transit vehicles in motion. Vehicle propulsion units generate: (1) whine from electric control systems and traction motors that propel rapid transit cars, (2) diesel-engine exhaust noise, from both diesel-electric locomotives and transit buses, (3) air-turbulence noise generated by cooling fans, and (4) gear noise. Additional noise of motion is generated by the interaction of wheels/tires with their running surfaces. Tire noise from rubber-tired vehicles is significant at normal operating speeds. The interaction of steel wheels and rails generates three types of noise: (1) rolling noise due to continuous rolling contact, (2) impact noise when a wheel encounters a discontinuity in the running surface, such as a rail joint, turnout or crossover, and (3) squeal generated by friction on tight curves.

Figure 2-5 illustrates typical dependence of source strength on vehicle speed for two types of transit vehicles. Plotted vertically in this figure is a qualitative indication of the maximum sound level during a passby. In the figure, speed dependence is strong for electric-powered transit trains because wheel/rail noise dominates, and noise from this source increases strongly with increasing speed. On the other hand, speed dependence is less for diesel-powered commuter rail trains, particularly at low speeds where the locomotive exhaust noise dominates. As

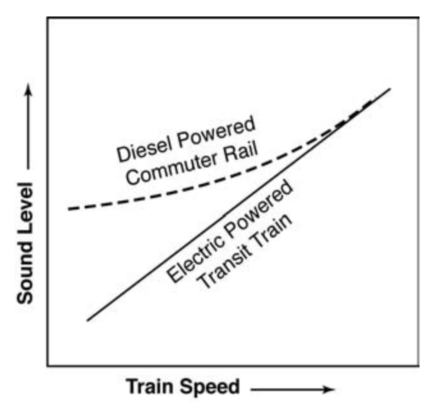


Figure 2-5. Example Sound Level Dependence on Speed

speed increases, wheel-rail noise becomes the dominant noise source and diesel- and electric-powered trains will generate similar noise levels. Similarly, but not shown, speed dependence is also strong for automobiles, city buses (two-axle) and non-accelerating highway buses (three-axle), because tire/pavement noise dominates for these vehicles; but it is not significant for accelerating highway buses where exhaust noise is dominant. For transit vehicles in motion, close-by sound levels also depend upon other parameters, such as vehicle acceleration and vehicle length, plus the type/condition of the running surfaces. For very high-speed rail vehicles, air turbulence can also be a significant source of noise. In addition, the guideway structure can also radiate noise as it vibrates in response to the dynamic loading of the moving vehicle.

Transit vehicles are equipped with horns and bells for use in emergency situations and as a general audible warning to track workers and trespassers within the right-of-way as well as to pedestrians and motor vehicles at highway grade crossings. Horns and bells on the moving transit vehicle, combined with stationary bells at grade crossings can generate noise levels considered to be extremely annoying to nearby residents.

Noise is generated by transit vehicles even when they are stationary. For example, auxiliary equipment often continues to run even when vehicles are stationary – equipment such as cooling fans on motors, radiator fans, plus hydraulic, pneumatic and air-conditioning pumps. Also, transit buses are often left idling in stations or storage yards. Noise is also generated by sources at fixed-transit facilities. Such sources include ventilation fans in transit stations, in subway tunnels, and in power substations, equipment in chiller plants, and many activities within maintenance facilities and shops.

Table 2-1 summarizes sources of transit noise separately by vehicle type and/or type of facility. Procedures for computing close-by noise levels for major sources as a function of operating parameters such as vehicle speed are given in Chapters 5 and 6.

Table 2-1. Sources of Transit Noise		
Vehicle or Facility	**Dominant Components**	**Comments**
Rail Rapid Transit (RRT), or Light Rail Transit (LRT) on exclusive right-of-way	Wheel/rail interaction and guideway amplification	Depends on condition of wheels and rails.
	Propulsion system	When accelerating and at higher speeds.
	Brakes	When stopping.
	Auxiliary equipment	When stopped.
	Wheel squeal	On tight curves.
	In general	Noise increases with speed and train length.
Light Rail Transit (LRT) in mixed traffic	Wheel squeal	On tight curves.
	Auxiliary equipment	When stopped.
	Horns and crossing bells	At grade crossings.
	In general	Lower speeds mean less noise than for RRT and LRT on exclusive right-of-way.
Commuter Rail	Diesel exhaust	On diesel-hauled trains.
	Cooling fans	On both diesel and electric-powered trains.
	Wheel/rail interaction	Depends on condition of wheels and rails.
	Horns and crossing gate bells	At grade crossings.
	In general	Noise is usually dominated by locomotives and horns at grade crossings.
Low and Intermediate Capacity Transit	Propulsion systems, including speed controllers	At low speeds.
	Ventilation systems	At low speeds.
	Tire/guideway interaction	For rubber-tired vehicles, including monorails.
	Wheel/rail interaction	Depends on condition of wheels and rails.
	In general	Wide range of vehicles: monorail, rubber-tired, steel wheeled, linear induction. Noise characteristics depend upon type.
Diesel Buses	Cooling fans	While idling.
	Engine casing	While idling.
	Diesel exhaust	At low speeds and while accelerating.
	Tire/roadway interaction	At moderate and high speeds.
	In general	Includes city buses (generally two axle) and commuter buses (generally three axle).
Electric Buses and Trackless Trolleys	Tire/roadway interaction	At moderate speeds.
	Electric traction motors	At moderate speeds.
	In general	Much quieter than diesel buses.

Table 2-1. Sources of Transit Noise (continued)		
Vehicle or Facility	**Dominant Components**	**Comments**
Bus Storage Yards	Buses starting up	Usually in early morning.
	Buses accelerating	Usually near entrances/exits.
	Buses idling	Warm-up areas
	In general	Site specific. Often peak periods with significant noise.
Rail Transit Storage Yards	Wheel squeal	On tight curves.
	Wheel impacts	On joints and switches.
	Wheel rolling noise	On tangent track
	Auxiliary equipment	Throughout day and night. Includes air-release noise.
	Coupling/uncoupling	On storage tracks
	Signal horns	Throughout yard site
	In general	Site specific. Often early morning and peak periods with significant noise.
Maintenance Facilities	Signal horns	Throughout facility
	PA systems	Throughout facility
	Impact tools	Shop buildings
	Car/bus washers/driers	Wash facility
	Vehicle activity	Throughout facility
	In general	Site specific. Considerable activity throughout day and night, some outside.
Stations	Automobiles	Patron arrival/departure, especially in early morning.
	Buses idling	Bus loading zone
	P.A. systems	Platform area
	Locomotive idling	At commuter rail terminal stations.
	Auxiliary systems	At terminal stations and layover facilities.
	In general	Site specific, with peak activity periods.
Subways	Fans	Noise through vent shafts.
	Buses/trains in tunnels	Noise through vent shafts.
	In general	Noise is not a problem.

2.3 PATHS OF TRANSIT NOISE, FROM SOURCE TO RECEIVER

This section contains a qualitative overview of noise-path characteristics from source to receiver, including attenuation along these paths. Equations for specific noise-level attenuations along source-receiver paths appear in Chapters 5 and 6.

Sound paths from source to receiver are predominantly through the air. Along these paths, sound reduces with distance due to (1) divergence, (2) absorption/diffusion and (3) shielding. These mechanisms of sound attenuation are discussed below.

Divergence. Sound levels naturally attenuate due to distance, as shown in Figure 2-6. Plotted vertically is the attenuation at the receiver, relative to the sound level 50 feet from the source. As shown, the sound level attenuates with increasing distance. Such attenuation, technically called "divergence," depends upon source configuration and source-emission characteristics. For sources grouped closely together (called point sources), attenuation with distance is large: 6 decibels per doubling of distance. Point sources include crossing signals along rail corridors, PA systems in maintenance yards and other closely grouped sources of noise. For vehicles passing along a track or roadway (called line sources), divergence with distance is less: 3 decibels per doubling of distance for L_{eq} and L_{dn}, and 3 to 6 decibels per doubling of distance for L_{max}. In Figure 2-6, the line source curve separates into three separate lines for L_{max}, with the point of departure depending on the length of the line source. These three noise descriptors – L_{eq} , L_{dn} and L_{max} – are discussed in Section 2.5. Equations for the curves in Figure 2-6 appear in Chapter 6.

Absorption/Diffusion. In addition to distance alone, sound levels are further attenuated when sound paths lie close to freshly-plowed or vegetation-covered ground. Plotted vertically in Figure 2-7 is this additional attenuation, which can be as large as 5 decibels as close in as several hundred feet. At very large distances, wind and temperature gradients sometimes modify the ground attenuation shown here; such variable atmospheric effects are not included in this manual because they generally occur beyond the range of typical transit-noise impact. Equations for the curves in this figure appear in Chapter 6.

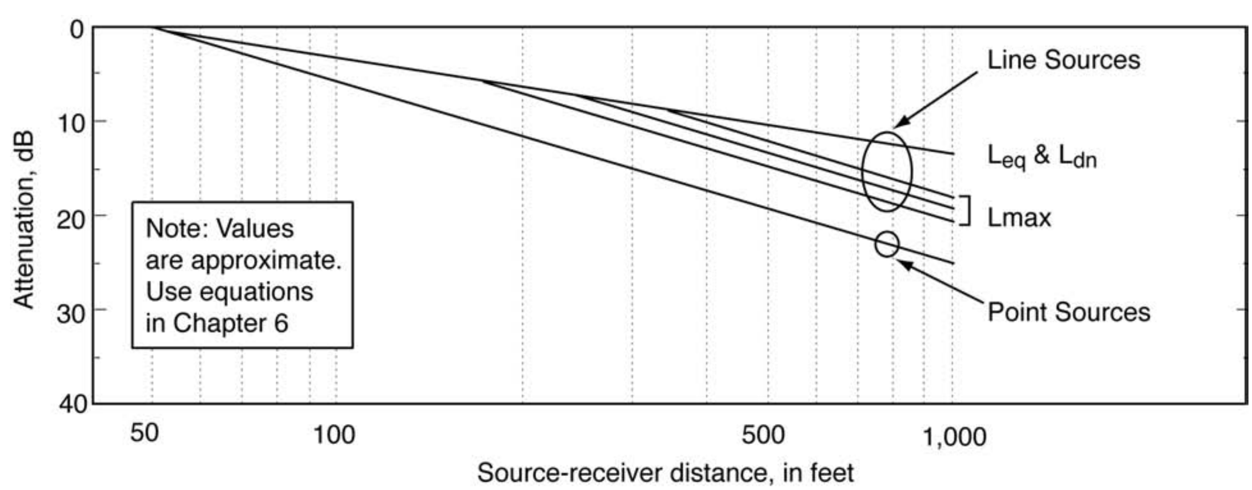


Figure 2-6. Attenuation due to Distance (divergence)

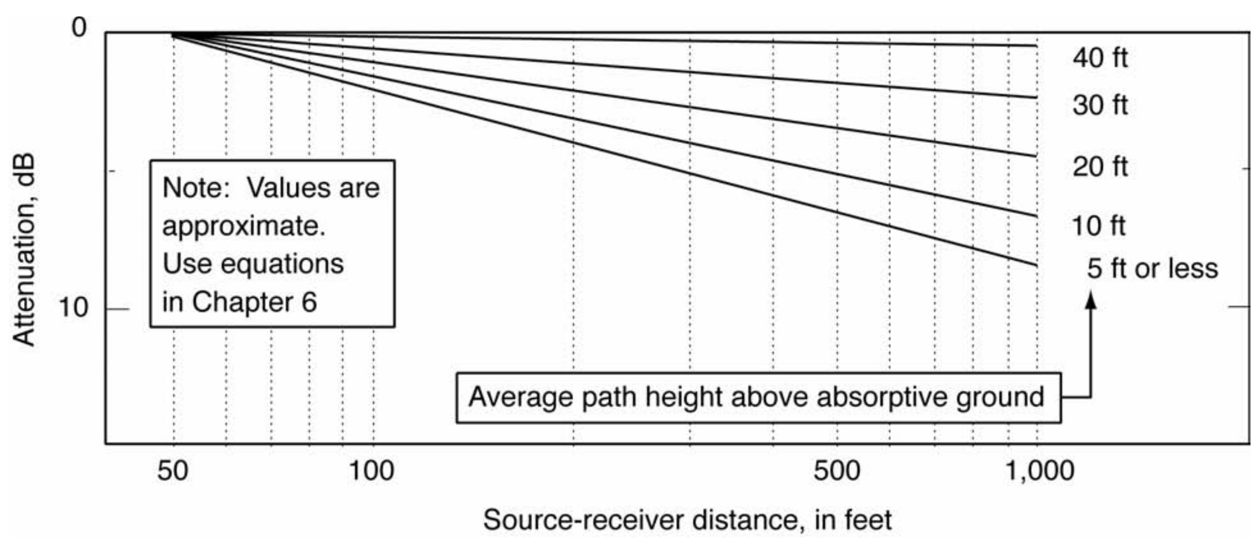


Figure 2-7. Attenuation due to Soft Ground

<u>Shielding</u>. Sound paths are sometimes interrupted by man-made noise barriers, by terrain, by rows of buildings, or by vegetation. Most important of these path interruptions are noise barriers, one of the best means of mitigating noise in sensitive areas. A noise barrier reduces sound levels at a receiver by breaking the direct line-of-sight between source and receiver with a solid wall (in contrast to vegetation, which hides the source but does not reduce sound levels significantly). Sound energy reaches the receiver only by bending (diffracting) over the top of the barrier, as shown in Figure 2-8, and this diffraction reduces the sound level at the receiver.

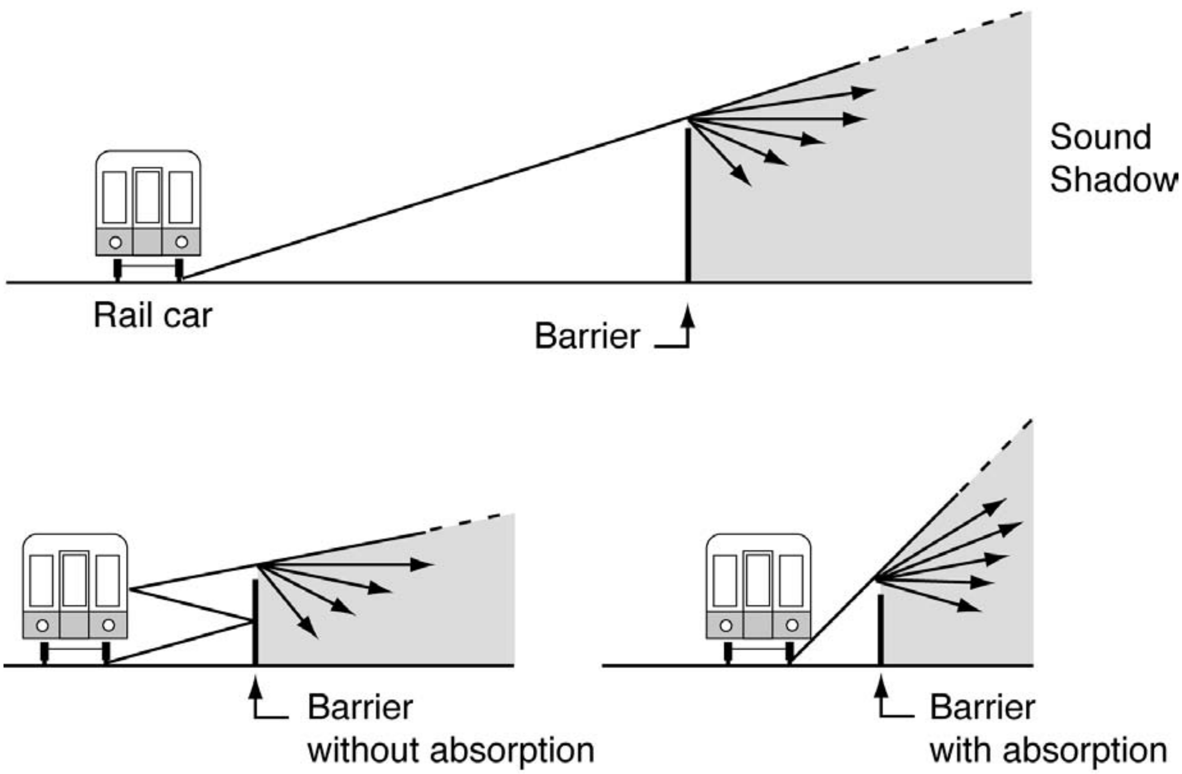


Figure 2-8. Noise Barrier Geometry

Sound barriers for transportation systems are typically used to attenuate noise at the receiver by 5 to 15 decibels, depending upon barrier height, length, and distance from both source and receiver. Barriers on structure, very close-in to the source, sometimes provide less attenuation than do barriers slightly more distant from the source, due to reverberation (multiple reflections) between the barrier and the body of the vehicle. However, this reverberation is often offset by increased barrier height, which is easy to obtain for such close-in barriers, and/or acoustical absorption on the source side of the barrier. Acoustical absorption is included as a mitigation option in Chapter 6. Equations for barrier attenuation, plus equations for other sound-path interruptions, also appear in Chapter 6.

Sometimes a portion of the source-to-receiver path is not through the air, but rather through the ground or through structural components of the receiver's building. Discussion of such ground-borne and structure-borne propagation is included in Chapter 7.

2.4 RECEIVER RESPONSE TO TRANSIT NOISE

This section contains an overview of receiver response to noise. It serves as background information for the noise impact criteria in Chapter 3.

Noise can interrupt ongoing activities and can result in community annoyance, especially in residential areas. In general, most residents become highly annoyed when noise interferes significantly with activities such as sleeping, talking, noise-sensitive work, and listening to radio or TV or music. In addition, some land uses, such as outdoor concert pavilions, are inherently incompatible with high noise levels.

Annoyance to noise has been investigated and approximate dose-response relationships have been quantified by the Environmental Protection Agency (EPA).(1) The selection of noise descriptors in this manual is largely based upon this EPA work. Beginning in the 1970s, the EPA undertook a number of research and synthesis studies relating to community noise of all types. Results of these studies have been widely published, and discussed and refereed by many professionals in acoustics. Basic conclusions of these studies have been adopted by the Federal Interagency Committee on Noise, the Department of Housing and Urban Development (HUD), the American National Standards Institute, and even internationally.(2)(3)(4)(5) Conclusions from this seminal EPA work remain scientifically valid to this day.

Figure 2-9 contains a synthesis of actual case studies of community reaction to newly introduced sources of noise in a residential urban neighborhood.(6) Plotted horizontally in the figure is the new noise's excess above existing noise levels. Both the new and existing noise levels are expressed as Day-Night Sound Levels, L_{dn}, discussed in Section 2.5. Plotted vertically is the community reaction to this newly introduced noise. As shown in the figure, community reaction varies from "No Reaction" to "Vigorous Action," for newly introduced noises averaging from "10 decibels below existing" to "25 decibels above existing." Note that these data points apply only when the stated assumptions are true. For other conditions, the points shift to the right or left somewhat.

In a large number of community attitudinal surveys, transportation noise has been ranked among the most significant causes of community dissatisfaction. A synthesis of many such surveys on annoyance appears in Figure 2-10.(7)(8) Plotted horizontally are different neighborhood noise exposures. Plotted vertically is the percentage of people who are *highly annoyed* by their particular level of neighborhood noise. As shown in the figure, the percentage of high annoyance is approximately 0 percent at 45 decibels, 10 percent around 60 decibels and increases quite rapidly to approximately 70 percent around 85 decibels. The scatter about the synthesis line is due to variation from community to community and to some wording differences in the various surveys. A recent update of the original research, containing several additional railroad, transit and street traffic noise surveys, has not significantly changed the shape of the original Schultz curve.(8)(9)

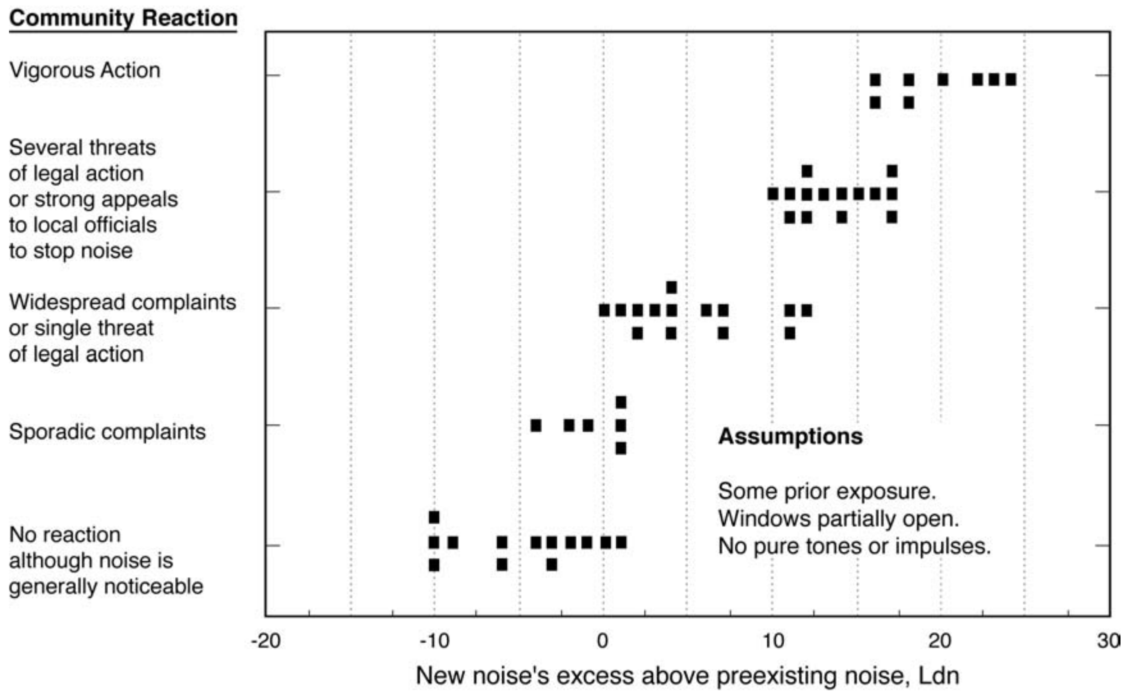


Figure 2-9. Community Reaction to New Noise, Relative to Existing Noise In a Residential Urban Environment

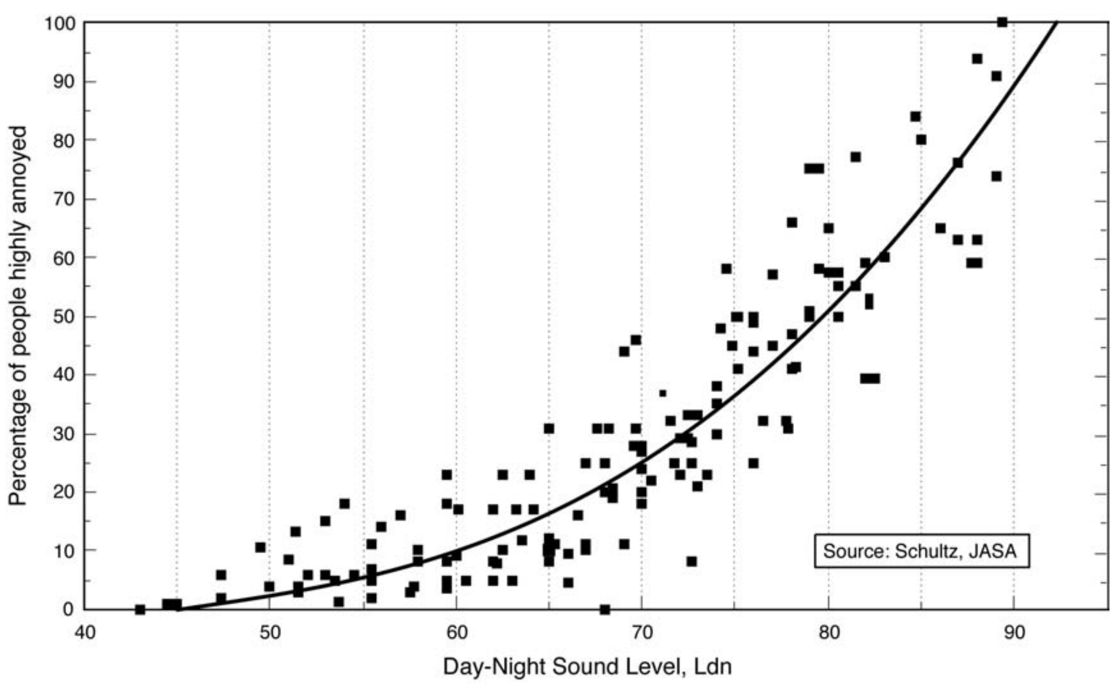


Figure 2-10. Community Annoyance Due to Noise

As indicated by these two figures, introduction of transit noise into a community may have two undesirable effects. First, it may significantly increase existing noise levels in the community, levels to which residents have mostly become accustomed. This effect is called "relative" noise impact. Evaluation of this effect is "relative" to existing noise levels; relative criteria are based upon noise increases above existing levels. Second, newly introduced transit noise may interfere with community activities, independent of existing noise levels; it may be simply too loud to converse or to sleep. This effect is called "absolute" noise impact, because it is expressed as a fixed level not to be exceeded and is independent of existing noise levels. Both these effects, relative and absolute, enter the assessment of transit noise impact in Chapters 4, 5 and 6. These two types of impact, relative and absolute, are merged into the transit noise criteria of Chapter 3.

2.5 DESCRIPTORS FOR TRANSIT NOISE

This manual uses the following single-number descriptors for transit-noise measurements, computations, and assessment. The terminology is consistent with common usage in the United States. For comparison with national standard terminology, see Appendix A.

The *A-weighted Sound Level*, which describes a receiver's noise at any moment in time.

The *Maximum Sound Level* (L_{max}) during a single noise event.

The *Sound Exposure Level (SEL)*, which describes a receiver's cumulative noise exposure from a single noise event.

The *Hourly Equivalent Sound Level* ($L_{eq}(h)$), which describes a receiver's cumulative noise exposure from all events over a one-hour period.

The *Day-Night Average Sound Level* (L_{dn}), which describes a receiver's cumulative noise exposure from all events over a full 24 hours, with events between 10pm and 7am increased by 10 decibels to account for greater nighttime sensitivity to noise.

This section illustrates all of these noise descriptors, in turn, and describes their particular application in this manual. Emphasized here are graphic illustrations rather than mathematical definitions to help the reader gain understanding and to see the interrelationships among descriptors.

2.5.1 A-weighted Sound Level: The Basic Noise Unit

The basic noise unit for transit noise is the A-weighted Sound Level. It describes a receiver's noise at any moment in time and is read directly from noise-monitoring equipment, with the "weighting switch" set on "A." Figure 2-11 shows some typical A-weighted Sound Levels for both transit and non-transit sources.

As is apparent from Figure 2-11, typical A-weighted Sound Levels range from the 30s to the 90s, where 30 is very quiet and 90 is very loud. The scale in the figure is labeled "dBA" to denote the way A-weighted Sound Levels are typically written, for example, 80 dBA. The letter "A" indicates that the sound has been filtered to reduce the strength of very low and very high-frequency sounds, as described in Section 2.1. Without this A-weighting, noise-monitoring equipment would respond to events people cannot hear, events such as high-frequency dog whistles and low-frequency seismic disturbances. On the average, each A-weighted sound level increase of 10 decibels corresponds to an approximate doubling of subjective loudness. Other frequency weighting such as B, C, and linear weights have been used to filter sound for specific applications.

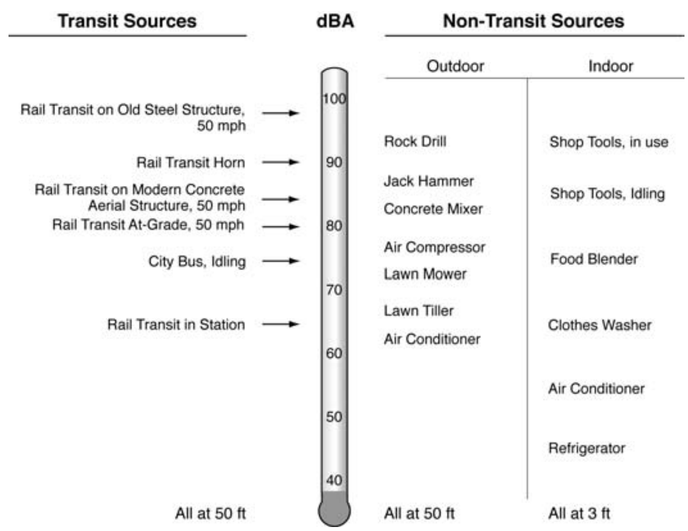


Figure 2-11. Typical A-weighted Sound Levels

A-weighted sound levels are adopted here as the basic noise unit because: (1) they can be easily measured, (2) they approximate our ear's sensitivity to sounds of different frequencies, (3) they match attitudinal-survey tests of annoyance better than do other basic units, (4) they have been in use since the early 1930s, and (5) they are endorsed as the proper basic unit for environmental noise by nearly every agency concerned with community noise throughout the world.

2.5.2 Maximum Sound Level (L_{max}) During a Single Noise Event

As a transit vehicle approaches, passes by, and then recedes into the distance, the A-weighted sound level rises, reaches a maximum, and then fades into the background noise. The maximum A-weighted sound level reached during this passby is called the Maximum Sound Level, abbreviated here as "L_{max}." For noise compliance tests of transient sources, such as moving transit vehicles under controlled conditions with smooth wheel and rail conditions, L_{max} is typically measured with the sound level meter's switch set on "fast." However, for tests of continuous or stationary transit sources, and for the general assessment of transit noise impact, it is usually more appropriate to use the "slow" setting. When set on "slow," sound level meters ignore some of the very transient fluctuations, which are unimportant to people's overall assessment of the noise. L_{max} is illustrated in Figure 2-12, where time is plotted horizontally and A-weighted sound level is plotted vertically.

Because L_{max} is commonly used in vehicle-noise specifications and because it is commonly measured for individual vehicles, equations are included in Appendices E and F to convert between L_{max} and the cumulative descriptors discussed below. However, L_{max} is not used as the descriptor for transit environmental noise impact assessment for several reasons. L_{max} ignores the number and duration of transit events, which are important to people's reaction to noise, and cannot be totalled into a one-hour or a 24-hour cumulative measure of impact. Moreover, the L_{max} is not conducive to comparison among different transportation modes. For example, noise descriptors used in highway noise assessments are L_{eq} and L_{10}, the noise level exceeded for 10 percent of the peak hour.

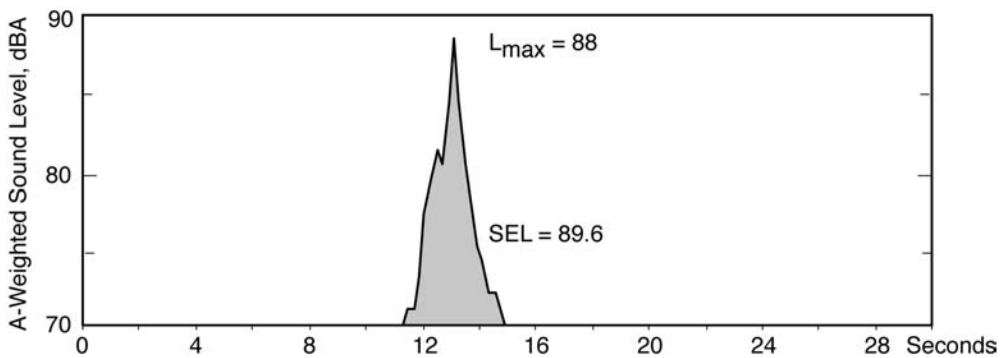


Figure 2-12. Typical Transit-Vehicle Passby

2.5.3 Sound Exposure Level (SEL): The Cumulative Exposure from a Single Noise Event

Shaded in Figure 2-12 is the noise "exposure" during a transit-vehicle passby. This exposure represents the total amount of sound energy that enters the receiver's ears (or the measurement microphone) during the vehicle passby. Figure 2-13 shows another noise event – this one within a fixed-transit facility as a transit bus is started, warmed up, and then driven away. For this event, the noise exposure is large due to *duration*.

The quantitative measure of the noise exposure for single noise events is the Sound Exposure Level, abbreviated here as "SEL" and shaded in both these figures. The fact that SEL is a cumulative measure means that (1) louder events have greater SELs than do quieter ones, and (2) events that last longer in time have greater SELs than do shorter ones. People react to the duration of noise events, judging longer events to be more annoying than shorter ones, assuming equal maximum A-Levels. Mathematically, the Sound Exposure Level is computed as:

$$\text{SEL} = 10 \log_{10} \begin{bmatrix} \text{Total sound energy} \\ \text{during the event} \end{bmatrix}$$

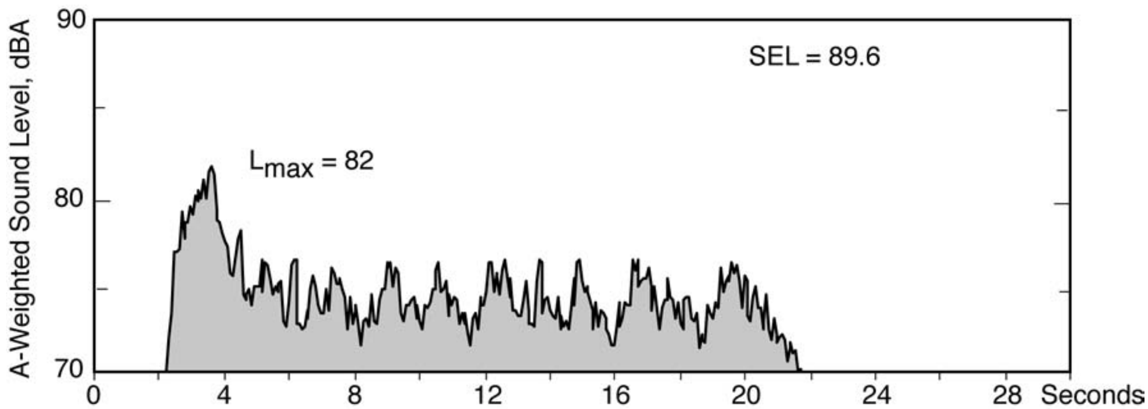


Figure 2-13. Typical Fixed-Facility Noise Event

Figure 2-14 repeats the previous time histories, but with a stretched vertical scale. The stretched scale corresponds to sound "energy" at any moment in time. Mathematically, sound energy is proportional to 10 raised to the (L/10) power, that is, $10^{(L/10)}$. The vertical scale has been stretched in this way because noise is "energy" exposure. Only in this way do the shaded zones properly correspond to the noise exposures that underlie the SEL. Note that the shaded zones in the two frames have equal numerical areas, corresponding to equal SELs for these two very different noise events.

Each frame of the figure also contains a tall, thin shaded zone of one-second duration. This tall zone is another way to envision SELs. Think of the original shaded zone being squeezed shorter and shorter in time, while retaining the same numerical area. As its duration is squeezed, its height must increase to keep the area constant. If an SEL shading is squeezed to a duration of one second, its height will then equal its SEL value; mathematically, its area is now $10^{(L/10)}$ times one second. Note that the resulting height of the squeezed zone depends both upon the L_{max} and the duration of the event -- that is, upon the total area under the original, time-varying A-Level. Often this type of "squeezing" helps communicate the meaning of SELs and noise doses to the reader.

SEL is used in this manual as the cumulative measure of each single transit-noise event because unlike L_{max}: (1) SEL increases with the duration of a noise event, which is important to people's reaction, (2) SEL, therefore, allows a uniform assessment method for both transit-vehicle passbys and fixed-facility noise events, and (3) SEL can be used to calculate the one-hour and 24-hour cumulative descriptors discussed below.

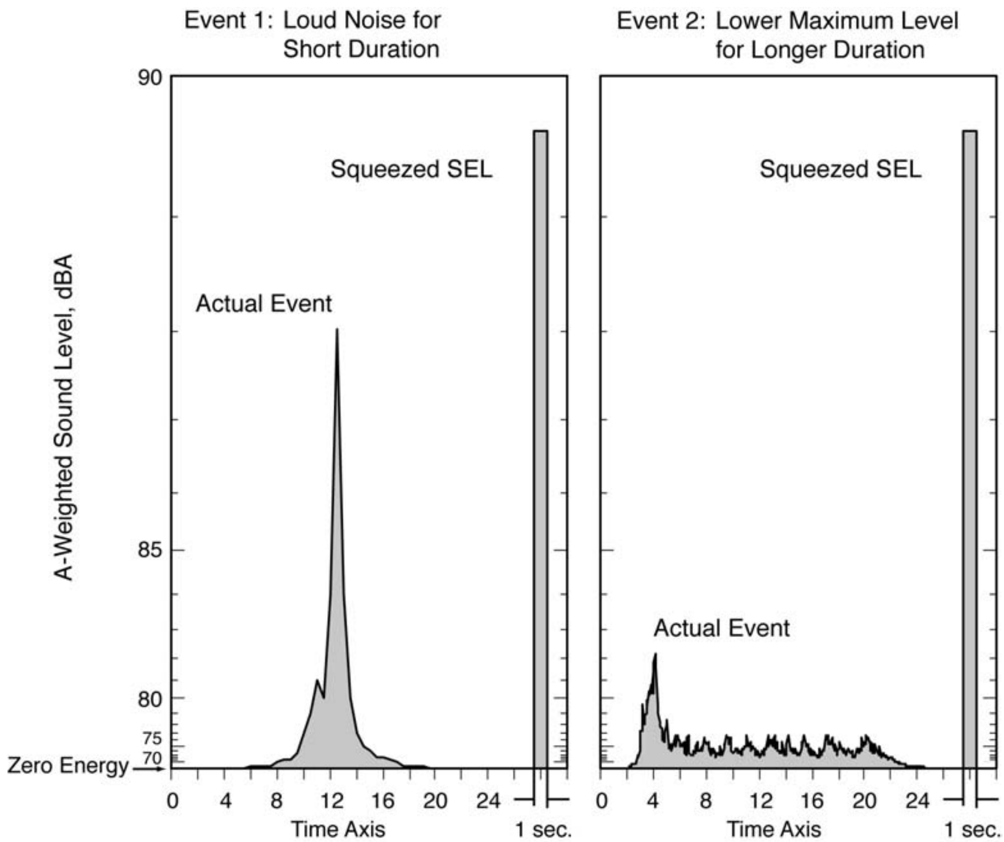


Figure 2-14. An "Energy" View of Noise Events

2.5.4 Hourly Equivalent Sound Level (L_{eq}(h))

The descriptor for cumulative one-hour exposure is the Hourly Equivalent Sound Level, abbreviated here as "L_{eq}(h)." It is an hourly measure that accounts for the moment-to-moment fluctuations in A-weighted sound levels due to all sound sources during that hour, combined. Sound fluctuation is illustrated in the upper frame of Figure 2-15 for a single noise event such as a train passing on nearby tracks. As the train approaches, passes by, and then recedes into the distance, the A-weighted Sound Level rises, reaches a maximum, and then fades into the background noise. The area under the curve in this upper frame is the receiver's noise dose over this five-minute period.

The center frame of the figure shows sound level fluctuations over the one-hour period that includes the five-minute period from the upper frame. Now the area under the curve represents the noise exposure for one hour. Mathematically, the Hourly Equivalent Sound Level is computed as:

$$L_{eq}(hour) = 10\ \log_{10}\begin{bmatrix}\text{Total sound energy}\\ \text{during one hour}\end{bmatrix} - 35.6$$

Sound energy is totaled here over a full hour; it accumulates from all noise events during that hour. Subtraction of 35.6 from this one-hour sound exposure converts it into a time average, as explained in Section 2.5.6. In brief, if the actual fluctuating noise were replaced by a constant noise equal to this average value, the same total sound energy would enter the receiver's ears. This type of average value is "equivalent" in that sense to the actual fluctuating noise.

A useful, alternative way of computing L_{eq} due to a series of transit-noise events is:

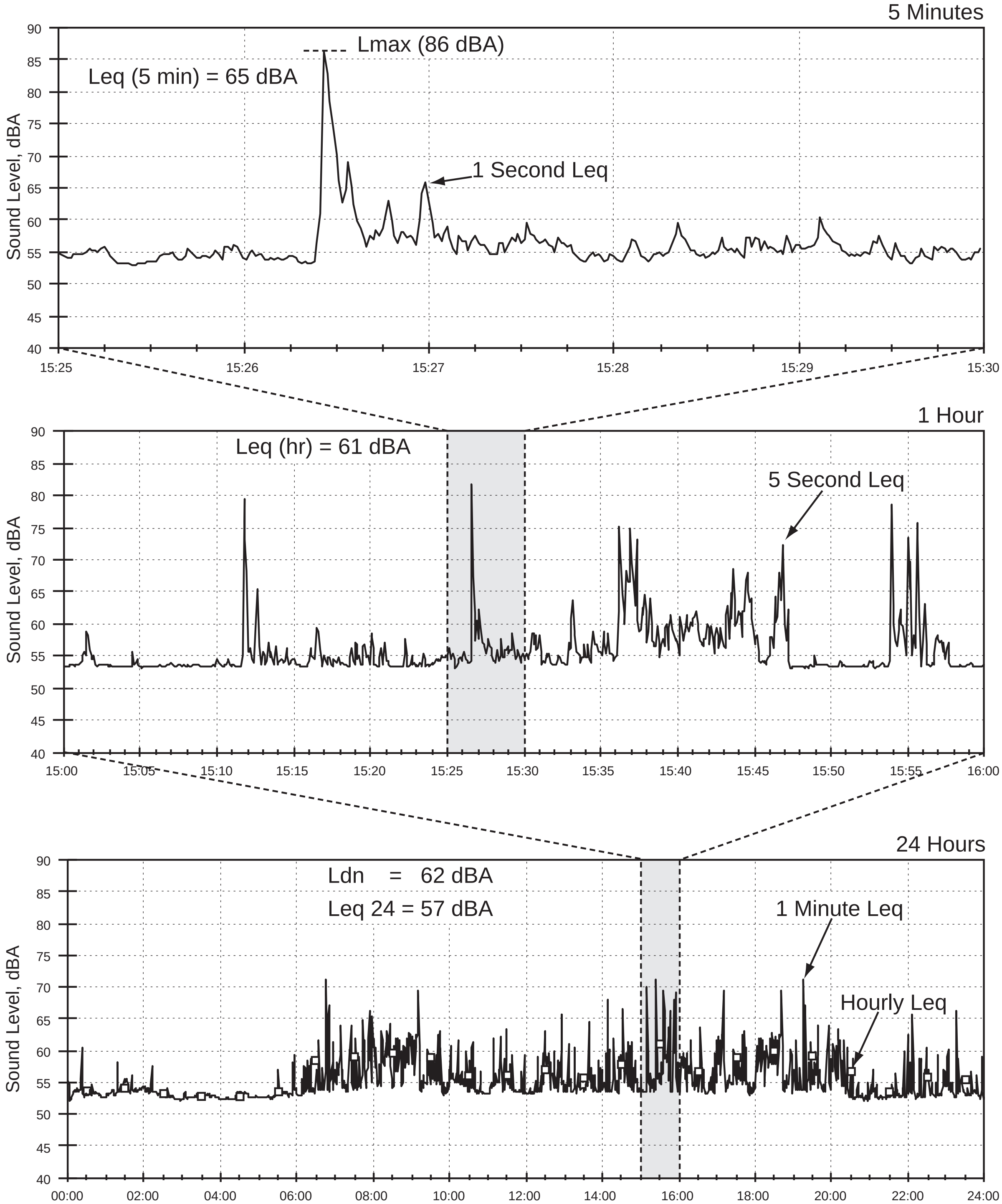
$$L_{eq}(hour) = 10 \log_{10} \begin{bmatrix} \text{Energy Sum of} \\ \text{all SELs} \end{bmatrix} - 35.6$$

This equation concentrates on the cumulative contribution of individual noise events, and is the fundamental equation incorporated into Chapters 5 and 6.

The bottom frame of Figure 2-15 shows the sound level fluctuations over a full 24-hour period. It is discussed in Section 2.5.5.

Figure 2-16 shows some typical hourly L_{eq}'s, both for transit and non-transit sources. As is apparent from the figure, typical hourly L_{eq}'s range from the 40s to the 80s. Note that these L_{eq}'s depend upon the number of events during the hour and also upon each event's duration, which is affected by vehicle speed. Doubling the number of events during the hour will increase the L_{eq} by 3 decibels, as will doubling the duration of each individual event.

Hourly L_{eq} is adopted here as the measure of cumulative noise impact for non-residential land uses (those not involving sleep) because: (1) L_{eq}'s correlate well with speech interference in conversation and on the telephone – as well as interruption of TV, radio and music enjoyment, (2) L_{eq}'s increase with the duration of transit events, which is important to people's reaction, (3) L_{eq}'s take into account the number of transit events over the hour, which is also important to people's reaction, and (4) L_{eq}'s are used by the Federal Highway Administration in assessing highway-traffic noise impact. Thus, this noise descriptor can be used for comparing and contrasting highway, transit and multi-modal alternatives. L_{eq} is computed for the loudest facility hour during noise-sensitive activity at each particular non-residential land use. Section 2.5.6 contains more detail in support of L_{eq} as the adopted descriptor for cumulative noise impact for non-residential land uses.



Typical A-weighted Sound Level Variation over a 24-Hour Period

Figure 2-15. Example A-weighted Sound Level Time Histories

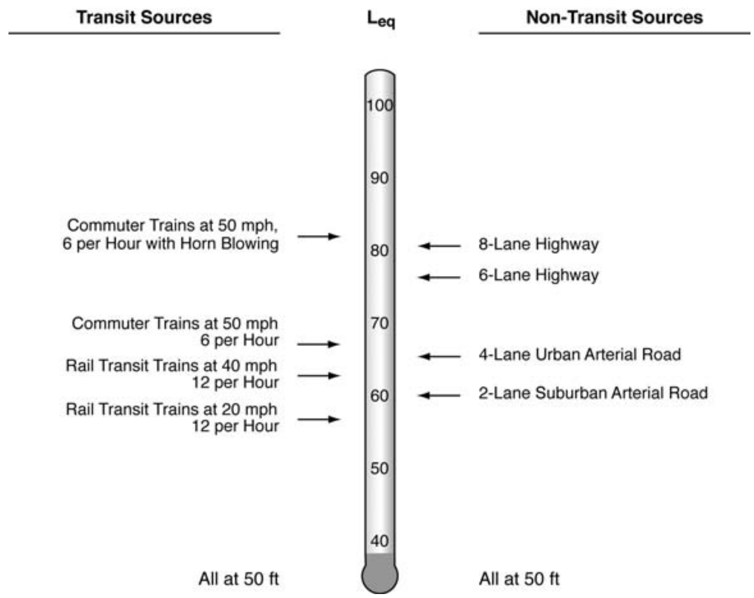


Figure 2-16. Typical Hourly L_{eq}'s

2.5.5 Day-Night Sound Level (L_{dn}): The Cumulative 24-Hour Exposure from All Events

The descriptor for cumulative 24-hour exposure is the Day-Night Sound Level, abbreviated here as "L_{dn}." It is a 24-hour measure that accounts for the moment-to-moment fluctuations in A-Levels due to all sound sources during 24 hours, combined. Such fluctuations are illustrated in the bottom frame of Figure 2-15. Here the area under the curve represents the receiver's noise dose over a full 24 hours. Note that some vehicle passbys occur at night in the figure, when the background noise is less. Mathematically, the Day-Night Level is computed as:

$$L_{dn} = 10 \log_{10} \begin{bmatrix} \text{Total sound energy} \\ \text{during 24 hours} \end{bmatrix} - 49.4$$

where nighttime noise (10pm to 7am) is increased by 10 decibels before totaling.

Sound energy is totaled over a full 24 hours; it accumulates from all noise events during that 24 hours. Subtraction of 49.4 from this 24-hour dose converts it into a type of "average," as explained in Section 2.5.6. In brief, if the actual fluctuating noise were replaced by a constant noise equal to this average value, the same total sound energy would enter the receiver's ears.

An alternative way of computing L_{dn} from twenty-four hourly L_{eq}'s is:

$$L_{dn} = 10 \log_{10} \begin{bmatrix} \text{Energy sum of} \\ \text{24 hourly } L_{eq}\text{s} \end{bmatrix} - 13.8$$

where nighttime L_{eq}'s are increased by 10 decibels before totaling, as in the previous equation. L_{dn} due to a series of transit-noise events can also be computed as:

$$L_{dn} = 10 \log_{10} \begin{bmatrix} \text{Energy sum of} \\ \text{all SELs} \end{bmatrix} - 49.4$$

assuming that transit noise dominates the 24-hour noise environment. Here again, nighttime SELs are increased by 10 decibels before totaling. This last equation concentrates upon individual noise events, and is the equation incorporated into Chapters 5 and 6.

Figure 2-17 shows some typical L_{dn}'s, both for transit and non-transit sources. As is apparent from the figure, typical L_{dn}'s range from the 50s to the 70s – where 50 is a quiet 24-hour period and 70 is an extremely loud one. Note that these L_{dn}'s depend upon the number of events during day and night separately – and also upon each event's duration, which is affected by vehicle speed.

L_{dn} is adopted here as the measure of cumulative noise impact for residential land uses (those involving sleep), because: (1) L_{dn} correlates well with the results of attitudinal surveys of residential noise impact, (2) L_{dn}'s increase with the duration of transit events, which is important to people's reaction, (3) L_{dn}'s take into account the number of transit events over the full twenty-four hours, which is also important to people's reaction, (4) L_{dn}'s take into account the increased sensitivity to noise at night, when most people are asleep, (5) L_{dn}'s allow composite measurements to capture all sources of community noise combined, (6) L_{dn}'s allow quantitative comparison of transit noise with all other community noises, (7) L_{dn} is the designated metric of choice of other Federal agencies (Department of Housing and Urban Development (HUD), Federal Aviation Administration (FAA), Environmental Protection Agency (EPA)) and also has wide acceptance internationally. Section 2.4.6 contains more detail in support of L_{dn} as the adopted descriptor for cumulative noise impact for residential land uses.

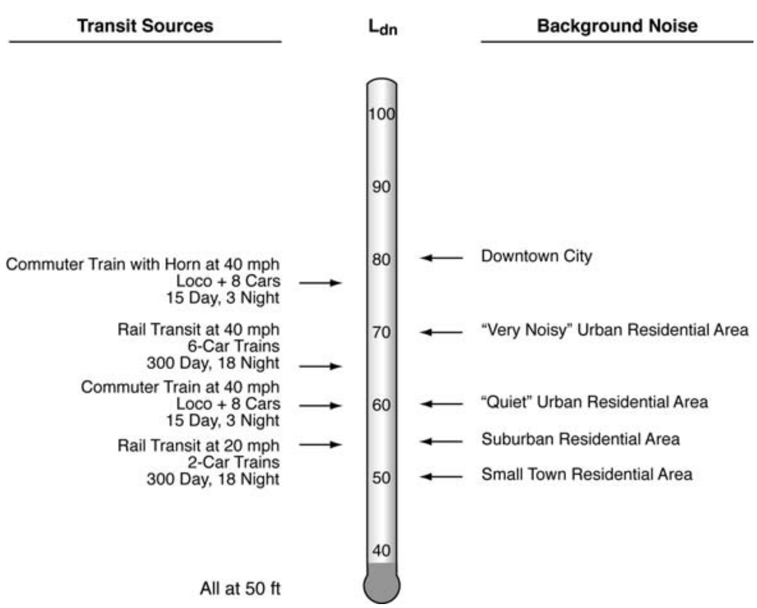


Figure 2-17. Typical L_{dn}'s

2.5.6 A Noise-Exposure Analogy for L_{eq} and L_{dn}

In Figure 2-15, the area under the curves represents noise exposure. An analogy between rainfall and noise is sometimes helpful to further explain these noise exposures.

The one-hour noise time history in the middle frame of the figure is analogous to one hour of rainfall, that is, the total accumulation of rain over this one-hour period. Note that every rain shower increases the one-hour accumulation. Also, note that heavier showers increase the amount more than do lighter ones, and longer showers increase the amount more than shorter ones. The same is true for noise: (1) every transit event increases the one-hour noise exposure; (2) loud events increase the noise exposure more than do quieter ones; and (3) events that stretch out longer in time increase the noise exposure more than shorter ones.

Unfortunately, the word "average" leaves many people with the impression that the maximum levels which attract their attention are being devalued or ignored. They are not. Just as all the rain that falls in the rain gauge in one hour counts toward the total, all sounds are included in the one-hour noise exposure that underlies L_{eq} and in the 24-hour noise exposure that underlies L_{dn}. None of the noise is being ignored, even though the L_{eq} and L_{dn} are often numerically lower than many maximum A-weighted Sound Levels. Noise exposure includes all transit events, all noise levels that occur during their time periods -- without exception. Every added event, even the quiet ones, will increase the noise exposure, and therefore increase L_{eq} and L_{dn}.

Neither the L_{eq} nor the L_{dn} is an "average" in the normal sense of the word, where introduction of a quiet event would pull down the average. Furthermore, similar to the effect of rainfall in watering a field or garden, scientific evidence strongly indicates that total noise exposure is the truest measure of noise impact. Neither the moment-to-moment rain rate nor the moment-to-moment A-level is a good measure of long-term effects.

Why not just compute transit noise impact on the basis of the highest L_{max} of the day, for example, as "loudest L_{max} equals 90 dBA?" If that were done, then there would be no difference in noise impact between a main trunk line and a suburban branch line; one passby per day would be no better than 100 per day, if the loudest level remained unchanged. Clearly such a reduction in number-of-passbys is a true benefit, so it should reduce the numerical measure of impact. It does with L_{eq} and L_{dn}, but not with L_{max}. In addition, if assessments were made just on the loudest passby, then one passby at 90 dBA would be worse than 100 passbys at 89 dBA. Clearly this is not true. Both L_{eq} and L_{dn} increase with the number of passbys, while L_{max} does not. Both the L_{eq} and the L_{dn} combine the number of passbys with each passby's L_{max} and duration, all into a cumulative noise exposure, with mathematics that make sense from an annoyance point of view. L_{eq} and L_{dn} mathematics produce results that correlate well with independent tests of noise annoyance from all types of noise sources.

In terms of individual passbys, here are some characteristics of both the L_{eq} and the L_{dn}:

When passby L_{max}'s increase:	→	Both L_{eq} and L_{dn} increase
When passby durations increase:	→	Both L_{eq} and L_{dn} increase
When the number of passbys increases:	→	Both L_{eq} and L_{dn} increase
When some operations shift to louder vehicles:	→	Both L_{eq} and L_{dn} increase
When passbys shift from day to night:	→	L_{dn} increases

All of these increases in L_{eq} and L_{dn} correlate to increases in community annoyance.

2.5.7 Summary of Noise Descriptors

In summary, the following noise descriptors are adopted in this manual for the computation and assessment of transit noise:

The **A-weighted Sound Level,** which describes a receiver's noise at any moment in time. It is adopted here as the basic noise unit, and underlies all the noise descriptors below.

The **Maximum Level (L_{max})** during a single noise event. The L_{max} descriptor is not recommended for transit noise impact assessment, but because it is commonly used in vehicle noise specifications and because it is commonly measured for individual vehicles, equations are included in Appendices E and F to convert between L_{max} and the cumulative descriptors adopted here.

The **Sound Exposure Level (SEL),** which describes a receiver's cumulative noise exposure from a single noise event. It is adopted here as the primary descriptor for the measurement of transit vehicle noise emissions, and as an intermediate descriptor in the measurement and calculation of both L_{eq} and L_{dn}.

The **Hourly Equivalent Sound Level (L_{eq}(h)),** which describes a receiver's cumulative noise exposure from all events over a one-hour period. It is adopted here to assess transit noise for non-residential land uses. For assessment, L_{eq} is computed for the loudest transit facility hour during the hours of noise-sensitive activity.

The **Day-Night Sound Level (L_{dn}),** which describes a receiver's cumulative noise exposure from all events over a full 24 hours. It may be thought of as a noise dose, totaled after increasing all nighttime A-Levels (between 10pm and 7am) by 10 decibels. Every noise event during the 24-hour period increases this dose, louder ones more than quieter ones, and ones that stretch out in time more than shorter ones. L_{dn} is adopted here to assess transit noise for residential land uses.

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2. Federal Interagency Committee on Urban Noise, "Guidelines for Considering Noise in Land Use Planning and Control," a joint publication of the Environmental Protection Agency, the Department of Transportation, the Department of Housing and Urban Development, the Department of Defense, and the Veterans Administration, Washington DC, June 1980.

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6. Theodore J. Schultz, "Noise Rating Criteria for Elevated Rapid Transit Structures," U.S. Department of Transportation Report No. UMTA-MA-06-0099-79-3, Washington DC, May 1979.

7. Theodore J. Schultz, "Synthesis of Social Surveys on Noise Annoyance," Journal of the Acoustical Society of America, Vol. 63, No. 8, August 1978.

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9. S. Fidell, “The Schultz Curve 25-years Later: A Research Perspective,” Journal of the Acoustical Society of America, Vol. 114, No. 6, Pt. 1, December 2003.

3. NOISE IMPACT CRITERIA

This chapter presents the criteria to be used in evaluating noise impact from mass transit projects. Different approaches are taken depending on the type of project and the agencies involved. In general terms, these criteria describe the noise environment considered acceptable for a given situation. Because some projects are strictly transit projects while other projects are basically highway projects that include a transit component, two different sets of criteria are required as follows:

- **Rail and Bus Facilities:** This category includes all rail projects (e.g., rail rapid transit, light rail transit, commuter rail, and automated guideway transit), as well as fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, substations, etc. Also included are rail transit projects built within a highway or railroad corridor. Certain bus facilities are included in this category, such as bus rapid transit (BRT) on separate roadways and bus operations on local streets and highways where the project does not include roadway construction or modification that significantly changes roadway capacity. The distinguishing feature in all these cases is that the existing noise levels generated by roadway traffic and other sources will not change as a result of the project; therefore the project noise is exclusively due to the new transit sources. For projects like these, FTA is generally the lead agency and the methodology from this manual is the appropriate approach.

- **Highway/Transit Projects:** Projects in this category involve transit as part of new highway construction or modifications to existing highways to increase carrying capacity. For these multi-modal projects, the Federal Highway Administration (FHWA) may be a joint lead agency with FTA, and the state department of transportation (DOT) would probably also be participating in the environmental impact assessment. Projects would involve traffic lanes with preferential treatment for buses or high-occupancy vehicles (HOVs). The distinguishing feature here is that the *project* noise includes a combination of highway and transit sources. Examples are: new highway construction providing general-purpose lanes as well as dedicated bus/HOV lanes and lane additions or reconfigurations on existing highways or arterials to accommodate buses/HOVs. These multi-modal projects fall into two sub-categories and the appropriate method to use for noise prediction and impact assessment depends on whether the highway noise dominates throughout day and night or the transit noise dominates during off-peak and late night hours.

If sufficient evidence shows that highway noise dominates, the methods of FHWA, including the latest authorized version of the Traffic Noise Model (TNM), should be used. Otherwise both FHWA and FTA prediction and impact assessment procedures should be used to determine whether neither, one or each mode causes impact and where mitigation is best applied.

Factors to consider when deciding which sub-category is appropriate for a given project are as follows:

- **Volume of traffic:** Major freeways and interstate highways often carry significant volumes of traffic throughout the day and night, such that the highway noise dominates at all times. Transit noise in this case may be insignificant in comparison, and the FHWA prediction method and noise abatement criteria would be used.
- **Traffic patterns:** Some highways and arterials serve primarily as commuter routes such that nighttime traffic diminishes considerably, while transit systems continue to operate well into the late hours. Here the dominant noise source at times of maximum sensitivity may be transit. Consequently, both FHWA and FTA prediction methods would be used.
- **Type of traffic:** Some highways and arterials may serve commuters during the daytime hours, but provide access to business centers by trucks at night. In this case, the roadway noise would likely continue to dominate and the FHWA methods would be appropriate.
- **Alignment configuration:** Elevation of the transit mode in the median or beside a busy highway may result in transit noise contributing more noise to nearby neighborhoods than a highway that may be partially shielded by rows of buildings adjacent to the right-of-way. In this case, both the FHWA and FTA methods should be used.

The noise impact criteria for rail and bus facilities are presented in Section 3.1. These criteria were developed specifically for transit noise sources operating on fixed guideways or at fixed facilities in urban areas. The criterion for the onset of Moderate Impact varies according to the existing noise level and the predicted project noise level, and is determined by the threshold at which the percentage of people highly annoyed by the project noise starts to become measurable. The corresponding criterion for Severe Impact similarly varies according to the existing noise level as well as the project noise level, but is determined by a higher, more significant percentage of people highly annoyed by project noise. Guidelines for the application of the criteria are included in Section 3.2, and background materials on the development of the criteria are included in Appendix B.

3.1 NOISE IMPACT CRITERIA FOR TRANSIT PROJECTS

The noise impact criteria for mass transit projects involving rail or bus facilities are shown graphically in Figure 3-1 and are tabulated in Table 3-1. The equations used to define these criteria are included in Appendix B. The criteria apply to all rail projects (e.g., rail rapid transit, light rail transit, commuter rail, and automated guideway transit) as well as fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, and substations. They may also be used for bus projects operating on local streets and separate roadways built exclusively for buses. In contrast, for busways and HOV lanes which are to be integrated in existing highways (e.g., the addition of new lanes or the redesignation of existing lanes on a highway), FHWA's noise abatement criteria are the appropriate noise criteria to use. Likewise, if the project is a new highway involving both general-purpose and dedicated bus/HOV lanes, the FHWA approach is followed. The FHWA criteria are briefly summarized in Section 3.3.

3.1.1 Basis of Noise Impact Criteria

The noise impact criteria in Figure 3-1 and Table 3-1 are based on comparison of the existing outdoor noise levels and the future outdoor noise levels from the proposed project. They incorporate both absolute criteria, which consider activity interference caused by the transit project alone, and relative criteria, which consider annoyance due to the change in the noise environment caused by the transit project.

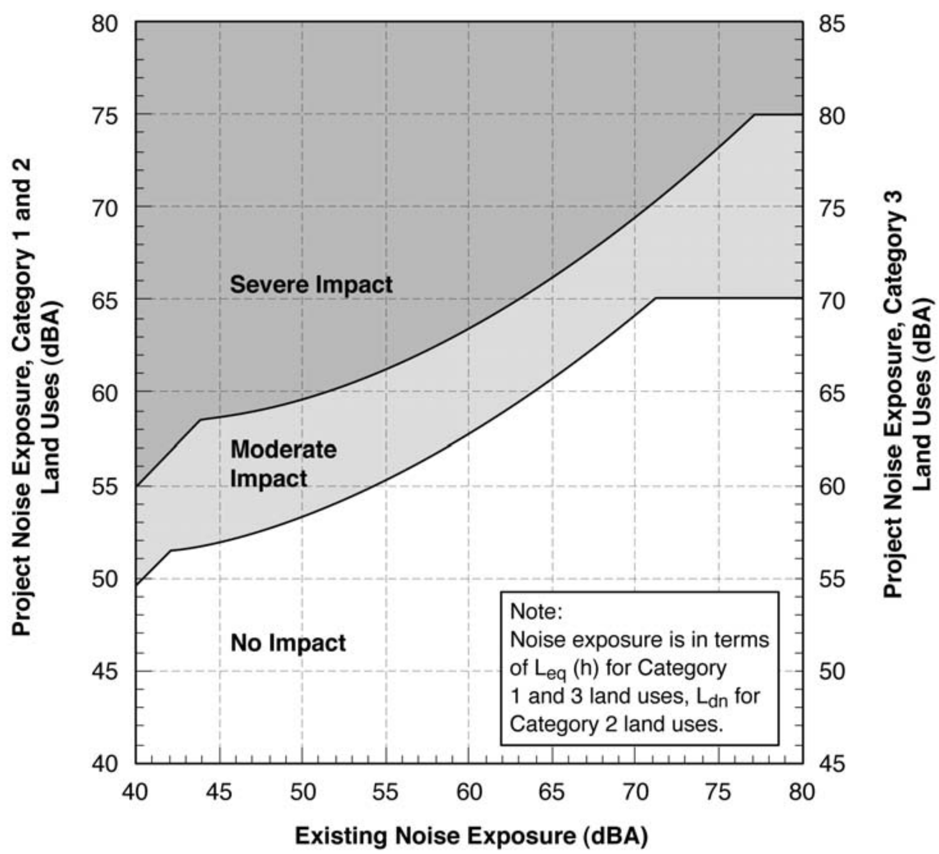

Figure 3-1. Noise Impact Criteria for Transit Projects

The noise criteria and descriptors depend on land use, as defined in Table 3-2. Further guidance on the definition of land use, the selection of the appropriate noise metric and the application of the criteria is given in Section 3.2 of this chapter, with more detailed guidelines given in Chapters 5 and 6.

Table 3-1. Noise Levels Defining Impact for Transit Projects

Existing Noise Exposure* L_{eq}(h) or L_{dn} (dBA)	**Project Noise Impact Exposure,*** L_{eq}(h) or L_{dn} (dBA)					
	Category 1 or 2 Sites			**Category 3 Sites**		
	No Impact	Moderate Impact	Severe Impact	No Impact	Moderate Impact	Severe Impact
<43	< Ambient+10	Ambient + 10 to 15	>Ambient+15	<Ambient+15	Ambient + 15 to 20	>Ambient+20
43	<52	52-58	>58	<57	57-63	>63
44	<52	52-58	>58	<57	57-63	>63
45	<52	52-58	>58	<57	57-63	>63
46	<53	53-59	>59	<58	58-64	>64
47	<53	53-59	>59	<58	58-64	>64
48	<53	53-59	>59	<58	58-64	>64
49	<54	54-59	>59	<59	59-64	>64
50	<54	54-59	>59	<59	59-64	>64
51	<54	54-60	>60	<59	59-65	>65
52	<55	55-60	>60	<60	60-65	>65
53	<55	55-60	>60	<60	60-65	>65
54	<55	55-61	>61	<60	60-66	>66
55	<56	56-61	>61	<61	61-66	>66
56	<56	56-62	>62	<61	61-67	>67
57	<57	57-62	>62	<62	62-67	>67
58	<57	57-62	>62	<62	62-67	>67
59	<58	58-63	>63	<63	63-68	>68
60	<58	58-63	>63	<63	63-68	>68
61	<59	59-64	>64	<64	64-69	>69
62	<59	59-64	>64	<64	64-69	>69
63	<60	60-65	>65	<65	65-70	>70
64	<61	61-65	>65	<66	66-70	>70
65	<61	61-66	>66	<66	66-71	>71
66	<62	62-67	>67	<67	67-72	>72
67	<63	63-67	>67	<68	68-72	>72
68	<63	63-68	>68	<68	68-73	>73
69	<64	64-69	>69	<69	69-74	>74
70	<65	65-69	>69	<70	70-74	>74
71	<66	66-70	>70	<71	71-75	>75
72	<66	66-71	>71	<71	71-76	>76
73	<66	66-71	>71	<71	71-76	>76
74	<66	66-72	>72	<71	71-77	>77
75	<66	66-73	>73	<71	71-78	>78
76	<66	66-74	>74	<71	71-79	>79
77	<66	66-74	>74	<71	71-79	>79
>77	<66	66-75	>75	<71	71-80	>80

* L_{dn} is used for land use where nighttime sensitivity is a factor; L_{eq} during the hour of maximum transit noise exposure is used for land use involving only daytime activities.

Table 3-2. Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)^*$	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)^*$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

* L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

3.1.2 Defining the Levels of Impact

The noise impact criteria are defined by two curves which allow increasing project noise levels as existing noise increases up to a point, beyond which impact is determined based on project noise alone. Below the lower curve in Figure 3-1, a proposed project is considered to have no noise impact since, on the average, the introduction of the project will result in an insignificant increase in the number of people highly annoyed by the new noise. The curve defining the onset of noise impact stops increasing at 65 dB for Category 1 and 2 land use, a standard limit for an acceptable living environment defined by a number of Federal agencies. Project noise above the upper curve is considered to cause Severe Impact since a significant percentage of people would be highly annoyed by the new noise. This curve flattens out at 75 dB for Category 1 and 2 land use, a level associated with an unacceptable living environment. As indicated by the right-hand scale on Figure 3-1, the project noise criteria are 5 decibels higher for Category 3 land uses since these types of land use are considered to be slightly less sensitive to noise than the types of land use in categories 1 and 2.

Between the two curves the proposed project is judged to have Moderate Impact. The change in the cumulative noise level is noticeable to most people, but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation, such as the existing level, predicted level of increase over existing noise levels and the types and numbers of noise-sensitive land uses affected.

Although the curves in Figure 3-1 are defined in terms of the project noise exposure and the existing noise exposure, it is important to emphasize that it is the increase in the cumulative noise – when project is added to existing – that is the basis for the criteria. The complex shapes of the curves are based on the considerations of cumulative noise increase described in Appendix B. To illustrate this point, Figure 3-2 shows the noise impact criteria for Category 1 and 2 land use in terms of the allowable increase in the cumulative noise exposure. The horizontal axis is the existing noise exposure and the vertical axis is the increase in cumulative noise level due to the transit project. The measure of noise exposure is L_{dn} for residential areas and L_{eq} for land uses that do not have nighttime noise sensitivity. Since L_{dn} and L_{eq} are measures of total acoustic energy, any new noise source in a community will cause an increase, even if the new source level is less than the existing level. Referring to Figure 3-2, it can be seen that the criterion for Moderate Impact allows a noise exposure increase of 10 dBA if the existing noise exposure is 42 dBA or less but only a 1 dBA increase when the existing noise exposure is 70 dBA

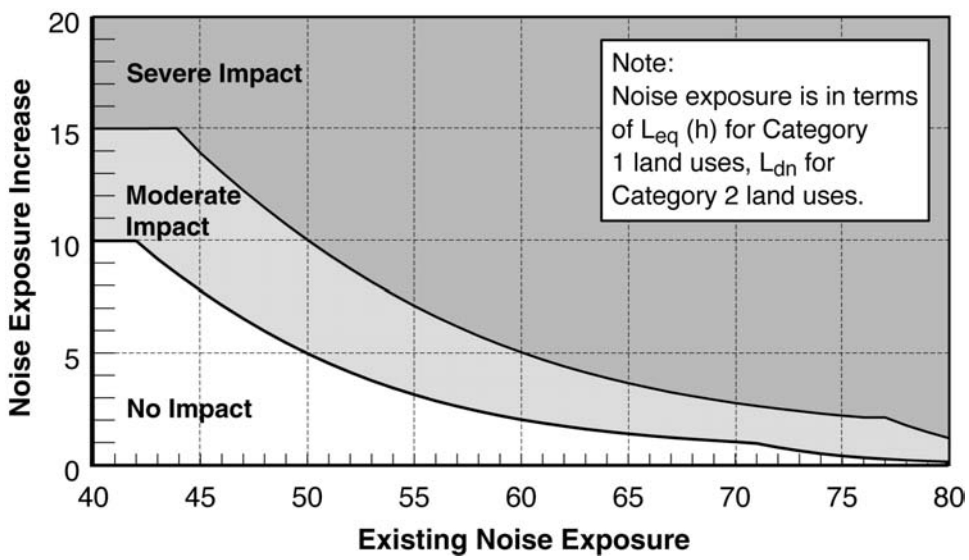

Figure 3-2. Increase in Cumulative Noise Levels Allowed by Criteria (Land Use Cat. 1 &2)

As the existing level of ambient noise increases, the allowable level of transit noise increases, but the total amount that community noise exposure is allowed to increase is reduced. This accounts for the unexpected result that a project noise exposure which is less than the existing noise exposure can still cause impact. This is clearer from the examples given in Table 3-3 which indicate the level of transit noise allowed for different existing levels of exposure.

Table 3-3. Noise Impact Criteria: Effect on Cumulative Noise Exposure			
L_{dn} or L_{eq} in dBA (rounded to nearest whole decibel)			
Existing Noise Exposure	**Allowable Project Noise Exposure**	**Allowable Combined Total Noise Exposure**	**Allowable Noise Exposure Increase**
45	51	52	7
50	53	55	5
55	55	58	3
60	57	62	2
65	60	66	1
70	64	71	1
75	65	75	0

Any increase greater than shown above in Table 3-3 will cause Moderate Impact. This table shows that as the existing noise exposure increases from 45 dBA to 75 dBA, the allowed transit noise exposure increases from 51 dBA to 65 dBA. However, the allowed increase in the cumulative noise level decreases from 7 dBA to 0 dBA (rounded to the nearest whole decibel). The justification for this is that people already exposed to high levels of noise should be expected to tolerate only a small increase in the amount of noise in their community. In contrast, if the existing noise levels are quite low, it is reasonable to allow a greater change in the community noise for the equivalent difference in annoyance. It should be noted that these criteria are based on general community reactions to noise at varying levels which have been documented in scientific literature and do not account for specific community attitudinal factors which may exist.

3.2 APPLICATION OF NOISE IMPACT CRITERIA

3.2.1 Noise-Sensitive Land Uses

As indicated in Section 3.1.1, the noise impact criteria and descriptors depend on land use, designated either Category 1, Category 2 or Category 3. Category 1 includes uses where quiet is an essential element in their intended purpose, such as indoor concert halls or outdoor concert pavilions or National Historic Landmarks where outdoor interpretation routinely takes place. Category 2 includes residences and buildings where people sleep, while Category 3 includes institutional land uses with primarily daytime and evening use such as schools, places of worship and libraries.

The criteria do not apply to most commercial or industrial uses because, in general, the activities within these buildings are compatible with higher noise levels. They do apply to business uses which depend on quiet as an important part of operations, such as sound and motion picture recording studios.

Historically significant sites are treated as noise-sensitive depending on the land use activities. Sites of national significance with considerable outdoor use required for site interpretation would be in Category 1. Historical sites that are currently used as residences will be in Category 2. Historic buildings with indoor use of an interpretive nature involving meditation and study fall into Category 3. These include museums, significant birthplaces and buildings in which significant historical events occurred.

Most busy downtown areas have buildings which are historically significant because they represent a particular architectural style or are prime examples of the work of an historically significant designer. If the buildings or structures are used for commercial or industrial purposes and are located in busy commercial areas, they are not considered noise-sensitive and the noise impact criteria do not apply. Similarly, historical transportation structures, such as terminals and railroad stations, are not considered noise-sensitive land uses themselves. These buildings or structures are, of course, afforded special protection under Section 4(f) of the DOT Act and Section 106 of the National Historic Preservation Act. However, based strictly on how they are used and the settings in which they are located, these types of historical buildings are not considered noise-sensitive sites.

Parks are a special case. Whether a park is noise-sensitive depends on how it is used. Most parks used primarily for active recreation would not be considered noise-sensitive. However, some parks---even some in dense urban areas-–are used for passive recreation like reading, conversation, meditation, etc. These places are valued as havens from the noise and rapid pace of everyday city life and they should be treated as noise-sensitive. The noise sensitivity of parks should be determined on a case-by-case basis after carefully considering how each facility is used. The state or local agency with jurisdiction over the park should be consulted on questions about how the park is used and how much use it gets.

3.2.2 Noise Metrics

The basis for the development of the noise impact criteria (see Appendix B) has been the relationship between the percentage of highly annoyed people and the noise levels of their residential environment. Consequently, the criteria are centered around residential land use with the use of L_{dn} as the noise descriptor sensitive to noise intrusion at night. The noise criteria use L_{dn} for other land uses where nighttime sensitivity is a factor. The criteria are also to be applied to non-residential land uses that are sensitive to noise during daytime hours. Because the L_{dn} and the maximum daytime hourly L_{eq} have similar values for a typical noise environment, the daytime or early evening L_{eq} can be used for evaluating noise impact at locations where nighttime sensitivity is not a factor. For land use involving only daytime activities (e.g. churches, schools, libraries, parks) the impact is evaluated in terms of $L_{eq}(h)$, defined as the L_{eq} for the noisiest hour of transit-related activity during which human activities occur at the noise-sensitive location.

However, due to the types of land use included in Category 3, the criteria allow the project noise for Category 3 sites to be 5 decibels greater than for Category 1 and Category 2 sites. With the exception of recreational facilities, which are clearly less sensitive to noise than Category 1 and 2 sites, Category 3 sites include primarily indoor activities and thus the criteria account for the noise reduction provided by the building structure.

Although the maximum noise level (L_{max}) is not used in this manual as the basis for the noise impact criteria for transit projects, it is a useful metric for providing a fuller understanding of the noise impact from some transit operations. Specifically, rail transit characteristically produces high intermittent noise levels which may be objectionable depending on the distance from the alignment. Thus, it is recommended that L_{max} information be provided in environmental documents to supplement the noise impact assessment and to help satisfy the "full disclosure" requirements of NEPA. Procedures for computing the L_{max} for a single train passby are provided in Appendix F.

3.2.3 Considerations in Applying the Noise Impact Criteria

The procedure for assessing impact is to determine the existing noise exposure and the predicted project noise exposure at a given site, in terms of either L_{dn} or L_{eq}(h) as appropriate, and to plot these levels on Figure 3-1. The location of the plotted point in the three impact ranges is an indication of the magnitude of the impact. For simplicity, noise impact can also be determined by using Table 3-1, rounding all noise level values to the nearest whole decibel before using the table. This level of precision is sufficient for determining the degree of noise impact at specific locations and should be adequate for most applications. However, a more precise determination of noise impact may be appropriate in some situations, such as when estimating the distance from the project to which noise impact extends. In such cases, more precise noise limits can be determined using the criteria equations provided in Appendix B.

In certain cases, the cumulative form of the noise criteria shown in Figure 3-2 must be used. These cases involve projects where changes are proposed to an existing transit system, as opposed to a new project in an area previously without transit. Such changes might include operations of a new type of vehicle, modifications of track alignments within existing transit corridors, or changes in facilities that dominate existing noise levels. In these cases, the existing noise sources change as a result of the project, and so it is not possible to define project noise separately from existing noise. An example would be a commuter rail corridor where the existing noise along the alignment is dominated by diesel locomotive-hauled trains, and where the project involves electrification with the resulting replacement of some of the diesel-powered locomotives with electric trains operating at increased frequency of service and higher speeds on the same tracks. In this case, the existing noise can be determined and a new future noise can be calculated, but it is not possible to describe what constitutes the “project noise.” For example, if the existing noise dominated by trains was measured to be an Ldn of 63 dBA at a particular location, and the new combination of diesel and electric trains is projected to be an Ldn of 65 dBA, the change in the noise exposure due to the project would be 2 dB. Referring to Figure 3-2, a 2 dB increase with an existing noise exposure of 63 dBA would be rated as a Moderate Impact. Normally the project noise is added to the existing noise to come up with a new cumulative noise, but in this case, the existing noise was dominated by a source that changed due to the project so it would be incorrect to add the project noise to the existing noise. Consequently, the existing noise determined by measurement is compared with a new calculated future noise, but a description of what constitutes the actual project is complex.

Another example would be a rail corridor where a track is added and grade crossings are closed, potentially resulting in a change in train location and horn operation. Here the "project noise" results from moving some trains closer to some receivers, away from others, and elimination of horns. In this case, the change in noise level is more readily determined than the noise from the actual project elements. In all cases, Figure 3-2 for changes in a transit system results in the same assessment of impact as Figure 3-1 for development of transit facilities in a new area.

For residential land use, the noise criteria are to be applied outside the *building locations* at noise-sensitive areas with frequent human use including outdoor patios, decks, pools, and play areas . If none, the criteria should be applied near building doors and windows. For parks and other significant outdoor use, apply criteria at the *property line*. However, for locations where land use activity is solely indoors, noise impact may be less significant if the outdoor-to-indoor reduction is greater than for typical buildings (about 25 dB with windows closed). Thus, if the project sponsor can demonstrate indoor activity only, mitigation may not be needed.

It is important to note that the criteria specify a comparison of future project noise with existing noise and *not* with projections of future "no-build" noise exposure (i.e. without the project). Furthermore, it should be emphasized that it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for "clusters" of sites based on measurements or estimates at representative locations in the community. In view of the sensitivity of the noise criteria to the existing noise exposure, careful characterization of pre-project ambient noise is important. Guidelines for selecting representative receiver locations and determining ambient noise are provided in Appendix C and Appendix D, respectively.

3.2.4 Mitigation Policy Considerations

The following statutes and implementing regulations concerning environmental protection guide the Federal Transit Administration's decisions on the need for noise mitigation. While the environmental impact statement requirement in the National Environmental Policy Act (NEPA) is widely known, the statute also establishes a broad mandate for Federal agencies to incorporate environmental protection and enhancement measures into the programs and projects they help finance.[(1)] In conjunction with FHWA, FTA has issued a regulation implementing NEPA which sets out the agencies' general policy on environmental mitigation. It states that measures necessary to mitigate adverse impacts are to be incorporated into the project and, further, that such measures are eligible for Federal funding when FTA determines that ". . . the proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures."[(2)]

While NEPA establishes broad policy, a more explicit statutory mandate for mitigating adverse noise impacts is set forth in the Federal Transit Laws.[(3)] Before approving a construction grant, FTA must make a finding that ". . . (ii) the preservation and enhancement of the environment, and the interest of the community in which a project is located, were considered; and (iii) no adverse environmental effect is likely to result from the project, or no feasible and prudent alternative to the effect exists and all reasonable steps have been taken to minimize the effect." (49 U.S.C. 5324(b)(3)(A)).

3.2.5 Determining the Need for Noise Mitigation

Because intrusive noise is frequently among the most significant environmental concerns of planned mass transit projects, FTA, working with the project sponsor, makes every reasonable effort to reduce predicted noise to levels deemed acceptable for affected noise-sensitive land uses. The noise impact criteria in Chapter 3 provide the framework for identifying the magnitude of the impact. Then, the need for noise mitigation is determined based on the magnitude and consideration of factors specifically related to the proposed project and affected land uses.

Project-generated noise in the “No Impact” range is not likely to be found annoying. Noise projections in this range are considered acceptable by FTA and mitigation is not required. At the other extreme, noise projections in the “Severe” range represent the most compelling need for mitigation. However, before mitigation measures are considered, the project sponsor should first evaluate alternative locations/alignments to determine whether it is feasible to avoid Severe impacts altogether. In densely populated urban areas, this evaluation of alternative locations may reveal a trade-off of one group of impacted noise-sensitive sites for another – especially for surface rail alignments passing through built-up areas. However, this is not always the case; projects which are characterized more as point sources of noise than line sources often present a greater opportunity for selecting alternative sites. Note that this guidance manual and FTA's environmental impact regulation both attempt to encourage project sites which are compatible with surrounding development. The regulation designates certain projects as categorical exclusions when located in areas with compatible land use (e.g., bus terminals and maintenance facilities located in areas with mostly commercial or industrial use). In this manual, the list of noise-sensitive land uses in Chapter 3 does not include most commercial and industrial land uses, thus obviating the need to consider noise mitigation in areas with predominantly commercial or industrial use.

If it is not practical to avoid Severe impacts by changing the location of the project, mitigation measures must be considered. Impacts in this range have the greatest adverse impact on the community; thus there is a presumption by FTA that mitigation will be incorporated in the project unless there are truly extenuating circumstances which prevent it. The goal is to gain substantial noise reduction through the use of mitigation measures, not simply to reduce the predicted levels to just below the Severe Impact threshold. Since FTA has to determine whether the mitigation is feasible and prudent, the evaluation of specific measures should include the noise reduction potential, the cost, the effect on transit operations and maintenance, and any other relevant factors, for example, any new environmental impacts which may be caused by the measure. A thorough evaluation enables FTA to make the findings required by section 5324(b) of the Federal Transit Laws and possibly other statutes, such as Section 4(f) of the DOT Act or Section 106 of the National Historic Preservation Act.

Projected noise levels in the Moderate Impact range will also require consideration and adoption of mitigation measures when it is considered reasonable. The range of Moderate Impact delineates an area where project planners are alerted to the potential for adverse impacts and complaints from the community and must then carefully consider project specifics as well as details concerning the affected properties in determining the need for mitigation. While impacts in this range are not of the same magnitude as Severe impacts, there can be circumstances regarding the factors outlined below which make a compelling argument for mitigation.

The following considerations will help project planners and FTA staff in reaching these determinations:

- The number of noise-sensitive sites affected at this level. A row or cluster of residences adjacent to a rail transit line establishes a greater need for mitigation than one or several isolated residences in a mixed-use area.
- The increase over existing noise levels. Since the noise impact criteria are delineated as bands or ranges, project noise can vary 5-7 decibels within the band of Moderate Impact at any specific ambient noise level. If the project and ambient noise plot falls just below the Severe range (in Figure 3-1), the need for mitigation is strongest. Similarly, if the plot falls just above the No Impact threshold, there is less need.
- The noise sensitivity of the property. Table 3-2 gives a comprehensive list of noise-sensitive land uses; yet there can be differences in noise sensitivity depending on individual circumstances. For example, parks and recreational areas vary in their sensitivity depending on the type of use they experience (active vs. passive recreation) and the settings in which they are located.
- Effectiveness of the mitigation measure(s). What is the magnitude of the noise reduction that can be achieved? Are there conditions which limit effectiveness, for example, noise barrier effectiveness for a multi-story apartment building?
- Neighborhoods with ambient noise levels already heavily influenced by transportation noise, especially the same type of noise source as the project. Ambient levels above 65 dB (Ldn) are considered “normally unsatisfactory” for residential land use by the Department of Housing and Urban Development. Thus there is a stronger need for mitigation if a project is proposed in an area currently experiencing high noise levels from surface transportation. An example would be a project where additional commuter tracks are added to a very busy rail corridor. If this project were placed in a less noisy environment, the impact assessment might show a Severe Impact, but when the project is overlaid on an existing noisy environment, the result could be Moderate Impact or, possibly, No Impact. However, in this situation the new cumulative noise environment may be very objectionable because people will not be compartmentalizing the existing noise versus the new noise and reacting only to the new noise. In this circumstance impacts predicted in the Moderate range should be treated as if they were Severe.
- Community views. This manual provides the methodology to make an objective assessment of the need for noise mitigation. However, the views of the community cannot be overlooked. The NEPA compliance process provides the framework for hearing the community's concerns about a proposed project and then making a good-faith effort to address those concerns. Many projects can be expected to have projected noise levels within the Moderate Impact range and decisions regarding mitigation should be made only after considering input from the affected public, relevant government agencies and community organizations. There have been cases where the solution to the noise problem – a sound barrier – was rejected by community members because of perceived adverse visual effects.
- Special protection provided by law. Section 4(f) of the DOT Act and Section 106 of the National Historic Preservation Act come into play frequently during the environmental review of transit projects. Section 4(f) protects historic sites and publicly-owned parks, recreation areas and wildlife refuges. Section 106

protects historic and archeological resources. In general, noise in the Moderate Impact range would not substantially impair the use of a property afforded protection under Section 4(f). Thus it would not constitute a "constructive use" as this term is defined in Section 4(f) regulations. In the Section 106 process protecting historic and cultural properties, Moderate Impact may or may not be considered an "adverse effect" depending on the individual circumstances. Historic properties are only noise-sensitive based on how they are used. As previously noted, some historic properties are not noise-sensitive at all. It is possible, though, that a historic building housing sensitive uses like a library or museum could be adversely affected by noise in the Moderate range. The regulatory processes stemming from these statutes require coordination and consultation with agencies and organizations having jurisdiction over these resources. Their views on the project's impact on protected resources are given careful consideration by FTA and the project sponsor, and their recommendations may influence the decision to adopt noise reduction measures.

Cost is an important consideration in reaching decisions about noise mitigation measures. One guideline for gauging the reasonableness of the cost of mitigation is the state DOT's procedures on the subject. Each state has established its own cost threshold for determining whether installation of sound barriers for noise reduction is a reasonable expenditure. The states' cost thresholds range from $15,000 to $50,000 per benefited residence, with a cost-weighted average of $24,000 per residence. Several airport authorities have placed limits on the costs they will incur for sound insulation per residence for homes that are impacted according to Federal Aviation Administration criteria. These costs range from $20,000 to $35,000 per residence (2002 dollars). As a starting point, FTA considers the midpoints of these ranges--$25,000 to $30,000 per benefited residence--to be reasonable from the standpoint of cost. It should be noted, though, that higher costs may be justified depending on the specific set of circumstances applying to a project.

The decision to include noise mitigation in a project is made by FTA after public review of the environmental document. This decision is reached in consultation with the project sponsor. If mitigation measures are deemed necessary to satisfy the statutory requirements, they will be incorporated as an integral part of the project, and subsequent grant documents will reference these measures as contractual obligations on the part of the project sponsor. FTA is required by law to ensure that the project sponsor complies with all design and mitigation commitments contained in the environmental document (23 U.S.C. 139 (c) (4)). There are some differences as to how noise mitigation and vibration mitigation are handled in EISs. The different approaches are discussed in Chapter 13.

3.3 NOISE IMPACT CRITERIA FOR HIGHWAY/TRANSIT PROJECTS

Under specific circumstances, noise impact from a mass transit project should be determined using FHWA's assessment procedures and noise abatement criteria, instead of the FTA procedures and guidelines. General guidance is given at the beginning of this chapter. FHWA methods are required for highway/transit projects (or portions of projects) that meet the following conditions:

- The project is jointly funded with FHWA and the state DOT is assisting with the impact assessment.

- The mass transit portions of the project are directly adjacent to (or within) FHWA-funded portions of the project.
- The project is located where highway noise predominates throughout the day and night.

In contrast, FTA methods should be used for other portions of the project that do not meet these requirements—for example, portions where the transit right-of-way diverges from the highway, or associated bus terminals and other transit facilities off the highway right-of-way.

In some cases, both FHWA and FTA methods should be used, such as when both highway and transit cause significant noise, but at different times of day. An example would be a transit alignment that shares the right-of-way with an arterial road with heavy traffic. Traffic noise may dominate during the peak commuting hours but not during off-peak periods when transit continues to operate. In this case, both sets of criteria would be used to determine whether impact occurs from neither, one or each mode.

In following the FHWA procedures, only loudest-hour noise levels are computed and assessed. These noise levels may be computed either with (1) the hourly calculation method in Chapter 6 of this manual or (2) the FHWA Traffic Noise Model (TNM). Often this choice of computation methods will depend upon the assistance provided by the FHWA-funded staff on the project. Even if methods in Chapter 6 are used for computation, however, the resulting noise levels must be assessed with FHWA methods under these circumstances.

FHWA criteria appear in the Code of Federal Regulations,[4, 5] which is supplemented by a separate FHWA policy and guidance document.[6] All three documents are available at: www.fhwa.dot.gov/environment/noise. The following sections summarize these FHWA criteria and their use.

3.3.1 FHWA Impact Criteria

FHWA requires assessment at affected existing activities, developed lands, and undeveloped lands for which development is planned, designed and programmed. At these locations, traffic noise is computed for the project's design year, which is often 20 years from the onset of environmental studies. This computation uses the traffic for the hour with the worst impact “on a regular basis.” In practice, traffic engineers often predict traffic volumes and speeds at several times during an average design-year day, and then noise computations decide the “worst” hour. Because assessment is for a single hour rather than for a 24-hour period, the noise metric is an hourly one, $L_{eq}(h)$.

FHWA requires two assessments of noise impact: one related to land-use type and the other to existing noise level.

First, noise impact occurs when predicted traffic noise levels “approach or exceed” the applicable Noise Abatement Criteria (NAC) in Table 3-4. FHWA allows individual state highway agencies to define “approach or exceed.” As a result, the actual impact criteria are all 1 to 3 decibels lower than the values in this table. Contact specific state highway agencies to learn their definition of “approach or exceed.” In addition, FHWA requires that primary consideration be given to exterior areas (Activity Categories A, B and C). The table's interior NAC (Category E) is used only where either (1) there are no affected exterior activities or (2) exterior activities are not impacted because they are far from or are physically shielded from the roadway.

Table 3-4. FHWA Noise Abatement Criteria

Activity Category	Hourly A-weighted Sound Level (dBA)		Description of Activity Category
	$L_{eq}(h)$	$L_{10}(h)$	
A	57 Exterior	60 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 Exterior	70 Exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	75 Exterior	Developed lands, properties, or activities not included in Categories A or B above.
D	--	--	Undeveloped lands.
E	52 Interior	55 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Note: Noise mitigation must be studied where predicted traffic noise levels approach or exceed the values in this table. Individual state highway agencies define “approach or exceed” within their states. As a result, the actual criteria that trigger mitigation studies are all 1 to 3 decibels lower than the values in this table. Contact specific state highway agencies to learn their definition of “approach or exceed.”

Second, noise impact occurs when predicted traffic noise levels substantially exceed existing noise levels (future no-build noise levels are not used here). FHWA allows individual state highway agencies to define “substantially exceed.” Contact specific state highway agencies to learn their definition of “substantially exceed” (a criterion of 10 decibels above existing levels is the most common).

3.3.2 Use of Impact Criteria

When impact occurs by either method of assessment, NAC or substantial increase, FHWA requires study of the following noise abatement measures: traffic management, alteration of horizontal and vertical alignments, noise barriers whether within or outside the right-of-way, acquisition of buffer zones, noise insulation of public-use or nonprofit institutional structures. Measures that are both feasible and reasonable must be incorporated into the project.

Feasibility. Feasibility deals with engineering considerations. To be feasible, an abatement measure must first meet all safety, maintenance and other accepted design requirements. After safety/maintenance issues are resolved, FHWA considers a noise-abatement measure to be feasible if that measure can technically achieve a noise reduction of 5 decibels or more, given its physical aspects and those of its surroundings. Such acoustical feasibility is objective, not subjective. It is a matter of acoustical computation, depending upon such factors as topography, location of other nearby sound sources, and location of driveways, ramps, and cross streets.

Reasonableness. In the context of FHWA regulations, reasonableness is a more subjective matter. Reasonableness implies that common sense and good judgment were applied in arriving at a decision concerning the abatement measure. FHWA requires that: (1) the views of the impacted residents be a major consideration, and (2) the overall noise abatement benefits outweigh the overall adverse social, economic, and environmental effects, as well as the abatement cost.

Reasonableness also depends upon community wishes, aesthetics, community desires for their surrounding view, projected noise-level increase above existing levels, projected noise-level increase above future no-build levels, amount of development that occurred before and after the initial construction of the highway, type of protected development, effectiveness of land-use controls by the local jurisdiction, construction effects of the abatement measure on the natural environment, and the potential ability of the abatement measure to reduce noise during project construction, as well. Many state highway agencies restrict or expand this list of factors.

Reasonableness also depends upon cost effectiveness. FHWA requires state highway agencies to develop quantitative cost-effectiveness guidelines, which generally consider abatement cost and the number of people protected by the abatement measure—and sometimes also the amount of noise reduction provided by the abatement measure.

REFERENCES

1. United States Congress, National Environmental Policy Act of 1969; P.L. 91-190, January 1, 1970.

2. U.S. Department of Transportation, Federal Transit Administration and Federal Highway Administration, "Environmental Impact and Related Procedures." Final Rule, 52 Federal Register 32646-32669; August 28, 1987 (23 Code of Federal Regulations 771.105(d)).

3. The Federal Transit Laws, 49 U.S.C. 5301 et seq.

4. Federal Highway Administration. *23 CFR Part 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise -- Final rule*. Federal Register, Vol. 62, No. 154, 11 August 1997.

5. Federal Highway Administration. *23 CFR Part 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise*. Federal Register, Vol. 67, No. 58, 26 March 2002 (provides further background).

6. Federal Highway Administration. *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* Office of Environment and Planning, Noise and Air Quality Branch, Washington DC, June 1995 (71 pages).

4. NOISE SCREENING PROCEDURE

The noise screening procedure is designed to identify locations where a project may cause noise impact. If no noise-sensitive land uses are present within a defined area of project noise influence, then no further noise assessment is necessary. This approach allows the focusing of further noise analysis on locations where impacts are likely. The screening procedure takes account of the noise impact criteria, the type of project and noise-sensitive land uses. For screening purposes, all noise-sensitive land uses are considered to be in a single category.

4.1 SCREENING DISTANCES

The distances given in Table 4-1 delineate a project's noise study area. The areas defined by the screening distances are meant to be sufficiently large to encompass all potentially impacted locations. They were determined using relatively high-capacity scenarios for a given project type. Data used in the calculations are listed in Table 4-2 as assumptions based on operations of a given project type and using the lowest threshold of impact, 50 dB, from the criteria curves in Figure 3-1. These distances can be scaled up or down for different sized projects by use of the methodology in Chapter 5, General Noise Assessment. FTA provides an Excel spreadsheet program to assist in these adjustments. The Federal Railroad Administration horn noise model is used to develop the screening distance at commuter rail grade crossings where horns and warning bells are used.(1)

The noise screening procedure is applicable to all types of transit projects. The types of projects listed in Table 4-1 cover nearly all of the kinds of projects expected to undergo environmental assessment. Clarification can be obtained from FTA on any special cases that are not represented in the table.

4.2 STEPS IN SCREENING PROCEDURE

The screening method works as follows:

- Determine the type of project and locate on Table 4-1.

- Review assumptions in Table 4-2. Make adjustments in screening distances to suit the project through the use of the methodology in Chapter 5, or the FTA spreadsheet model. The appropriate screening distance is where the project noise reaches 50 dBA for the descriptor shown.

- Determine the appropriate column under Screening Distance in Table 4-1. If buildings occur in the sound paths, then use the distances under Intervening Buildings. Otherwise use the distances under "Unobstructed”.

- Note the distance in feet for that project in Table 4-1, or in the adjusted values obtained from Step 2. Apply this distance from the guideway centerline or nearest right-of-way line on both sides of a highway or access road. For small fixed facilities apply the distance from the center of the noise-generating activity. In the case of a fixed facility spread out over a large area, apply the distance from the outer boundary of the proposed project site.

- Within the distance noted above, locate any of the noise-sensitive land uses listed in Table 3-2.

- If it is determined that none of the listed land uses are within the distances noted in Table 4-1, then no further noise analysis is needed. On the other hand, if one or more of the noise-sensitive land uses are within the screening distances noted in Table 4-1, as adjusted, then further analysis is needed and the procedure described in Chapter 5 is followed.

Table 4-1. Screening Distances for Noise Assessments

Type of Project		Screening Distance* (ft) Unobstructed	Screening Distance* (ft) Intervening Buildings
Fixed Guideway Systems:			
Commuter Rail Mainline		750	375
Commuter Rail Station	With Horn Blowing	1,600	1,200
	Without Horn Blowing	250	200
Commuter Rail-Highway Crossing with Horns and Bells		1,600	1,200
Rail Rapid Transit		700	350
Rail Rapid Transit Station		200	100
Light Rail Transit		350	175
Access Roads		100	50
Low- and Intermediate-Capacity Transit	Steel Wheel	125	50
	Rubber Tire	90	40
	Monorail	175	70
Yards and Shops		1000	650
Parking Facilities		125	75
Access Roads		100	50
Ancillary Facilities			
Ventilation Shafts		200	100
Power Substations		250	125
***Bus Systems*:**			
Busway		500	250
BRT on exclusive roadway		200	100
Bus Facilities	Access Roads	100	50
	Transit Mall	225	150
	Transit Center	225	150
	Storage & Maintenance	350	225
	Park & Ride Lots w/Buses	225	150
Ferry Boat Terminals:		300	150

*Measured from centerline of guideway/roadway for mobile sources; from center of noise-generating activity for stationary sources.

Table 4-2. Assumptions for Screening Distances for Noise Assessments				
Type of Project		**Operations**	**Speeds**	**Descriptor**
Fixed Guideway Systems:				
Commuter Rail Mainline		66 day /12 night; 1 loco, 6 cars	55 mph	Ldn
Commuter Rail Station	With Horn Blowing	22 day / 4 night	N/A	Ldn
	W/O Horn Blowing	22 day / 4 night	N/A	Ldn
Commuter Rail-Highway Crossing with Horns and Bells		22 day / 4 night	55 mph	Ldn
Rail Rapid Transit		220 day / 24 night; 6-car trains	50 mph	Ldn
Rail Rapid Transit Station		220 day / 24 night	20 mph	Ldn
Light Rail Transit		150 day / 18 night; 2 artic veh.	35 mph	Ldn
Access Roads to Stations		1000 cars, 12 buses	35 mph	PH Leq*
Low- and Intermediate-Capacity Transit	Steel Wheel	220 day / 24 night	30 mph	Ldn
	Rubber Tire	220 day / 24 night	30 mph	Ldn
	Monorail	220 day / 24 night	30 mph	Ldn
Yards and Shops		20 train movements	N/A	PH Leq
Parking Facilities		1000 cars	N/A	PH Leq
Access Roads to Parking		1000 cars	35 mph	PH Leq
Ancillary Facilities				
Ventilation Shafts		Rapid Transit in Subway	50 mph	Ldn
Power Substations		Sealed shed, air conditioned	N / A	Ldn
Bus Systems:				
Busway		30 buses, 120 automobiles	50 mph	PH Leq
BRT on exclusive roadway		30 buses	35 mph	PH Leq
Bus Facilities	Access Roads	1000 cars	35 mph	PH Leq
	Transit Mall	20 buses	N/A	PH Leq
	Transit Center	20 buses	N/A	PH Leq
	Storage & Maintenance	30 buses	N/A	PH Leq
	Park & Ride Lots w/Buses	1000 cars, 12 buses	N/A	PH Leq
Ferry Boat Terminals:		8 boats with horns used in normal docking cycle	N/A	PH Leq

* PH Leq = hour of maximum transit activity

REFERENCES

1. U.S. Department of Transportation, Federal Railroad Administration. “Final Environmental Impact Statement: Interim Final Rule for the Use of Locomotive Horns at Highway-Rail Grade Crossings; Technical Supplement to DEIS and Chapter 3.4," Office of Railroad Development, Washington, D.C., December 5, 2003. Also see: http://www.fra.dot.gov/downloads/RRDev/hornmodel.xls.

5. GENERAL NOISE ASSESSMENT

This chapter contains procedures for the computation of both project and existing ambient noise levels for use in noise assessments required beyond the stage of the screening procedure of Chapter 4.

The **Screening Procedure** described in Chapter 4 is used to determine whether any noise-sensitive receivers are within a distance where impact is likely to occur. The distance given in the table defines the study area of any subsequent noise impact assessment. Where there is potential for noise impact, the procedures of Chapters 5 and 6 will be used to determine the extent and severity of impact. In some cases, a General Assessment may be all that is needed. On the other hand, if the proposed project is in close proximity to noise-sensitive land uses and it appears at the outset that the impact would be substantial, it is prudent to conduct a Detailed Analysis.

The **General Assessment** is used for a wide range of projects which show potential noise impact from the screening procedure. For a variety of smaller transit projects, a General Assessment may be all that is needed to evaluate noise impact and propose mitigation measures where necessary. It is also used to compare alternatives, such as locations of facilities or alignments, or even candidate transportation modes in a corridor. A General Assessment can provide the appropriate level of detail about noise impacts when an Alternatives Analysis/Draft EIS is being prepared to evaluate alternatives for a major capital investment. The procedure involves noise predictions commensurate with the level of design of the alternatives in the early stages of major investment planning. Estimates are made of project noise levels and of existing noise conditions to estimate the location of a noise impact contour which defines the outer limit of an impact corridor or area. An inventory of noise impacts within the area identifies locations where noise mitigation is likely and is used in comparing noise impact among alternatives. Noise mitigation policy considerations are discussed in Section 3.2.4 and the application of noise mitigation measures is described in Section 6.8.

Detailed Analysis is undertaken when the greatest accuracy is needed to assess impacts and the effectiveness of mitigation measures on a site-specific basis. In order to do this, the project must be defined to the extent that location, alignment, mode and operating characteristics are determined.

Detailed Analysis is often accomplished during the preliminary engineering phase. The results of the Detailed Analysis would be used in predicting the effectiveness of noise mitigation measures on particular noise-sensitive receivers. The procedures for performing a Detailed Analysis are described in Chapter 6.

This chapter describes the procedure for performing a General Noise Assessment. The General Assessment is based on noise source and land use information likely to be available at an early stage in the project development process. Sections of this chapter cover the key elements of the prediction procedure:

- Section 5.2 describes how to predict noise source levels with preliminary estimations of the effect of mitigation.
- Section 5.3 covers a simplified procedure for estimating noise propagation characteristics assuming flat terrain, with approximate shielding by rows of buildings or other barriers.
- Section 5.4 includes a simplified procedure for estimating existing noise.
- Section 5.5 shows how to estimate the noise impact contour that defines the approximate outer limit of noise impact.
- Section 5.6 describes how to conduct the noise impact inventory and how to present the information in an environmental document or a technical noise report.
- Four examples of General Assessments are given at the end of this chapter.

5.1 OVERVIEW

The steps in the General Noise Assessment are shown in Figure 5-1 and are described below. When several alternatives are evaluated in an environmental document, this approach can be applied to each alternative and the results compared.

Project Alternatives. Place the alternative under study into one of three categories: fixed-guideway transit, highway/transit, or stationary facility. Determine the Source Reference Level from the tables in Section 5.2. Each Source Reference Level pertains to a typical operation for one hour for a stationary source or one vehicle passby under reference operating conditions. Each utilizes the SEL noise descriptor, as discussed in Chapter 2.

Operational Characteristics. Convert the Source Reference Level to noise exposure in terms of L_{eq}(h) or L_{dn} under approximate project operating conditions, using the appropriate equations depending upon the type of source. The noise exposure is determined at the reference distance of 50 feet.

Propagation Characteristics. Draw noise exposure-vs.-distance curve for this source, using the graphic in Section 5.3. This curve will show the source's noise exposure as a function of distance, ignoring shielding. To account for shielding attenuation from rows of buildings, use a general rule for estimating the reduction in noise level and draw an adjusted exposure-vs-distance curve.

Study Area Characteristics. Estimate the existing noise exposure for areas surrounding the project from Table 5-7 in Section 5.4.

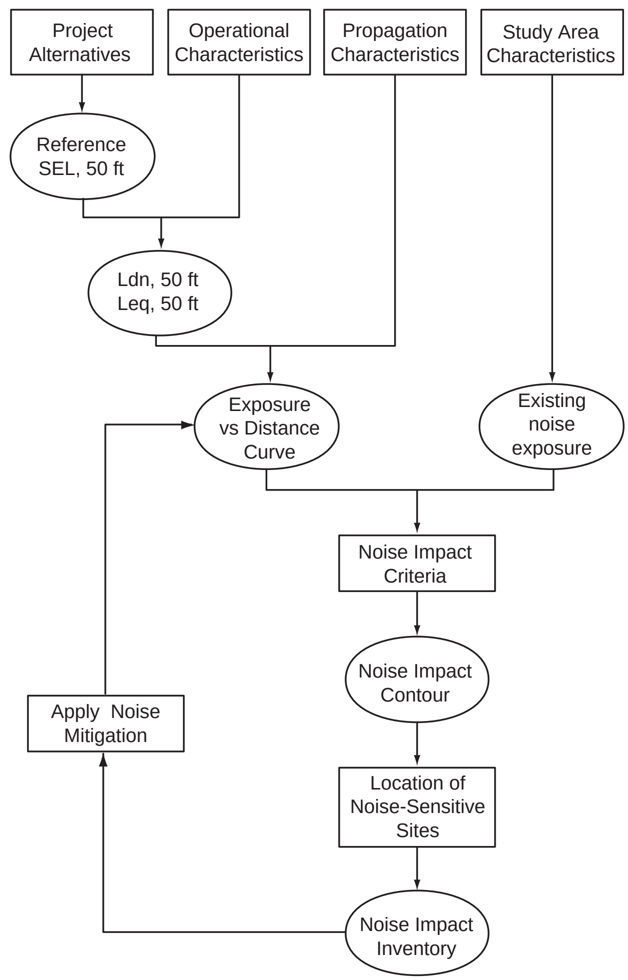

Figure 5-1. Procedure for General Noise Assessment

Noise Impact Contour Estimation. On a point-by-point basis, locate the project noise exposure and existing noise exposure combination that results in Moderate Impact according to the impact criteria from Chapter 3. Connect the points to obtain a contour line around the project which signifies the outer limits of Moderate Impact.

Alternatively, in the case where it is desired to make a comparison among different modal alternatives, specific decibel-level noise contours can be determined from the exposure-vs-distance curves (for example, 60dB, 65dB, 70dB contours).

Noise Impact Inventory. Tabulate noise-sensitive land uses within the specific contours using general assumptions for shielding attenuation from rows of buildings.

Noise Mitigation. Apply estimates of the noise reduction from mitigation in the community areas where potential impact has been identified and repeat the tabulation of noise impacts.

5.2 NOISE SOURCE LEVELS FOR GENERAL ASSESSMENT

The General Noise Assessment procedure begins by determining the project noise exposure at a reference distance for the various project alternatives. The reference noise exposure estimation procedures differ depending on the type of project (fixed-guideway, highway/transit, or stationary facility) as described in the following sections.

5.2.1 Fixed-Guideway Transit Sources

Fixed-guideway transit sources include commuter rail, rail rapid transit, light rail transit, automated guideway transit (AGT), monorail, and magnetically levitated vehicles (maglev). The noise characteristics of each depend on the system characteristics described in Chapter 2. For commuter railroads and light rail transit systems, the crossing of streets and highways at grade is likely, in which case the noise assessment of warning devices will have to be taken into account. At an early project stage, the information available includes:

- Candidate transit mode
- Guideway options
- Time of operation
- Operational headways
- Design speed
- Alternative alignments

This information is not sufficient to predict noise levels at all locations along the right-of-way, but by using conservative estimates (for example, maximum design speeds and operations at design capacities) it is sufficient to estimate worst-case noise impact contours.

Reference Levels in SEL. The procedure starts with predicting the source noise levels, expressed in terms of SEL at a reference distance and a reference speed. These are given in Table 5-1.

The reference SEL's are used in the equations of Table 5-2 to predict the noise exposure at 50 feet. Also shown in Table 5-2 are rough estimates of the noise reduction available from wayside noise barriers, the most common noise mitigation measure. See Chapter 6 for a complete description of the benefits resulting from noise mitigation. The approximate noise barrier lengths and locations developed in a General Assessment provide a preliminary basis for evaluating the costs and benefits of impact mitigation.

Table 5-1. Reference SEL's at 50 feet from Track and 50 mph

Source / Type		Reference Conditions	Reference SEL (SEL_{ref}), dBA
Commuter Rail, At-Grade	Locomotives	Diesel-electric, 3000 hp, throttle 5	92
		Electric	90
	Diesel Multiple Unit (DMU)	Diesel-powered, 1200 hp	85
	Horns	Within ¼ mile of grade crossing	110
	Cars	Ballast, welded rail	82
Rail Transit		At-grade, ballast, welded rail	82
Transit whistles / warning devices		Within 1/8 mile of grade crossing	93
AGT	Steel wheel	Aerial, concrete, welded rail	80
	Rubber Tire	Aerial, concrete guideway	78
Monorail		Aerial straddle beam	82
Maglev		Aerial, open guideway	72

Noise Exposure at 50 feet. After determining the reference levels for each of the noise sources, the next step is to determine the noise exposure at 50 feet expressed in terms of $L_{eq}(h)$ and L_{dn}. The additional data needed include:

- Number of train passbys during the day (defined as 7am to 10 pm) and night (defined as 10 pm to 7 am).
- Maximum number of train passbys during hours that Category 1 or Category 3 land uses are normally in use. This is usually the peak hour train volume.
- Number of vehicles per train (if this number varies during the day, take the average).
- Speed (maximum expected).
- Guideway configuration.
- Noise barrier location (if noise mitigation is determined necessary at the end of the first pass on the General Assessment).
- Location of highway and street grade crossings, if any.

These data are used in the equations in Table 5-2 to obtain adjustment factors to calculate L_{dn} and $L_{eq}(h)$ at 50 feet.

Table 5-2. Computation of Noise Exposure at 50 feet for Fixed-Guideway General Assessment	
LOCOMOTIVES[†] Hourly L_{eq} at 50 ft:	$L_{eqL}(h) = SEL_{ref} + 10\log(N_{locos}) + K\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$ Where K = -10 for passenger diesel; = 0 for DMU; = +10 for electric
LOCOMOTIVE WARNING HORNS[†††] Hourly L_{eq} at 50 ft:	$L_{eqH}(h) = SEL_{ref} + 10\log(V) - 35.6$
RAIL VEHICLES[††] Hourly L_{eq} at 50 ft:	$L_{eqC}(h) = SEL_{ref} + 10\log(N_{cars}) + 20\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$ use the following adjustments as applicable: + 5 $\rightarrow$ JOINTED TRACK + 3 $\rightarrow$ EMBEDDED TRACK ON GRADE + 4 $\rightarrow$ AERIAL STRUCTURE WITH SLAB TRACK (except AGT & monorail) - 5 $\rightarrow$ if a NOISE BARRIER blocks the line of sight
TRANSIT WARNING HORNS[†††] Hourly L_{eq} at 50 ft:	$L_{eqH}(h) = SEL_{ref} - 10\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$
COMBINED Hourly L_{eq} at 50 ft:	$L_{eq}(h) = 10\log\left[10^{\left(L_{eqL}/10\right)} + 10^{\left(L_{eqC}/10\right)}\right]$
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = L_{eq}(h)\big\vert\ v = v_d$
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = L_{eq}(h)\big\vert\ v = v_n$
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left((L_{eq}(night)+10)/10\right)}\right] - 13.8$

N_{locos} = average number of locomotives per train

N_{cars} = average number of cars per train

S = train speed, in miles per hour

V = average hourly volume of train traffic, in trains per hour

V_d = average hourly daytime volume of train traffic, in trains per hour

$$= \frac{number\ of\ trains, 7am\ to 10\,pm}{15}$$

V_n = average hourly nighttime volumes of train traffic, in trains per hour

$$= \frac{number\ of\ trains, 10\,pm\ to 7am}{9}$$

[†] Assumes a passenger diesel locomotive power rating at approximately 3000 hp

[††] Includes all commuter rail cars, transit cars, AGT and monorail

[†††] Based on FRA's horn noise model (www.fra.dot.gov/downloads/RRDev/hornmodel.xls)

5.2.2 Highway/Transit Sources

The highway/transit type sources include most transit modes that do not require a fixed-guideway. Examples are high-occupancy vehicles, such as buses, commuter vanpools and carpools. As noted in Chapter 3, some highway/transit projects are best analyzed with FHWA's noise prediction and impact assessment procedures. However, the procedures in this manual can be used for all types of projects involving highway vehicles. The noise characteristics of the vehicles depend on the system characteristics described in Chapter 2. Recent research has shown there is no statistically significant difference in the reference noise levels from various types of buses, so all buses are placed in a single category. At an early project development stage, the information available is as follows:

- Vehicle type
- Transitway design options
- Time of operation
- Typical headways
- Design speed
- Alternative alignments

This information is not sufficient to predict noise levels at all locations along the right-of-way, but is sufficient to estimate worst-case noise impact contours. The procedure is consistent with FHWA's highway noise prediction method (see Section 6.7.2 for an overview of the computation methods), with buses and vans corresponding to user-defined source emission levels and speed coefficients for buses and automobiles, respectively(1).

Reference Levels in SEL. Projections of noise from highway/transit sources begin by defining the source SEL at a reference distance of 50 feet and a reference speed. These are given in Table 5-3. The reference distance SEL's are used in the equations of Table 5-4 to predict the noise exposure at 50 feet. Also shown in Table 5-4 is a rough estimate of the minimum noise reduction available with wayside sound barriers. See Chapter 6 for descriptions of other mitigation measures and procedures for developing more accurate estimates of noise reduction from mitigation measures. The approximate noise barrier lengths and locations developed in a General Assessment allow preliminary estimates of the costs and benefits of impact mitigation.

Noise Exposure at 50 feet. After determining the reference levels for each of the noise sources, the next step is to determine the noise exposure at 50 feet. The additional data needed include:

- Number of vehicle passbys during the day (7am to 10 pm) and night (10 pm to 7 am).
- Number of vehicle passbys during hours that Category 1 or Category 3 land uses are normally in use.
- Speed (maximum expected).
- Transitway configuration (with or without noise barrier).

These data are used in the equations in Table 5-4 with the reference SEL's to calculate L_{eq}(h) and L_{dn} at 50 feet.

Table 5-3. Source Reference Levels at 50 feet from Roadway, 50 mph

Source†	Reference SEL (dBA)
Automobiles and Vans	74
Buses (diesel-powered)	82
Buses (electric)	80
Buses (hybrid)	83**

† Assumes normal roadway surface conditions

** For hybrid buses, Reference SEL should be determined on a case-by-case basis.

Table 5-4. Computation of L_{eq} and L_{dn} at 50 feet for Highway/Transit General Assessment

Hourly L_{eq} at 50 ft:	$L_{eq}(h) = SEL_{ref} + 10\log(V) + C_s \log\left(\frac{S}{50}\right) - 35.6$	
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = L_{eq}(h)\vert v = v_d$	
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = L_{eq}(h)\vert v = v_n$	
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$	
Speed Constant:	C_s = 15 = 28 = 30,	Diesel Buses Electric Buses Automobile and van pools
Adjustment:	- 5	Noise Barrier

V	= hourly volume of vehicles of this type, in vehicles per hour.
V_d	= average hourly daytime volume of vehicles of this type, in vehicles per hour
	$= \frac{totalvehiclevolume, 7am to 10pm}{15}$
V_n	= average hourly nighttime volume of vehicles of this type, in vehicles per hour
	$= \frac{totalvehiclevolume, 10pm to 7am}{9}$
S	= average vehicle speed, in miles per hour

5.2.3 Stationary Sources

This section covers the general approach to assessment of noise from fixed transit system facilities. New transit facilities undergo a site review for best location which includes consideration of the noise sensitivity of surrounding land uses. Although many facilities, such as bus maintenance garages, are usually located in industrial and commercial areas, some facilities such as bus terminals, ferry terminals, train stations and park-and-ride lots may be placed near residential neighborhoods where noise impact may occur. Access roads to some of these facilities may also pass through noise-sensitive areas. In a General Assessment, only the salient features of each fixed facility are considered in the noise analysis.

Reference Levels in SEL. The source reference levels given in Table 5-5 are determined based on measurements for the peak hour of operation of a typical stationary source of the type and size noted. A large facility, such as a rail yard, is spread out over considerable area with various noise levels depending on the layout of the facility. Specifying the reference SEL at a distance of 50 feet from the property line would be misleading in this case. Consequently, the reference distance is described as "the equivalent distance of 50 feet," which is determined by estimating the noise levels at a greater distance and projecting back to 50 feet, assuming the noise sources are concentrated at the center of the site. If the location of noise sources is known, then the distance should be taken from the point of the noisiest activity on the site (e.g. the dock in the case of ferry boat operations). The reference SEL's are used in the equations of Table 5-6 to predict noise exposure at an equivalent distance of 50 feet from the center of the site. Noise from access roads is treated according to the procedures described in Section 5.2.2.

Table 5-6 also includes an estimate of the minimum noise reduction available with wayside noise barriers. Only approximate locations and lengths for barrier or other noise mitigation measures are developed during a General Assessment to provide a preliminary indication of the costs and benefits of mitigation.

Noise Exposure at Equivalent Distance of 50 feet. After determining the reference SEL's for each of the noise sources, the next step is to determine the noise exposure expressed in terms of L_{eq} and L_{dn} at an equivalent distance of 50 feet. The additional data needed include:

- Number of layover tracks and hours of use.
- Number of buses, if different from assumed reference conditions (if this number varies during the day, take the average).
- Number of ferry boat landings, if different from assumed reference conditions (if this number varies during the day, take the average).
- Actual capacity of parking garage or lot.

These data are used in the equations in Table 5-6 with the reference SEL's to calculate $L_{eq}(h)$ and L_{dn} at an equivalent distance of 50 feet.

Table 5-5. Source Reference Levels at 50 feet from Center of Site, Stationary Sources		
Source	**Reference SEL (dBA)**	**Reference Conditions**
Rail System:		
Yards and Shops	118	20 train movements in peak activity hour
Layover Tracks (commuter rail)	109	One train with diesel locomotive idling for one hour
Crossovers	100	One train
Crossing signals	109	3600 seconds duration
Bus System:		
Storage Yard	111	100 buses accessing facility in peak activity hour
Operating Facility	114	100 buses accessing facility, 30 buses serviced and cleaned in peak activity hour
Transit Center	101	20 buses in peak activity hour
Ferry Terminal:		
Ferry Boat (no fog horn sounded)	97	4 ferry boats landings in one hour
Ferry Boat (fog horn sounded)	100	
Parking Garage	92	1000 cars in peak activity hour
Park & Ride Lot	101	12 buses, 1000 cars in peak activity hour

Table 5-6. Computation of L_{eq} and L_{dn} at 50 feet for Stationary Source General Assessment

Hourly L_{eq} at 50 ft:	$L_{eq}(h) = SEL_{ref} + C_N - 35.6$	
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = 10\log\left[\left(\frac{1}{15}\right)\sum_{7am-10pm} 10^{L_{eq}(h)/10}\right]$	
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = 10\log\left[\left(\frac{1}{9}\right)\sum_{10pm-7am} 10^{L_{eq}(h)/10}\right]$	
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$	
Volume Adjustment:	$C_N = 10\log\left(\frac{N_T}{20}\right),$	Rail Yards and Shops
	$= 10\log(N_T),$	Layover Tracks
	$= 10\log(N_T),$	Crossovers
	$= 10\log\left(\frac{N_B}{100}\right),$	Bus Storage Yard
	$= 10\log\left(\frac{N_B}{200} + \frac{N_S}{60}\right),$	Bus Operating Facility
	$= 10\log\left(\frac{N_B}{20}\right),$	Bus Transit Center
	$= 10\log\left(\frac{N_F}{4}\right),$	Ferry Terminal
	$= 10\log\left(\frac{N_A}{1000}\right),$	Parking Garage
	$= 10\log\left(\frac{N_A}{2000} + \frac{N_B}{24}\right),$	Park & Ride Lot
Duration Adjustment:	$= 10\log(E/3600),$	Crossing Signals
Other Adjustment:	-5	Noise Barrier at Property Line
N_T = Number of trains per hour N_B = Number of buses per hour N_F = Number of ferry boat landings per hour N_S = Number of buses serviced and cleaned per hour N_A = Number of automobiles per hour		
E = average hourly duration of one event in seconds		
Note: If any of these numbers is zero, then omit that term		

5.3 COMPUTATION OF NOISE EXPOSURE-VS.-DISTANCE CURVES

The previous section results in estimates of noise exposure at 50 feet for each type of project. The following procedure is used to estimate the project noise exposure at other distances, resulting in a noise exposure-vs.-distance curve sufficient for use in a General Assessment. The procedure is as follows:

1. Determine the L_{dn} or L_{eq} at 50 feet for one of the three project types in Section 5.2.

2. Select the appropriate distance correction curve from Figure 5-2.

3. Apply the Distance Corrections ($C_{distance}$) to the noise exposure at 50 feet using:

$$L_{dn}(orL_{eq})\Big|_{atnewdistance} = L_{dn}(orL_{eq})\Big|_{at50feet} - C_{distance}$$

4. Plot the noise exposure curve as a function of distance. This curve will be used to determine the noise impact contour for the first row of unobstructed buildings. This plot can be used to display noise from both unmitigated and mitigated conditions in order to assess the benefits from mitigation measures.

5. For second row receivers and beyond, it is necessary to account for shielding attenuation from rows of intervening buildings. Without accounting for shielding, impact may be substantially over-estimated. Use the following general rules of thumb to determine the effect of shielding from intervening rows of buildings:

   - Assign -4.5 dB of shielding attenuation for the *first* row of intervening buildings only.
   - Assign -1.5 dB of shielding attenuation for each subsequent row, up to a maximum total attenuation of 10 dB.

   Figure 5-2 can then be used to develop a curve of noise exposure vs. distance when there is shielding. The curve of noise exposure as a function of this distance will be used to determine the location of the noise impact contours.

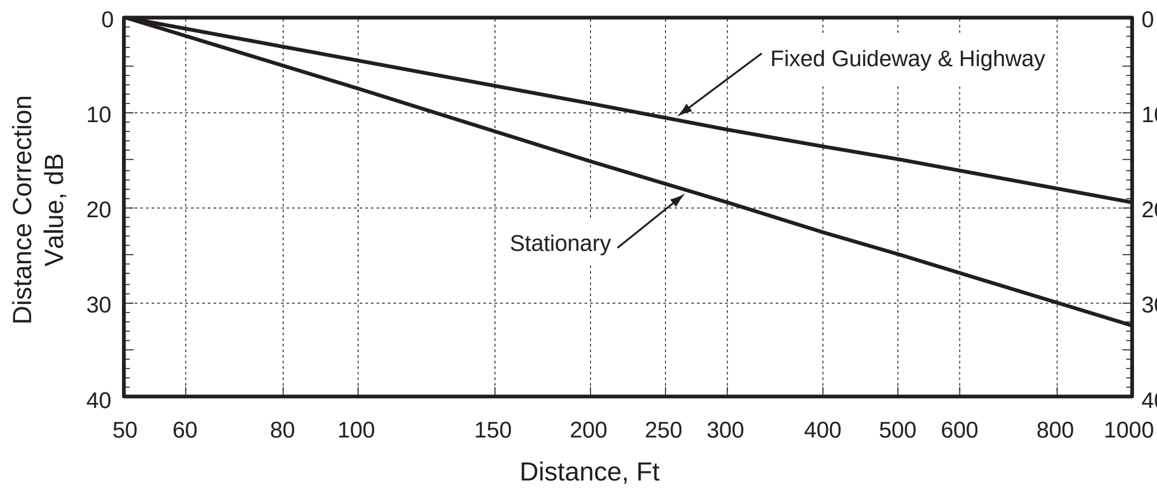

Figure 5-2. Curves for Estimating Exposure vs. Distance in General Noise Assessment

5.4 ESTIMATING EXISTING NOISE EXPOSURE

The existing noise in the vicinity of the project is required to determine the noise impact according to the criteria described in Chapter 3. Recall that impact is assessed based on a combination of the existing ambient noise exposure and the additional noise exposure that will be caused by the project. In the Detailed Analysis, the existing noise exposure is based on noise measurements at representative locations in the community. It is generally a good idea to base all estimates of existing noise on measurements, especially at locations known to be noise-sensitive. However, measurements are not always available at the General Assessment stage. This section describes how to estimate the existing noise in the project study area from general data available early in project planning. The procedure uses Table 5-7, where a neighborhood's existing noise exposure is based on proximity to nearby major roadways or railroads or on population density. For areas near major airports, published aircraft noise contours can also be used to estimate the existing noise exposure. The process is as follows:

1. Mapping: Obtain scaled mapping and aerial photographs showing the project location and alternatives. A scale of 1" = 200' or 400' is convenient for the accuracy needed in the noise assessment. The size of the base map should be sufficient to show distances of at least 1000' from the center of the alignment or property center, depending on whether the project is a guideway/roadway or a stationary facility.

2. Identify Sensitive Receivers: Review the maps, together with the most current land use information, to determine the proximity of noise-sensitive land uses to the project and to the nearest major roadways and railroad lines. When necessary, windshield surveys or more detailed land use maps may be used to confirm the location of sensitive receivers. For land uses more than

1000 feet from major roadways or railroad mainlines (see definitions in Table 5-7), obtain an estimate of the population density in the immediate area, expressed in people per square mile.

3. Use Table 5-7 to Estimate Existing Noise Exposure: Existing noise exposure is estimated by first looking at a site's proximity to major roads and railroad lines. If these noise sources are far enough away that ambient noise is dominated by local streets and community activities, then the estimate is made based on population density. The decision of which to use is made by comparing the noise levels from each of the three categories, roadways, railroads and population density, and selecting the highest level. In case of a lightly used railroad, one train per day or less, select the population density category.

Major roadways are separated into two categories: "Interstates," or roadways with four or more lanes that allow trucks; and "Others," parkways without trucks and city streets with the equivalent of 75 or more heavy trucks per hour or 300 or more medium trucks per hour. The estimated roadway noise levels are based on data for light to moderate traffic on typical highways and parkways using FHWA highway noise prediction procedures. Where a range of distances is given, the predictions are made at the outer limit, thereby underestimating the traffic noise at the inner distance. For highway noise, distances are measured from the centerline of the near lane for roadways with two lanes, while for roadways with more than two lanes the distance is measured from the geometric mean of the roadway. This distance is computed as follows:

$$D_{GM} = \sqrt{(D_{NL})(D_{FL})}$$

where D_{GM} is the distance to the geometric mean, D_{NL} and D_{FL} are distances to the nearest lane and farthest lane centerlines, respectively.

For railroads, the estimated noise levels are based on an average train traffic volume of 5-10 trains per day at 30-40 mph for main line railroad corridors, and the noise levels are provided in terms of L_{dn} only. Distances are referenced to the track centerline, or in the case of multiple tracks, to the centerline of the rail corridor. Because of the intermittent nature of train operations, train noise will affect the L_{eq} only during certain hours of the day, and these hours may vary from day to day. Therefore, to avoid underestimating noise impact when using the one-hour L_{eq} descriptor, it is recommended that the L_{eq} at sites near rail lines be estimated based on nearby roadways or population density unless very specific train information is available.

In areas away from major roadways, noise from local streets or in neighborhoods is estimated using a relationship determined during a research program by the U.S. EPA.[(2)] EPA determined that ambient noise can be related to population density in locations away from transportation corridors, such as airports, major roads and railroad tracks, according to the following relation:

$$L_{dn} = 22 + 10\log(p) \qquad \text{(in dBA)}$$

where p = population density in people per square mile.

Table 5-7. Estimating Existing Noise Exposure for General Assessment

Distance from Major Noise Source[1] (feet)			Population Density (people per sq mile)	Noise Exposure Estimates			
Interstate Highways[2]	Other Roadways[3]	Railroad Lines[4]		L_{eq} Day	L_{eq} Evening	L_{eq} Night	L_{dn}
10 - 50				75	70	65	75
50 - 100				70	65	60	70
100 - 200				65	60	55	65
200 - 400				60	55	50	60
400 - 800				55	50	45	55
800 and up				50	45	40	50
	10 - 50			70	65	60	70
	50 - 100			65	60	55	65
	100 - 200			60	55	50	60
	200 - 400			55	50	45	55
	400 and up			50	45	40	50
		10 - 30		--	--	--	75
		30 - 60		--	--	--	70
		60 - 120		--	--	--	65
		120 - 240		--	--	--	60
		240 - 500		--	--	--	55
		500 - 800		--	--	--	50
		800 and up		--	--	--	45
			1 - 100	35	30	25	35
			100 - 300	40	35	30	40
			300 - 1000	45	40	35	45
			1000 - 3000	50	45	40	50
			3000 - 10000	55	50	45	55
			10000 - 30000	60	55	50	60
			30000 and up	65	60	55	65

NOTES:

1 Distances do not include shielding from intervening rows of buildings. General rule for estimating shielding attenuation in populated areas: Assume 1 row of buildings every 100 ft; -4.5 dB for the first row, -1.5 dB for every subsequent row up to a maximum of -10 dB attenuation.

2 Roadways with 4 or more lanes that permit trucks, with traffic at 60 mph.

3 Parkways with traffic at 55 mph, but without trucks, and city streets with the equivalent of 75 or more heavy trucks per hour and 300 or more medium trucks per hour at 30 mph.

4 Main line railroad corridors typically carrying 5-10 trains per day at speeds of 30-40 mph.

In areas near major airports, published noise contours can be used to estimate the existing noise exposure. The L_{dn} from such contours should be applied if greater than the estimates of existing noise from other sources at a given location.

5.5 DETERMINING NOISE IMPACT CONTOURS

It is often desirable to draw noise impact contours on the land use map mentioned in the previous section to aid the impact inventory. Once the contours are on the map, the potential noise impacts can be estimated by counting the buildings inside the contours.

The first step is to identify the noise-sensitive neighborhoods and buildings and estimate existing noise exposure following the procedures described in Section 5.4. The estimate of existing noise exposure is used along with the noise impact criteria in Figure 3-1 to determine how much additional noise exposure would need to be created by the project before there would be Moderate Impact or Severe Impact.

The next step is to determine the distances from the project boundary to the two impact levels using the noise exposure-vs.-distance curves from Section 5.3. Plot points on the map corresponding to those distances in the neighborhood under study. Continue this process for all areas surrounding the project. The plotted points are connected by lines to represent the noise impact contours.

Alternatively, if it is desired to plot specific decibel-level noise contours, for example, 65 dBA, the distances can also be determined directly from the approach described in Section 5.3. Again, the points associated with a given decibel level are plotted on the map and connected by lines to represent that contour.

Locations of points will change with respect to the project boundary as the existing ambient exposure changes, as project source levels change, and as shielding effects change. In general, the points should be placed close enough to allow a smooth curve to be drawn. For a General Assessment, the contours may be drawn through buildings and salient terrain features as if they were not present. This practice is acceptable considering the level of detail associated with a project in its early stages of development. Examples 5-1 and 5-4 describe the development of noise contours, with illustrations in Figures 5-3 and 5-4.

5.6 INVENTORY NOISE IMPACT

The final step in the General Assessment is to develop an inventory of noise-impacted land uses. Using the land-use information and noise impact contours from Sections 5.4 and 5.5, it should be possible to locate which buildings are within the impact contours. In some cases it may be necessary to supplement the land-use information or determine the number of dwelling units within a multi-family building with a visual survey. If the objective is to compare and contrast major alignment or modal alternatives on the basis of noise impact, as in an Alternatives Analysis/Draft EIS, it may not be necessary to identify every different type of noise-sensitive land use. The inventory might be limited to only a few types, for example, residential and public institutional uses.

The steps for developing the inventory are:

1. Construct tables for all the noise-sensitive land uses identified in the three land-use categories from Section 5.4.

2. Tabulate buildings and sites that lie between the impact contours and the project boundary. For residential buildings, an estimate of the number of dwelling units is satisfactory. This is done for each alternative being considered.

3. Prepare summary tables showing the number of buildings (and estimated dwelling units, if available) within each impact zone for each alternative. Various alternatives can be compared in this way, including those with and without noise mitigation measures.

4. Determine the need for mitigation based on the policy considerations discussed in Section 3.2.4 and the application guidelines provided in Section 6.8.

Example 5-1. General Noise Assessment for a Commuter Rail System in an Existing Abandoned Railroad Right of Way

The following example illustrates the General Noise Assessment procedure for a new fixed-guideway project. The hypothetical project is a commuter rail system to be built within the abandoned right-of-way of a railroad. The example covers a segment of the corridor that passes through a densely developed area with population density of 25,000 people per square mile in mixed single-family and multi-family residential land use as shown in Figure 5-3. The example is presented in two parts: first, a segment where the rail line is grade-separated and a horn is not sounded; and second, an at-grade street-rail crossing where the horn is sounded.

<u>Assumptions for Example</u>
The assumptions for the project are as follows:

- **Project Corridor:** Existing population density is 25,000 people per square mile.

- **Commuter Rail System:** Commuter train with one locomotive and a three car consist on a double-track at-grade system with welded rail. Trains operate with 20-minute headways during peak hours, and 1-hour headways during off-peak. Speeds are approximately 40 mph along the corridor.

- **Operating Schedule:**

	Period	Headway (minutes)		Trains per hour		
		Inbound	Outbound	Inbound	Outbound	Total
Daytime	7am - 8am	20	20	3	3	6
	8am – 4pm	60	60	1	1	2
	4pm - 6pm	20	20	3	3	6
	6pm - 10pm	60	60	1	1	2
Nighttime	10pm – 11pm	60	60	1	1	2
	11pm – 5am	--	--	--	--	--
	5am - 6am	60	60	1	1	2
	6am - 7am	20	20	1	1	2

Procedure

The Screening Procedure calls for additional analysis for noise-sensitive land use within 375 feet of a commuter rail mainline. Figure 5-3 shows that the closest residences are about 100 ft from the Commuter Rail corridor centerline, thereby requiring further noise analysis. The procedure is summarized as follows:

Part 1. Grade-Separated Street Crossing

Determination of Noise Exposure at 50 feet

1. Determine average hourly daytime and nighttime volumes of train traffic.

   Daytime (7am - 10pm):
   V_d = 42 trains/15 hours = 2.8 trains/hour

   Nighttime (10pm - 7am):
   V_n = 6 trains/9 hours = 0.7 trains/hour

2. Calculate L_{eq}(day), and L_{eq}(night) 50 ft.

   From Table 5-1 and 5-2 these levels are determined as follows:

   $L_{eqL}(day) = SEL_{ref} + 10\log(N_{locos}) - 10\log(S/50) + 10\log(V_d) - 35.6$
   $= 92 + 10 \log (1) - 10 \log (40/50) + 10 \log (2.8) - 35.6$
   $= 61.8$ dB

   $L_{eqC}(day) = SEL_{ref} + 10 \log (N_{cars}) + 20 \log (S/50) + 10 \log (V_n) - 35.6$
   $= 82 + 10 \log (3) + 20 \log (40/50) + 10 \log (2.8) - 35.6$
   $= 53.7$ dB

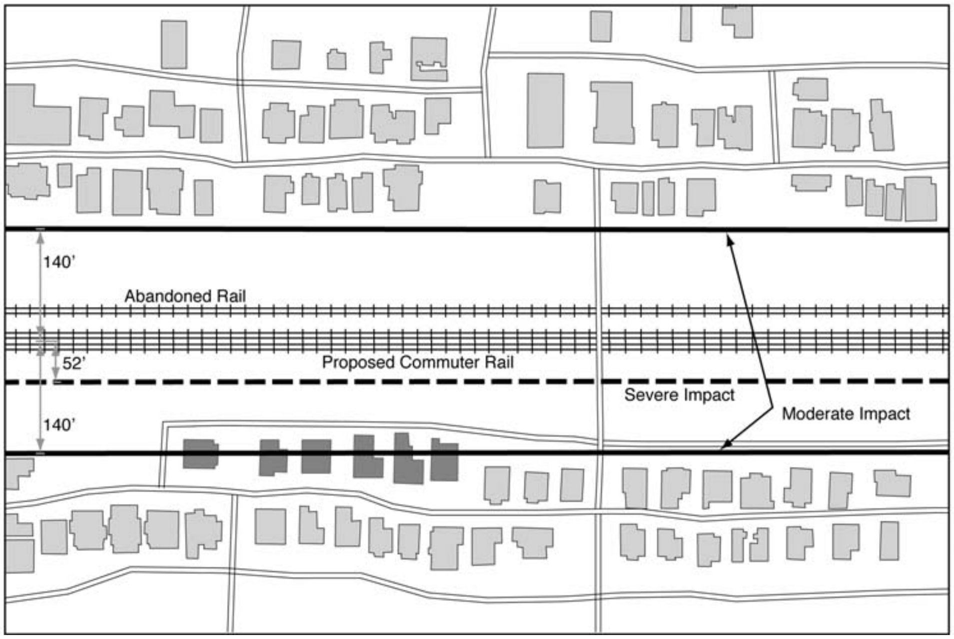

Figure 5-3. Noise Impacts of Commuter Rail

Calculate the total daytime L_{eq} for the locomotive and rail cars.

$$L_{eqT}(day) = 10*log(10^{(LeqL/10)} + 10^{(LeqC/10)})$$
$$= 10*log(10^{(62.2/10)} + 10^{(54.1/10)})$$
$$= 62.4 \text{ dB}$$

Calculate the nighttime L_{eq} for the locomotive and rail cars.

$$L_{eqL}(night) = SEL_{ref} + 10\log(N_{locos}) - 10\log(S/50) + 10\log(V_n) - 35.6$$
$$= 92 + 10 \log (1) - 10 \log (40/50) + 10 \log (0.7) - 35.6$$
$$= 55.8 \text{ dB}$$

$$L_{eqC}(night) = SEL_{ref} + 10 \log (N_{cars}) + 20 \log (S/50) + 10 \log (V_n) - 35.6$$
$$= 82 + 10 \log (3) + 20 \log (40/50) + 10 \log (0.7) - 35.6$$
$$= 47.7 \text{ dB}$$

Calculate the total nighttime L_{eq} for the locomotive and rail cars.

$$L_{eqT}(night) = 10*log(10^{(LeqL/10)} + 10^{(LeqC/10)})$$
$$= 10*log(10^{(55.6/10)} + 10^{(47.5/10)})$$
$$= 56.4 \text{ dB}$$

3. Calculate project L_{dn} at 50 ft.

From Table 5-2 this level is determined as follows:

$$L_{dn} = 10\log\left[(15)10^{L_{eq}(day)/10} + (9)10^{(L_{eq}(night)+10)/10}\right] - 13.8$$

which gives:

$$L_{dn} = 78.2 - 13.8$$

or

$$L_{dn} = 64.4 \text{ dB}$$

Estimate Existing Noise Exposure

4. Estimate existing noise at noise-sensitive sites. Since the existing alignment is on an abandoned railroad, the dominant existing noise source can be described by a "generalized" noise level to characterize a large area. An estimate of the existing noise environment is obtained from Table 5-7 with population density of 25,000 people per square mile, giving an Ldn = 60 dBA.

   From Figure 5-3, unobstructed residences range from 100 to 200 ft from the rail line. Based on Table 5-7 the L_{dn} is 60 dB for the area.

Noise Impact Contours

5. The following table is constructed using the impact criteria curves.
   Note: The project criteria for L_{eq} is not shown since L_{eq} only applies to the non-residential receptors.

Existing Noise, L_{dn} or L_{eq}(day)	Onset of Moderate Impact	Onset of Severe Impact
	L_{dn}	L_{dn}
60 dB	58 dB	64 dB

6. Distance to impact contours are determined using the curve in Figure 5-2 for "Fixed-Guideway" and the project impact thresholds obtained above. The results are summarized as follows for the residences:

Existing Noise, L_{dn} or L_{eq}(h)	Distance to Noise Impact Threshold, feet	
	Moderate Impact	Severe Impact
60 dB	140	52

7. Draw contours for each affected land use, based on the above table and its distance from the rail line. Note that the impact distances listed are in terms of distance to the *centerline of the Commuter Rail corridor*.

8. Within the contours defining "Moderate Impact" are six residential buildings (shaded in Figure 5-3).

Noise Mitigation

9. The procedure is repeated assuming a noise barrier to be placed at the railroad right-of-way line. The barrier serves to reduce project noise from the Commuter Rail by at least 5 dB. This, however, does not affect the project criteria to be used in determining impact. That is, the same existing noise levels (as the case without a barrier) are used to determine these thresholds.

   The net effect of the noise barrier is to decrease the Moderate Impact distance from 140 to 60 ft. Hence, the noise barrier eliminates all residential noise impact for this segment of the project area.

Part 2. Crossing At-Grade with Horn Blowing

Now consider the case of an active street crossing of the commuter railroad tracks. The General Assessment method includes source reference levels for horns on moving trains and warning bells (crossing signals) at the street crossing. According to Table 5-1, the horn noise applies to track segments within ¼ mile of the grade crossing. Using the train volumes from Part 1 and the information in Tables 5-1 and 5-2, the day- and nighttime Leqs from sounding the horns are determined at 50 feet as follows:

$$\begin{aligned} L_{eqL}(day)_{horns} &= SEL_{ref} + 10\log(V_d) - 35.6 \\ &= 113 + + 10 \log (3.1) - 35.6 \\ &= 82.3 \text{ dB} \end{aligned}$$

$$\begin{aligned} L_{eqC}(night)_{horns} &= SEL_{ref} + 10 \log (V_n) - 35.6 \\ &= 113 + 10 \log (0.7) - 35.6 \\ &= 75.9 \text{ dB} \end{aligned}$$

The L_{dn} at 50 ft. from train horns is the next calculation:

From Table 5-2 this level is determined as follows:

$$L_{dn} = 10\log\left[(15)10^{Leq(day)/10} + (9)10^{(Leq(night)+10)/10}\right] - 13.8$$

which gives:

$$L_{dn} = 84 \text{ dB}$$

At-grade street crossings will have warning bells, typically sounding for 20 seconds for every train pass-by. The total day- and nighttime durations are as follows:

E_d = average daytime hourly duration
= 20 seconds x 3.1 trains/hour = 62 seconds/hour

E_n = average nighttime hourly duration
= 20 seconds x 0.7 trains/hour = 14 seconds/hour.

From Table 5-6 for stationary sources:

$L_{eqL}(day)_{cs}$ = SEL_{ref} + 10log(E_d/3600) - 35.6
= 109 + + 10 log (62/3600) - 35.6
= 55.8 dB

$L_{eqC}(night)_{cs}$ = SEL_{ref} + 10 log (E_n/3600) - 35.6
= 109 + 10 log (14/3600) - 35.6
= 49.3 dB

Applying the L_{dn} equation from Table 5-6, $L_{dn, cs}$ = 57.5 dB.

Compared to horn blowing, the crossing signal noise is negligible.

Noise impact distances are found in the same way as in Part 1, with a new noise level, L_{dn} = 84 dB.

Again, the existing noise level is used to determine the onset of Moderate and Severe Impacts:

Existing Noise, L_{dn} or L_{eq}(day)	Onset of Moderate Impact	Onset of Severe Impact
	L_{dn}	L_{dn}
60 dB	58 dB	64 dB

Distance to impact contours is determined using the curve in Figure 5-2 for "Fixed-Guideway" and the project impact thresholds obtained above. The results are summarized as follows for the residences:

Existing Noise, L_{dn} or L_{eq}(h)	Distance to Noise Impact Threshold, feet	
	Moderate Impact	Severe Impact
60 dB	1000	500

Contours are drawn as in Part 1, extending to the distances above for ¼ mile on either side of the grade crossing.

End of Example 5-1

Example 5-2. Example of Highway/Transit Corridor Projects

This example illustrates two cases of highway/transit projects, one where the highway noise dominates and the FHWA procedures should be used and another where the FTA methodology is appropriate.

Case 1: Highway dominates

A new LRT system is planned for the median of a major freeway that carries heavy traffic both day and night. The noise levels at the first row of houses along the freeway were measured during peak hour, mid-day and late evening with hourly Leq readings of 65 dBA, 63 dBA and 60 dBA, respectively. The LRT tracks will be 125 feet from the first row of houses. The LRT operations during peak hour will be 4-car trains at 45 mph, with 5-minute headways in both directions. Late evening service decreases to 2-car trains and 20 minute headways. Referring to Table 5-2, "Rail Vehicles," the applicable terms for determining the peak hour Leq in this case are: SEL_{REF} = 82 dBA; N = 4 cars per train; S = 45 mph; and V = 24 trains per hour. Inserting these parameters into the equation in Table 5-2, the LRT peak-hour noise level is determined to be 65 dBA at 50 feet, and from Figure 5-2, the level at 125 feet is 60 dBA. The corresponding calculation for late evening hourly Leq results in 51 dBA.

FTA is providing a share of the funding for the LRT project, but the State DOT and the FHWA are co-lead agencies because the median requires considerable preparation for the tracks, including replacing bridge piers of street crossings and moving some highway lanes. In this case, the freeway dominates the noise environment in the area both day and night, by 5 dB during peak hour and 9 dB at night. According to Chapter 3, the FHWA procedures are to be used when sufficient evidence shows that highway noise dominates. Consequently TNM is used to calculate the future noise levels at the first row of houses, with a result of peak-hour Leq of 66 dBA. The State has a policy of implementing noise abatement measures if the FHWA Noise Abatement Criteria (NAC) are approached and the increase over existing noise levels is 5 dB or more at residential land use.

Combining the freeway noise and LRT noise during the peak traffic hour by decibel addition results in a combined noise level of 67 dBA.

In this case, no mitigation is proposed because although the combined level reaches the FHWA NAC of 67 dBA for residential land use, the increase in noise over existing conditions is only 2 dB, thereby failing this State's policy requirement of at least a 5 dB increase over existing levels to justify noise mitigation measures.

Case 2: LRT dominates at night

A new LRT is planned for the median of a major arterial highway used by commuters primarily during rush hours. Traffic volume on the arterial drops considerably during off-peak and nighttime hours. Currently the arterial has signalized intersections, but in the future the cross streets will be grade-separated, but commercial businesses and residential developments will continue to be accessible with “right-turn-off / right-turn-on”. The existing noise at the nearest homes adjacent to the arterial has been measured, resulting in a peak-hour Leq of 63 dBA and an Ldn of 60 dBA.

The future traffic noise after improvements to the arterial is projected to be 65 dBA for the two-hour morning peak period and the same for the two-hour evening peak period, falling to hourly Leq’s of 60 dBA during the remaining daytime hours and 50 dBA after 10 p.m. Accordingly, Ldn is calculated to be 61 dBA from the arterial at the homes.

The LRT is proposed to be on elevated structure in the median of the arterial, located 125 feet from the nearest homes in the development. The proposed operations at this location are:

- Peak hours (7:00 a.m. to 9:00 a.m. and 5:00 p.m. to 7:00 p.m.): 4-car trains, with 5 minute headways, at 50 mph.
- Off-peak hours (9:00 a.m. to 5:00 p.m. and 7:00 p.m. to 10:00 p.m.): 3-car trains, with 10 minute headways, at 50 mph.
- Night hours (10:00 p.m. to 1:00 a.m.): 2-car trains, with 15 minute headways, at 40 mph.

This train schedule results in an average hourly volume of 15.2 trains per hour, with an average of 3.42 cars per train in both directions during the daytime, and 2-car trains with an average hourly volume of 2.67 trains per hour during the nighttime. According to the equations in Table 5-2 and the propagation curve in Figure 5-2, the Ldn = 63 dBA at these homes. The combined arterial and LRT noise is projected to be Ldn = 64.7 dBA by decibel addition.

FTA procedures are appropriate in this case, since the LRT continues to operate into the nighttime hours and actually dominates the noise environment because the arterial noise diminishes in those hours. Here is a case where the cumulative noise impact curve (Figure 3-2) is applicable because the project included changes to the arterial as well as addition of a new transportation source. With an existing Ldn of 60 dB and a future Ldn of 64.7 dBA, Figure 3-2 indicates the increase of 4.7 dB would cause Moderate Impact.

End of Example 5-2

Example 5-3. General Noise Assessment for a BRT System in an Existing Railroad Right of Way

This example for an uncomplicated Bus Rapid Transit (BRT) project is meant to illustrate the approach for a highway/transit type project using the FTA procedures.

A new BRT corridor is planned in an existing abandoned railroad right-of-way. For this project source,

SEL_{ref} = 82 for buses
S = 25 mph
V_d = (344 buses)/(15 hours) = 22.9 buses per hour
V_n = (116 buses)/(9 hours) = 12.9 buses per hour

In addition, from Table 5-4,

C_s = 15 for buses

Using the equations in Table 5-4 the resulting L_{eq}'s at 50 feet are:

L_{eq}(day) = 55.5
L_{eq}(night) = 53

This total day and night traffic results in:

L_{dn} = 60 at 50 ft

The surrounding area is residential with 2,500 people per square mile starting approximately 100 feet away from the proposed alignment. Using Table 5-7 the existing noise in the area is 50 dBA.

From Figure 3-1 the impacts thresholds are:

Background Level	Moderate Impact	Severe Impact
50	54	59

Therefore, from Figure 5-2:

Project Level	Onset of Moderate Impact	Onset of Severe Impact
60	125 feet	60 feet

This results in impacts to the residences. A barrier is proposed for mitigation, resulting in a predicted new level of 55 and:

Mitigated Project Level	Onset of Moderate Impact	Onset of Severe Impact
55	60 feet	N/A

The onset of Severe Impact is listed as N/A because the Severe Impact criterion is not exceeded by the project. Mitigation is accomplished by a barrier because the Moderate Impact contour has been moved in to a distance of 60 feet, whereas the residential area lies beyond 100 feet.

End of Example 5-3

Example 5-4. General Noise Assessment for a Transit Center

The following example illustrates the procedure for performing a General Noise Assessment for a stationary source. The example represents a typical FTA-assisted project in an urban area, the siting of a busy transit center in a mixed commercial and residential area, as shown in Figure 5-4.

Assumptions for Example

The assumptions for the Transit Center and its environs are as follows:

- **Main Street Traffic:** Peak hour traffic of 1200 autos, 20 heavy trucks, 300 medium trucks.

- **Population Density:** 12 houses per block; single family homes; 3 people per family.

  Block area = 78,750 square feet.
  Population density = 9,750 people/square mile.

- **Bus Traffic:**

Period	Hours	Buses per Hour
Peak, Morning	7am - 9am	30
Peak, Afternoon	4pm - 6pm	30
Mid-day	9am - 4pm	15
Evening	6pm - 10pm	12
Early Morning (Night)	6am - 7am	15
Late Night	10pm - 1am	4

Procedure

Before beginning the General Assessment, note that the Screening Procedure calls for additional analysis if any residential or other noise-sensitive land use is within 150 feet of a Transit Center when there are intervening buildings. According to Figure 5-4 the nearest residence is about 140 feet from the center of the proposed Transit Center, thereby calling for further analysis. The General Assessment proceeds as follows:

Determination of Noise Exposure at 50 feet

1. Determine the average number of buses per hour during day and night.

   Day (7am - 10pm):
   N_B *(avg day)* = 273 buses/15 hours = 18.2 buses/hour average

   Night (10pm - 7am):
   N_B *(avg night)* = 27 buses/9 hours = 3 buses/hour average

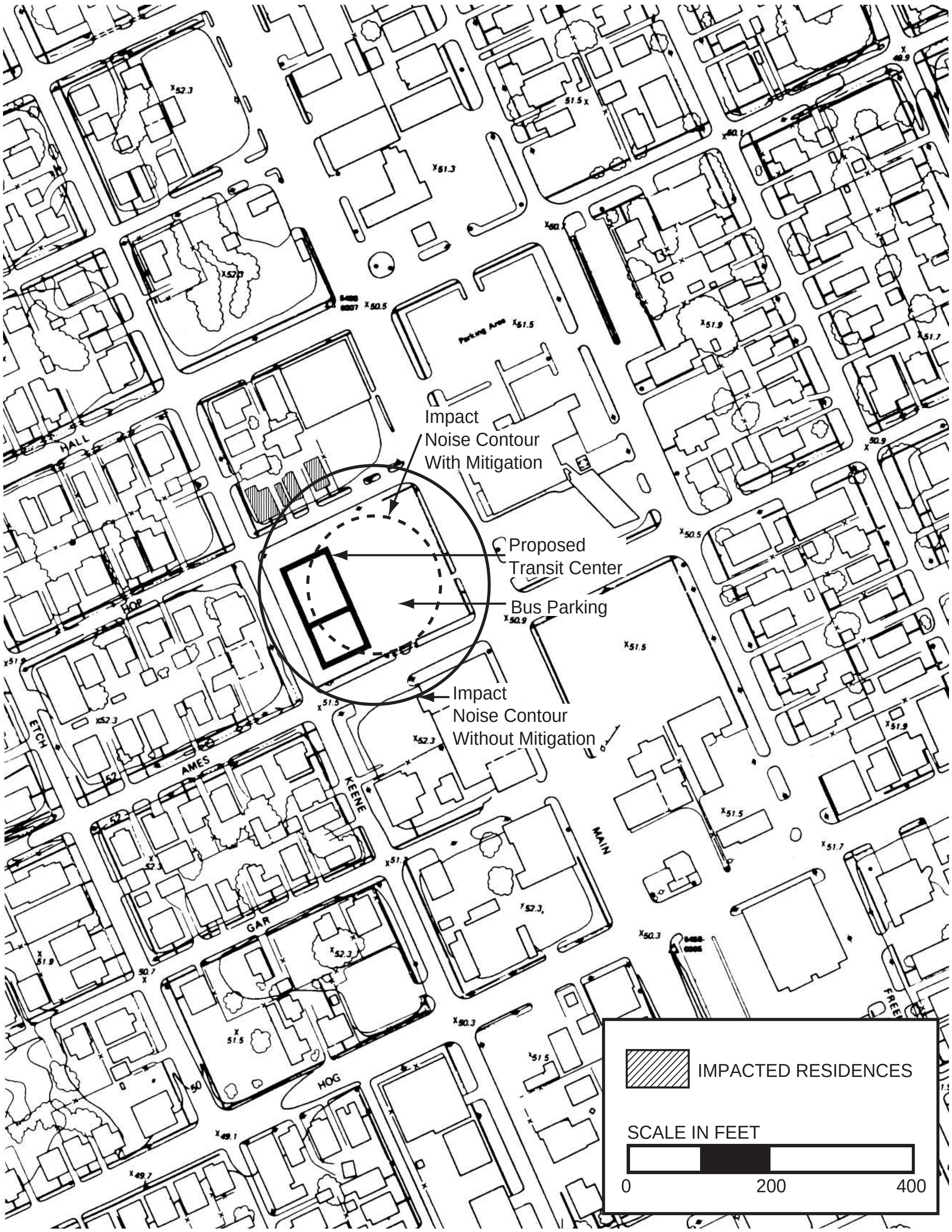

Figure 5-4. Example of Project for General Assessment: Siting of Transit Center in Mixed Commercial/Residential Area

2. Calculate $L_{eq}(day)$ and $L_{eq}(night)$ at 50 feet, assuming no noise barrier.

   From Table 5-5 and Table 5-6 the levels are determined as follows:

$$L_{eq}(day) = SEL_{ref} + C_N - 35.6$$
$$= 101 + 10 \log (18.2/20) - 35.6$$
$$= 65 \text{ dB}$$

$$L_{eq}(night) = SEL_{ref} + C_N - 35.6$$
$$= 101 + 10 \log (3/20) - 35.6$$
$$= 57 \text{ dB}$$

3. Calculate L_{dn} at 50 ft for the project.

   From Table 5-6 the level at 50 feet is determined as follows:

$$L_{dn} = 10\log\left[(15)10^{Leq(day)/10} + (9)10^{(Leq(night)+10)/10}\right] - 13.8$$

   which gives:

$$L_{dn} = 79.7 - 13.8$$

   or L_{dn} = 66 dB

Estimate Existing Noise Exposure

4. Estimate existing noise at noise-sensitive sites from the dominant noise source, either major roadways or local streets (population density).

   Roadway Noise Estimate: The traffic on Main Street qualifies this street for the "Other Major Roadway" category in Table 5-7. According to the map, the nearest residence is 275 feet from the edge of Main Street. The table shows existing L_{dn} = 55 dB at this distance for representative busy city street traffic.

   Population Density Noise Estimate: As a check on which ambient noise category to use, noise from local streets is estimated from the population density of 9,750 people/square mile. Table 5-7 indicates the L_{dn} should be approximately 55 dB.

   The existing noise level associated with the residential neighborhood is therefore taken to be L_{dn} = 55 dB. In case the two estimates are different, use the lower L_{dn} value.

Noise Impact Contours

5. Distance to Impact Contours: For an existing noise exposure of 55 dB, the noise impact criteria indicate that the onset of Moderate Impact will occur at a project noise level of 56 dB, and onset of Severe Impact will occur at 62 dB. The next step is to determine the distances from the center of the property at which these levels are reached. This is accomplished by use of Figure 5-2, the exposure-vs-distance curve. With the project noise level at 50 feet given as 66 dB and the two

impact levels at 56 dB and 62 dB, the differences are 10 dB and 4 dB, respectively. Using the curve in Figure 5-2 labeled "Stationary" source, the distance to where the project level drops 10 dB is approximately 160 feet, and 4 dB attenuation occurs at about 80 feet. Consequently, the Moderate Impact contour occurs about 140 feet from the center of the property and the Severe Impact contour occurs at 80 feet.

6. Draw Contours: Lines are drawn at 80 feet and 140 feet from the center of the property of the proposed Transit Center. These lines represent the noise impact contours. (Note in Figure 5-4 the Severe Impact contour is left out for clarity: it is just within the dashed line representing the Moderate Impact contour after mitigation.)

7. Assessment: Within, or touching, the contour defining "Moderate Impact" are three residential buildings (shaded in Figure 5-4). No residences are within the "Severe Impact contour."

Noise Mitigation

8. Noise Barrier: The process is repeated with a hypothetical noise barrier at the property line on the residential side of the Transit Center. This would consist of a wall approximately 15 feet high partially enclosing the transit center, sufficient to screen the residences but not the commercial block facing Main Street. According to Table 5-6, the approximate noise barrier effect is -5 dB. Repeating the procedure above, the effect of the noise barrier is to shrink the Moderate Impact contour to 90 feet and the Severe Impact contour to 45 feet, which in this example eliminates all adverse effect on the residences.

End of Example 5-4

REFERENCES

1. U.S. Department of Transportation, Federal Highway Administration, *FHWA Traffic Noise Model User's Guide*, Report FHWA-PD-96-009, Washington, DC, January 1998. In addition, *FHWA Traffic Noise Model User's Guide (Version 2.5 Addendum)*, April 2004.

2. U.S. Environmental Protection Agency, "Population Distribution of the United States as a Function of Outdoor Noise Level," Report 550/9-74-009, June 1974.

6. DETAILED NOISE ANALYSIS

This chapter describes the detailed computation of both project and existing noise levels for a comprehensive assessment of project noise impact. The main purpose of this chapter is to provide a procedure that allows prediction of impact and assessment of the effectiveness of mitigation with greater precision than can be achieved with the General Assessment. In some cases, decisions on appropriate mitigation measures can be made based on the results of the General Assessment. When a more detailed evaluation of mitigation measures is needed, the procedures in this chapter should be followed.

It is important to recognize that use of the Detailed Analysis methods will not provide more accurate results than the General Assessment unless more detailed and specific input data are used. In the case of a transit center, for example, the General Assessment provides a source level at a reference distance from the center of the site based on the number of buses at the facility during each hour. Thus, the only information needed for a General Assessment of the transit center is the site location and hourly bus volumes. However, a Detailed Analysis would require specific information on the locations, reference levels, traffic volumes and duration of operations for individual sources that contribute to the total noise output of the transit center. Such information would include a detailed design plan for the facility, the locations of idling buses and the idling durations, as well as the bus and automobile traffic patterns and volumes. A Detailed Analysis cannot be done until such information is available.

Detailed Noise Analysis is appropriate in two main circumstances: first, for a major fixed-guideway project after the preferred mode and alignment have been selected; and second, for any other transit project where potentially severe impacts are identified at an early stage. For fixed-guideway projects, once the preferred mode and alignment are established, the project sponsor begins preliminary engineering and works to complete the environmental impact assessment, usually with a Final EIS. Information required for the Detailed Noise Analysis is generally available at the preliminary engineering stage; such information includes hourly operational schedules during day and night, speed profiles, plan and profiles of guideways, locations of access roads, and landform topography including terrain and building features.

Even for relatively minor transit projects, noise impacts are likely to occur whenever the project is in close proximity to noise-sensitive sites, particularly residences. Some examples are: (1) a terminal or station sited adjacent to a residential neighborhood; (2) a maintenance facility located near a school; (3) a storage yard adjacent to residences; and (4) an electric substation located adjacent to a hospital. As with the larger fixed-guideway projects mentioned above, a Detailed Noise Analysis for these projects will require information normally developed at the preliminary design stage.

The procedures of this chapter include everything needed for a fully detailed transit noise analysis. They are aimed at major transit projects that have enough lead time for thorough environmental analysis. They need not be followed to the letter; they can be tempered by competent engineering judgment and adapted somewhat to specific project constraints.

This chapter employs equations as the primary mode of computation, rather than graphs or tables of numbers, in order to facilitate the use of spreadsheets and/or programmable calculators. Moreover, these equations and their supporting text have been streamlined to provide as concise a view of the Detailed Noise Analysis as possible. As a result, basic noise concepts are not repeated in this chapter.

The steps in the procedure appear in Figure 6-1 and are described below. They parallel the steps for the General Noise Assessment, though they are more refined in the prediction of project noise and subsequent evaluation of mitigation measures.

1. Receivers of Interest. Select receivers of interest, guided by Section 6.1. The number of receivers will depend upon the land use in the vicinity of the proposed project and the extent of the study area defined by the Screening Procedure. If a General Assessment has been done, this will give a good indication of the extent of potential impacts.

2. Project Noise. Determine whether the project is primarily a fixed-guideway transit, highway/transit, or stationary facility. Note that a major fixed-guideway system will have stationary facilities associated with it, and that a stationary facility may have highway/transit elements associated with it. Identify the project noise sources that are in the vicinity of receivers of interest. For these sources, determine the source reference noise in terms of SEL from the tables in Section 6.2. Each reference SEL pertains to reference operating conditions for stationary sources or to one vehicle passby under reference operating conditions for fixed-guideway and highway/transit sources. These reference levels should incorporate source-noise mitigation only if such mitigation will be incorporated into the system specifications. For example, if the specifications include vehicle noise limits which may not be exceeded, these limits should be used to determine the reference level, and this level should be used in the analysis rather than the standard, tabulated reference level. Convert each source SEL to noise exposure (L_{dn} or L_{eq} (h)) at 50 feet, for the appropriate project operating parameters, using additional equations in Section 6.2.

3. Propagation and Summation of Project Noise at Receivers of Interest. Draw a noise exposure-vs.-distance curve for each relevant source, using the equations in Section 6.3. This curve will show source noise as a function of distance, accounting for shielding along the path, as well as any

propagation-path mitigation that will be included in the project. From these curves, determine the total project noise exposure at all receivers of interest by combining the levels from all relevant sources (Section 6.4).

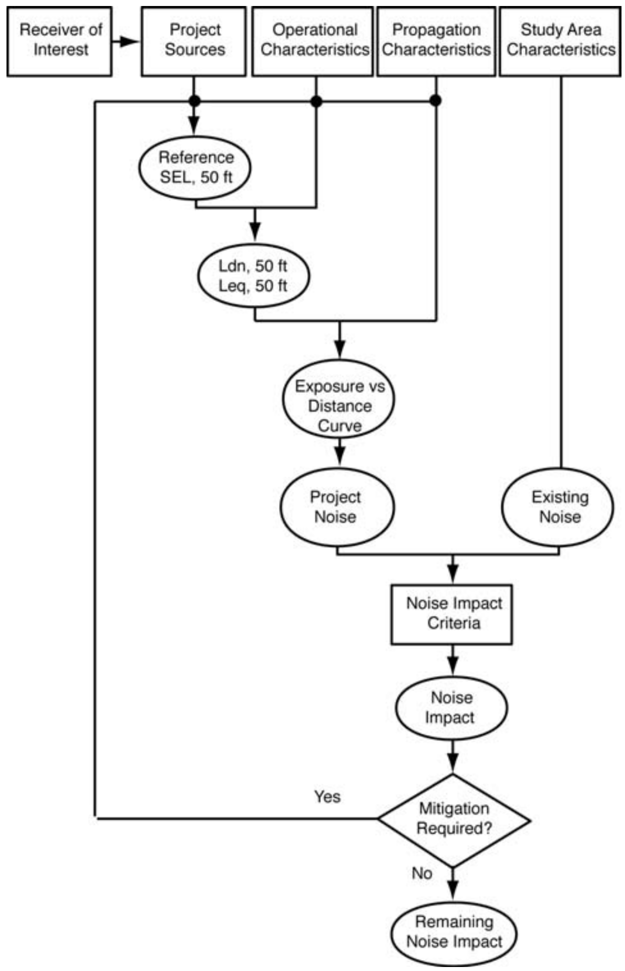

Figure 6-1. Procedure for Detailed Analysis

4. Existing Noise in the Study Area. Estimate the existing noise exposure at each receiver of interest, using the methods in Section 6.6.

5. Noise Impact Assessment. Assess noise impact at each receiver of interest using the procedures in Section 6.7 which incorporate the noise impact criteria of Chapter 3.

6. Mitigation of Noise Impact. Where the assessment shows either Severe Impact or Moderate Impact, evaluate alternative mitigation measures referring to Section 6.8. Then loop back to modify

the project-noise computations, thereby accounting for the adopted mitigation, and reassess the remaining noise impact.

6.1 RECEIVERS OF INTEREST

The steps in identifying the receivers of interest, both the number of receivers needed and their locations, are shown in Figure 6-2. Later sections discuss the measurement/computation of ambient noise, the computation of project noise, and the resulting assessment of noise impact that is done for each receiver. The basic steps, which are discussed in the following subsections, are:

1. Identify all noise-sensitive land uses.
2. Find individual receivers of interest. Examples are isolated residences and institutional resources such as schools.
3. Cluster residential neighborhoods and other relatively large noise-sensitive areas.

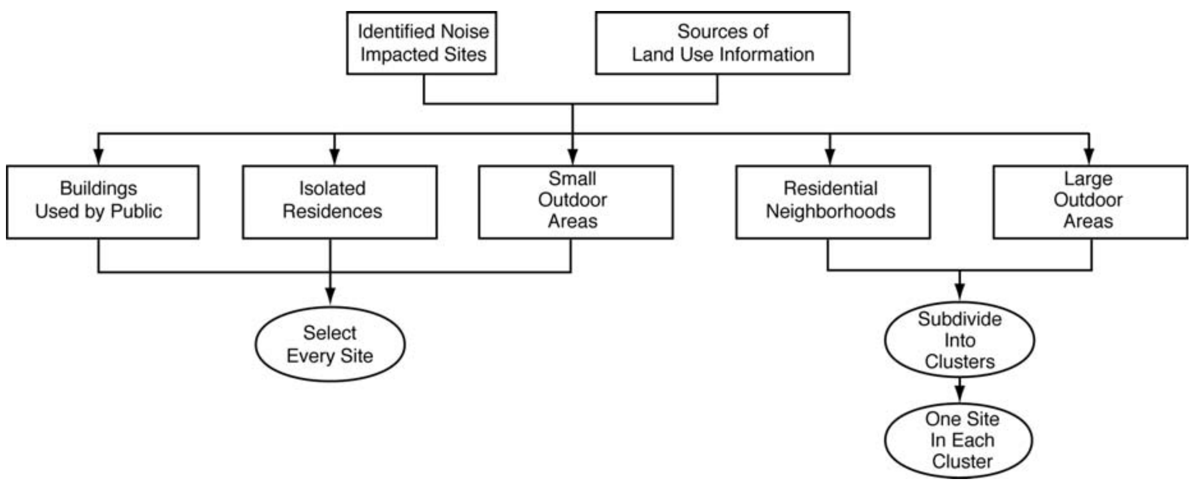

Figure 6-2. Guide to Selecting Receivers of Interest

6.1.1 Identifying Noise-Sensitive Land Uses

A Detailed Noise Analysis should usually be performed on all noise-sensitive land uses where impact is identified by the General Noise Assessment. If a General Noise Assessment has not been done, but there appears to be potential for noise impacts, all noise-sensitive sites within the area defined by the noise screening procedure should be included. In areas where ambient noise is low, the assessment will include land uses that are farther from the proposed project than for areas with higher ambient levels.

Some of the land-use materials and methods that can be helpful in locating noise-sensitive land uses in the vicinity of the proposed project include:

- **Land-use maps**, prepared by regional or local planning agencies or by the project staff. Area-wide maps often do not have sufficient detail to be of much use. However, they can provide broad guidance and may suggest residential pockets hidden within otherwise commercial zones. Of more use are project-specific maps which provide building-by-building detail on the land nearest the proposed project.
- **USGS maps,** prepared by the United States Geological Survey generally at 2000-foot scale. These maps contain details of house placement, except in highly urbanized areas, and generally show the location of all schools and places of worship, plus many other public-use buildings. In addition, the topographic contours on these maps may be useful later during noise computation.
- **Road and town maps**. These can supplement the USGS maps, are generally more up-to-date, and may be of larger scale.
- **Aerial photographs,** especially those of 400-foot scale or better. When current, aerial photos are valuable in locating all potential noise-sensitive land uses close to the proposed project. In addition, they can be useful in determining the distances between receivers and the project.
- **Windshield survey** of the corridor. Definitive identification of noise-sensitive sites is accomplished by a windshield survey in which the corridor is driven and land uses are annotated on base maps. The windshield survey, supplemented by footwork where needed, is especially useful in identifying newly-constructed sites and in confirming land uses very close to the proposed project.
- **Geographic Information Systems (GIS).** Mapping needed for identifying noise-sensitive land uses is often available in electronic GIS format. GIS data may include land parcels, building structures, aerial photography and project-specific information. These data may be obtained during the project study or from local or regional agencies that store and maintain GIS data. Using electronic GIS data has advantages over paper mapping in being able to automate the process of identifying noise-sensitive land use and accurately being able to determine their distances to the project alignment.

Table 6-1 contains the types of land use of most interest in the impact assessment, separated into three types of land use. If noise impact was identified at other types of buildings/areas with noise-sensitive use by the General Noise Assessment, these should be selected also.

6.1.2 Selecting Individual Receivers of Interest

Select as an individual receiver of interest: (1) every major noise-sensitive building used by the public; (2) every isolated residence; and (3) every relatively small outdoor noise-sensitive area. Use judgment here to avoid analyzing noise where such analysis is obviously not needed. For example, many roadside motels are not particularly sensitive to noise from outdoors. On the other hand, be careful to include buildings used by the public or outdoor areas which are considered to be particularly noise-sensitive by the community. Isolated residences that are particularly close to the project should certainly be included, while those at some distance may often be omitted or "clustered" together with other land uses, as described in the next section. Use judgment also concerning relatively small outdoor noise-sensitive areas. For example, playgrounds can often be omitted unless they directly abut the proposed project, since noise sensitivity in playgrounds is generally low.

Table 6-1. Land Uses of Interest

Land Uses	Specific Use	Selecting Receivers
Outdoor noise-sensitive areas	Certain parks Historic sites used for interpretation Amphitheaters Passive recreation areas Cemeteries Other outdoor noise-sensitive areas	For relatively small noise-sensitive areas: same as indoor noise-sensitive sites. For relatively large areas: same as for residential areas.
Residences	Single family residences Multi-family residences (apartment buildings, duplexes, etc.)	Select each isolated residence as a receiver of interest. For residential areas, cluster by proximity to project sources, proximity to ambient-noise sources, and location along project line. Choose one receiver of interest in each cluster.
Indoor noise-sensitive sites	Places of worship Schools Hospitals/nursing homes Libraries Public meeting halls Concert halls/auditoriums/theaters Recording/broadcast studios Museums and certain historic buildings Hotels and motels Other public buildings with noise-sensitive indoor use	Select noise-sensitive buildings as separate receivers of interest.

6.1.3 Clustering Residential Neighborhoods and Outdoor Noise-Sensitive Areas

Residential neighborhoods and relatively large outdoor noise-sensitive areas can often be clustered, simplifying the analysis that is required without compromising the accuracy of the analysis. The goal is to subdivide all such neighborhoods/areas into clusters of approximately uniform noise, each containing a collection of noise-sensitive sites. Attempt to obtain uniformity of both project noise and ambient noise, guided by these considerations:

1. In general, project noise drops off with distance from the project. For this reason, project noise uniformity requires nearly equal distances between the project noise source and all points within the cluster. Such clusters will usually be shaped as long narrow strips parallel to the transit corridor and/or circling project point sources such as a maintenance facility. Suggested are clusters within which the project noise will vary over a range of 5 decibels or less. Be guided here by the fact that project noise will drop off approximately 3 decibels per doubling of distance for line sources and 6 decibels per doubling of distance for point sources over open terrain. Drop-off with distance will be faster in areas containing obstacles to sound propagation, such as rows of buildings.

2. Ambient noise usually drops off from non-project sources in the same manner as does noise from project sources. For this reason, clustering for uniform ambient noise will usually result in long narrow strips parallel to major roadways or circling major point sources of ambient noise, such as a manufacturing facility. Suggested are clusters within which the ambient noise will vary over a range

of 5 decibels or less, though this may be hard to judge without measurements. In areas without predominant sources of noise, like highways, ambient noise varies with population density, which is generally uniform along the corridor. In situations where ambient noise tends to be uniform, the clusters can encompass relatively large areas.

After defining the cluster, select one receiver as representative in each cluster. Generally choose the receiver closest to the project and at an intermediate distance from the predominant sources of existing noise. Detailed procedures for clustering appear in Appendix C along with an example of clustering for a segment of rail line. This method will generally result in an adequate selection of receivers along the corridor or surrounding the site.

6.2 PROJECT NOISE

Once receivers have been selected, projections of noise from the project must be developed for each receiver. This section describes the first step, calculating the noise exposure at an equivalent distance of 50 feet from each project noise source. As shown in Figure 6-3, the basic procedures for the computation are: (1) Separate nearby sources into these source-type categories: fixed-guideway sources, highway/transit sources, and stationary sources; (2) Determine the reference SEL for each source; and (3) Use the projected source operating parameters to convert each reference SEL to noise exposure (either L_{dn} or $L_{eq}(h)$) at 50 feet.

Table 6-2 lists many of the noise sources that are involved in transit projects. The right-hand column of the table indicates whether or not each source is a major contributor to overall noise impact. Note that some noise sources, such as track maintenance equipment, create high noise levels but are not indicated as "major." Although such sources are loud, they rarely stay in a neighborhood for more than a day or two; therefore, the overall noise exposure is relatively minor. Computations are required for all major noise sources in this table. The computations for the three basic groups – fixed-guideway sources, highway/transit sources, and stationary sources – appear in separate sections below.

6.2.1 Fixed-Guideway Sources

This section describes the computation of project noise at 50 feet from fixed-guideway sources of transit noise, identified in the second column of Table 6-2.

Step 1: Source SELs at 50 feet

For each major fixed-guideway noise source, first determine the reference SEL at 50 feet, either by measurement or by table look-up. Table 6-3 provides guidance on which method is preferred for each source type. A "NO" implies that the source levels are based on a solid and consistent data base; a "YES" means that a solid data base is not available. In general, measurements are preferred for source types that vary significantly from project to project, including any emerging technology sources. Table look-up is adequate for source types that do not vary significantly from project to project. In general, table look-up is adequate for fewer source types during Detailed Noise Analysis than during General Noise Assessment where less precision is acceptable.

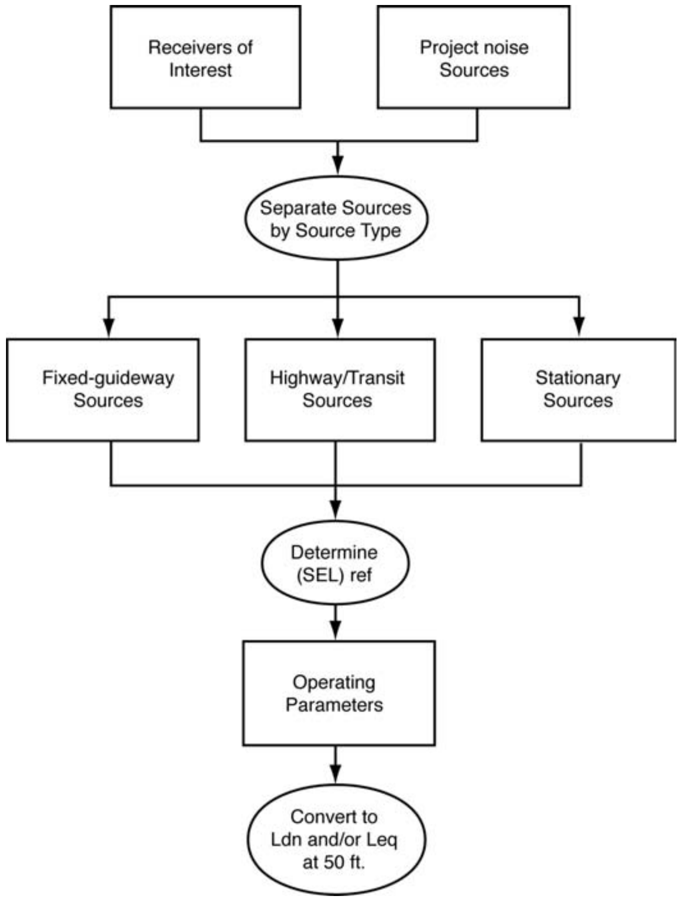

Figure 6-3. Flow Diagram for Determining Project Noise at 50 ft

For sources where measurements are indicated in Table 6-3, Appendix E discusses measurement procedures and conversion of these measurements to the reference conditions of Table 6-3. These procedures have been placed in an appendix because of their relative complexity. For projects where source-noise specifications have been defined (e.g., noise limits are usually included in the specifications for purchase of new transit vehicles), these specifications may be used instead of measurements, after conversion to reference conditions with the equations of Appendix E. This would only be appropriate where there is a firm commitment to adopt the noise specifications in the vehicle procurement documents during final design and adhere to the specifications throughout the procurement, delivery and testing of the vehicles.

For sources where table look-up is indicated in Table 6-3, the table provides appropriate Source Reference SELs. Approximate L_{max} values also appear in the table for general user information and for comparison with factors such as the noise limits that are included in transit vehicle specifications. As discussed in Chapter 2, L_{max} is not used directly in the evaluation of noise impact.

Table 6-2. Sources of Transit Noise

Project Type	Source Type	Actual Source	Major?
Commuter Rail Light Rail Rail Rapid Transit	Fixed-Guideway	Locomotive and rail car passbys	YES
		Horns and whistles	YES
		Crossing signals	YES
		Crossovers/switches	YES
		Squeal on tight curves	YES
		Track-maintenance equipment	NO
	Stationary	Substations	YES
		Chiller plants	NO
Busways Bus Transit Malls	Highway/Transit	Bus passbys	YES
		Buses parking	NO
	Stationary	Buses idling	YES
Automated Guideway Transit Monorail	Fixed-Guideway	Vehicle passbys	YES
	Miscellaneous	Line equipment	NO
Terminals Stations Transit Centers	Fixed-Guideway	Locomotive and rail car passbys	YES
		Crossovers/switches	YES
		Squeal on tight curves	YES
	Highway/Transit	Bus passbys	YES
		Buses parking	NO
		Automobile passbys	NO
	Stationary	Locomotives idling	YES
		Buses idling	YES
		Ferry boats landing, idling and departing at dock	YES
		HVAC equipment	NO
		Cooling towers	NO
		P/A systems	NO
Park-and-Ride Lots	Highway/Transit	Bus passbys	YES
		Buses idling	YES
		Automobile passbys	NO
	Stationary	P/A systems	NO
Traffic Diversion Projects	Highway/Transit	Highway vehicle passbys	YES
Storage Facilities Maintenance Facilities	Fixed-Guideway	Locomotive and rail car passbys	YES
		Locomotives idling	YES
		Squeal on tight curves	YES
		Horns, warning signals, coupling/ uncoupling, auxiliary equipment, crossovers/ switches, brake squeal and air release	YES
	Highway/Transit	Bus passbys	YES
	Stationary	Buses idling	YES
		Yard/shop activities	NO
		Car washes	NO
		HVAC Equipment	NO
		P/A Systems	NO

Table 6-3. Source Reference SELs at 50 Feet: Fixed-Guideway Sources @ 50 mph			
Source	**Reference SEL (dBA)**	**Approximate L_{max} (dBA)**	**Prefer Measurements?**
Rail Cars	82	80	NO
Locomotives – Diesel	92	88	NO
Locomotives – Electric	90	86	NO
Diesel Multiple Unit (DMU)	85	81	YES
AGT - Steel Wheel	80	78	YES
AGT - Rubber Tire	78	75	YES
Monorail	82	80	YES
Maglev	72	70	YES
Transit Car Horns (Emergency)	93	90	NO
Transit Car Whistles	81	78	NO
Locomotive Horns			
At Grade Crossing	113	110	NO
From Crossing to 1/8 mile	113-3*(D_p/660)	110	
From 1/8 mile to ¼ mile	110	110	
D_p = distance from grade crossing parallel to tracks			

Step 2: Conversion to Noise Exposure at 50 feet

Step 1 results in reference SELs at 50 feet. Step 2 is to convert from these reference SELs to noise exposure based on operating conditions and parameters such as train consists, speed, and number of trains per hour. The steps are:

1. Identify operating conditions. Trains with different consists require separate conversion since they will produce different noise exposure. The same is true for trains at different speeds, or under different operating conditions. As guidance here, the following percentage changes in operating conditions will produce an approximate 2-decibel change in noise exposure:

   - 40 percent change in number of locomotives or cars per train
   - 40 percent change in number of trains per hour
   - 40 percent change in number of trains per day, or per night (for computation of L_{dn})
   - 15 percent change in train speed
   - Change of one notch in diesel locomotive throttle setting (e.g. from notch 5 to notch 6)

   In general, where operating conditions change by these amounts, separate calculations should be made. Without separate conversions, the risk is that the results may not be accurate enough.

2. Establish relevant time periods. For each of these source types/conditions, decide what are the relevant time periods for all receivers that may be affected by this source. For residential receivers, the two time periods of interest for computation of L_{dn} are: daytime (7 am to 10 pm) and nighttime

(10 pm to 7 am). If the source will affect non-residential receivers, choose the loudest project hour during noise-sensitive activity. Several different hours may be of interest for non-residential receivers depending on the hours the facility is used.

3. Collect input data.
   - Source reference SELs for locomotives, rail cars, and warning horns.
   - N_{cars}, the number of rail cars in the train.
   - N_{locos}, the number of locomotives in the train, if any.
   - *S*, the train speed, in miles per hour.
   - *T*, the average throttle setting of the train's locomotive(s), if it is diesel-electric.[1] If this input is not available, assume a throttle setting of 8.
   - For residential receivers of interest:

     V_d, the average hourly train volume during daytime hours (equals the total number of train passbys between 7 am and 10 pm, divided by 15), and

     V_n, the average hourly train volume during nighttime hours (equals the total number of train passbys between 10 pm and 7 am, divided by 9).
   - For non-residential receivers: *V*, the hourly train volume for each hour of interest.
   - Track type (continuously welded or jointed) and profile (at-grade or elevated).

4. Calculate L_{eq} at 50 ft for each hour of interest.
   - Compute $L_{eqL}(h)$ for the locomotive(s) using the first equation in Table 6-4.
   - Compute $L_{eqC}(h)$ for the rail car(s) using the second equation in Table 6-4. Use the adjustments indicated in the table, as needed.
   - Compute $L_{eqH}(h)$ for the train horn using the third equation in Table 6-4.
   - Compute the total $L_{eq}(h)$ using the fourth equation in Table 6-4. Two totals may be necessary: one with the warning horn and one without it. These will pertain to different neighborhoods along the corridor, depending upon whether the horn is sounded in that neighborhood or not.

5. Compute L_{dn} at 50 ft. If the project noise will affect any residential receivers, compute the total train L_{dn} from the fifth equation in Table 6-4. Again two totals may be necessary: one with the warning horn and one without it, as explained above.

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1 Otherwise, this term is not applicable and should be omitted from the equation in Table 6-4.

Table 6-4. Computation of L_{eq} and L_{dn} at 50 feet: Fixed-Guideway Sources	
LOCOMOTIVES† Hourly L_{eq} at 50 ft:	$L_{eqL}(h) = SEL_{ref} + 10\log(N_{locos}) + C_T + K\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$ $where C_T = \begin{cases} 0 & for T < 6 \\ 2(T-5) & for T \geq 6 \end{cases}$ $and\ K = -10\ for\ passenger\ diesel; = 0\ for\ DMU; = +10\ for\ electric$
AIL VEHICLES†† Hourly L_{eq} at 50 ft:	$L_{eqC}(h) = SEL_{ref} + 10\log(N_{cars}) + 20\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$ use the following adjustments as applicable: + 5 → JOINTED TRACK + 3 → EMBEDDED TRACK ON GRADE + 4 → AERIAL STRUCTURE WITH SLAB TRACK
LOCOMOTIVE WARNING HORNS††† Hourly L_{eq} at 50 ft:	$L_{eqH}(h) = SEL_{ref} + 10\log(V) - 35.6$
TRANSIT WARNING HORNS††† Hourly L_{eq} at 50 ft:	$L_{eqH}(h) = SEL_{ref} - 10\log\left(\frac{S}{50}\right) + 10\log(V) - 35.6$
COMBINED Hourly L_{eq} at 50 ft:	$L_{eq}(h) = 10\log\left[10^{\left(L_{eqL}/10\right)} + 10^{\left(L_{eqC}/10\right)} + 10^{\left(L_{eqH}/10\right)}\right]$
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = L_{eq}(h)\Big\|_{v=v_d}$
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = L_{eq}(h)\Big\|_{v=v_n}$
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\cdot 10^{\left(L_{eq}(day)/10\right)} + (9)\cdot 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$

N_{locos} = average number of locomotives per train
N_{cars} = average number of cars per train
T = average throttle setting of diesel-powered locomotives and DMU's
S = train speed, in miles per hour
V = average hourly volume of train traffic, in trains per hour
V_d = average hourly daytime volume of traffic, in trains per hour

$$= \frac{number\ of\ trains, 7am\ to\ 10pm}{15}$$

V_n = average hourly nighttime volume of train traffic, in trains per hour

$$= \frac{number\ of\ trains, 10pm\ to 7am}{9}$$

† Assumes a passenger diesel locomotive power rating of approximately 3000 hp
†† Includes all commuter rail cars, transit cars, AGT and monorail
††† Based on FRA's horn noise model (www.fra.dot.gov/downloads/RRDev/hornmodel.xls)

Example 6-1. Computation of L_{eq} and L_{dn} at 50 feet for Fixed-Guideway Source

A commuter train with 1 diesel locomotive and 6 cars will pass close to a residential area at a grade crossing. For this project source,

SEL_{ref}	=	92 for locomotives,
	=	82 for rail cars,
	=	113 for locomotive warning horns at grade crossing

In addition,

N_{cars}	=	6
N_{locos}	=	1
S	=	43 mph
T	=	8
V_d	=	(40 trains)/(15 hours)= 2.667 trains per hour, and
V_n	=	(2 trains)/(9 hours) = 0.222 trains per hour.

The track is also jointed in this vicinity. Using Table 6-4, the resulting daytime L_{eq}'s at 50 feet are as follows:

L_{eqL}(day)	=	67.3 for locomotives,
L_{eqC}(day)	=	62.1 for cars, and
L_{eqH}(day)	=	81.7 for horns.
Total L_{eq}(day)	=	81.9 in neighborhoods where the horn is sounded, and
	=	69.3 in neighborhoods where it is not.

Using Table 6-4, the resulting nighttime L_{eq}'s at 50 feet are as follows:

L_{eqL}(night)	=	56.5 for locomotives,
L_{eqC}(night)	=	51.3 for cars, and
L_{eqH}(night)	=	70.9 for horns,
Total L_{eq}(night)	=	71.1 with horns, and
	=	57.6 without horns.

Finally, this total day and night traffic results in:

L_{dn}	=	81.6 at 50 ft in neighborhoods where horns are sounded, and
	=	68.7 at 50 ft in neighborhoods where they are not.

(Note: Computation results should always be rounded to the nearest decibel at the end of the computation. In all examples of this chapter, however, the first decimal place is retained in case readers wish to precisely match their own computations against the example computations.)

End of Example 6-1

6.2.2 Highway/Transit Sources

This section describes the computation of project noise at 50 feet for highway/transit sources, identified in the second column of Table 6-2. This method is based on the original FHWA highway noise prediction model, with updated noise emission levels.[(1)] This model can be used because the vehicle equations are applicable to speeds typical of freely-flowing traffic on city streets and access roads. In Chapter 3 there is a discussion of specific types of projects and conditions for which the FHWA procedures should be used, including TNM, the currently approved highway noise prediction model.

Step 1: Source SELs at 50 feet

Determine the source reference SEL at 50 feet for each "major" highway/transit source near a receiver of interest. As indicated in the fourth column of Table 6-5, it is usually adequate to use the standard Reference SELs of Table 6-5 for highway/transit sources. If measurements are chosen, however, Appendix E discusses the measurement procedures, plus procedures for the conversion of these measurements to reference conditions of Table 6-5. These measurement/conversion procedures have been placed in an appendix because of their relative complexity.

Table 6-5. Source Reference SELs at 50 Feet: Highway/Transit Sources @ 50 mph.

Source	Reference SEL (dBA)	Approximate L_{max} (dBA)	Prefer Measurements?
Automobiles	74	70	No
Buses (diesel)	82	79	No
Buses (electric trolleybus)	80	77	No
Buses (hybrid)[i]	83	80	Yes

[i]Hybrid bus with full-time diesel engine and electric drive motors.

Step 2: Conversion to Noise Exposure

Convert the source reference SELs at 50 feet to actual operating conditions such as actual vehicle speed and number of vehicles per hour. Next convert to noise exposure using the following steps:

1. Identify actual source operating conditions. Noise emission from most transit buses does not depend significantly upon whether the buses are accelerating or cruising. On the other hand, accelerating suburban buses are significantly louder than are cruising suburban buses. For this reason, suburban buses require separate conversion along roadway stretches where they are accelerating. Separate conversion is also needed for all highway/transit vehicles at different speeds, since speed affects noise emissions. As guidance here, the following percentage changes in operating conditions will produce an approximate 2-decibel change in noise exposure:

    - 40 percent change in number of vehicles per hour
    - 40 percent change in number of vehicles per day, or per night (for computation of L_{dn})
    - 15 percent change in vehicle speed.

    In general, where operating conditions change by these amounts, separate conversions should be made.

2. <u>Establish relevant time periods</u>. For each of these source types/conditions, decide what are the relevant time periods for all receivers that may be affected by this source. If the source will affect residential receivers, two time periods are of interest to compute L_{dn}: daytime (7 am to 10 pm) and nighttime (10 pm to 7 am). In addition, if the source will affect non-residential receivers, choose the loudest facility hour during noise-sensitive activity. Several different hours may be of interest for non-residential receivers, depending on the hours the facility is used.

3. <u>Collect input data</u>. Gather the following information:
   - Source reference SELs for the vehicle types of concern.
   - *S*, the average running speed in miles per hour.
   - For residential receivers of interest:

     V_d, the average hourly vehicle volume during daytime hours (equals the total number of vehicle passbys between 7 am and 10 pm, divided by 15), and

     V_n, the average hourly vehicle volume during nighttime hours (equals the total number of vehicle passbys between 10 pm and 7 am the next day, divided by 9).
   - For non-residential receivers of interest: *V*, the hourly vehicle volume for each hour of interest, in vehicles per hour.

4. <u>Calculate L_{eq} at 50 ft for each hour of interest</u>. Compute $L_{eq}(h)$ for the vehicle type using the first equation in Table 6-6.

5. <u>Compute L_{dn} at 50 ft</u>. If this vehicle type will affect any residential receivers, compute the total L_{dn} for the vehicle type using the fourth equation in Table 6-6.

Table 6-6. Computation of L_{eq} and L_{dn} at 50 feet: Highway/Transit Sources

Hourly L_{eq} at 50 ft:	$L_{eq}(h) = SEL_{ref} + 10\log(V) + C_{emissions} - 10\log\left(\frac{S}{50}\right) - 35.6$
Daytime L_{eq} at 50 ft:	$L_{eq}(day) = L_{eq}(h)\Big\vert_{v=v_d}$
Nighttime L_{eq} at 50 ft:	$L_{eq}(night) = L_{eq}(h)\Big\vert_{v=v_n}$
L_{dn} at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$
Noise Emissions	$C_{emissions}$ $= 25\times\log\left(\frac{S}{50}\right)$ $\rightarrow$ buses $= 1.6$ $\rightarrow$ accelerating 3-axle commuter buses $= 40\times\log\left(\frac{S}{50}\right)$ $\rightarrow$ automobiles
Other adjustments	-3 $\rightarrow$ automobiles, open-graded asphalt +3 $\rightarrow$ automobiles, grooved pavement

V = hourly volume of vehicles of this type, in vehicles per hour

V_d = average hourly daytime volume of vehicles of this type, in vehicles per hour

$$= \frac{total\,vehicle\,volume, 7am\,to\,10pm}{15}$$

V_n = average hourly nighttime volume of vehicles of this type, in vehicles per hour

$$= \frac{total\,vehicle\,volume, 10pm\,to\,7am}{9}$$

S = average vehicle speed in miles per hour (distance divided by time, excluding stop time at red lights)

Note: Idling buses appear under Stationary Sources.

Example 6-2. Computation of L_{eq} and L_{dn} at 50 feet for Highway/Transit Source

A bus route with city buses will pass close to a school that is in session from 8 am to 4 pm on weekdays. Within this time period, the hour of greatest activity for this bus route is 8 am to 9 am. For this project source,

SEL_{ref} = 82 dB
S = 40 mph, and
V = 30 buses per hour

Using Table 6-6, the resulting hourly L_{eq} at 50 ft = 59.7 dB.
(Note: Computation results should always be rounded to the nearest decibel at the end of the computation.)

Continuing the example, this same bus also passes close to a residential area. For this project source, SEL_{ref} is the same as above, as is S. In addition,

V_d = (200 buses)/(15 hours) = 13.33 buses per hour, and
V_n = (20 buses)/(9 hours) = 2.22 buses per hour.

Using Table 6-6, the resulting L_{eq}'s at 50 ft are as follows:

L_{eq}(day) = 56.2 dB and
L_{eq}(night) = 48.4 dB.

Finally, the total day and night traffic results in L_{dn} at 50 ft = 57.2 dB.

End of Example 6-2

6.2.3 Stationary Sources

This section describes the computation of project noise at 50 feet for stationary sources of transit noise, identified in the second column of Table 6-2.

Step 1: Source SELs at 50 feet

Determine the reference SEL at 50 feet for each major source, either by measurement or by table look-up. Table 6-7 provides guidance on which method is preferred for each source type. In general, measurements are preferred for source types that vary significantly from project to project. For example, curve squeal is highly variable depending on weather conditions, curve radius, and train speed. In general, a standard steel wheel on steel rail system will tend to initiate curve squeal at curves with radii less than 100 time the truck wheelbase. Table look-up is adequate for source types that do not vary significantly from project to project (crossing signals, for example). Ferry boat landings are included in the stationary source category because the noise from the landing remains in one area even though the boats move in and out.

Table 6-7. Source Reference SELs at 50 Feet: Stationary Sources

Source	Reference SEL (dBA)	Approximate L_{max} (dBA)	Prefer Measurements?
Auxiliary Equipment	101	65	YES
Locomotive Idling	109	73	NO
Rail Transit Idling	106	70	NO
Buses Idling	111	75	NO
Ferry Boat Landing, Idling and Departing	91	78	NO
Ferry Boat Fog Horn	90	84	NO
Track Crossover	100	90	NO
Track Curve Squeal	136	100	YES
Car Washes	111	75	YES
Crossing Signals	109	73	NO
Substations	99	63	NO

For sources where measurements are indicated in Table 6-7, Appendix E discusses the measurement procedures, plus procedures for the conversion of these measurements to the reference conditions of Table 6-7.

For most sources where table look-up is indicated in Table 6-7, the table provides appropriate reference SELs for one typical noise event at 50 feet and of 1-hour duration (3600 seconds). For ferry boats and fog horns, the reference SELs are for one typical noise event at 50 feet. Approximate L_{max} values are also given in the table for general user information.

Layover facilities and transit centers can be the sources of low-frequency noise from idling diesel engines. Sounds with considerable low-frequency components can cause greater annoyance than would be expected based on their A-weighted levels. Low-frequency sounds often cause windows and walls to vibrate resulting in secondary effects in buildings such as rattling of dishes in cupboards and wall-mounted pictures. The SEL's in Table 6-7 are adjusted to include a factor to take increased annoyance into account. However, for a detailed analysis at locations where such idling takes place for an extended period, the method described in ANSI Standard S12.9-Part 4, Annex D, should be used.[(2)]

Step 2: Conversion to Noise Exposure at 50 feet

Step 1 results in reference SELs at 50 feet. Step 2 is to convert from these reference SELs to actual operating conditions, such as actual event durations and numbers of events, and calculate noise exposure at 50 ft. The steps are:

1. Identify actual source durations and numbers of events. The following percentage changes in durations/numbers will produce an approximate 2-decibel change in noise exposure:

    - 40 percent change in event duration (e.g. from 30 to 42 minutes)
    - 40 percent change in number of events per hour (e.g. from 10 to 14 events per hour).

    In general, where durations/numbers change by these amounts, separate conversions should be made.

2. Establish relevant time periods. For each source, determine the relevant time periods for all receivers that may be affected by the source. For residential receivers, the two time periods of interest to compute L_{dn} are: daytime (7 am to 10 pm) and nighttime (10 pm to 7 am). If the source will affect non-residential receivers, choose the loudest facility hour during noise-sensitive activity.

3. Collect input data. Gather the following input information:
    - Source reference SELs for each relevant source.
    - E, the average duration of one event, in seconds.
    - For residential receivers of interest:

        N_d, the average number of events per hour that occur during the daytime (equals the total number of events between 7 am and 10 pm, divided by 15), and

        N_n, the average number of events per hour that occur during the nighttime (equals the total number of events between 10 pm and 7 am, divided by 9).

    - For non-residential receivers of interest: N, the number of events that occur during each hour of interest, in events per hour.

4. Compute L_{eq} at 50 ft. For each hour of interest, compute the L_{eq} for the source using the first equation in Table 6-8.

5. Compute L_{dn} at 50 ft. If this source will affect any residential receivers of interest, compute the total L_{dn} for the source using the fourth equation in Table 6-8.

Table 6-8. Computation of L_{eq} and L_{dn} at 50 feet: Stationary Sources	
Hourly L_{eq} at 50 ft:	$L_{eq}(h) = SEL_{ref} + 10\log(N) + 10\log\left(\frac{E}{3600}\right) - 35.6$
Daytime Leq at 50 ft:	$L_{eq}(day) = L_{eq}(h)\Big\vert_{N=N_d}$
Nighttime Leq at 50 ft:	$L_{eq}(night) = L_{eq}(h)\Big\vert_{N=N_n}$
Ldn at 50 ft:	$L_{dn} = 10\log\left[(15)\times 10^{\left(L_{eq}(day)/10\right)} + (9)\times 10^{\left(L_{eq}(night)+10/10\right)}\right] - 13.8$

E[†] = duration of one event, in seconds
N = number of events of this type that occur during one hour
N_d = hourly average number of events of this type that occur during daytime (7am to 10pm)
$= \frac{number that occur between 7am and 10pm}{15}$
N_n = hourly average number of events of this type that occur during nighttime (10pm to 7am)
$= \frac{number that occur between 10pm and 7am}{9}$
[†] Omit the term containing E for ferry boat and fog horn and crossover noise sources

Example 6-3. Computation of L_{eq} and L_{dn} at 50 feet for Stationary Source

A signal crossing lies close to a school that is in session from 8 am to 4 pm on weekdays. Within this time period, the hour of greatest activity for the signal crossing is 8am to 9am. For this project source,

SEL_{ref}	=	109 dB
E	=	25 seconds (counting both cycles of the signal), and
N	=	22

Using Table 6-8 the resulting $L_{eq}(h)$ = 65.2 from 8 to 9 am. (Computation results should always be rounded to the nearest decibel at the end of the computation.)

This same signal crossing lies close to a residential area. For this project source, SEL_{ref} is the same as above, as is E. In addition,

N_d	=	(200)/(15 hours) = 13.3 events per hour, and
N_n	=	(12)/(9 hours) = 1.33 events per hour.

Using Table 6-8, the resulting daytime and nighttime L_{eq}'s are:

L_{eq}(day)	=	63.0 and
L_{eq}(night)	=	53.0.

Finally, using the fourth equation in Table 6-8, the resulting L_{dn} at 50 feet = 63.0 dB.

End of Example 6-3

6.3 PROPAGATION CHARACTERISTICS

Once estimates of noise exposure at 50 feet from each source are available, then propagation characteristics must be taken into account to compute the noise exposure at receivers of interest. The steps, shown in Figure 6-4, for this are: 1) determine the propagation characteristics between each source and the receiver of interest; then, 2) draw a noise exposure-vs.-distance curve outward from each relevant source as a function of distance; and 3) add a final adjustment using the appropriate shielding term based on intervening barriers between source and receiver.

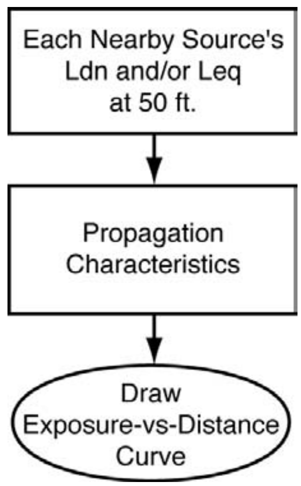


Figure 6-4. Flow Diagram for Determining Project Noise at Receiver Location

6.3.1 Noise Exposure vs. Distance

The following steps result in a noise exposure-vs.-distance curve for each project source:

1. Draw several approximate topographic sections, each perpendicular to the path of moving sources or outward from point sources, similar to those shown in Figure 6-5. Draw separate sections, if necessary, to account for significant changes in topography. Use judgment here to prevent an extreme number of different topographic sections. Often, several typical sections will suffice throughout the transit corridor.

2. For each topographic section, use the relationship illustrated in Figure 6-5 to determine the effective path height, H_{eff}, and from it the Ground Factor, G. Larger Ground Factors mean larger amounts of ground attenuation with increasing distance from the source. As shown in the figure, the effective path height depends upon source heights, which are standardized at the bottom of the figure, and upon receiver heights, which can often be taken as 5 feet for both outdoor receivers and first-floor receivers. With these standard heights, only one H_{eff} (and therefore one Ground Factor)

results from each cross section. For acoustically "hard" (i.e. non-absorptive) ground conditions, G should be taken to be zero.

3. Then for each L_{dn} and each L_{eq} at 50 feet developed earlier in the analysis, plot a noise exposure-vs.-distance curve with L_{dn} or L_{eq} represented on the vertical axis and distance on the horizontal axis using one of the following equations:

L_{dn} or L_{eq}

$$= (L_{dn} or L_{eq})\Big|_{at\,50\,ft} - 20\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{50}\right)$$

for stationary sources

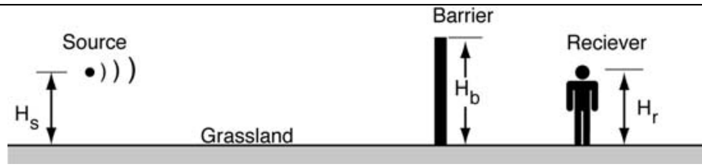
$$= (L_{dn} or L_{eq})\Big|_{at\,50\,ft} - 10\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{42}\right)$$

for fixed-guideway rail car passbys

$$= (L_{dn} or L_{eq})\Big|_{at\,50\,ft} - 10\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{29}\right)$$

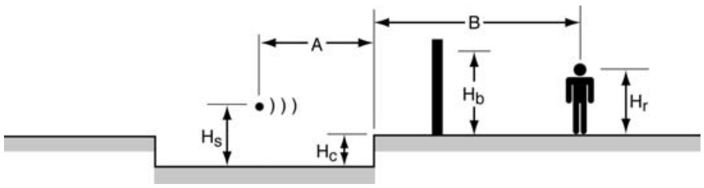
For fixed-guideway locomotive and rubber-tired vehicle passbys, highway vehicle passbys and horns

IN GENERAL: H_{eff} = sum of average path heights on either side of barrier



$$H_{eff} = \frac{H_s + 2H_b + H_r}{2} \qquad (1)$$

Example 1: Source in shallow cut

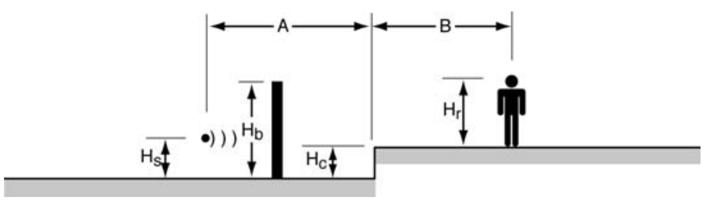


$For B \le A/2,$

$$H_{eff} = \frac{H_S + 2H_b + H_c + H_r}{2}$$

* Otherwise use Equation (1)

Example 2: Receiver elevated



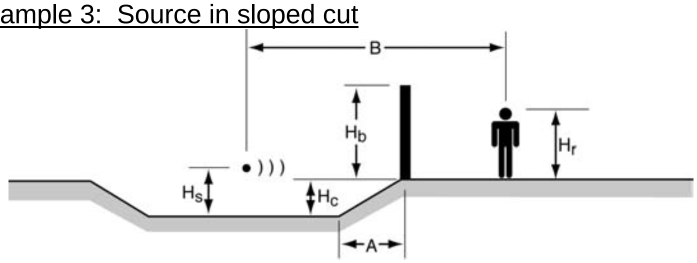
$For H_b \ge H_c,$

$$H_{eff} = \frac{H_s + 2H_b - H_c + H_r}{2}$$

$For H_b \le H_c,$

$$H_{eff} = \frac{H_s + H_c + H_r}{2}$$

Example 3: Source in sloped cut



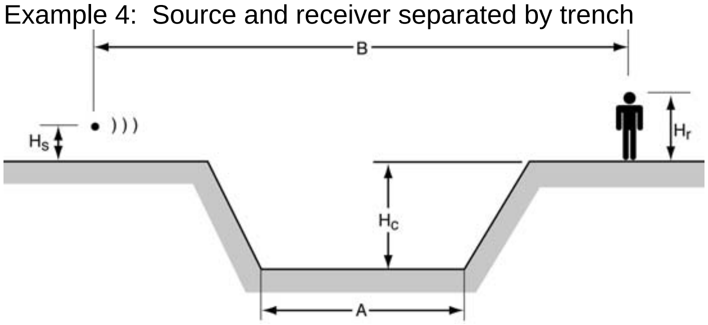
$For A \le B/2,$

use equation (1)

$For A \ge B/2,$

$$H_{eff} = \frac{H_s + 2H_b + H_c + H_r}{2}$$

Example 4: Source and receiver separated by trench



$For A \ge B/2,$

$$H_{eff} = \frac{H_s + 2H_c + H_r}{2}$$

$For A \le B/2,$

$$H_{eff} = \frac{H_s + H_r}{2}$$

Source Heights:

H_s = 8 ft, trains **with** diesel-electric locomotives

2 ft, trains **without** diesel-electric locomotives

0 ft, automobiles

3 ft, 2-axle city buses

8 ft, 3-axle commuter buses

Note: Equations for H_{eff} remain valid even when H_b = 0.

Ground Factor

For soft ground:

$$G = \begin{cases} 0.66 & H_{eff} \le 5 \\ 0.75\left(1 - \frac{H_{eff}}{42}\right) & 5 \le H_{eff} \le 42 \\ 0 & H_{eff} \ge 42 \end{cases}$$

For hard ground:

G=0

Figure 6-5. Computation of Ground Factor G for Ground Attenuation

Example 6-4. Computing Exposure-vs.-Distance Curve for Fixed-Guideway Source

A commuter train will produce the following levels without horn blowing at 50 feet:

L_{eq}(8-9am) = 72 decibels
L_{dn} = 68 decibels.

For sound propagation over grassland with a flat cross-sectional geometry without a noise barrier, and H_R = 5 feet:

H_{eff} = 6.5 feet

and from Figure 6-5 the resulting Ground Factor is:

G = 0.63

Hence the relevant equations from above become:

L_{eq}(8-9am) = 72 _ 10 log(D/50) _ 6.3 log(D/42)
L_{dn} = 68 _ 10 log(D/50) _ 6.3 log(D/42)

Plots of these two equations appear in Figure 6-6. From these curves, the noise levels due to this train operation can be determined for a receiver of interest at any distance. The only factor not accounted for is the effect of shielding between source and receiver, which is the subject of the next section.

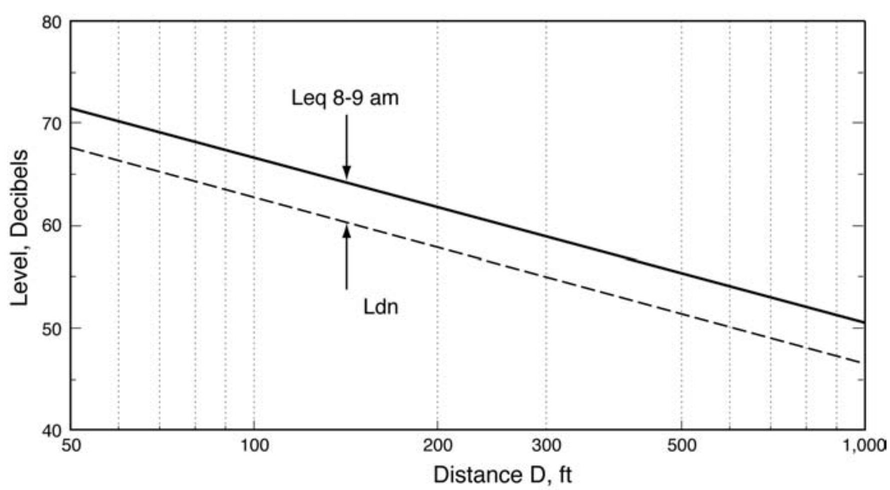


Figure 6-6. Example Exposure-vs.-Distance Curves

End of Example 6-4

6.3.2 Shielding at each Receiver

The resulting L_{eq}'s and L_{dn}'s from the previous section do not include shielding between source and receiver. Such shielding can be due to intervening noise barriers, terrain features, rows of buildings, and dense tree zones. The individual attenuations are computed using the equations from Table 6-9 for barriers and terrain, or from Table 6-10 for rows of buildings and dense tree zones.

The results are attenuation values which are applied to the previously determined project noise at receiver locations (Figure 6-4).

Table 6-9. Computation of Shielding: Barriers and Terrain

Condition	Equation[†]
For ***non-absorptive*** transit barriers within 5 feet of the track:	$A_{barrier} = \min\{12 or [5.3 \times \log(P) + 6.7]\}$
For ***absorptive*** transit barriers within 5 feet of the track:	$A_{barrier} = \min\{15 or [5.3 \times \log(P) + 9.7]\}$
For all other barriers, and for protrusion of terrain above the line of sight:	$A_{barrier} = \min\left\{15 or \left[20 \times \log\left(\frac{2.51\sqrt{P}}{\tanh[4.46\sqrt{P}]}\right) + 5\right]\right\}$
Barrier Insertion Loss	$IL_{barrier} = \max\left\{0 or \left[A_{barrier} - 10(G_{NB} - G_B)\log\left(\frac{D}{50}\right)\right]\right\}$

D = closest distance between the receiver and the source, in feet
P = path length difference, in feet (see figure below)
G_{NB} = Ground factor G computed *without barrier* (see Figure 6-5)
G_B = Ground factor G computed *with barrier* (see Figure 6-5)

† The term "tanh(variable)" stands for hyperbolic tangent, available on many scientific calculators. If "tanh" is not available, then compute E = exp(variable), and set tanh(variable) = (E - 1/E) / (E + 1/E), where exp(variable) is the "exponential" function, also written as e^x on calculator keypads.

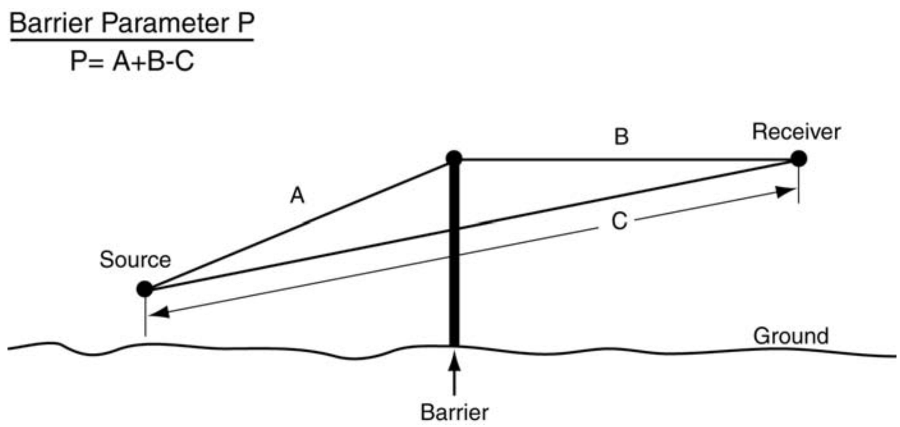


Figure 6-7. Sketch Showing Noise Barrier Parameter "P"

Table 6-10. Computation of Shielding: Rows of Buildings and Dense Tree Zones	
Condition	**Equation**
If gaps in the row of buildings constitute less than 35 percent of the length of the row:	$A_{buildings} = \min\{10 or [1.5(R-1)+5]\}$
If gaps in the row of buildings constitute between 35 and 65 percent of the length of the row:	$= \min\{10 or [1.5(R-1)+3]\}$
If gaps in the row of buildings constitute more than 65 percent of the length of the row:	= 0
Where at least 100 feet of trees intervene between source and receiver, *and* if no clear line-of-sight exists between source and receiver, *and* if the trees extend 15 feet or more above the line-of-sight:	$A_{trees} = \min\left\{10 or \frac{W}{20}\right\}$
If above conditions do not occur:	= 0
R = number of rows of houses that intervene between source and receiver W = width of the tree zone along the line-of-site between source and receiver, in feet	
NET ATTENUATION	$A_{shielding} = \max\{IL_{barrier} or A_{buildings} or A_{trees}\}$

Example 6-5. Computation of Shielding

Intervening between the rail corridor and a receiver of interest is the following shielding:

(1) a 15-foot high noise barrier, 40 feet from the closest track and 130 feet from the 5-foot-high receiver, and
(2) a dense tree zone 100 feet thick. The source height H_S = 8 feet, per Figure 6-5.

For the barrier: A = 40.61 feet, B = 130.38 feet, C = 170.03 feet, and therefore P = 0.96 feet, according to Table 6-9.

From Figure 6-5,

H_{eff} (no barrier) = 6.5 feet and
H_{eff} (with barrier) = 21.5 feet,

which results in
G_{NB} = 0.63, and
G_B = 0.37.

From Table 6-9, the resulting barrier attenuation is

$$\begin{aligned} A_{barrier} &= \min\{15 \textit{ or } 20x\log[2.45/\tanh(4.37)]+5\} \\ &= \min\{15 \textit{ or } 12.8\} \\ &= 12.8 \text{ dB} \end{aligned}$$

and the resulting barrier Insertion Loss is

$$\begin{aligned} IL_{barrier} &= 12.8 - 10(0.63-0.37)x\log(170/50) \\ &= 12.8 - 1.4 \\ &= 11.4 \text{ decibels.} \end{aligned}$$

For the tree zone: The attenuation is estimated to be 5 decibels using Table 6-10. The total shielding is the maximum of the barrier and tree zone shielding, i.e. 11.4 decibels. (Computation results should always be rounded to the nearest decibel at the end of the calculation.)

End of Example 6-5

6.3.3 Combined Propagation Characteristics

The result of combining shielding with geometrical spreading and ground effects involves subtracting the attenuation values obtained from Tables 6-9 and 6-10 from the noise exposure values obtained in Section 6.3.1 at the receiver location.

	$= (L_{dn} or L_{eq})\Big\vert_{at\,50\,ft} - 20\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{50}\right) - A_{shielding}$	$\rightarrow$ for stationary sources
L_{dn} or L_{eq}	$= (L_{dn} or L_{eq})\Big\vert_{at\,50\,ft} - 10\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{42}\right) - A_{shielding}$	$\rightarrow$ for fixed-guideway rail car passbys
	$= (L_{dn} or L_{eq})\Big\vert_{at\,50\,ft} - 10\log\left(\frac{D}{50}\right) - 10G\log\left(\frac{D}{29}\right) - A_{shielding}$	$\rightarrow$ for fixed-guideway locomotive and rubber-tired vehicle passbys, highway vehicle passbys and horns

6.4 COMBINED NOISE EXPOSURE FROM ALL SOURCES

Once propagation adjustments have been made for the noise exposure from each source separately, then the sources must be combined to predict the total project noise at the receivers. Table 6-11 contains the equations for combining sources. Total noise exposure is used in Section 6.7 to assess the transit noise at each receiver of interest.

Table 6-11. Computing Total Noise Exposure	
Total L_{eq} from All Sources Combined, for the hour of interest:	$L_{eq}(total) = 10\log\left(\sum_{allsources} 10^{L_{eq}/10}\right)$
Total L_{dn} from All sources Combined:	$L_{dn}(total) = 10\log\left(\sum_{allsources} 10^{L_{dn}/10}\right)$

Example 6-6. Computation of Total Exposure from Combined Sources

A commuter train operation produces the following levels at a certain receiver of interest:

L_{eq}(8-9am) = 72 decibels, and
L_{dn} = 68 decibels.

At this same receiver, a light rail system produces the following levels:

L_{eq}(8-9am) = 69 decibels, and
L_{dn} = 70 decibels.

No other project sources affect this receiver. Using Table 6-11, the receiver's total noise exposures are therefore:

L_{eq}(8-9am, total) = 73.8 decibels, and
L_{dn}(total) = 72.1 decibels.

(Computation results should always be rounded to the nearest decibel at the end of the calculation.)

End of Example 6-6

6.5 MAXIMUM NOISE LEVEL FOR FIXED-GUIDEWAY SOURCES

The assessment of noise impact in this manual utilizes either the L_{dn} or the L_{eq} descriptor. As such, in determining impact it is not necessary to determine and tabulate the maximum levels (L_{max}). However, it is often desirable to include computations of L_{max} in environmental documents, particularly for rail projects, because the noise from an individual train passby is quite distinguishable from the existing background noise. The L_{max} is also the descriptor used in vehicle specifications. Because L_{max} represents the sound level heard during a transportation vehicle passby, people can relate this metric with other noise experienced in the environment. Particularly with rail transit projects, it is representative of what people hear at any particular instant and can be measured with a sound level meter. A comparison of L_{max} with other sources can be made by referring to Figure 2-11. Thus, although L_{max} is not used in this manual as a basis for assessing noise impact, it can provide people with a more complete description of the noise effects of a proposed project and should be reported in environmental documents. Equations for computing L_{max} from SEL are given in Appendix F.

6.6 STUDY AREA CHARACTERISTICS

This section contains procedures to estimate existing noise exposure at each receiver of interest identified previously for use in assessing noise impact. Figure 6-8 shows the flow diagram for estimating ambient noise. First decide whether to measure noise exposure, to compute it from partial measurements, or to estimate it from the table provided in this chapter. Different methods may be used at different receivers along the project. Finally, make the measurements, computations or estimates of the ambient noise at each receiver of interest.

6.6.1 Deciding Whether to Measure, Compute, or Estimate

In general, it is better to measure existing noise than to compute or estimate it. Measurements are more precise than computations and estimates and therefore lead to more precise conclusions concerning noise impact. However, measurements are expensive, are often thwarted by weather, and take significant time in the field. So the choice between measurements and computations/estimates is a choice between the precision of measurements and the convenience of computations/estimates. A mixture of these is generally selected, relying on measurements where the greatest precision is needed.

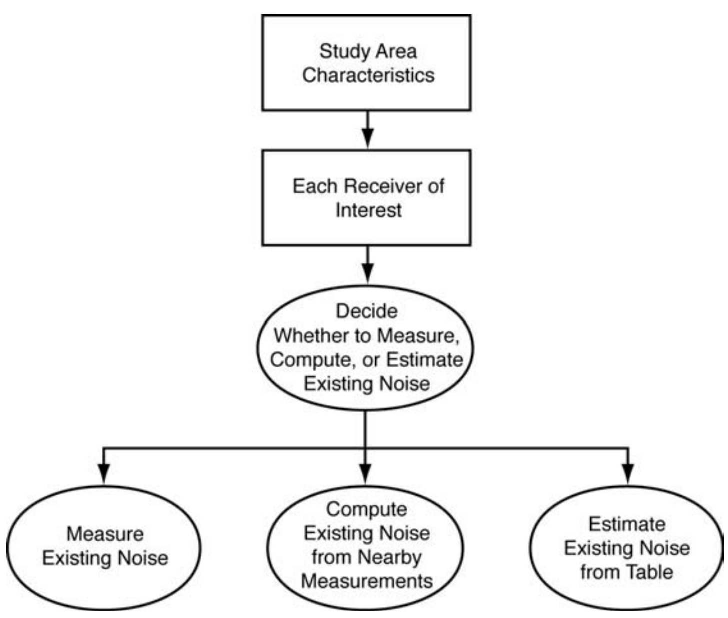


Figure 6-8. Flow Diagram for Determining Existing Noise

A penalty comes along with the convenience of computations and especially of tabular estimates. Because computations/estimates are less precise than measurements, the procedures for them (in Appendix D) are purposely conservative and consequently are inappropriate for the accuracy needed in a Detailed Noise Analysis. When more precise impact projections are desired, measurements must be chosen instead.

The combination of measurements, computations, and estimates depends partly upon the type of land use. For non-residential land uses with daytime use only, it is usually adequate to measure only one hour's ambient L_{eq}, preferably during the hour when project activity is likely to cause the greatest impact. This is relatively easy to measure. On the other hand, in residential areas that are not near major roadways, a full day's ambient L_{dn} is usually required. The following sections describe the approaches to be taken in each case and how to combine the results to characterize the existing ambient conditions.

6.6.2 Noise Exposure Measurements

Full one-hour measurements are the most precise way to determine ambient noise exposure for non-residential receivers. For residential receivers, full 24-hour measurements are most precise. Such full-duration measurements are preferred over other options, where time and study funds allow. The following procedures apply to full-duration measurements:

- For non-residential land uses, measure a full hour's L_{eq} at the receiver of interest, on at least two non-successive weekdays (generally between noon Monday and noon Friday). Select the hour of the day when the maximum project activity is expected to occur.
- For residential land uses, measure a full 24-hours' L_{dn} at the receiver of interest, for a single weekday (generally between noon Monday and noon Friday).
- Use judgment in positioning the measurement microphone. Location of the microphone at the receiver depends upon the proposed location of the transit noise source. If, for example, a new rail line will be in front of the house, do not locate the microphone in the back yard. Figure 6-9 illustrates recommended measurement positions for various locations of the project, with respect to the house and the existing source of ambient noise.
- Undertake all measurements in accordance with good engineering practice following guidelines given in ASTM and ANSI standards.[3,4]

6.6.3 Noise Exposure Computations from Partial Measurements

Often measurements can be made at some of the receivers of interest and then these measurements can be used to estimate noise exposure at nearby receivers. In other situations, several hourly L_{eq}'s can be measured at a receiver and then the L_{dn} computed from these. Both of these options require experience and knowledge of acoustics to select representative measurement sites.

Measurements at one receiver can be used to represent the noise environment at other sites, but only when proximity to major noise sources is similar among the sites. For example, a residential neighborhood with otherwise similar homes may have greatly varying noise environments: one part of the neighborhood may be located where the ambient noise is clearly due to highway traffic; a second part, toward the interior of the neighborhood, may have highway noise as a factor but also a significant contribution from other community noise; and a third part located deep into the residential area will have local street traffic and other community activities dominate the ambient noise. In this example, three or more measurement sites would be required to represent the varying ambient noise conditions in a single neighborhood.

Typical situations where representative measurement sites can be used to estimate noise levels at other sites occur when both share the following characteristics:

- proximity to the same major transportation noise sources, such as highways, rail lines and aircraft flight patterns;

- proximity to the same major stationary noise sources, such as power plants, industrial facilities, rail yards and airports;
- similar type and density of housing, such as single-family homes on quarter-acre lots and multi-family housing in apartment complexes.

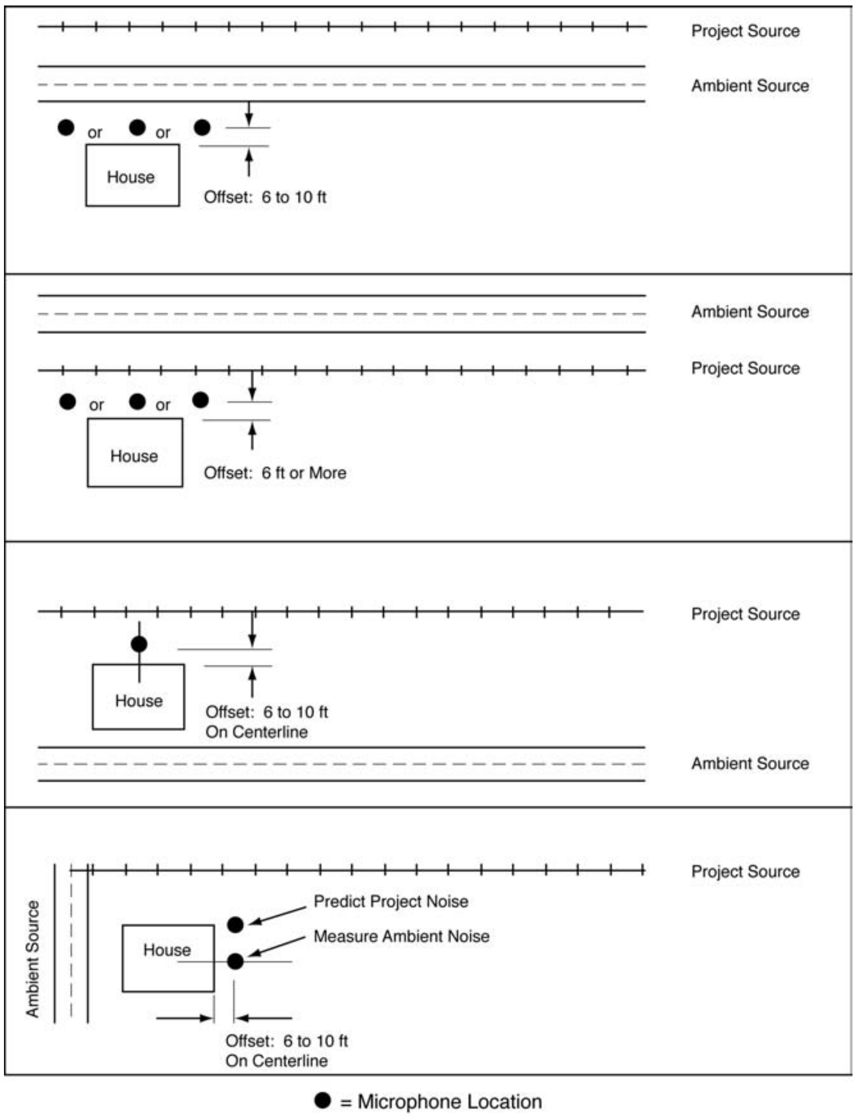


Figure 6-9. Recommended Microphone Locations for Existing Noise Measurements

Acoustical professionals are often adept at such computations from partial data and are encouraged here to use their experience and judgment in fully utilizing the measurements in their computations. Required here is an attempt to somewhat underestimate ambient noise in the process, to account for reduced precision compared to full noise measurements.

On the other hand, people lacking the background in acoustics are encouraged to use the procedures in Appendix D to accomplish this same aim. These procedures are an attempt to systematize such computations from partial measurements. The methods in Appendix D are designed with a safety factor to underestimate ambient noise to account for reduced precision compared to full noise measurements.

6.6.4 Estimating Existing Noise Exposure

The least precise way to determine noise exposure is to estimate it from a table. This method can be used for the General Noise Assessment, but it is not recommended for a Detailed Noise Analysis. However, it can be used in the absence of better data for locations where roadways or railroads are the predominant ambient noise source. Table 5-7 presents these ambient levels. In general, the tabulated values of noise exposure are underestimates. As explained above, underestimates here are intended to compensate for the reduced precision of the estimated ambient levels compared to the options that incorporate full or partial measurements.

Notwithstanding the guidance above, there is one situation where it may be more accurate to estimate rather than measure the existing noise exposure, namely in areas near major airports where aircraft noise is dominant. Because airport noise is highly variable based on weather conditions and corresponding runway usage, it is preferable in such cases to base the existing noise exposure on published aircraft noise contours in terms of Annual Average L_{dn}.

6.7 NOISE IMPACT ASSESSMENT

This section contains procedures for the assessment of project noise impact, utilizing the ambient noise and project noise results from the previous analysis. Two assessment methods are included:

- Rail and Bus Facilities: This category includes all rail projects (e.g., rail rapid transit, light rail transit, commuter rail, and automated guideway transit), as well as fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, substations, etc. Also included are rail transit projects built within a highway or railroad corridor. Certain bus facilities are included in this category, such as bus rapid transit (BRT) on separate roadways and bus operations on local streets and highways where the project does not include roadway construction or modification that significantly changes roadway capacity. The distinguishing feature in all these cases is that the existing noise levels generated by roadway traffic and other sources will not change as a result of the project; therefore the project noise is exclusively due to the new transit sources. For projects like these, FTA is generally the lead agency and the methodology from this manual is the appropriate approach.
- Highway/Transit Projects: Projects in this category involve transit as part of new highway construction or modifications to existing highways to increase carrying capacity. For these multi-

modal projects, the Federal Highway Administration (FHWA) may be a joint lead agency with FTA, and the State department of transportation (DOT) would probably also be participating in the environmental impact assessment. Projects would involve traffic lanes with preferential treatment for buses or high-occupancy vehicles (HOVs). The distinguishing feature here is that the *project* noise includes a combination of highway and transit sources. Examples are: new highway construction providing general-purpose lanes as well as dedicated bus/HOV lanes and lane additions or reconfigurations on existing highways or arterials to accommodate buses/HOVs. These multi-modal projects fall into two sub-categories and the appropriate method to use for noise prediction and impact assessment depends on whether the highway noise dominates throughout day and night or the transit noise dominates during off-peak and late night hours. If sufficient evidence shows that highway noise dominates, the methods of FHWA, including the latest authorized version of the Traffic Noise Model (TNM), should be used. Otherwise both FHWA and FTA prediction procedures should be used along with both sets of impact assessment criteria since the transit mode's greatest impact will likely not occur during the worst traffic hours.

The factors to consider when deciding which sub-category is appropriate for a given project are given in the beginning of Chapter 3.

6.7.1 Assessment for Rail and Bus Facilities

For these types of projects, noise impact is assessed at each receiver of interest using the criteria for transit projects described in Chapter 3. The assessment procedure is as follows:

1. Tabulate existing ambient noise exposure (rounded to the nearest whole decibel) at all receivers of interest from earlier in the analysis. In cases where large residential buildings are exposed to noise on one side only, the receivers on that side are included in the analysis.

2. Tabulate project noise exposure at these receivers from the analytical procedures described in this chapter.

3. Determine the level of noise impact (No Impact, Moderate Impact or Severe Impact) following the procedures in Chapter 3.

4. Document the results in noise-assessment inventory tables. These tables should include the following types of information:

   - Receiver identification and location
   - Land-use description
   - Number of noise-sensitive sites represented (number of dwelling units in residences or acres of outdoor noise-sensitive land)
   - Closest distance to the project

- Existing noise exposure
- Project noise exposure
- Level of noise impact (No Impact, Moderate Impact, or Severe Impact)

These tables should provide a sum of the total number of receivers, especially numbers of dwelling units, predicted to experience Moderate Impact or Severe Impact.

5. Illustrate the areas of Moderate Impact and Severe Impact on maps or aerial photographs. Two methods of impact display are labeling and contouring. In a Detailed Analysis, the most accurate indication of impact is a label attached to each impacted building or cluster identified in the inventory table. A less precise illustration of impacted areas is a plot of project noise contours on the maps or aerial photographs, along with shaded impact areas. This is done by delineating two impact lines: one between the areas of No Impact and Moderate Impact and the second between Moderate Impact and Severe Impact. Such impact contours would be similar to those estimated in the General Assessment of Chapter 5, but with greater precision. As a cautionary note, it is difficult to position noise contours in urban areas due to shielding, terrain features and other propagation anomalies. If noise contours are used, they should be considered illustrative rather than definitive. If desired to conform with the practices of another agency, the contouring may perhaps include several contour lines of constant project noise, such as L_{dn} 65, L_{dn} 70 and L_{dn} 75.

6. Discussion of the magnitude of the impacts is an essential part of the assessment. The magnitude of noise impact is defined by the two threshold curves delineating onset of Moderate Impact and Severe Impact. Interpretation of the two impact regimes is discussed in Chapter 3.

6.7.2 Assessment for Highway/Transit Projects

For most highway/transit projects where highway noise dominates, the FHWA Noise Abatement Criteria should be used, with the exceptions noted in Chapter 3.(5) In general the appropriate calculation method is the current version of FHWA's Traffic Noise Model (TNM). The TNM was first released by FHWA in April 1998 for use on Federal-aid highway projects.(6) TNM is a state of the art computer program used for predicting noise impacts in the vicinity of highways. TNM Version 2.5 was released in April 2004, which includes updates to the User's Guide and Technical Manual.(7)

The program allows for a detailed assessment at each receiver of interest by separately calculating the noise contribution of each roadway segment. For each roadway segment, the noise from each vehicle type is computed from reference energy-mean emission levels, adjusted for:

- Vehicle volume,
- Vehicle speed,
- Grade,
- Roadway segment length, and

- Source-to-receiver distance.

Further adjustments needed to accurately model the sound propagation from source to receiver include:

- Shielding provided by rows of buildings,
- Effects of different ground types,
- Source and receiver elevations, and
- Effect of any intervening noise barriers.

The program sums the noise contributions of each vehicle type for a given roadway segment at the receiver. TNM then repeats this process for all roadway segments, summing their contributions to generate the predicted noise level at each receiver.

6.8 MITIGATION OF NOISE IMPACT

6.8.1 Noise Mitigation Measures

Where the noise impact assessment shows either Severe Impact or Moderate Impact, this section provides guidance on considering and implementing noise reduction measures. In general, mitigation options are chosen from those below, and then portions of the project noise are recomputed and reassessed to account for this mitigation. This allows an accurate prediction of the level of noise reduction. It is important to emphasize that the source levels used in this manual are typical of systems designed according to current engineering practice, but they do not include special noise control features that could be incorporated in the specifications at extra cost. This approach provides a reasonable analysis of conditions without mitigation measures. If special features that result in noise reductions are included in any of the predictions, then the Federal environmental document must include a commitment by the project sponsor to adopt such treatments before the project is approved for construction. Since cost considerations often play into decisions before committing to mitigation, this manual provides general cost information based on data presented in a Transit Cooperative Research Program (TCRP) report.[8] A detailed discussion of mitigation costs is presented in Chapter 5 of the TCRP report, especially the tables included in Chapter 5.

Mitigation of noise impact from transit projects may involve treatments at the three fundamental components of the noise problem: (1) at the noise source, (2) along the source-to-receiver propagation path or (3) at the receiver. Generally, the transit property has authority to treat the source and some elements of the propagation path, but may have little or no authority to modify anything at the receiver.

A list of practical noise mitigation measures that should be considered by project sponsors is summarized in Table 6-12 and discussion of the measures follows. This table is organized according to whether the treatment applies to the source, path or receiver, and includes estimates of the acoustical effectiveness of each treatment.

6.8.2 Source Treatments

Vehicle Noise Specifications (Rail and Bus)

Among the most effective noise mitigation treatments is noise control at the outset, during the specification and design of the transit vehicle. Such source treatments apply to all transit modes. By developing and enforcing stringent but achievable noise specifications, the transit property takes a major step in controlling noise everywhere on the system. It is important to ensure that the noise levels quoted in the specifications are achievable with the application of best available technology during the development of the vehicle and reasonable in light of the noise reduction benefits and costs.

Effective enforcement includes significant penalties for non-compliance with the specifications. The noise mitigation achieved by source treatment depends on the quality of installation and maintenance. In the past, transit vehicles have been delivered that did not meet a noise specification, causing complaints from the public and requiring additional noise mitigation measures applied to the wayside.

Table 6-12. Transit Noise Mitigation Measures

Application	Mitigation Measure		Effectiveness
SOURCE	Stringent Vehicle & Equipment Noise Specifications		Varied
	Operational Restrictions		Varied
	Resilient or Damped Wheels*	For Rolling Noise on Tangent Track:	2 dB
		For Wheel Squeal on Curved Track:	10-20 dB
	Vehicle Skirts*		6-10 dB
	Undercar Absorption*		5 dB
	Spin-slide control (prevents flats)*		**
	Wheel Truing (eliminates wheel flats)*		**
	Rail Grinding (eliminates corrugations)*		**
	Turn Radii greater than 1000 ft*		(Avoids Squeal)
	Rail Lubrication on Sharp Curves*		(Reduces Squeal)
	Movable-Point Frogs (reduce rail gaps at crossovers)*		(Reduces Impact Noise)
	Engine Compartment Treatments (Buses)		6-10 dB
PATH	Sound Barriers close to Vehicles		6-15 dB
	Sound Barriers at ROW Line		3-10 dB
	Alteration of Horiz. & Vert. Alignments		Varied
	Acquisition of Buffer Zones		Varied
	Ballast on At-Grade Guideway*		3 dB
	Ballast on Aerial Guideway*		5 dB
	Resilient Track Support on Aerial Guideway		Varied
RECEIVER	Acquisition of Property Rights for Construction of Sound Barriers		5-10 dB
	Building Noise Insulation		5-20 dB

* Applies to rail projects only

** These mitigation measures work to maintain a rail system in its as-new condition. Without incorporating them into the system, noise levels could increase up to 10 dB.

Stationary Source Noise Specifications

Stringent but achievable noise specifications also represent an effective approach for mitigating noise impact from stationary sources associated with a transit system. Such equipment includes fixed plant equipment (for example, transformers and mechanical equipment) as well as grade-crossing signals. For example, noise impact from grade-crossing signals can be mitigated by specifying equipment that sets the level of the warning signal lower where ambient noise is lower, that minimizes the signal duration, and that minimizes signal noise in the direction of noise-sensitive receivers.

Wheel Treatments (Rail)

A major source of noise from steel-wheel/steel-rail systems is the wheel/rail interaction which has three components: roar, impact and squeal. Roar is the rolling noise caused by small-scale roughness on the wheel tread and rail running surface. Impacts are caused by discontinuities in the running surface of the rail or by a flat spot on the wheels. Squeal occurs when a steel-wheel tread or its flange rubs across the rail, setting up resonant vibrations in the wheel which cause it to radiate a screeching sound. Various wheel designs and other mitigation measures exist to reduce the noise from each of these three mechanisms.

- **Resilient wheels** serve to reduce rolling noise, but only slightly. A typical reduction is 2 decibels on tangent track. This treatment is more effective in eliminating wheel squeal on tight turns; reductions of 10 to 20 decibels for high-frequency squeal noise are typical. The costs for resilient wheels are approximately $3000 per wheel, in comparison to about $700 for standard steel wheels.
- **Damped wheels,** like resilient wheels, serve to reduce rolling noise, but only slightly. A typical reduction is 2 decibels on tangent track. This treatment involves attaching vibration absorbers to standard steel wheels. Damping is effective in eliminating wheel squeal on tight turns; reductions of 5 to 15 decibels for high-frequency squeal noise are typical. The costs for damped wheels add approximately $500 to $1000 to the normal $700 for each steel wheel.
- **Spin-slide control systems,** similar to anti-locking brake systems (ABS) on automobiles, reduce the incidence of wheel flats, a major contributor of impact noise. Trains with smooth wheel treads can be up to 20 decibels quieter than those with wheel flats. To be effective, the anti-locking feature should be in operation during all braking phases, including emergency braking. Wheel flats are more likely to occur during emergency braking than during dynamic braking. The cost of slip-slide control may be incorporated in the new vehicle costs, but may be between $5,000 and $10,000 per vehicle.
- **Maintenance** of wheels by truing eliminates wheel flats from the treads and restores the wheel profile. As discussed above, wheel flats are a major source of impact noise. A good maintenance program includes the installation of equipment to detect and correct wheel flats on a continuing basis. Costs vary according to transit property practices, but the TCRP report identifies a cost for truing wheels at $60 per wheelset.

Vehicle Treatments (Rail and Bus)

Vehicle noise mitigation measures are applied to the various mechanical systems associated with propulsion, ventilation and passenger comfort.

- **Propulsion systems** of transit vehicles include diesel engines, electric motors and diesel-electric combinations. Noise from the propulsion system depends on the type of unit and how much noise mitigation is built into the design. Mufflers on diesel engines are generally required to meet noise specifications; however, mufflers are generally practical only on buses, not on locomotives. Control of noise from engine casings may require shielding the engine by body panels without louvers, dictating other means of cooling and ventilation.
- **Ventilation** requirements for vehicle systems are related to the noise generated by a vehicle. Fan noise often remains a major noise source after other mitigation measures have been instituted because of the need to have direct access to cooling air. This applies to heat exchangers for electric traction motors, diesel engines and air-conditioning systems. Fan-quieting can be accomplished by installation of one of several new designs of quiet, efficient fans. Forced-air cooling on electric traction motors can be quieter than self-cooled motors at operating speeds. Placement of fans on the vehicle can make a significant difference in the noise radiated to the wayside or to patrons on the station platforms.
- The **vehicle body** design can provide shielding and absorption of the noise generated by the vehicle components. Acoustical absorption under the car has been demonstrated to provide up to 5 decibels of mitigation for wheel/rail noise and propulsion-system noise on rapid transit trains. Similarly, vehicle skirts over the wheels can provide more than 5 decibels of mitigation. By carrying their own noise barriers, vehicles with these features can provide cost-effective noise reduction.

Use of Locomotive Horns at Grade Crossings

In cases where commuter rail operations share tracks or rights-of-way with freight or intercity passenger trains that are part of the "general railroad system," the safety rules of the Federal Railroad Administration (FRA) apply. In particular, the rule for the use of locomotive horns at highway-rail grade crossings is in effect.(9) This rule requires generally that horns be sounded at public road crossings, although some exceptions are allowed in carefully defined circumstances. One exception enables the establishment of a "quiet zone" in which certain supplemental safety measures (SSM's) are used in place of the locomotive horn to provide an equivalent level of safety at grade crossings. By adopting an approved SSM at each public grade crossing, a quiet zone of at least a half-mile long can be established. These measures are in addition to the standard safety devices required at most public grade crossings (e.g., stop signs, reflectorized crossbucks, flashing lights with gates that do not completely block travel over the tracks). Below are four SSM's which have been predetermined by the FRA to fully compensate for the lack of a locomotive horn:

- Temporary closure of a public highway-rail grade crossing. This measure requires closure of the grade crossing one period for each 24 hours, and must be closed the same time each day.

- Four-quadrant gate system. This measure involves the installation of at least one gate for each direction of traffic to fully block vehicles from entering the crossing.
- Gates with medians or channelization devices. This measure keeps traffic in the proper travel lanes as it approaches the crossing. This denies the driver the option of circumventing the gates by traveling in the opposing lane.
- One-way street with gates. This measure consists of one-way streets with gates installed so that all approaching travel lanes are completely blocked.

In addition to the pre-approved SSM's, the FRA rule also identifies a range of other measures that may be used in establishing a quiet zone. These could be modified SSM's or non-engineering types of measures, such as increased monitoring by law enforcement for grade crossing violations or instituting public education and awareness programs that emphasize the risks associated with grade crossings and applicable requirements. These alternative safety measures (ASMs) require approval by FRA based on a demonstration that public safety would not be compromised by eliminating the horn.

Locomotive horns are quite loud, and horn noise is often the major contributor in projections of adverse noise impact in the community from proposed commuter rail projects. Since sound barriers are not feasible at highway-rail grade crossings, the establishment of quiet zones may be an attractive option. The lead agency in designating a quiet zone is the local public authority responsible for traffic control and law enforcement on the roads crossing the tracks. In order to satisfy the FRA regulatory requirements, the public transit agency must work closely with this agency while also coordinating with any freight or passenger railroad operator sharing the right-of-way. Depending on the circumstances, establishment of a quiet zone would probably not be completed in the time frame of the environmental review process. However, as with other types of mitigation, the final environmental document should discuss the main considerations in adopting the quiet zone, for example, engineering feasibility, receptiveness of the local public authority, consultation with the railroad, preliminary cost estimates, etc., and show evidence of the planning and interagency coordination that has occurred to date. If a quiet zone will be relied on as a mitigation measure, the final environmental document should provide reasonable assurance that any remaining issues can and will be resolved.

The cost of establishing a quiet zone varies considerably, depending on the number of intersections that must be treated and the specific SSM's, ASM's, or combination of measures that are used. The FRA gives a cost estimate of $15,000 per crossing for installing two 100-foot-long non-traversable medians that prevent motorists from driving around closed gates. A typical installation of a four-quadrant gate system is in the range of $175,000-$300,000 per crossing. Who pays for the installation of modifications can become a major consideration in a decision to pursue a quiet zone designation, especially in cases where noise from preexisting railroad operations has been a sore point in the community. In cases where a quiet zone would mitigate a Severe Impact situation brought about by the proposed transit project, the costs would be borne by the local transit agency and FTA in the same proportion as the overall cost-sharing for the project.

Guideway Support (Bus and Rail)

The smoothness of the running surface is critical in the mitigation of noise from a moving vehicle. Smooth roadways for buses and smooth rail running surfaces for rail systems are required. In either case, roughness of the street, roadway and rail surfaces can be eliminated by resurfacing roads or grinding rails, thereby reducing noise levels by up to 10 decibels. Bridge expansion joints are also a source of noise for rubber-tire vehicles. This source of noise can be reduced by placing expansion joints on an angle or by specifying the serrated type rather than joints with right-angle edges.

In the case of steel-wheel/steel-rail systems with non-steerable trucks and sharp turns, squeal can be mitigated by installation of rail lubricators. Squeal in such systems can usually be eliminated altogether by designing all turn radii to be greater than 1000 feet, or 100 times the truck wheelbase, whichever is less.

Operational Restrictions (Rail and Bus)

Two changes in operations that can mitigate noise are the lowering of speed and the reduction of nighttime (10 pm to 7 am) operations. Because noise from most transit vehicles depends on speed, a reduction of speed results in lower noise levels. The effect can be considerable. For example, the speed dependency of steel-wheel/steel-rail systems for L_{eq} and L_{dn} (see Table 6-4) results in a 6 dB reduction for a halving of the speed. Complete elimination of nighttime operations has a strong effect on reducing the L_{dn}, because nighttime noise is increased by 10 decibels when calculating L_{dn}. Restrictions on operations are usually not feasible because of service demands, and FTA does not pursue restrictions on operations as a noise reduction measure. However, if early morning idling can be curtailed to the minimum necessary, this can have a measurable effect on L_{dn}.

Other operational restrictions that can reduce noise impact for light rail and commuter rail systems include minimizing or eliminating horn blowing and other types of warning signals at grade crossings. While these mitigation options are limited by safety considerations, they can be effective in the right circumstances and they are discussed elsewhere in this section (e.g., wayside horns).

6.8.3 Path Treatments

Sound Barriers

Sound barriers are effective in mitigating noise when they break the line-of-sight between source and receiver. The mechanism of sound shielding is described in Chapter 2. The necessary height of a barrier depends on such factors as the source height and the distance from the source to the barrier. For example, if a barrier is located very close to a rapid transit train, it need only be 3 to 4 feet above the top of rail to be effective. Barriers close to vehicles can provide noise reductions of 6 to 10 decibels. For barriers further away, such as on the right-of-way line or for trains on the far track, the height must be increased to provide equivalent effectiveness. Otherwise, the effectiveness can drop to 5 decibels or less, even if the barrier breaks the line-of-sight. Where the barrier is very close to the transit vehicle or where the vehicles travel between sets of parallel barriers, barrier effectiveness can be increased by as much as 5 decibels by applying sound-absorbing material to the inner surface of the barrier.

Similarly, the length of the barrier wall is important to its effectiveness. The barrier must be long enough to screen out a moving train along most of its visible path. This is necessary so that train noise from beyond the ends of the barrier will not severely compromise noise-barrier performance at sensitive locations.

Noise barriers can be made of any outdoor weather-resistant solid material that meets a minimum sound transmission loss requirement. The sound requirements are not particularly strict; they can be met by many commonly available materials, such as 16-gauge steel, 1-inch thick plywood, and any reasonable thickness of concrete. The normal minimum requirement is a surface density of 4 pounds per square foot. To hold up under wind loads, structural requirements are more stringent. Achieving the maximum possible noise reduction requires careful sealing of gaps between barrier panels and between the barrier and the ground or elevated guideway deck.

Costs for noise barriers, based on highway installations, range from $25 to $35 per square foot of installed noise barrier at-grade, not counting design and inspection costs[(10)]. Installation on aerial structure may be a factor of two greater, especially if the structure has to be strengthened to accommodate the added weight and wind load.

Location of a transit alignment in cut, as part of grade separation, can accomplish the same result as installation of a noise barrier at-grade or on aerial structure. The walls of the cut serve the same function as barrier walls in breaking the line-of-sight between source and receiver.

Wayside Horns

The sounding of a locomotive horn as the train approaches an at-grade intersection produces a very wide noise “footprint” in the community. Using wayside horns at the intersection instead of the locomotive horn has been shown to substantially reduce the noise footprint without compromising safety at the grade crossing. A wayside horn does not need to be as loud as a locomotive horn, but the real advantage is the focusing of the warning sound only on the area where it is needed. These are pole-mounted horns used in conjunction with flashing lights and gates at the intersection, with a separate horn oriented toward each direction of oncoming vehicle traffic. Field tests have shown that noise levels in nearby residential and business areas can be reduced significantly with wayside horns, depending on the location with respect to the grade crossing.

A plan to use wayside horns in place of the locomotive horn at public grade crossings must be coordinated with several public and private entities, notably the local agency having responsibility for traffic control and law enforcement on the road crossings, the state agency responsible for railroad safety, any railroads that share the right-of-way, and FRA. Public notification must also be given.

Preliminary cost information from testing programs indicates a wayside horn system at a railroad/ highway grade crossing costs approximately $50,000.

Noise Buffers

Because noise levels attenuate with distance, one noise mitigation measure is to increase the distance between noise sources and the closest sensitive receivers. This can be accomplished by locating alignments away from sensitive sites. Acquisition of land or purchasing easements for noise buffer zones is an option that may be considered if impacts due to the project are severe enough.

Ground Absorption

Propagation of noise over ground is affected by whether the ground surface is absorptive or reflective. Noise from vehicles on the surface is strongly affected by the character of the ground in the immediate vicinity of the vehicle. Roads and streets for buses are hard and reflective, but the ground at the side of a road has a significant effect on the propagation of noise to greater distance. This effect is described in Chapter 2 and taken into account in the computations of this chapter. Guideways for rail systems can be either reflective or absorptive, depending on whether they are concrete or ballast. Ballast on a guideway can reduce train noise 3 decibels at-grade and up to 5 decibels on aerial structure.

6.8.4 Receiver Treatments

Sound Barriers

In certain cases it may be possible to acquire limited property rights for the construction of sound barriers at the receiver. As discussed above, barriers need to break the line-of-sight between the noise source and the receiver to be effective and are most effective when they are closest to either the source or the receiver. Computational procedures for estimating barrier effectiveness are given earlier in this chapter.

Building Insulation

In cases where sound barriers are not feasible, such as multi-story buildings, buildings very close to the rights-of-way, or grade crossings, the only practical noise mitigation measure may be to provide sound insulation for the buildings. Effective treatments include caulking and sealing gaps in the building façade, and installation of new doors and windows that are specially designed to meet acoustical transmission-loss requirements. Exterior doors facing the noise source should be replaced with well-gasketed, solid-core wood doors and well-gasketed storm doors. Acoustical windows are usually made of multiple layers of glass with air spaces between to provide noise reduction. Acoustical performance ratings are published in terms of “Sound Transmission Class” (STC) for these special windows. A minimum STC rating of 39 should be used on any window exposed to the noise source. These treatments are beneficial for heat insulation as well as for sound insulation. As an added consideration for costs, however, acoustical windows are usually non-operable so that central ventilation or air conditioning is needed.

Additional building sound insulation, if needed, can be provided by sealing vents and ventilation openings and relocating them to a side of the building away from the noise source. In cases where low frequency noise from diesel locomotives is the problem, it may be necessary to increase the mass of the building façade of wood frame houses by adding a layer of sheathing to the exterior walls.

Criteria for Interior Noise Levels. Depending on the quality of the original building façade, especially windows and doors, sound insulation treatments can improve the noise reductions from transit noise by 5 to 20 dBA. In order to be considered cost-effective, a treatment should provide a minimum of 5 dBA reduction in the interior of the building and provide an interior noise level of 65 dBA or less from transit sources. In homes where noise impact from train horns is identified, the sound insulation should provide sufficient noise reduction such that horn noise inside the building is 70 dBA or less.

Examples of residential sound insulation for rail or highway projects are limited. However, much practical experience with sound insulation of buildings has been gained through grants for noise mitigation to local airport authorities by the Federal Aviation Administration (FAA). Based on FAA experience, a typical single-family home can be fitted for sound insulation for costs ranging from $25,000 to $50,000.

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7. BASIC GROUND-BORNE VIBRATION CONCEPTS

Ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment.

The effects of ground-borne vibration include feelable movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for normal transportation projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings.

The basic concepts of ground-borne vibration are illustrated for a rail system in Figure 7-1. The train wheels rolling on the rails create vibration energy that is transmitted through the track support system into the transit structure. The amount of energy that is transmitted into the transit structure is strongly dependent on factors such as how smooth the wheels and rails are and the resonance frequencies of the vehicle suspension system and the track support system. These systems, like all mechanical systems, have resonances which result in increased vibration response at certain frequencies, called natural frequencies.

The vibration of the transit structure excites the adjacent ground, creating vibration waves that propagate through the various soil and rock strata to the foundations of nearby buildings. The vibration propagates from the foundation throughout the remainder of the building structure. The maximum vibration amplitudes of the floors and walls of a building often will be at the resonance frequencies of various components of the building.

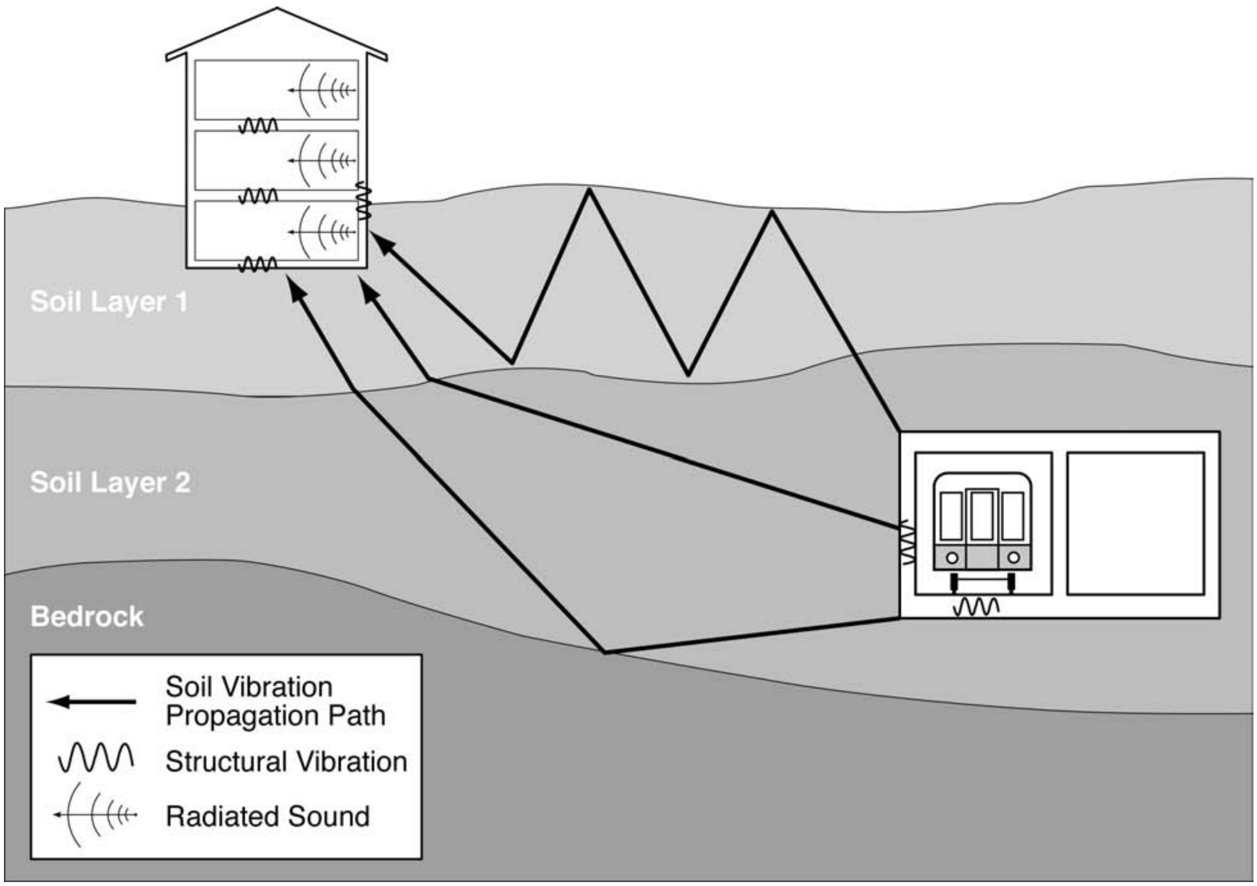

Figure 7-1. Propagation of Ground-Borne Vibration into Buildings

The vibration of floors and walls may cause perceptible vibration, rattling of items such as windows or dishes on shelves, or a rumble noise. The rumble is the noise radiated from the motion of the room surfaces. In essence, the room surfaces act like a giant loudspeaker causing what is called ground-borne noise.

Ground-borne vibration is almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of a building, the motion does not provoke the same adverse human reaction. In addition, the rumble noise that usually accompanies the building vibration is perceptible only inside buildings.

7.1 DESCRIPTORS OF GROUND-BORNE VIBRATION AND NOISE

7.1.1 Vibratory Motion

Vibration is an oscillatory motion which can be described in terms of the displacement, velocity, or acceleration. Because the motion is oscillatory, there is no net movement of the vibration element and the average of any of the motion descriptors is zero. Displacement is the easiest descriptor to understand. For a vibrating floor, the displacement is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement and acceleration is the rate of change of the speed.

Although displacement is easier to understand than velocity or acceleration, it is rarely used for describing ground-borne vibration. Most transducers used for measuring ground-borne vibration use either velocity or acceleration. Furthermore, the response of humans, buildings, and equipment to vibration is more accurately described using velocity or acceleration.

7.1.2 Amplitude Descriptors

Vibration consists of rapidly fluctuating motions with an average motion of zero. Several descriptors can be used to quantify vibration amplitude, three of which are shown in Figure 7-2. The raw signal is the lighter-weight curve in the top graph. This curve shows the instantaneous vibration velocity which fluctuates positive and negative about the zero point. The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is often used in monitoring of blasting vibration since it is related to the stresses that are experienced by buildings.

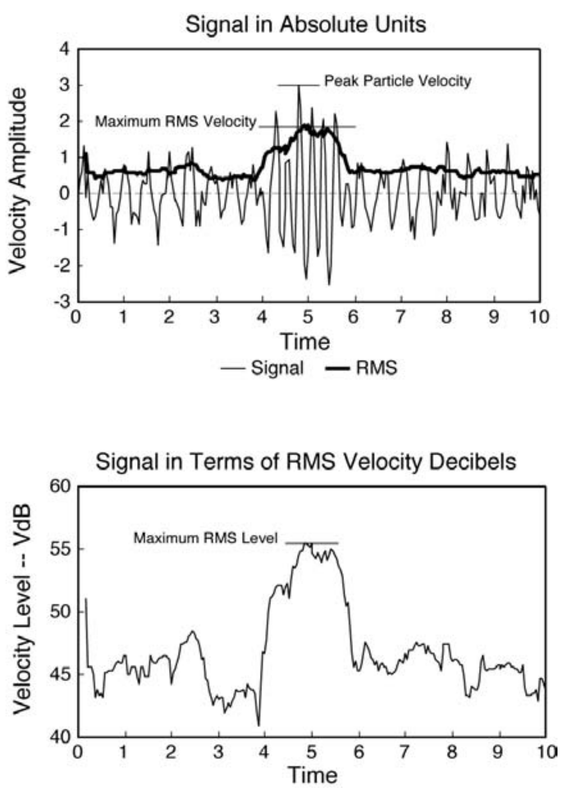

Figure 7-2. Different Methods of Describing a Vibration Signal

Although peak particle velocity is appropriate for evaluating the potential of building damage, it is not suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to an average vibration amplitude. Because the net average of a vibration signal is zero, the root mean square (rms) amplitude is used to describe the "smoothed" vibration amplitude. The root mean square of a signal is the square root of the average of the squared amplitude of the signal. The average is typically calculated over a one-second period. The rms amplitude is shown superimposed on the vibration signal in Figure 7-2. The rms amplitude is always less than the PPV* and is always positive.

The PPV and rms velocity are normally described in inches per second in the USA and meters per second in the rest of the world. Although it is not universally accepted, decibel notation is in common use for vibration.

Decibel notation acts to compress the range of numbers required to describe vibration. The bottom graph in Figure 7-2 shows the rms curve of the top graph expressed in decibels. Vibration velocity level in decibels is defined as:

$$L_v = 20 \times \log_{10}\left(\frac{v}{v_{ref}}\right)$$

where "L_v" is the velocity level in decibels, "v" is the rms velocity amplitude, and "v_{ref}" is the reference velocity amplitude. A reference must always be specified whenever a quantity is expressed in terms of decibels. The accepted reference quantities for vibration velocity are $1x10^{-6}$ inches/second in the USA and either $1x10^{-8}$ meters/second or $5x10^{-8}$ meters/second in the rest of the world. Because of the variations in the reference quantities, it is important to be clear about what reference quantity is being used whenever velocity levels are specified. ***All** vibration levels in this manual are referenced to $1x10^{-6}$ in./sec.* Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels.

7.1.3 Ground-Borne Noise

As discussed above, the rumbling sound caused by the vibration of room surfaces is called ground-borne noise. The annoyance potential of ground-borne noise is usually characterized with the A-weighted sound level. Although the A-weighted level is almost the only metric used to characterize community noise, there are potential problems when characterizing low-frequency noise using A-weighting. This is because of the non-linearity of human hearing which causes sounds dominated by low-frequency components to seem louder than broadband sounds that have the same A-weighted level. The result is that ground-borne noise with a level of 40 dBA sounds louder than 40 dBA broadband noise. This is accounted for by setting the limits for ground-borne noise lower than would be the case for broadband noise.

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*The ratio of PPV to maximum rms amplitude is defined as the **crest factor** for the signal. The crest factor is always greater than 1.71, although a crest factor of 8 or more is not unusual for impulsive signals. For ground-borne vibration from trains, the crest factor is usually 4 to 5.

7.2 HUMAN PERCEPTION OF GROUND-BORNE VIBRATION AND NOISE

This section gives some general background on human response to different levels of building vibration, laying the groundwork for the criteria for ground-borne vibration and noise that are presented in Chapter 8.

7.2.1 Typical Levels of Ground-Borne Vibration and Noise

In contrast to airborne noise, ground-borne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 VdB or lower, well below the threshold of perception for humans which is around 65 VdB. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

Figure 7-3 illustrates common vibration sources and the human and structural response to ground-borne vibration. The range of interest is from approximately 50 VdB to 100 VdB. Background vibration is usually well below the threshold of human perception and is of concern only when the vibration affects very sensitive manufacturing or research equipment. Electron microscopes and high-resolution lithography equipment are typical of equipment that is highly sensitive to vibration.

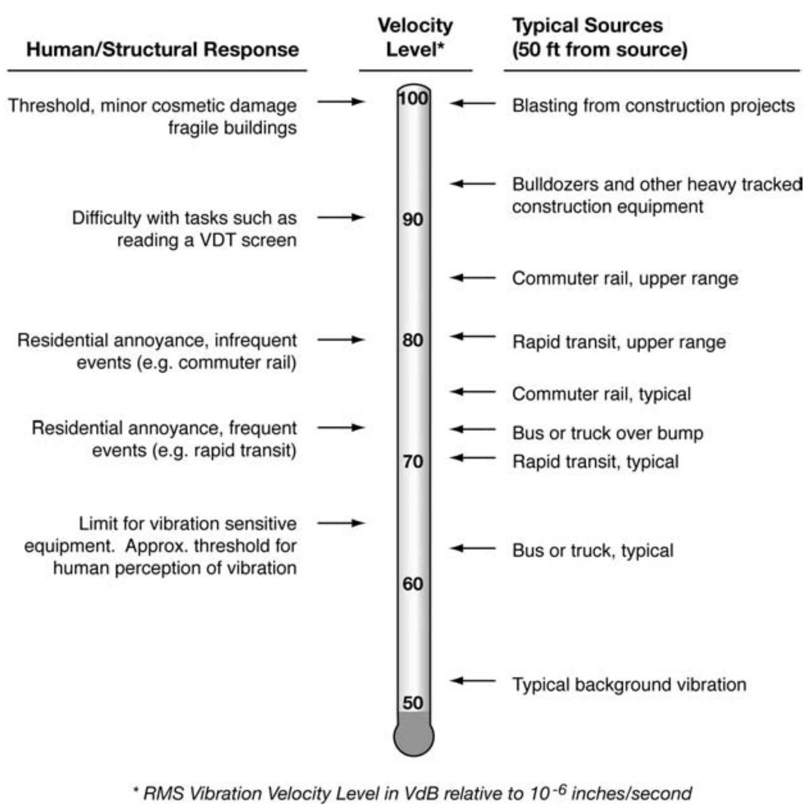

Figure 7-3. Typical Levels of Ground-Borne Vibration

Although the perceptibility threshold is about 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. Rapid transit or light rail systems typically generate vibration levels of 70 VdB or more near their tracks. On the other hand, buses and trucks rarely create vibration that exceeds 70 VdB unless there are bumps in the road. Because of the heavy locomotives on diesel commuter rail systems, the vibration levels average about 5 to 10 decibels higher than rail transit vehicles. If there is unusually rough road or track, wheel flats, geologic conditions that promote efficient propagation of vibration, or vehicles with very stiff suspension systems, the vibration levels from any source can be 10 decibels higher than typical. Hence, at 50 feet, the upper range for rapid transit vibration is around 80 VdB and the high range for commuter rail vibration is 85 VdB. If the vibration level in a residence reaches 85 VdB, most people will be strongly annoyed by the vibration.

The relationship between ground-borne vibration and ground-borne noise depends on the frequency content of the vibration and the acoustical absorption of the receiving room. The more acoustical absorption in the room, the lower will be the noise level. For a room with average acoustical absorption, the unweighted sound pressure level is approximately equal to the average vibration velocity level of the room surfaces.[*] Hence, the A-weighted level of ground-borne noise can be estimated by applying A-weighting to the vibration velocity spectrum. Since the A-weighting at 31.5 Hz is -39.4 dB, if the vibration spectrum peaks at 30 Hz, the A-weighted sound level will be approximately 40 decibels lower than the velocity level. Correspondingly, if the vibration spectrum peaks at 60 Hz, the A-weighted sound level will be about 25 decibels lower than the velocity level.

7.2.2 Quantifying Human Response to Ground-Borne Vibration and Noise

One of the major problems in developing suitable criteria for ground-borne vibration is that there has been relatively little research into human response to vibration, in particular, human annoyance with building vibration. The American National Standards Institute (ANSI) developed criteria for evaluation of human exposure to vibration in buildings in 1983[(1)] and the International Organization for Standardization (ISO) adopted similar criteria in 1989[(2)] and revised them in 2003 [(3)]. The 2003 version of ISO 2361-2 acknowledges that "human response to vibration in buildings is very complex." It further indicates that the degree of annoyance can not always be explained by the magnitude of the vibration alone. In some cases the complaints are associated with measured vibration that is lower than the perception threshold. Other phenomena such as ground-borne noise, rattling, visual effects such as movement of hanging objects, and time of day (e.g., late at night) all play some role in the response of individuals. To understand and evaluate human response, which is often measured by complaints, all of these related effects need to be considered. The available data documenting real world experience with these phenomena is still relatively sparse. Experience with U.S. rapid transit projects represents a good foundation for developing suitable limits for residential exposure to ground-borne vibration and noise from transit operations.

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[*]The sound level approximately equals the average vibration velocity level *only* when the velocity level is referenced to 1 micro-inch/second. When velocity level is expressed using the international standard of 1×10^{-8} m/sec, the sound level is approximately 8 decibels lower than the average velocity level.

Figure 7-4 illustrates the relationship between the vibration velocity level measured in 22 homes and the general response of the occupants to the vibration. The data shown were assembled from measurements performed for several transit systems along with subjective ratings by the researchers and residents. These data were previously published in the "State-of-the-Art Review of Ground-borne Noise and Vibration."[4] Both the occupants and the people who performed the measurements agreed that floor vibration in the "Distinctly Perceptible" category was unacceptable for a residence. The data in Figure 7-4 indicate that residential vibration exceeding 75 VdB is unacceptable for a repetitive vibration source such as rapid transit trains that pass every 5 to 15 minutes. Also shown in Figure 7-4 is a curve showing the percent of people annoyed by vibration from high-speed trains in Japan.[5] The scale for the percent annoyed is on the right-hand axis of the graph. The results of the Japanese study confirm the conclusion that at a vibration velocity level of 75 to 80 VdB, many people will find the vibration annoying.

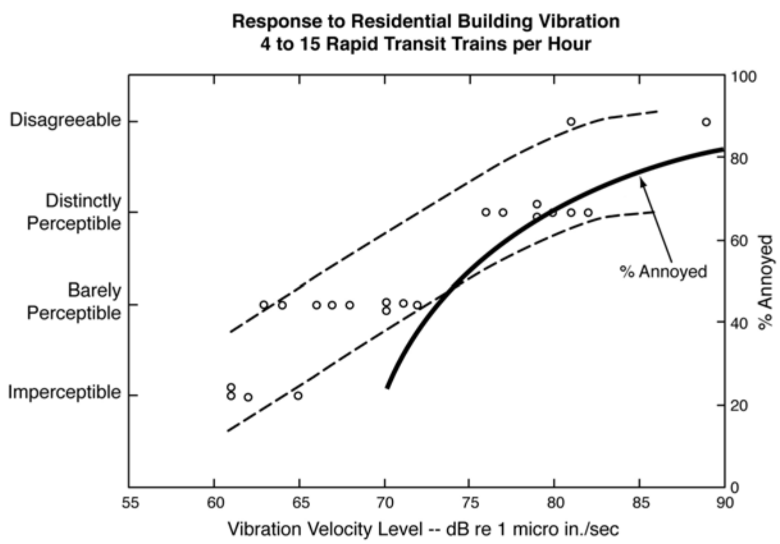

Figure 7-4. Response to Transit-induced Residential Vibration

Table 7-1 describes the human response to different levels of ground-borne noise and vibration. The first column is the vibration velocity level, and the next two columns are for the corresponding noise level assuming that the vibration spectrum peaks at 30 Hz or 60 Hz. As discussed above, the A-weighted noise level will be approximately 40 dB less than the vibration velocity level if the spectrum peak is around 30 Hz, and 25 dB lower if the spectrum peak is around 60 Hz. Table 7-1 illustrates that achieving either the acceptable vibration or acceptable noise levels does not guarantee that the other will be acceptable. For example, the noise caused by vibrating structural components may be very annoying even though the vibration cannot be felt. Alternatively, a low-frequency vibration could be annoying while the ground-borne noise level it generates is acceptable.

Table 7-1. Human Response to Different Levels of Ground-Borne Noise and Vibration

Vib. Velocity Level	Noise Level		Human Response
	Low Freq1	Mid Freq2	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible, mid-frequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying. Low-frequency noise acceptable for sleeping areas, mid-frequency noise annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise annoying for sleeping areas, mid-frequency noise annoying even for infrequent events with institutional land uses such as schools and churches.

Notes:
1. Approximate noise level when vibration spectrum peak is near 30 Hz.
2. Approximate noise level when vibration spectrum peak is near 60 Hz.

7.3 GROUND-BORNE VIBRATION FOR DIFFERENT TRANSIT MODES

This section provides a brief discussion of typical problems with ground-borne vibration and noise for different modes of transit.

- **Steel-Wheel Urban Rail Transit:** This category includes both heavy rail transit and light rail transit. Heavy rail is generally defined as electrified rapid transit trains with dedicated guideway, and light rail as electrified transit trains that do not require dedicated guideway. The ground-borne vibration characteristics of heavy and light rail vehicles are very similar since they have similar suspension systems and axle loads. Most of the studies of ground-borne vibration in this country have focused on urban rail transit. Problems with ground-borne vibration and noise are common when there is less than 50 feet between a subway structure and building foundations. Whether the problem will be perceptible vibration or audible noise is strongly dependent on local geology and the structural details of the building. Complaints about ground-borne vibration from surface track are more common than complaints about ground-borne noise. A significant percentage of complaints about both ground-borne vibration and noise can be attributed to the proximity of special trackwork, rough or corrugated track, or wheel flats.

- **Commuter and Intercity Passenger Trains:** This category includes passenger trains powered by either diesel or electric locomotives. In terms of vibration effects at a single location, the major difference between commuter and intercity passenger trains is that the latter are on a less frequent schedule. Both often share track with freight trains, which have quite different vibration characteristics as discussed below. The locomotives usually create the highest vibration levels. There is the potential of vibration-related problems anytime that new commuter or intercity rail passenger service is introduced in an urban or suburban area.

- **High-Speed Passenger Trains:** High-speed passenger trains have the potential of creating high levels of ground-borne vibration. Ground-borne vibration should be anticipated as one of the major environmental impacts of any high-speed train located in an urban or suburban area. The Amtrak trains on the Northeast Corridor between Boston and Washington, D.C., which attain moderate to high speeds in some sections with improved track, fit into this category.

- **Freight Trains:** Local and long-distance freight trains are similar in that they both are diesel-powered and have the same types of cars. They differ in their overall length, number and size of locomotives, and number of heavily loaded cars. Locomotives and rail cars with wheel flats are the sources of the highest vibration levels. Because locomotive suspensions are similar, the maximum vibration levels of local and long-distance freights are similar. It is not uncommon for freight trains to be the source of intrusive ground-borne vibration. Most railroad tracks used for freight lines were in existence for many years before the affected residential areas were developed. Vibration from freight trains can be a consideration for FTA-assisted projects when a new transit line will share an existing freight train right-of-way. Relocating the freight tracks within the right-of-way to make room for the transit tracks must be considered a direct impact of the transit system which must be evaluated as part of the proposed project. However, vibration mitigation is very difficult to implement on tracks where trains with heavy axle loads will be operating.

- **Automated Guideway Transit Systems (AGT):** This transit mode encompasses a wide range of transportation vehicles providing local circulation in downtown areas, airports and theme parks. In general, ground-borne vibration can be expected to be generated by steel-wheel/steel-rail systems even when limited in size. Because AGT systems normally operate at low speeds, have lightweight vehicles, and rarely operate in vibration-sensitive areas, ground-borne vibration problems are very rare.

- **Bus Projects:** Because the rubber tires and suspension systems of buses provide vibration isolation, it is unusual for buses to cause ground-borne noise or vibration problems. When buses cause effects such as rattling of windows, the source is almost always airborne noise. Most problems with bus-related vibration can be directly related to a pothole, bump, expansion joint, or other discontinuity in the road surface. Smoothing the bump or filling the pothole will usually solve the problem. Problems are likely when buses will be operating inside buildings. Intrusive building vibration can be caused by sudden loading of a building slab by a heavy moving vehicle or by vehicles running over lane divider bumps. A bus transfer station with commercial office space in the same building may have annoying vibration within the office space caused by bus operations.

7.4 FACTORS THAT INFLUENCE GROUND-BORNE VIBRATION AND NOISE

One of the major problems in developing accurate estimates of ground-borne vibration is the large number of factors that can influence the levels at the receiver position. This section gives a general appreciation of which factors have significant effects on the levels of ground-borne vibration. Table 7-2 is a summary of some of the many factors that are known to have, or are suspected of having, a significant influence on the levels of ground-borne vibration and noise. As indicated, the physical parameters of the transit facility, the geology, and the receiving building all influence the vibration levels. The important physical parameters can be divided into the following four categories:

- **Operational and Vehicle Factors:** This category includes all of the parameters that relate to the vehicle and operation of the trains. Factors such as high speed, stiff primary suspensions on the vehicle, and flat or worn wheels will increase the possibility of problems from ground-borne vibration.

- **Guideway:** The type and condition of the rails, the type of guideway, the rail support system, and the mass and stiffness of the guideway structure will all have an influence on the level of ground-borne vibration. Jointed rail, worn rail, and wheel impacts at special trackwork can all cause substantial increases in ground-borne vibration. A rail system guideway will be either subway, at-grade, or elevated. It is rare for ground-borne vibration to be a problem with elevated railways except when guideway supports are located within 50 feet of buildings. For guideways at-grade, directly radiated noise is usually the dominant problem, although vibration can be a problem. For subways, ground-borne vibration is often one of the most important environmental problems. For rubber-tired systems, the smoothness of the roadway/guideway is the critical factor; if the surface is smooth, vibration problems are unlikely.

- **Geology:** Soil and subsurface conditions are known to have a strong influence on the levels of ground-borne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock. Experience with ground-borne vibration is that vibration propagation is more efficient in stiff clay soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in ground-borne vibration problems at large distances from the track. Factors such as layering of the soil and depth to water table can have significant effects on the propagation of ground-borne vibration.

- **Receiving Building:** The receiving building is a key component in the evaluation of ground-borne vibration since ground-borne vibration problems occur almost exclusively inside buildings. The train vibration may be perceptible to people who are outdoors, but it is very rare for outdoor vibration to cause complaints. The vibration levels inside a building are dependent on the vibration energy that reaches the building foundation, the coupling of the building foundation to the soil, and the propagation of the vibration through the building. The general guideline is that the heavier a building is, the lower the response will be to the incident vibration energy.

Table 7-2. Factors that Influence Levels of Ground-Borne Vibration and Noise	
Factors Related to Vibration Source	
Factors	**Influence**
Vehicle Suspension	If the suspension is stiff in the vertical direction, the effective vibration forces will be higher. On transit cars, only the primary suspension affects the vibration levels, the secondary suspension that supports the car body has no apparent effect.
Wheel Type and Condition	Use of pneumatic tires is one of the best methods of controlling ground-borne vibration. Normal resilient wheels on rail transit systems are usually too stiff to provide significant vibration reduction. Wheel flats and general wheel roughness are the major cause of vibration from steel wheel/steel rail systems.
Track/Roadway Surface	Rough track or rough roads are often the cause of vibration problems. Maintaining a smooth surface will reduce vibration levels.
Track Support System	On rail systems, the track support system is one of the major components in determining the levels of ground-borne vibration. The highest vibration levels are created by track that is rigidly attached to a concrete trackbed (e.g. track on wood half-ties embedded in the concrete). The vibration levels are much lower when special vibration control track systems such as resilient fasteners, ballast mats and floating slabs are used.
Speed	As intuitively expected, higher speeds result in higher vibration levels. Doubling speed usually results in a vibration level increase of 4 to 6 decibels.
Transit Structure	The general rule-of-thumb is that the heavier the transit structure, the lower the vibration levels. The vibration levels from a lightweight bored tunnel will usually be higher than from a poured concrete box subway.
Depth of Vibration Source	There are significant differences in the vibration characteristics when the source is underground compared to surface level.
Factors Related to Vibration Path	
Factor	**Influence**
Soil Type	Vibration levels are generally higher in stiff clay-type soils than in loose sandy soils.
Rock Layers	Vibration levels are usually high near at-grade track when the depth to bedrock is 30 feet or less. Subways founded in rock will result in lower vibration amplitudes close to the subway. Because of efficient propagation, the vibration level does not attenuate as rapidly in rock as it does in soil.
Soil Layering	Soil layering will have a substantial, but unpredictable, effect on the vibration levels since each stratum can have significantly different dynamic characteristics.
Depth to Water Table	The presence of the water table may have a significant effect on ground-borne vibration, but a definite relationship has not been established.
Factors Related to Vibration Receiver	
Factor	**Influence**
Foundation Type	The general rule-of-thumb is that the heavier the building foundation, the greater the coupling loss as the vibration propagates from the ground into the building.
Building Construction	Since ground-borne vibration and noise are almost always evaluated in terms of indoor receivers, the propagation of the vibration through the building must be considered. Each building has different characteristics relative to structureborne vibration, although the general rule-of-thumb is the more massive the building, the lower the levels of ground-borne vibration.
Acoustical Absorption	The amount of acoustical absorption in the receiver room affects the levels of ground-borne noise.

REFERENCES

1. American National Standards Institute, Guide to the Evaluation of Human Exposure to Vibration in Buildings. ANSI S3.29-1983

2. International Organization for Standardization, "Evaluation of Human exposure to whole body vibration: Part 2 – Continuous and shock-induced vibration in buildings (1 – 80 Hz), ISO 2361-2-1989

3. International Organization for Standardization, "Mechanical Vibration and Shock : Evaluation of human exposure to whole body vibration: Part 2 – Vibration in buildings (1 to 80 Hz), ISO 2631-2-2003.

4. J. T. Nelson, H. J. Saurenman, "State-of-the-Art Review: Prediction and Control of Groundborne Noise and Vibration from Rail Transit Trains," U.S. Department of Transportation, Urban Mass Transportation Administration, Report Number UMTA-MA-06-0049-83-4, DOT-TSC-UMTA-83-3, December 1983.

5. Y. Tokita, "Vibration Pollution Problems in Japan," In Inter-Noise 75, Sendai, Japan, pp. 465-472, 1975.

8. VIBRATION IMPACT CRITERIA

Because of the relatively rare occurrence of annoyance due to ground-borne vibration and noise, there has been only limited sponsored research of human response to building vibration and structure-borne noise. However, with the construction of new rail rapid transit systems in the past 30 years, considerable experience has been gained as to how people react to various levels of building vibration. This experience, combined with the available national and international standards,[1,2,3] represents a good foundation for predicting annoyance from ground-borne noise and vibration in residential areas as well as interference with vibration-sensitive activities.

The criteria for environmental impact from ground-borne vibration and noise are based on the maximum root-mean-square (rms) vibration levels for repeated events of the same source. The criteria presented in Table 8-1 account for variation in project types as well as the frequency of events, which differ widely among transit projects. Most experience is with the community response to ground-borne vibration from rail rapid transit systems with typical headways in the range of 3 to 10 minutes and each vibration event lasting less than 10 seconds. It is intuitive that when there will be many fewer events each day, as is typical for commuter rail projects, it should take higher vibration levels to evoke the same community response. This is accounted for in the criteria by distinguishing between projects with varying numbers of events, where *Frequent Events* are defined as more than 70 events per day, *Occasional Events* range between 30 and 70 events per day, and *Infrequent Events* are fewer than 30 events per day. Most commuter rail branch lines will fall into the infrequent events category, although the trunk lines of some commuter rail lines serving major cities are in the occasional events category.

The criteria are primarily based on experience with passenger train operations with only limited experience from freight train operations. The difference is that passenger train operations, whether rapid transit, commuter rail, or intercity passenger railroad, create vibration events that last less than about 10 seconds. A typical line-haul freight train is about 5000 feet long. At a speed of 30 mph, it will take a 5000-foot freight train approximately two minutes to pass. Even though the criteria are primarily based on experience with shorter vibration events and this manual is oriented to transit projects, there will be situations where potential impacts from freight train ground-borne vibration will need to be evaluated. The prime example is when freight train tracks must be relocated to provide space for a transit project within a railroad right-of-way. Some guidelines for applying these criteria to freight train operations are given later in this chapter.

8.1 VIBRATION IMPACT CRITERIA FOR GENERAL ASSESSMENT

8.1.1 Sensitive-Use Categories

The criteria for acceptable ground-borne vibration are expressed in terms of rms velocity levels in decibels and the criteria for acceptable ground-borne noise are expressed in terms of A-weighted sound levels. The limits are specified for the three land-use categories defined below:

- **Vibration Category 1 - High Sensitivity:** Included in Category 1 are buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance. Concert halls and other special-use facilities are covered separately in Table 8-2. Typical land uses covered by Category 1 are: vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, and university research operations. The degree of sensitivity to vibration will depend on the specific equipment that will be affected by the vibration. Equipment such as electron microscopes and high resolution lithographic equipment can be very sensitive to vibration, and even normal optical microscopes will sometimes be difficult to use when vibration is well below the human annoyance level. Manufacturing of computer chips is an example of a vibration-sensitive process.

  The vibration limits for Vibration Category 1 are based on acceptable vibration for moderately vibration-sensitive equipment such as optical microscopes and electron microscopes with vibration isolation systems. Defining limits for equipment that is even more sensitive requires a detailed review of the specific equipment involved. This type of review is usually performed during the Detailed Analysis associated with the final design phase and not as part of the environmental impact assessment. Mitigation of transit vibration that affects sensitive equipment typically involves modification of the equipment mounting system or relocation of the equipment rather than applying vibration control measures to the transit project.

  Note that this category does not include most computer installations or telephone switching equipment. Although the owners of this type of equipment often are very concerned about the potential of ground-borne vibration interrupting smooth operation of their equipment, it is rare for computer or other electronic equipment to be particularly sensitive to vibration. Most such equipment is designed to operate in typical building environments where the equipment may experience occasional shock from bumping and continuous background vibration caused by other equipment.

- **Vibration Category 2 - Residential:** This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas. This is primarily because ground-borne vibration and noise are experienced indoors and building occupants have practically no means to reduce their exposure. Even in a noisy urban area, the bedrooms often will be quiet in buildings that have effective noise insulation and tightly closed windows. Moreover, street traffic often abates at night when transit continues to operate. Hence, an occupant of a bedroom in a noisy urban area is likely to be just as exposed to ground-borne noise and vibration as someone in a quiet suburban area. The criteria apply to the transit-generated ground-borne vibration and noise whether the source is subway or surface running trains.

- **Vibration Category 3 - Institutional:** Vibration Category 3 includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference. Although it is generally appropriate to include office buildings in this category, it is not appropriate to include all buildings that have any office space. For example, most industrial buildings have office space, but it is not intended that buildings primarily for industrial use be included in this category.

Table 8-1. Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for General Assessment

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch /sec)			GBN Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Notes:

1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
5. Vibration-sensitive equipment is generally not sensitive to ground-borne noise.

There are some buildings, such as concert halls, TV and recording studios, and theaters, that can be very sensitive to vibration and noise but do not fit into any of the three categories. Because of the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. Table 8-2 gives criteria for acceptable levels of ground-borne vibration and noise for various types of special buildings.

Table 8-2. Ground-Borne Vibration and Noise Impact Criteria for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro-Pascals)	
	Frequent [1] Events	Occasional or Infrequent[2] Events	Frequent[1] Events	Occasional or Infrequent[2] Events
Concert Halls	65 VdB	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

Notes:
1."Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2."Occasional or Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3.If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example, consider locating a commuter rail line next to a concert hall. If no commuter trains will operate after 7 pm, it should be rare that the trains interfere with the use of the hall.

The criteria in Tables 8-1 and 8-2 are related to ground-borne vibration causing human annoyance or interfering with use of vibration-sensitive equipment. It is extremely rare for vibration from train operations to cause any sort of building damage, even minor cosmetic damage. However, there is sometimes concern about damage to fragile historic buildings located near the right-of-way. Even in these cases, damage is unlikely except when the track will be very close to the structure. Damage thresholds that apply to these structures are discussed in Section 12.2.2.

8.1.2 Existing Vibration Conditions

One factor not incorporated in the criteria is how to account for existing vibration. In most cases, the existing environment does not include a significant number of perceptible ground-borne vibration or noise events. The most common example of needing to account for the pre-existing vibration is when the project will be located in an existing rail corridor. When the project will cause vibration more than 5 VdB greater than the existing source, the existing source can be ignored and the standard vibration criteria applied to the project. Following are methods of handling representative scenarios:

1. *Infrequently-used rail corridor (fewer than 5 trains per day):* Use the general vibration criteria, Tables 8-1 and 8-2.

2. *Moderately-used rail corridor (5 to 12 trains per day):* If the existing train vibration exceeds the impact criteria given in Tables 8-1 and 8-2, there will be no impact from the project vibration if the levels estimated using the procedures outlined in either Chapter 10 or 11 are at least 5VdB less than the existing train vibration. Otherwise, vibration criteria in Tables 8-1 and 8-2 apply to the project. The existing train vibration can be either measured or estimated using the General Assessment procedures in Chapter 10. It is usually preferable to measure vibration from existing train traffic.

3. *Heavily-used rail corridor (more than 12 trains per day):* If the existing train vibration exceeds the impact criteria given in Tables 8-1 and 8-2, the project will cause additional impact if the project significantly increases the number of vibration events. Approximately doubling the number of events is required for a significant increase.

   If there is not a significant increase in vibration events, there will be additional impact only if the project vibration, estimated using the procedures of Chapters 10 or 11, will be 3 VdB or more higher than the existing vibration. An example of a case with no additional impact would be an automated people mover system planned for a corridor with an existing rapid transit service with 220 trains per day. On the other hand, there could be impact if it is a new commuter rail line planned to share a corridor with the rapid transit system. In this latter case, the project vibrations are likely to be higher than the existing vibrations by 3 VdB or more.

4. *Moving existing tracks:* Another scenario where existing vibration can be significant is when a new transit project will use an existing railroad right-of-way and result in shifting the location of existing railroad tracks. The track relocation and reconstruction can result in lower vibration levels, in which case this aspect of the project represents a benefit, not an adverse impact. If the track relocation will cause higher vibration levels at sensitive receptors, then the projected vibration levels must be compared to the appropriate impact criterion to determine if there will be new impacts. If impact is judged to have existed prior to moving the tracks, new impact will be assessed only if the relocation results in more than a 3 VdB increase in vibration level.

8.1.3 Application to Freight Trains

The impact thresholds given in Tables 8-1 and 8-2 are based on experience with vibration from rail transit systems. They have been used to assess vibration from freight trains since no specific impact criteria exist for freight railroads. However, the significantly greater length, weight and axle loads of freight trains make it problematic to use these impact criteria for freight rail. Nevertheless, in shared right-of-way situations where the proposed transit alignment causes the freight tracks to be moved closer to sensitive sites, these impact criteria will have to be used. In assessing the freight train vibration, a dual approach is recommended with separate consideration of the locomotive and rail car vibration. Because the locomotive vibration only lasts for a very short time, the few-event criterion is appropriate for fewer than 30 events per day. However, for a typical line-haul freight train where the rail car vibration lasts for several minutes, the many-event limits should be applied to the rail car vibration. Some judgment must be exercised to make sure that the approach is reasonable. For example, some spur rail lines carry very little rail traffic (sometimes only one train per week) or have short trains, in which case the criteria may be disregarded altogether.

Finally, it should be pointed out that the vibration control measures developed for rail transit systems are not effective for freight trains. Consequently, any decision to relocate freight tracks closer to sensitive sites should be made with the understanding that the increased vibration impact due to freight rail will be very difficult, if not impossible, to mitigate.

8.2 VIBRATION IMPACT CRITERIA FOR DETAILED ANALYSIS

8.2.1 Ground-Borne Vibration

Specification of mitigation measures requires more detailed information and more refined impact criteria than what were used in the General Assessment. A frequency distribution, or spectrum, of the vibration energy determines whether the vibrations are likely to generate a significant response in a receiving building or structure. The Detailed Analysis method in this manual provides an estimate of building response in terms of a one-third octave band frequency spectrum. This section provides criteria for assessing the potential for interference or annoyance from building response and for determining the performance of vibration reduction methods.

International standards have been developed for the effects of vibration on people in buildings with ratings related to annoyance and interference with activities based on frequency distribution of acceptable vibrations.(2) These criteria have been supplemented by industry standards for vibration-sensitive equipment.(3) Both sets of criteria are expressed in terms of one-third octave band velocity spectra, with transient events like train passbys described in terms of the maximum rms vibration velocity level with a one-second averaging time. The measurement point is specified as the floor of the receiving building at the location of the prescribed activity.

The vibration impact criteria are shown in Figure 8-1 where the international standard curves and the industry standards are plotted on the same figure. Interpretations of the various levels are presented in Table 8-3. Detailed Analysis results in one-third octave band spectra levels that are plotted over the curves shown in Figure 8-1. Band levels that exceed a particular criterion curve indicate the need for mitigation and the frequency range within which the treatment needs to be effective.

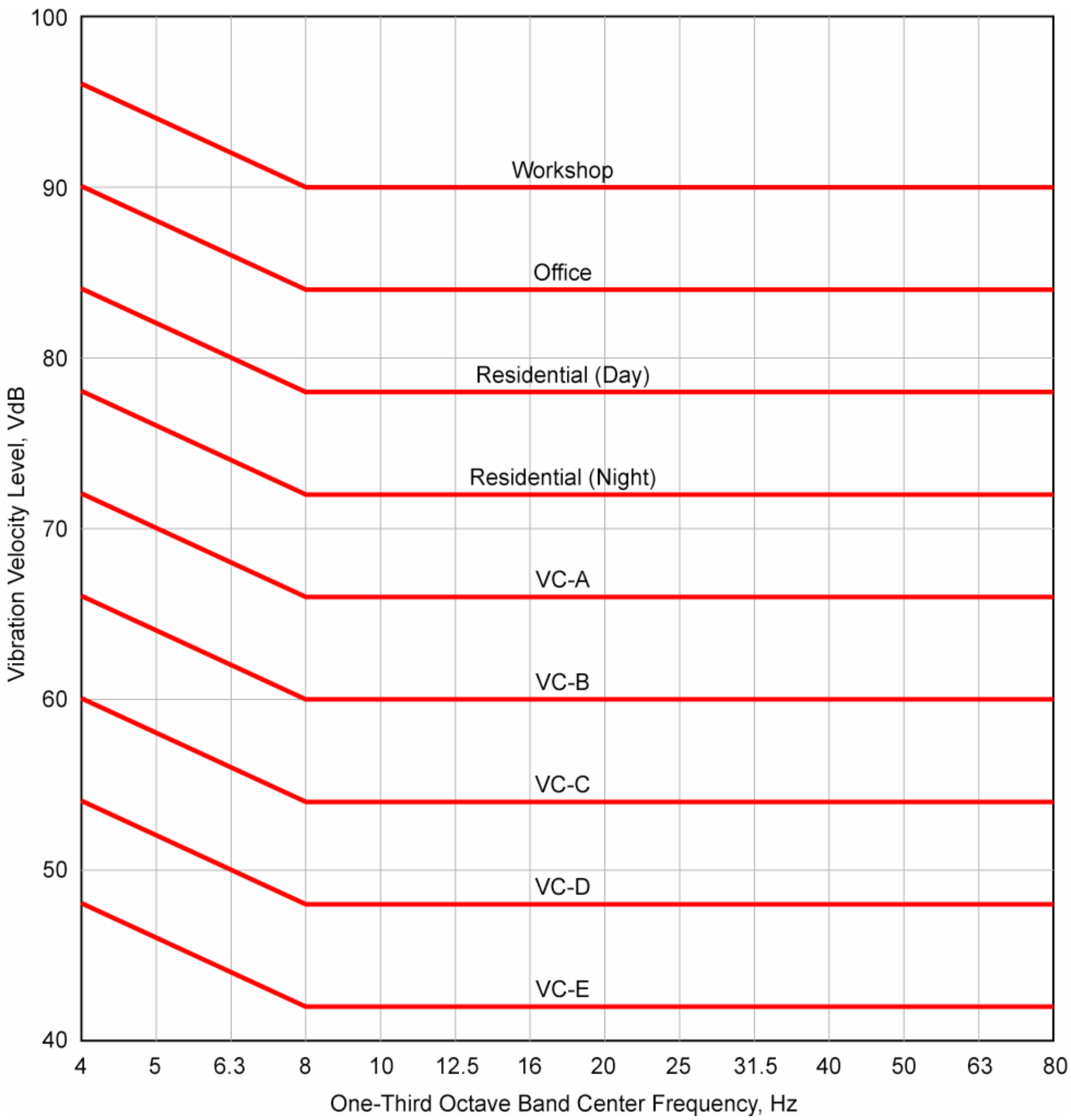

Figure 8-1. Criteria for Detailed Vibration Analysis

Table 8-3. Interpretation of Vibration Criteria for Detailed Analysis

Criterion Curve[1] (See Figure 8-1)	Max L_v (VdB)[2]	Description of Use
Workshop	90	Distinctly feelable vibration. Appropriate to workshops and non-sensitive areas.
Office	84	Feelable vibration. Appropriate to offices and non-sensitive areas.
Residential Day	78	Barely feelable vibration. Adequate for computer equipment and low-power optical microscopes (up to 20X).
Residential Night, Operating Rooms	72	Vibration not feelable, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power optical microscopes (100X) and other equipment of low sensitivity.
VC-A	66	Adequate for medium- to high-power optical microscopes (400X), microbalances, optical balances, and similar specialized equipment.
VC-B	60	Adequate for high-power optical microscopes (1000X), inspection and lithography equipment to 3 micron line widths.
VC-C	54	Appropriate for most lithography and inspection equipment to 1 micron detail size.
VC-D	48	Suitable in most instances for the most demanding equipment, including electron microscopes operating to the limits of their capability.
VC-E	42	The most demanding criterion for extremely vibration-sensitive equipment.

[1]Descriptors on curves are those provided by References 2 and 3.
[2]As measured in 1/3-octave bands of frequency over the frequency range 8 to 80 Hz.

These criteria use a frequency spectrum because vibration-related problems generally occur due to resonances of the structural components of a building or vibration-sensitive equipment. Resonant response is frequency-dependent. A Detailed Analysis can provide an assessment that identifies potential problems resulting from resonances.

The detailed vibration criteria are based on generic cases when people are standing or equipment is mounted on the floor in a conventional manner. Consequently, the criteria are less stringent at very low frequencies below 8 Hz. Where special vibration isolation has been provided in the form of pneumatic isolators, the resonant frequency of the isolation system is very low. Consequently, in this special case, the curves may be extended flat at lower frequencies.

8.2.2 Ground-Borne Noise

Ground-borne noise impacts are assessed based on criteria for human annoyance and activity interference. The results of the Detailed Analysis provide vibration spectra inside a building. These vibration spectra can be converted to sound pressure level spectra in the occupied spaces using the method described in Section 11.2.2. For residential buildings, the criteria for acceptability are given in terms of the A-weighted sound pressure level in Table 8-1. For special buildings listed in Table 8-2, a single-valued level may not be sufficient to assess activity interference at the Detailed Analysis stage. Each special building may have a unique specification for acceptable noise levels. For example, a recording studio may have stringent requirements for allowable noise in each frequency band. Therefore, the ground-borne noise criteria for each sensitive building in this category will have to be determined on a case-by-case basis.

REFERENCES

1. Acoustical Society of America, "American National Standard: Guide to Evaluation of Human Exposure to Vibration in Buildings," ANSI S3.29-1983 (ASA 48-1983).

2. International Organization for Standardization, "Evaluation of Human Exposure to Whole-Body Vibration, Part 2: Continuous and Shock-Induced Vibrations in Buildings (1-80Hz)," ISO-2361-2, 1989.

3. Institute of Environmental Sciences and Technology, "Considerations in Clean Room Design," RR-CC012.1, 1993.

9. VIBRATION SCREENING PROCEDURE

The vibration screening procedure is designed to identify projects that have little possibility of creating significant adverse impact. If the screening procedure does not identify any potential problem areas, it is usually safe to eliminate further consideration of vibration impact from the environmental analysis.

9.1 STEPS IN SCREENING PROCEDURE

The steps in the vibration screening procedure are summarized in Figure 9-1 in a flow chart format. Following is a summary of the steps:

Initial Decision: If the project includes any type of steel-wheeled/steel-rail vehicle, there is potential for vibration impact. Proceed directly to the evaluation of screening distances. Transit projects that do not involve vehicles, such as a station rehabilitation, do not have potential for vibration impact unless the track system will be modified (e.g., tracks moved or switches modified). Rail systems include urban rapid transit, light rail transit, commuter rail, and steel-wheel intermediate capacity transit systems. For projects that involve rubber-tire vehicles, vibration impact is unlikely except in unusual situations. Three specific factors shown in Figure 9-1 should be checked to determine if there is potential vibration impact from bus projects or any other projects that involve rubber-tire vehicles:

1. Will there be expansion joints, speed bumps, or other design features that result in unevenness in the road surface near vibration-sensitive buildings? Such irregularities can result in perceptible ground-borne vibration at distances up to 75 feet away.
2. Will buses, trucks or other heavy vehicles be operating close to a sensitive building? Research using electron microscopes and manufacturing of computer chips are examples of vibration-sensitive activities.

3. Does the project include operation of vehicles inside or directly underneath buildings that are vibration-sensitive? Special considerations are often required for shared-use facilities such as a bus station located inside an office building complex.

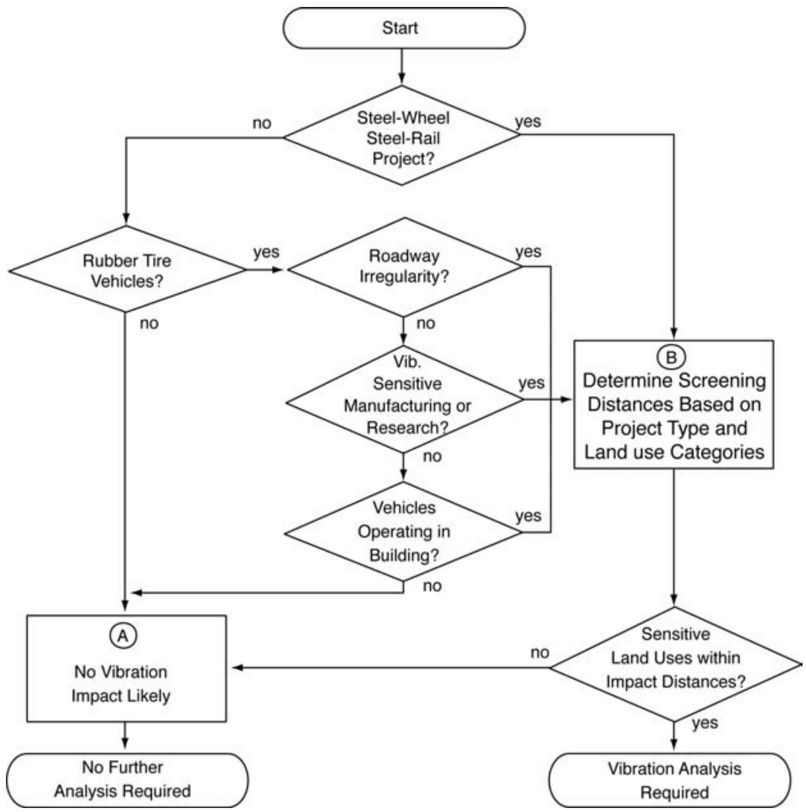

Figure 9-1. Flow Chart of Vibration Screening Process

No Impact (Box A): The decisions in step 1 lead to either box A, "No vibration impact likely," or box B. Reaching box A indicates that further analysis is not required. The majority of smaller FTA-assisted projects, such as bus terminals and park-and-ride lots, will be eliminated from further consideration of ground-borne vibration impact in the first step.

Screening Distances (Box B): If the result of the first step is that there is potential for vibration impact, determine if any vibration-sensitive land uses are within the screening zones. Vibration-sensitive land uses are identified in Chapter 8. Tables 9-1 and 9-2 are used to determine the applicable vibration screening distances for the project.

Impact: If there are any vibration-sensitive land uses within the screening distances, there is the potential for vibration impact. The result of the screening procedure is that a General Vibration Assessment should be done as part of the environmental analysis.

9.2 SCREENING DISTANCES

9.2.1 Project Categories

The vibration screening procedure is applicable to all types of FTA-assisted projects. The project categories for the vibration screening procedure are summarized in Table 9-1 for four types of rail transit. The fifth category includes all bus projects. Any project that does not include some type of vehicle is not likely to cause vibration impact.

With respect to Project Type 5, the rubber-tire vehicle category, most complaints about vibration caused by buses and trucks are related to rattling of windows or items hung on the walls. These vibrations are usually the result of airborne noise and not ground-borne vibration. In the case where ground-borne vibration is the source of the problem, the vibration can usually be related to potholes, some sort of bump in the road, or other irregularities.

Table 9-1. Project Types for Vibration Screening Procedure

Project Type	Description
1. Conventional Commuter Railroad	Both the locomotives and the passenger vehicles create significant vibration. The highest vibration levels are usually created by the locomotives. Electric commuter rail vehicles create levels of ground-borne vibration that are comparable to electric rapid transit vehicles.
2. Rail Rapid Transit	Ground-borne vibration impact from rapid transit trains is one of the major environmental issues for new systems. For operation in subway, the ground-borne vibration is usually a significant environmental impact. It is less common for at-grade and elevated rapid transit lines to create intrusive ground-borne vibration.
3. Light Rail Transit	The ground-borne vibration characteristics of light rail systems are very similar to those of rapid transit systems. Because the speeds of light rail systems are usually lower, the typical vibration levels usually are lower. Steel-wheel/steel-rail Automated Guideway Transit (AGT) will fall into either this category or the Intermediate Capacity Transit category depending on the level of service and train speeds.
4. Intermediate Capacity Transit	Because of the low operating speeds of most ICT systems, significant vibration problems are not common. However, steel-wheel ICT systems that operate close to vibration-sensitive buildings have the potential of causing intrusive vibration. With a stiff suspension system, an ICT system could create intrusive vibration.
5. Bus and Rubber-Tire Transit Projects	This category encompasses most projects that do not include steel-wheel trains of some type. Examples are diesel buses, electric trolley buses, and rubber-tired people movers. Most projects that do not include steel-wheel trains do not cause significant vibration impact.

9.2.2 Distances

The screening distances are given in Table 9-2. These distances are based on the criteria presented in Chapter 8, with a 5-decibel factor of safety included. The distances have been determined using vibration prediction procedures that are summarized in Chapter 10 assuming "normal" vibration propagation. As discussed in Chapter 10, efficient vibration propagation can result in substantially higher vibration levels.

Because of the 5-decibel safety factor, even with efficient propagation, the screening distances will identify most of the potentially impacted areas. By not specifically accounting for the possibility of efficient vibration propagation, there is some possibility that some potential impact areas will not be identified in the screening process. When there is evidence of efficient propagation, such as previous complaints about existing transit facilities or a history of problems with construction vibration, the distances in Table 9-2 should be increased by a factor of 1.5.

Table 9-2. Screening Distances for Vibration Assessment

Type of Project	Critical Distance for Land Use Categories* Distance from Right-of-Way or Property Line		
	Cat. 1	Cat. 2	Cat. 3
Conventional Commuter Railroad	600	200	120
Rail Rapid Transit	600	200	120
Light Rail Transit	450	150	100
Intermediate Capacity Transit	200	100	50
Bus Projects (if not previously screened out)	100	50	--

* The land-use categories are defined in Chapter 8. Some vibration-sensitive land uses are not included in these categories. Examples are: concert halls and TV studios which, for the screening procedure, should be evaluated as Category 1; and theaters and auditoriums which should be evaluated as Category 2.

10. GENERAL VIBRATION ASSESSMENT

This chapter outlines procedures that can be used to develop generalized predictions of ground-borne vibration and noise. This manual includes three different levels of detail for projecting ground-borne vibration:

- **Screening:** The screening procedure is discussed in Chapter 9. A standard table of impact distances is used to determine if ground-borne vibration from the project may affect sensitive land uses. More detailed analysis is required if any sensitive land uses are within the screening distances. The screening procedure does not require any specific knowledge about the vibration characteristics of the system or the geology of the area. If different propagation conditions are known to be present, a simple adjustment is provided.

- **General Assessment:** The general level of assessment, as described in this chapter, is an extension of the screening procedure. It uses generalized data to develop a curve of vibration level as a function of distance from the track. The vibration levels at specific buildings are estimated by reading values from the curve and applying adjustments to account for factors such as track support system, vehicle speed, type of building, and track and wheel condition. The general level deals only with the overall vibration velocity level and the A-weighted sound level. It does not consider the frequency spectrum of the vibration or noise.

- **Detailed Analysis:** Discussed in Chapter 11, the Detailed Analysis involves applying all of the available tools for accurately projecting the vibration impact at specific sites. The procedure outlined in this manual includes a test of the vehicle (or similar vehicle) to define the forces generated by the vibration source and tests at the site in question to define how the local geology affects vibration propagation. It is considerably more complex to develop detailed projections of ground-borne vibration than it is to develop detailed projections of airborne noise. Accurate projections of ground-borne vibration require professionals with experience in performing and interpreting vibration propagation tests. As such, detailed vibration predictions are usually performed during the final design phase of a project when there is sufficient reason to suspect adverse vibration impact from the project. The procedure for Detailed Vibration Analysis presented in Chapter 11 is based on measurements to characterize vibration propagation at specific sites.

There is not always a clear distinction between general and detailed predictions. For example, it is often appropriate to use several representative measurements of vibration propagation along the planned alignment in developing generalized propagation curves. Other times, generalized prediction curves may be sufficient for the majority of the alignment, but with Detailed Analysis applied to particularly sensitive buildings such as a concert hall. The methods for analyzing transit vibration in this manual are consistent with those described in recognized handbooks and international standards.[1, 2]

The purpose of the General Assessment is to provide a relatively simple method of developing estimates of the overall levels of ground-borne vibration and noise that can be compared to the acceptability criteria given in Chapter 8. For many projects, particularly when comparing alternatives, this level of detail will be sufficient for the environmental impact assessment. Where there are potential problems, the Detailed Analysis is then undertaken during final design of the selected alternative to accurately define the level of impact and design mitigation measures. A Detailed Analysis usually will be required when designing special track-support systems such as floating slabs or ballast mats. Detailed Analysis is not usually required if, as is often the case, the mitigation measure consists of relocating a crossover or turnout. Usually, the General Assessment is adequate to determine whether a crossover needs to be relocated.

The basic approach for the General Assessment is to define a curve, or set of curves, that predicts the overall ground-surface vibration as a function of distance from the source, then apply adjustments to these curves to account for factors such as vehicle speed, building type, and receiver location within the building. Section 10.1 includes curves of vibration level as a function of distance from the source for the common types of vibration sources such as rapid transit trains and buses. When the vehicle type is not covered by the curves included in this section, it will be necessary to define an appropriate curve either by extrapolating from existing information or performing measurements at an existing facility.

10.1 SELECTION OF BASE CURVE FOR GROUND SURFACE VIBRATION LEVEL

The base curves for three standard transportation systems are defined in Figure 10-1. This figure shows typical ground-surface vibration levels assuming equipment in good condition and speeds of 50 mph for the rail systems and 30 mph for buses. The levels must be adjusted to account for factors such as different speeds and different geologic conditions than assumed. The adjustment factors are discussed in Section 10.2.

The curves in Figure 10-1 are based on measurements of ground-borne vibration at representative North American transit systems. The top curve applies to trains that are powered by diesel or electric locomotives. It includes intercity passenger trains and commuter rail trains. The curve for rapid transit rail cars covers both heavy and light-rail vehicles on at-grade and subway track. It is somewhat surprising that subway and at-grade track can be represented by the same curve since ground-borne vibration created by a train operating in a subway has very different characteristics than vibration from at-grade track. However, in spite of these differences, the overall vibration velocity levels are comparable. Subways tend to have more vibration problems than at-grade track. This is probably due to two factors: (1) subways are usually located in more densely developed areas, and (2) the airborne noise is usually a more serious problem for at-grade systems than the ground-borne vibration. Another difference between subway and at-grade track is that the ground-borne vibration from subways tends to be higher frequency than the vibration from at-grade track, which makes the ground-borne noise more noticeable.

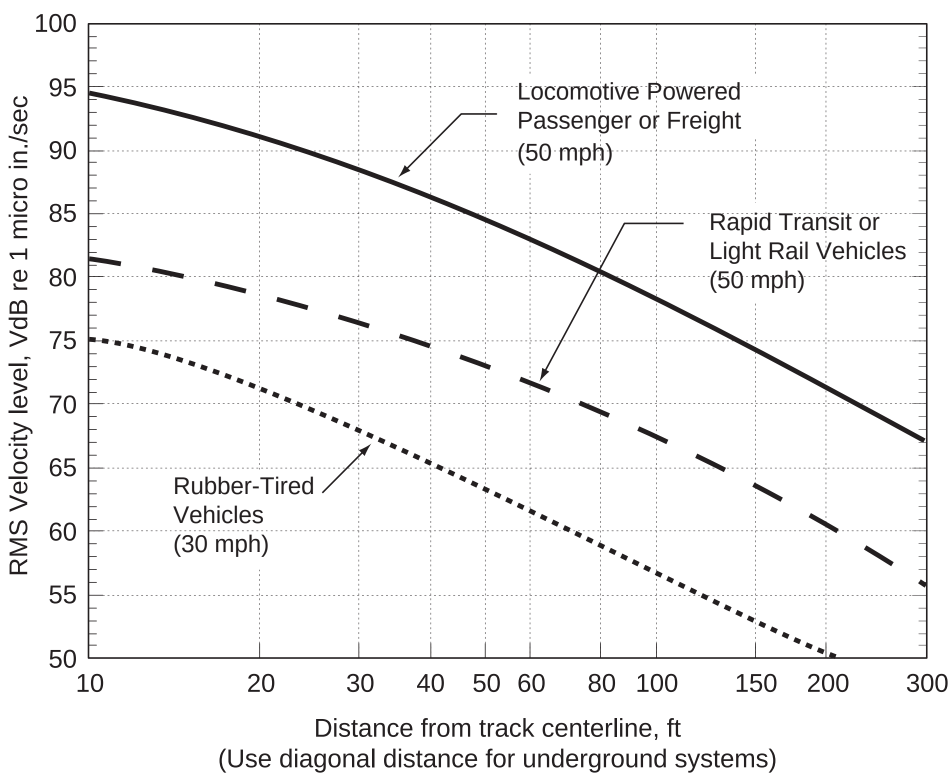

Figure 10-1. Generalized Ground Surface Vibration Curves

The curves in Figure 10-1 were developed from many measurements of ground-borne vibration. Experience with ground-borne vibration data is that, for any specific type of transit mode, a significant variation in vibration levels under apparently similar conditions is not uncommon. The curves in Figure

10-1 represent the upper range of the measurement data from well-maintained systems. Although actual levels fluctuate widely, it is rare that ground-borne vibration will exceed the curves in Figure 10-1 by more than one or two decibels unless there are extenuating circumstances, such as wheel- or running-surface defects.

One approach to dealing with the normal fluctuation is to show projections as a range. For example, the projected level from Figure 10-1 for an LRT system with train speeds of 50 mph is about 72 VdB at a distance of 60 feet from the track centerline, just at the threshold for acceptable ground-borne vibration for residential land uses. To help illustrate the normal fluctuation, the projected level of ground-borne vibration might be given as 67 to 72 VdB. This approach is not recommended since it tends to confuse the interpretation of whether or not the projected vibration levels exceed the impact threshold. However, because actual levels of ground-borne vibration will sometimes differ substantially from the projections, some care must be taken when interpreting projections. Some guidelines are given below:

1. Projected vibration is below the impact threshold. Vibration impact is unlikely in this case.
2. Projected ground-borne vibration is 0 to 5 decibels greater than the impact threshold. In this range there is still a significant chance that actual ground-borne vibration levels will be below the impact threshold. In this case, the impact would be reported in the environmental document as exceeding the applicable threshold and a commitment would be made to conduct more detailed studies to refine the vibration impact analysis during final design and determine appropriate mitigation, if necessary. A site-specific Detailed Analysis may show that vibration control measures are not needed.
3. Projected ground-borne vibration is 5 decibels or more greater than the impact threshold. Vibration impact is probable and Detailed Analysis will be needed during final design to help determine appropriate vibration control measures.

The two most important factors that must be accounted for in a General Assessment are the type of vibration source (the mode of transit) and the vibration propagation characteristics. It is well known that there are situations where ground-borne vibration propagates much more efficiently than normal. The result is unacceptable vibration levels at distances two to three times the normal distance. Unfortunately, the geologic conditions that promote efficient propagation have not been well documented and are not fully understood. Shallow bedrock or stiff clay soil often are involved. One possibility is that shallow bedrock acts to keep the vibration energy near the surface. Much of the energy that would normally radiate down is directed back towards the surface by the rock layer with the result that the ground surface vibration is higher than normal.

The selection of a base curve depends on the mode of rail transit under consideration. Appropriate correction factors are then added to account for any unusual propagation characteristics. For less common modes such as magnetically-levitated vehicles (maglev), monorail, or automated guideway transit (AGT), it is necessary to either make a judgment about which curve and adjustment factors best fit the mode or to develop new estimates of vibration level as a function of distance from the track. For example, the vibration from a rubber-tire monorail that will be operating on aerial guideway can be approximated using the bus/rubber tire systems with the appropriate adjustment for the aerial structure. Another example is a magnetic levitation system. Most of the data available on the noise and vibration characteristics of maglev vehicles comes from high-speed systems intended for inter-city service. Even though there is no direct contact between the vehicle and the guideway, the dynamic loads on the guideway can generate ground-borne vibration. Measurements on a German high-speed maglev resulted in ground-borne vibrations at 75 mph comparable to the base curve for rubber-tired vehicles at 30 mph.[3] Considerations for selecting a base curve are discussed below:

- **Intercity Passenger Trains:** Although intercity passenger trains can be an important source of environmental vibration, it is rare that they are significant for FTA-funded projects unless a new transit mode will use an existing rail alignment. When a new transit line will use an existing rail alignment, the changes in the intercity passenger traffic can result in either positive or negative impacts. Unless there are specific data available on the ground-borne vibration created by the train operations, the upper curve in Figure 10-1 should be used for intercity passenger trains.
- **Locomotive-Powered Commuter Rail:** The locomotive curve from Figure 10-1 should be used for any commuter rail system powered by either diesel or electric locomotives. The locomotives often create vibration levels that are 3 to 8 decibels higher than those created by the passenger cars. Self-powered electric commuter rail trains can be considered to be similar to rapid transit vehicles. Although they are relatively rare in the U.S., self-powered diesel multiple units (DMU's) create vibration levels somewhere between rapid transit vehicles and locomotive-powered passenger trains. When the axle loads and suspension parameters of a particular DMU are comparable to typical rapid transit vehicles, the rapid transit curve in Figure 10-1 can be used for that mode.
- **Subway Heavy Rail:** Complaints about ground-borne vibration are more common near subways than near at-grade track. This is not because subways create higher vibration levels than at-grade systems - rather it is because subways are usually located in high-density areas in close proximity to building foundations. When applied to subways, the rapid transit curve in Figure 10-1 assumes a relatively lightweight bored concrete tunnel in soil. The vibration levels will be lower for heavier subway structures such as cut-and-cover box structures and stations.
- **At-Grade Heavy Rail or LRT:** The available data show that heavy rail and light rail transit vehicles create similar levels of ground-borne vibration. This is not surprising since the vehicles have similar suspension systems and axle loads. Light-rail systems tend to have fewer problems with ground-borne vibration because of the lower operating speeds. Similar to the subway case, an adjustment factor must be used if the transit vehicle has a primary suspension that is stiff in the vertical direction.
- **Intermediate Capacity Transit:** The vibration levels created by an intermediate capacity transit system or an AGT system will depend on whether the vehicles have steel wheels or rubber wheels. If they have steel wheels, the transit car curve in Figure 10-1 should be used with appropriate adjustments for operating speed. The bus/rubber tire curve should be used for rubber-tired ICT systems.

- **Bus/Rubber Tire:** Rubber-tire vehicles rarely create ground-borne vibration problems unless there is a discontinuity or bump in the road that causes the vibration. The curve in Figure 10-1 shows the vibration level for a typical bus operating on smooth roadway.

10.2 ADJUSTMENTS

Once the base curve has been selected, the adjustments in Table 10-1 can be used to develop vibration projections for specific receiver positions inside buildings. All of the adjustments are given as single numbers to be added to, or subtracted from, the base level. The adjustment parameters are speed, wheel and rail type and condition, type of track support system, type of building foundation, and number of floors above the basement level. It should be recognized that many of these adjustments are strongly dependent on the frequency spectrum of the vibration source and the frequency dependence of the vibration propagation. The single number values are suitable for generalized evaluation of the vibration impact and vibration mitigation measures since they are based on typical vibration spectra. However, the single number adjustments are not adequate for detailed evaluations of impact of sensitive buildings or for detailed specification of mitigation measures. Detailed Analysis requires consideration of the relative importance of different frequency components.

Table 10-1. Adjustment Factors for Generalized Predictions of Ground-Borne Vibration and Noise

Source Factor	Adjustment to Propagation Curve			Comment
Factors Affecting Vibration Source				
		Reference Speed		
Speed	Vehicle Speed	50 mph	30 mph	Vibration level is approximately proportional to 20*log(speed/speed$_{ref}$). Sometimes the variation with speed has been observed to be as low as 10 to 15 log(speed/speed$_{ref}$).
	60 mph	+1.6 dB	+6.0 dB	
	50 mph	0.0 dB	+4.4 dB	
	40 mph	-1.9 dB	+2.5 dB	
	30 mph	-4.4 dB	0.0 dB	
	20 mph	-8.0 dB	-3.5 dB	
Vehicle Parameters (not additive, apply greatest value only)				
Vehicle with stiff primary suspension	+8 dB			Transit vehicles with stiff primary suspensions have been shown to create high vibration levels. Include this adjustment when the primary suspension has a vertical resonance frequency greater than 15 Hz.
Resilient Wheels	0 dB			Resilient wheels do not generally affect ground-borne vibration except at frequencies greater than about 80 Hz.
Worn Wheels or Wheels with Flats	+10 dB			Wheel flats or wheels that are unevenly worn can cause high vibration levels. This can be prevented with wheel truing and slip-slide detectors to prevent the wheels from sliding on the track.
Track Conditions (not additive, apply greatest value only)				
Worn or Corrugated Track	+10 dB			If both the wheels and the track are worn, only one adjustment should be used. Corrugated track is a common problem. Mill scale on new rail can cause higher vibration levels until the rail has been in use for some time.
Special Trackwork	+10 dB			Wheel impacts at special trackwork will significantly increase vibration levels. The increase will be less at greater distances from the track.
Jointed Track or Uneven Road Surfaces	+5 dB			Jointed track can cause higher vibration levels than welded track. Rough roads or expansion joints are sources of increased vibration for rubber-tire transit.
Track Treatments (not additive, apply greatest value only)				
Floating Slab Trackbed	-15 dB			The reduction achieved with a floating slab trackbed is strongly dependent on the frequency characteristics of the vibration.
Ballast Mats	-10 dB			Actual reduction is strongly dependent on frequency of vibration.
High-Resilience Fasteners	-5 dB			Slab track with track fasteners that are very compliant in the vertical direction can reduce vibration at frequencies greater than 40 Hz.

Table 10-1. Adjustment Factors for Generalized Predictions of Ground-Borne Vibration and Noise (Continued)

Factors Affecting Vibration Path		
Path Factor	**Adjustment to Propagation Curve**	**Comment**
Resiliently Supported Ties	-10 dB	Resiliently supported tie systems have been found to provide very effective control of low-frequency vibration.
Track Configuration (not additive, apply greatest value only)		
Type of Transit Structure	Relative to at-grade tie & ballast: Elevated structure -10 dB Open cut 0 dB	The general rule is the heavier the structure, the lower the vibration levels. Putting the track in cut may reduce the vibration levels slightly. Rock-based subways generate higher-frequency vibration.
	Relative to bored subway tunnel in soil: Station -5 dB Cut and cover -3 dB Rock-based - 15 dB	
Ground-borne Propagation Effects		
Geologic conditions that promote efficient vibration propagation	Efficient propagation in soil +10 dB	Refer to the text for guidance on identifying areas where efficient propagation is possible.
	Propagation in rock layer **Dist.** / **Adjust.** 50 ft +2 dB 100 ft +4 dB 150 ft +6 dB 200 ft +9 dB	The positive adjustment accounts for the lower attenuation of vibration in rock compared to soil. It is generally more difficult to excite vibrations in rock than in soil at the source.
Coupling to building foundation	Wood Frame Houses -5 dB 1-2 Story Masonry -7 dB 3-4 Story Masonry -10 dB Large Masonry on Piles -10 dB Large Masonry on Spread Footings -13 dB Foundation in Rock 0 dB	The general rule is the heavier the building construction, the greater the coupling loss.
Factors Affecting Vibration Receiver		
Receiver Factor	**Adjustment to Propagation Curve**	**Comment**
Floor-to-floor attenuation	1 to 5 floors above grade: -2 dB/floor 5 to 10 floors above grade: -1 dB/floor	This factor accounts for dispersion and attenuation of the vibration energy as it propagates through a building.
Amplification due to resonances of floors, walls, and ceilings	+6 dB	The actual amplification will vary greatly depending on the type of construction. The amplification is lower near the wall/floor and wall/ceiling intersections.
Conversion to Ground-borne Noise		
Noise Level in dBA	Peak frequency of ground vibration: Low frequency (<30 Hz): -50 dB Typical (peak 30 to 60 Hz): -35 dB High frequency (>60 Hz): -20 dB	Use these adjustments to estimate the A-weighted sound level given the average vibration velocity level of the room surfaces. See text for guidelines for selecting low, typical or high frequency characteristics. Use the high-frequency adjustment for subway tunnels in rock or if the dominant frequencies of the vibration spectrum are known to be 60 Hz or greater.

Without careful consideration of the shape of the actual vibration spectra, an inappropriate vibration control measure may be selected that could actually cause an increase in the vibration levels.

The following guidelines are used to select the appropriate adjustment factors. Note that the adjustments for wheel and rail condition are not cumulative. The general rule-of-thumb to use when more than one adjustment may apply is to apply only the largest adjustment. For example: the adjustment for jointed track is 5 decibels and the adjustment for wheel flats is 10 decibels. In an area where there is jointed track and many vehicles have wheel flats, the projected vibration levels should be increased by 10 decibels, not 15 decibels.

- **Train Speed:** The levels of ground-borne vibration and noise vary approximately as 20 times the logarithm of speed. This means that doubling train speed will increase the vibration levels approximately 6 decibels and halving train speed will reduce the levels by 6 decibels. Table 10-1 tabulates the adjustments for reference vehicle speeds of 30 mph for rubber-tired vehicles and 50 mph for steel-wheel vehicles. The following relationship should be used to calculate the adjustments for other speeds.

$$adjustment(dB) = 20 \times \log\left(\frac{speed}{speed_{ref}}\right)$$

- **Vehicle:** The most important factors for the vehicles are the suspension system, wheel condition, and wheel type. Most new heavy rail and light rail vehicles have relatively soft primary suspensions. However, experience in Atlanta, New York, and other cities has demonstrated that a stiff primary suspension (vertical resonance frequency greater than 15 Hz) can result in higher than normal levels of ground-borne vibration. Vehicles for which the primary suspension consists of a rubber or neoprene "donut" around the axle bearing usually have a very stiff primary suspension with a vertical resonance frequency greater than 40 Hz.

  Deteriorated wheel condition is another factor that will increase vibration levels. It can be assumed that a new system will have vehicles with wheels in good condition. However, when older vehicles will be used on new track, it may be appropriate to include an adjustment for wheel condition. The reference curves account for wheels without defects, but wheels with flats or corrugations can cause vibration levels that are 10 VdB higher than normal. Resilient wheels will reduce vibration levels at frequencies greater than the effective resonance frequency of the wheel. Because this resonance frequency is relatively high, often greater than 80 Hz, resilient wheels usually have only a marginal effect on ground-borne vibration.

  It is important to use only one of the adjustments in this category, the greatest one that applies.

- **Track System and Support:** This category includes the type of rail (welded, jointed or special trackwork), the track support system, and the condition of the rail. The base curves all assume good-condition welded rail. Jointed rail causes higher vibration levels than welded rail; the amount higher depends on the condition of the joints. The wheel impacts at special trackwork, such as frogs at crossovers, create much higher vibration forces than normal. Because of the higher vibration levels at special trackwork, crossovers often end up being the principal areas of vibration impact on new systems. Modifying the track support system is one method of mitigating the vibration impact. Special track support systems such as ballast mats, high-resilience track fasteners, resiliently supported ties, and floating slabs have all been shown to be effective in reducing vibration levels.

  The condition of the running surface of the rails can strongly affect vibration levels. Factors such as corrugations, general wear, or mill scale on new track can cause vibration levels that are 5 to 15 decibels higher than normal. Mill scale will usually wear off after some time in service; however, the track must be ground to remove corrugations or to reduce the roughness from wear.

  Again, apply only one of the adjustments.

  Roadway surfaces in the case of rubber-tired systems are assumed to be smooth. Rough washboard surfaces, bumps or uneven expansion joints are the types of running surface defects that cause increased vibration levels over the smooth road condition.

- **Transit Structure:** The weight and size of a transit structure affects the vibration radiated by that structure. The general rule-of-thumb is that vibration levels will be lower for heavier transit structures. Hence, the vibration levels from a cut-and-cover concrete double-box subway can be assumed to be lower than the vibration from a lightweight concrete-lined bored tunnel. The vibration from elevated structures is lower than from at-grade track because of the mass and damping of the structure and the extra distance that the vibration must travel before it reaches the receiver. Elevated structures in automated guideway transit applications sometimes are designed to bear on building elements. These are a special case and may require detailed design considerations.

- **Propagation Characteristics:** In the General Assessment it is necessary to make a selection among the general propagation characteristics. For a subway, the selection is a fairly straightforward choice of whether or not the subway will be founded in bedrock. Bedrock is considered to be hard rock. It is usually appropriate to consider soft siltstone and sandstone to be more similar to soil than hard rock. As seen in Table 10-1, whether the subway is founded in soil or rock can be a 15 VdB difference in the vibration levels.

  When considering at-grade vibration sources, the selection is between "normal" vibration propagation and "efficient" vibration propagation. Efficient vibration propagation results in approximately 10 decibels higher vibration levels. This more than doubles the potential impact zone for ground-borne vibration. One of the problems with identifying the cause of efficient propagation is the difficulty in determining whether higher than normal vibration levels are due to geologic conditions or due to special source conditions (e.g. rail corrugations or wheel flats).

  Although it is known that geologic conditions have a significant effect on the vibration levels, it is rarely possible to develop more than a broad-brush understanding of the vibration propagation characteristics for a General Assessment. The conservative approach would be to use the 10-decibel adjustment for efficient propagation to evaluate all potential vibration impact. The problem with this approach is that it tends to greatly overstate the potential for vibration impact. Hence, it is best to review available geological data and any complaint history from existing transit lines and major construction sites near the transit corridor to identify areas where efficient propagation is possible. If there is any reason to suspect efficient propagation conditions, then a Detailed Analysis during final design would include vibration propagation tests at the areas identified as potentially efficient propagation sites.

Some geologic conditions are repeatedly associated with efficient propagation. Shallow bedrock, less than 30 feet below the surface, is likely to have efficient propagation. Other factors that can be important are soil type and stiffness. In particular, stiff clayey soils have sometimes been associated with efficient vibration propagation. Investigation of soil boring records can be used to estimate depth to bedrock and the presence of problem soil conditions.

A factor that can be particularly complex to address is the effect of vibration propagation through rock. There are three factors from Table 10-1 that need to be included when a subway structure will be founded in rock. First is the -15 decibel adjustment in the "Type of Transit Structure" category. Second is the adjustment based on the propagation distance in the "Geologic Conditions" category. This positive adjustment is applied to the distances shown in Figure 10-1; the adjustment increases with distance because vibration attenuates more slowly in rock than in the soil used as a basis for the reference curve. The third factor is in the "Coupling to Building" category. When a building foundation is directly on the rock layer, there is no "coupling loss" due to the weight and stiffness of the building. Use the standard coupling factors if there is at least a 10-foot layer of soil between the building foundation and the rock layer.

- **Type of Building and Receiver Location in Building:** Since annoyance from ground-borne vibration and noise is an indoor phenomenon, the effects of the building structure on the vibration must be considered. Wood frame buildings, such as the typical residential structure, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration.

  Vibration generally reduces in level as it propagates through a building. As indicated in Table 10-1, a 1- to 2-decibel attenuation per floor is usually assumed. Counteracting this, resonances of the building structure, particularly the floors, will cause some amplification of the vibration. Consequently, for a wood-frame structure, the building-related adjustments nearly cancel out. The adjustments for the first floor assuming a basement are: -5 decibels for the coupling loss; -2 decibels for the propagation from the basement to the first floor; and +6 decibels for the floor amplification. The total adjustment in this case is -1 decibel.

- **Vibration to Ground-Borne Noise Adjustment**: It is possible to estimate the levels of radiated noise given the average vibration amplitude of the room surfaces (floors, walls and ceiling), and the total acoustical absorption in the room. The unweighted sound pressure level is approximately equal to the vibration velocity level when the velocity level is referenced to $1x10^{-6}$ inches/second.

However, to estimate the A-weighted sound level from the velocity level, it is necessary to have some information about the frequency spectrum. The A-weighting adjustment drops rapidly at low frequencies, reflecting the relative insensitivity of human hearing to low frequencies. For example, A-weighting is -16 dB at 125 Hz, -26 dB at 60 Hz and -40 dB at 30 Hz. Table 10-1 provides adjustments for vibration depending on whether it has low-frequency, typical or high-frequency characteristics. Some general guidelines for classifying the frequency characteristics are:

- Low Frequency: Low-frequency vibration characteristics can be assumed for subways surrounded by cohesiveless sandy soil or whenever a vibration isolation track support system will be used. Low-frequency characteristics can be assumed for most surface track.
- Typical: The typical vibration characteristic is the default assumption for subways. It should be assumed for subways until there is information indicating that one of the other assumptions is appropriate. It should be used for surface track when the soil is very stiff with a high clay content.
- High Frequency: High-frequency characteristics should be assumed for subways whenever the transit structure is founded in rock or when there is very stiff clayey soil.

10.3 INVENTORY OF VIBRATION-IMPACTED LOCATIONS

This chapter includes generalized curves for surface vibration for different transit modes along with adjustments to apply for specific operating conditions and buildings. The projected levels are then compared with the criteria in Chapter 8 to determine whether vibration impact is likely. The results of the General Assessment are expressed in terms of an inventory of all sensitive land uses where either ground-borne vibration or ground-borne noise from the project may exceed the impact thresholds. The General Assessment may include a discussion of mitigation measures which would likely be needed to reduce vibration to acceptable levels.

The purpose of the procedure is to develop a reasonably complete inventory of the buildings that may experience ground-borne vibration or noise that exceed the impact criteria. At this point, it is preferable to make a conservative assessment of the impact. That is, it is better to include some buildings where ground-borne vibration may be below the impact threshold than to exclude buildings where it may exceed the impact threshold. The inventory should be organized according to the categories described in Chapter 8. For each building where the projected ground-borne vibration or noise exceeds the applicable impact threshold, one or more of the vibration control options from Section 11.5 should be considered for applicability. See Section 11.4 for a more complete description of how the General Vibration Assessment fits into the overall procedure.

REFERENCES

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2. International Organization for Standardization, "Mechanical vibration – Ground-borne noise and vibration arising from rail systems," ISO/FDIS 14837-1:2005.

3. U.S. Department of Transportation, Volpe National Transportation Systems Center, "Vibration Characteristics of the Transrapid TR08 Maglev System," Report No. DOT-VNTSC-FRA-02-06, March 2002.

11. DETAILED VIBRATION ANALYSIS

The goal of the Detailed Analysis is to use all available tools to develop accurate projections of potential ground-borne vibration impact and, when necessary, to design mitigation measures. This is appropriate when the General Assessment has indicated impact and the project has entered the final design and engineering phase. It may also be appropriate to perform a Detailed Analysis at the outset when there are particularly sensitive land uses within the screening distances. Detailed Analysis will require developing estimates of the frequency components of the vibration signal, usually in terms of 1/3-octave-band spectra. Analytical techniques for solving vibration problems are complex and the technology continually advances. Consequently, the approach presented in this chapter focuses on the key steps usually taken by a professional in the field.

Three examples of cases where a Detailed Vibration Analysis might be required are:

Example 1: A particularly sensitive building such as a major concert hall is within the impact zone. A Detailed Analysis would ensure that effective vibration mitigation is feasible and economically reasonable.

Example 2: The General Assessment indicates that a proposed commuter rail project has the potential to create vibration impact for a large number of residential buildings adjacent to the alignment. The projections for many of the buildings exceed the impact threshold by less than 5 decibels, which means that more accurate projections may show that vibration levels will be below the impact criterion. Detailed Analysis will refine the impact assessment and help determine whether mitigation is needed.

Example 3: A transit alignment will be close to university research buildings where vibration-sensitive optical instrumentation is used. Vibration from the trains could make it impossible to continue using the building for this type of research. A Detailed Analysis would determine if it is possible to control the vibration from the trains such that sensitive instrumentation will not be affected.

A Detailed Vibration Analysis consists of three parts:

1. **Survey Existing Vibration.** Although knowledge of the existing levels of ground-borne vibration is not usually required for the assessment of vibration impact, there are times when a survey of the existing vibration is valuable. Examples include documenting existing background vibration at sensitive buildings, measuring the vibration levels created by sources such as existing rail lines, and, in some cases, characterizing the general background vibration in the project corridor. Characterizing the existing vibration is discussed in Section 11.1.
2. **Predict Future Vibration and Vibration Impact.** All of the available tools should be applied in a Detailed Analysis to develop the best possible estimates of the potential for vibration impact. Section 11.2 discusses an approach to projecting ground-borne vibration that involves performing tests to characterize vibration propagation at sites where significant impact is probable. Section 11.3 describes the vibration propagation test procedure and Section 11.4 discusses the assessment of vibration impact.
3. **Develop Mitigation Measures.** Controlling the impact from ground-borne vibration requires developing cost-effective measures to reduce the vibration levels. The Detailed Analysis helps to select practical vibration control measures that will be effective at the dominant vibration frequencies and compatible with the given transit structure and track support system. Vibration mitigation measures are discussed in Section 11.5.

The discussion in this chapter generally assumes that detailed vibration analysis applies to a steel-wheel/ rail system. The procedures could be adapted to bus systems. However, this is rarely necessary because vibration problems are very infrequent with rubber-tired transit.

11.1 CHARACTERIZING EXISTING VIBRATION CONDITIONS

Environmental vibration is rarely of sufficient magnitude to be perceptible or cause audible ground-borne noise unless there is a specific vibration source close by, such as a rail line. In most cases, feelable vibration inside a building is caused by equipment or activities within the building itself, such as heating and ventilation systems, footsteps or doors closing. Because the existing environmental vibration is usually below human perception, a limited vibration survey is sufficient even for a Detailed Analysis. This contrasts with analysis of noise impact where documenting the existing ambient noise level is required to assess the impact.

Examples of situations where measurements of the ambient vibration are valuable include:

- **Determining existing vibration at sensitive buildings:** Serious vibration impact may occur when there are vibration-sensitive manufacturing, research, or laboratory activities within the screening distances. Careful documentation of the pre-existing vibration provides valuable information on the real sensitivity of the activity to external vibration and gives a reference condition under which vibration is not a problem.

- **Using existing vibration sources to characterize propagation:** Existing vibration sources such as freight trains, industrial processes, quarrying operations, or normal traffic sometimes can be used to characterize vibration propagation. Carefully designed and performed measurements may eliminate the need for more complex propagation tests.
- **Documenting existing levels of general background:** Some measurements of the existing levels of background vibration can be useful simply to document that, as expected, the vibration is below the normal threshold of human perception. Existing vibration in urban and suburban areas is usually due to traffic. If a measurement site has existing vibration approaching the range of human perception (e.g., the maximum vibration velocity levels are greater than about 65 VdB), then this site should be carefully evaluated for the possibility of efficient vibration propagation. Areas with efficient vibration propagation could have vibration problems when the project is built.
- **Documenting vibration from existing rail lines:** Measurements to document the levels of vibration created by existing rail lines can be important in evaluating the impact of the new vibration source and determining vibration propagation characteristics in the area. As discussed in Chapter 8, if vibration from an existing rail line will be higher than that from the proposed transit trains, there may not be impact even though the normal impact criterion would be exceeded.

Although ground-borne vibration is almost exclusively a problem inside buildings, measurements of existing ambient vibration generally should be performed outdoors. Two important reasons for this are: (1) equipment inside the building may cause more vibration than exterior sources, and (2) the building structure and the resonances of the building can have strong, but difficult to predict, effects on the vibration. However, there are some cases where measurements of indoor vibration are important. Documenting the vibration levels inside a vibration-sensitive building can be particularly important since equipment and activities inside the building sometimes cause vibration greater than that due to external sources such as street traffic or aircraft overflights. Floor vibration measurements are taken near the center of a floor span where the vibration amplitudes are the highest.

The goal of most ambient vibration tests is to characterize the root mean square (rms) vertical vibration velocity level at the ground surface. In almost all cases it is sufficient to measure only vertical vibration and ignore the transverse components of the vibration. Although transverse components can transmit significant vibration energy into a building, the vertical component usually has greater amplitudes than transverse vibration. Moreover, vertical vibration is usually transmitted more efficiently into building foundations than transverse vibration.

The manner in which a transducer is mounted can affect the measured levels of ground-borne vibration. However, at the frequencies usually of concern for ground-borne vibration (less than about 200 Hz), straightforward methods of mounting transducers on the ground surface or on pavement are adequate for vertical vibration measurements. Quick-drying epoxy or beeswax is often used to mount transducers to smooth paved surfaces or to metal stakes driven into the ground. Rough concrete or rock surfaces require special mountings. One approach is to use a liberal base of epoxy to attach small aluminum blocks to the surface and then mount the transducers on the aluminum blocks.

Selecting sites for an ambient vibration survey requires good common sense. Sites selected to characterize a transit corridor should be distributed along the entire project and should be representative of the types of vibration environments found in the corridor. This would commonly include:

- measurements in quiet residential areas removed from major traffic arterials to characterize low-ambient vibrations;
- measurements along major traffic arterials and highways or freeways to characterize high-vibration areas;
- measurements in any area with vibration-sensitive activities; and
- measurements at any significant existing source of vibration such as railroad lines.

The transducers should be located near the building setback line for background vibration measurements. Ambient measurements along railroad lines ideally will include: multiple sites; several distances from the rail line at each site; and 4 to 10 train passbys for each test. Because of the irregular schedule for freight trains and the low number of operations each day, it is often impractical to perform tests at more than two or three sites along the rail line or to measure more than two or three passbys at each site. Rail type and condition strongly affect the vibration levels. Consequently, it is important to inspect the track at each measurement site to locate any switches, bad rail joints, corrugations, or other factors that could be responsible for higher than normal vibration levels.

The appropriate methods of characterizing ambient vibration are dependent on the type of information required for the analysis. Following are some examples:

- **Ambient Vibration:** Ambient vibration is usually characterized with a continuous 10- to 30-minute measurement of vibration. The L_{eq} of the vibration velocity level over the measurement period gives an indication of the average vibration energy. L_{eq} is equivalent to a long averaging time rms level. Specific events can be characterized by the maximum rms level (L_{max}) of the event or by performing a statistical analysis of rms levels over the measurement period. An rms averaging time of 1 second should be used for statistical analysis of the vibration level.
- **Specific Events:** Specific events such as train passbys should be characterized by the rms level during the time that the train passes by. If the locomotives have vibration levels more than 5 dB higher than the passenger or freight cars, a separate rms level for the locomotives should be obtained. The locomotives can usually be characterized by the L_{max} during the train passby. The rms averaging time or time constant should be 1 second when determining L_{max}. Sometimes it is adequate to use L_{max} to characterize the train passby, which is simpler to obtain than the rms averaged over the entire train passby.
- **Spectral Analysis:** When the vibration data will be used to characterize vibration propagation or for other special analysis, a spectral analysis of the vibration is required. An example would be if

vibration transmission of the ground is suspected of having particular frequency characteristics. For many analyses, 1/3-octave band charts are best for describing vibration behavior. Narrowband spectra also can be valuable, particularly for identifying pure tones and designing specific mitigation measures.

Note that it is preferable that ambient vibration be characterized in terms of the root mean square (rms) velocity level, not the peak particle velocity (ppv) as is commonly used to monitor construction vibration. As discussed in Chapter 7, rms velocity is considered more appropriate than ppv for describing human response to building vibration.

11.2 VIBRATION PREDICTION PROCEDURE

Predicting ground-borne vibration associated with a transportation project continues to be a developing field. Because ground-borne vibration is a complex phenomenon that is difficult to model and predict accurately, most projection procedures that have been used for transit projects rely on empirical data. The procedure described in this section is based on site-specific tests of vibration propagation. Developed under an FTA-funded research contract,(1) this procedure is recommended for detailed evaluations of ground-borne vibration. There have been other approaches to a prediction procedure including some that use pure numerical methods. For example, approaches using finite elements are being used to estimate ground-borne vibration from subway tunnels, but most numerical approaches are still in the early stages of development.

11.2.1 Overview of Prediction Procedure

The prediction method described in this section was developed to allow the use of data collected in one location to accurately predict vibration levels in another site where the geologic conditions may be completely different. The procedure is based on using a special measured function, called *transfer mobility*. Transfer mobility measured at an existing transit system is used to normalize ground-borne vibration data and remove the effects of geology. The normalized vibration is referred to as the force density. The force density can be combined with transfer mobility measurements at sensitive sites along a new project to develop projections of future ground-borne vibration.

Transfer mobility represents the relationship between a vibration source that excites the ground and the resulting vibration of the ground surface. It is a function of both frequency and distance from the source. The transfer mobility between two points completely defines the composite vibration propagation characteristics between the two points. In most practical cases, receivers are close enough to the train tracks that the vibration cannot be considered to be originating from a single point. The vibration source must be modeled as a line-source. Consequently, the point transfer mobility must be modified to account for a line-source. In the following text, TM_{point} is used to indicate the measured point-source transfer mobility and TM_{line} is used for the line-source transfer mobility derived from TM_{point}.

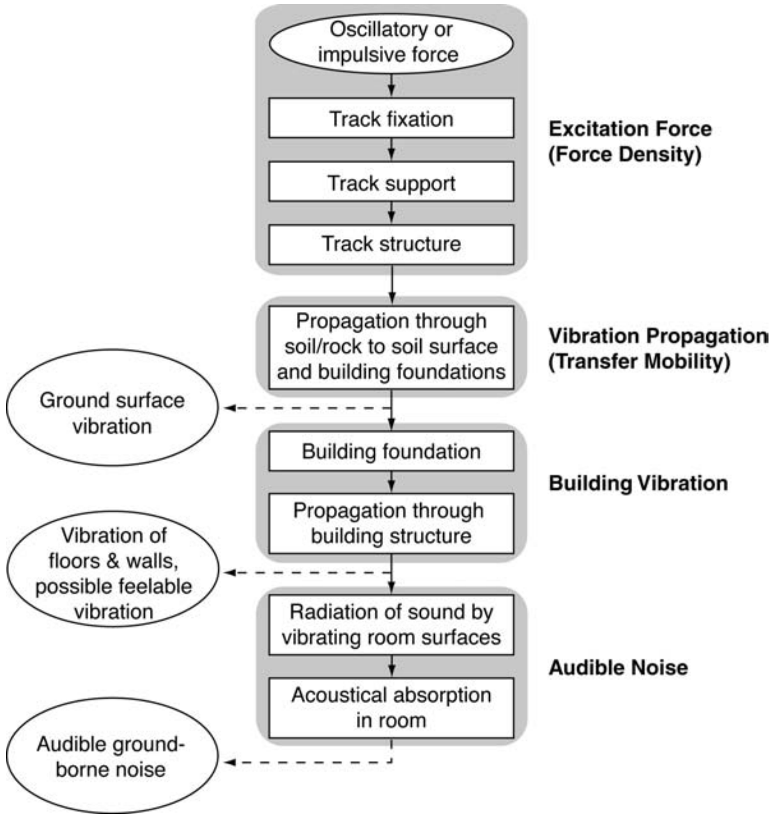

Figure 11-1. Block Diagram of Ground-Borne Vibration and Noise Model

The prediction procedure considers ground-borne vibration to be divided into several basic components as shown schematically in Figure 11-1. The components are:

1. **Excitation Force.** The vibration energy is created by oscillatory and impulsive forces. Steel wheels rolling on smooth steel rails create random oscillatory forces. When a wheel encounters a discontinuity such as a rail joint, an impulsive force is created. The force excites the transit structure, such as the subway tunnel, or the ballast for at-grade track. In the prediction method, the combination of the actual force generated at the wheel/rail interface and the vibration of the transit structure are usually combined into an equivalent force density level. The force density level describes the force that excites the soil/rock surrounding the transit structure.

2. **Vibration Propagation.** The vibration of the transit structure causes vibration waves in the soil that propagate away from the transit structure. The vibration energy can propagate through the soil or rock in a variety of wave forms. All ground vibration includes shear and compression waves. In addition, Rayleigh waves, which propagate along the ground surface, can be a major carrier of vibration energy. The mathematical modeling of vibration is complicated when, as is usually the case, there are soil strata with different elastic properties. As indicated in Figure 11-1, the

propagation through the soil/rock is modeled using the transfer mobility, which is usually determined experimentally.

The combination of the force density level and the transfer mobility is used to predict the ground-surface vibration. Here is the essential difference between the General and Detailed approaches: the projection process is simplified in a General Assessment by going directly to generalized estimates of the ground-surface vibration.

3. **Building Vibration.** When the ground vibration excites a building foundation, it sets the building into vibration motion and starts vibration waves propagating throughout the building structure. The interaction between the ground and the foundation causes some reduction in vibration levels. The amount of reduction is dependent on the mass and stiffness of the foundation. The more massive the foundation, the lower the response to ground vibration. As the vibration waves propagate through the building, they can create feelable vibration and can cause annoying rattling of windows and decorative items either hanging or on shelves.

4. **Audible Noise.** In addition to feelable vibration, the vibration of room surfaces radiates low-frequency sound that may be audible. As indicated in Figure 11-1, the sound level is affected by the amount of acoustical absorption in the receiver room.

A fundamental assumption of the prediction approach outlined here is that the force density, transfer mobility, and the building coupling to the ground are all independent factors. The following equations are the basis for the prediction procedure where all of the quantities are one-third octave band spectral levels in decibels with consistent reference values:

$$L_v = L_F + TM_{line} + C_{build}$$

$$L_A = L_v + K_{rad} + K_{A\text{-}wt}$$

where:

L_v = rms vibration velocity level,

L_A = A-weighted sound level,

L_F = force density for a line vibration source such as a train,

TM_{line} = line-source transfer mobility from the tracks to the sensitive site,

C_{build} = adjustments to account for ground–building foundation interaction and attenuation of vibration amplitudes as vibration propagates through buildings,

K_{rad} = adjustment to account for conversion from vibration to sound pressure level including accounting for the amount of acoustical absorption inside the room (A value of zero can be used for K_{rad} for typical residential rooms when the decibel reference value for L_v is 1 micro in./sec.[1]),

$K_{A\text{-}wt}$ = A-weighting adjustment at the 1/3-octave band center frequency.

All of the quantities given above are functions of frequency. The standard approach to dealing with the frequency dependence is to develop projections on a 1/3-octave band basis using the average values for each 1/3-octave band. The end results of the analysis are the 1/3-octave band spectra of the ground-borne vibration and the ground-borne noise. The spectra are then applied to the vibration criteria for Detailed Analysis. The A-weighted ground-borne noise level can be calculated from the vibration spectrum. This more detailed approach is in contrast to the General Assessment where the overall vibration velocity level and A-weighted sound level are predicted without any consideration of the particular frequency characteristics of the propagation path.

11.2.2 Major Steps in Detailed Analysis

The major steps in performing a Detailed Analysis are intended to obtain quantities for the equations given above. These are:

1. Develop estimates of the force density. The estimate of force density can be based on previous measurements or a special test program can be designed to measure the force density at an existing facility. If no suitable measurements are available, testing should be done at a transit facility with equipment similar to the planned vehicles. Adjustments for factors such as train speed, track support system, and vehicle suspension may be needed to match the force density to the conditions at a specific site. Some appropriate adjustments can be found in the report "State-of- the-Art Review: Prediction and Control of Ground-Borne Noise and Vibration from Rail Transit Trains."[2]

2. Measure the point-source transfer mobility at representative sites. The transfer mobility is a function of both frequency and distance from the source. Point-source transfer mobility is used for sources with short lengths, such as single vehicles or columns supporting elevated structures.

3. Use numerical integration to estimate a line-source transfer mobility from the point-source transfer mobilities. Line-source transfer mobility is applicable to long sources like trains.

4. Combine force density and line-source transfer mobility to project ground-surface vibration.

5. Add adjustment factors to estimate the building response to the ground-surface vibration and to estimate the A-weighted sound level inside buildings.

The two key elements of the transfer mobility procedure are a measured force function that represents the vibration energy put into the ground and a measured transfer mobility that characterizes the propagation of the vibration from the source to the receiver. The unit of force density is force divided by square root of train length, represented here in decibels relative to 1 $lb/(ft)^{1/2}$. The force density represents an incoherent line of vibration force equal to the length of transit trains. The process of estimating force density from train vibration and transfer mobility tests is discussed in Section 11.3. Figure 11-2 shows some trackbed force densities that have been developed from measurements of vibration from heavy and light rail transit vehicles. This figure provides a comparison of the vibration forces from heavy commuter trains and light rail transit vehicles with different types of primary suspensions illustrating the range of vibration forces commonly experienced in a transit system. A force density of a vehicle includes the characteristics of its track support system at the measurement site. Adjustments must be made to the force density to account for differences between the facility where the force density was measured and the new system being analyzed.

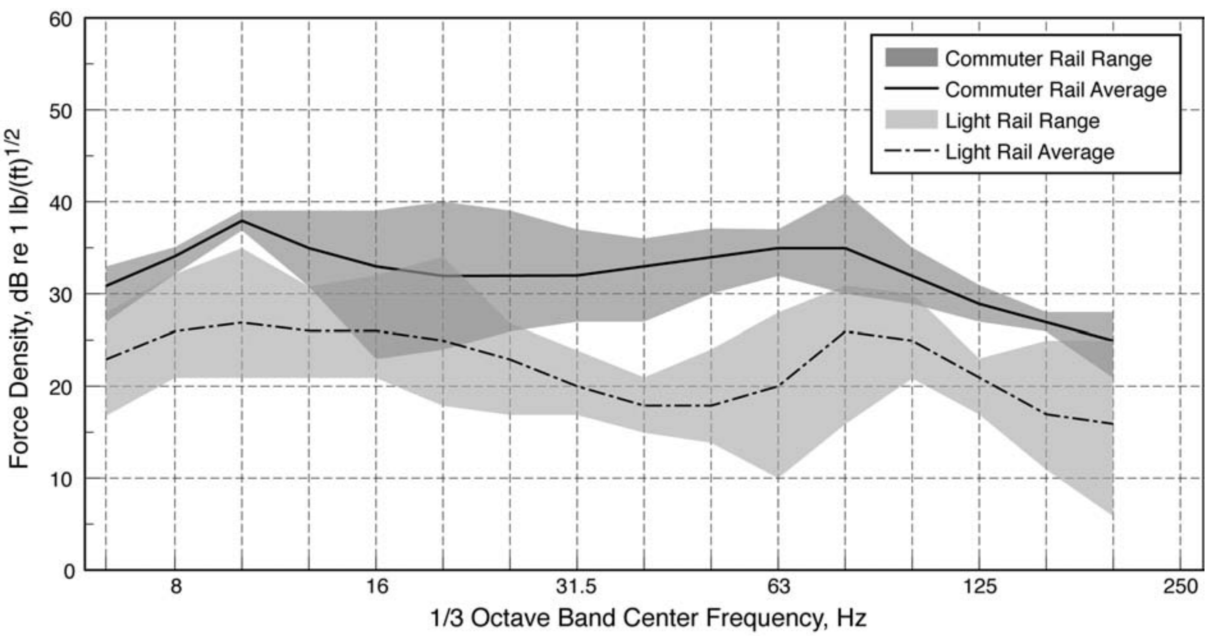

Figure 11-2. Typical Force Densities for Rail Transit Vehicles, 40 mph

The key elements of the vibration prediction procedure are implementation of field tests to measure the transfer mobility and the subsequent use of transfer mobility to characterize vibration propagation. The process of measuring transfer mobility involves impacting the ground and measuring the resulting vibration pulse at various distances from the impact. Standard signal-processing techniques are used to determine the transfer function, or frequency response function, between the exciting force and the resultant ground-surface vibration. Numerical regression methods are used to combine a number of two-point transfer functions into a smooth point-source transfer mobility that represents the average vibration propagation characteristics of a site as a function of both distance from the source and frequency. The transfer mobility is usually expressed in terms of a group of 1/3-octave band transfer mobilities. This processing is performed after transferring the data to a computer. Figure 11-3 shows the point-source transfer mobilities from a series of tests at the Transportation Technology Center in Pueblo, Colorado.[3,4,5,6]

Once the point-source transfer mobility has been defined, the line-source transfer mobility can be calculated using numerical integration techniques. This process has been described in a Transportation Research Board paper.[1] Figure 11-4 shows the line-source transfer mobilities that were derived from the point-source transfer mobilities shown in Figure 11-3. The line-source transfer mobilities are used to normalize measured vibration velocity levels from train passbys and to obtain force density.

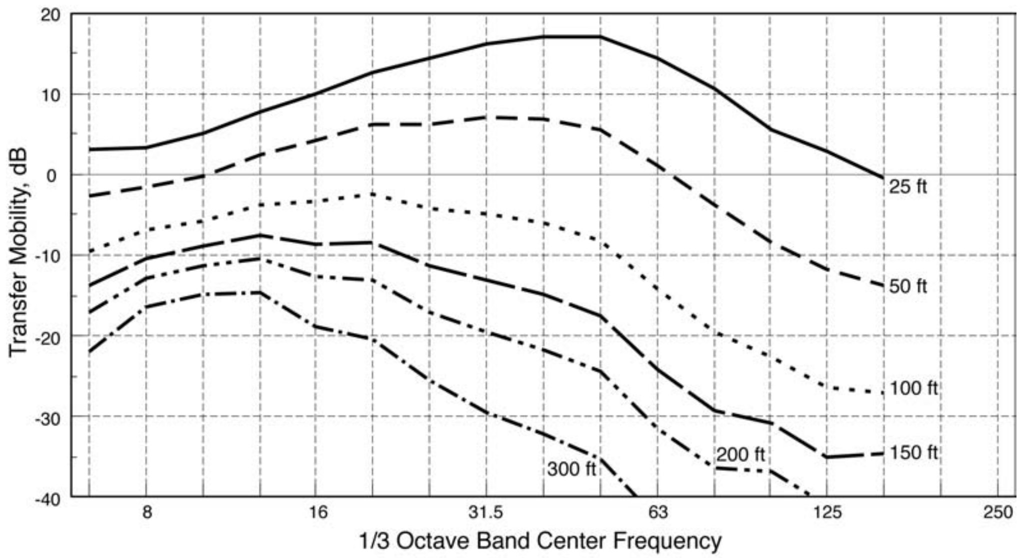

Figure 11-3. Example of Point-Source Transfer Mobility

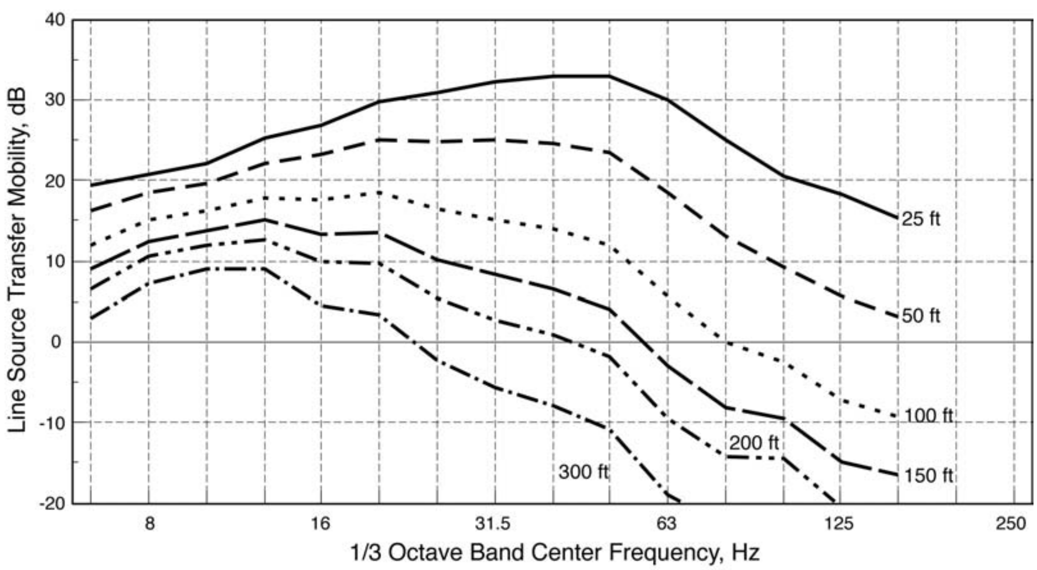

Figure 11-4. Example of Line-Source Transfer Mobility

The propagation of vibration from the building foundation to the receiver room is a very complex problem dependent on the specific design of the building. Detailed evaluation of the vibration propagation would require extensive use of numerical procedures such as the finite element method. Such a detailed evaluation is generally not practical for individual buildings considered in this manual. The propagation of vibration through a building and the radiation of sound by vibrating building surfaces is consequently estimated using simple empirical or theoretical models. The recommended procedures are outlined in the *Handbook of Urban Rail Noise and Vibration Control*.(7) The approach consists of adding the following adjustments to the 1/3-octave band spectrum of the projected ground-surface vibration:

1. **Building response or coupling loss.** This represents the change in the incident ground-surface vibration due to the presence of the building foundation. The adjustments in the *Handbook,* are shown in Figure 11-5. Note that the correction is zero when estimating basement floor vibration or vibration of at-grade slabs. Measured values may be used in place of these generic adjustments.

2. **Transmission through the building.** The vibration amplitude typically decreases as the vibration energy propagates from the foundation through the remainder of the building. The normal assumption is that vibration attenuates by 1 to 2 dB for each floor.

3. **Floor resonances.** Vibration amplitudes will be amplified because of resonances of the floor/ceiling systems. For a typical wood-frame residential structure, the fundamental resonance is usually in the 15- to 20-Hz range. Reinforced-concrete slab floors in modern buildings will have fundamental resonance frequencies in the 20- to 30- Hz range. An amplification resulting in a gain of approximately 6 dB should be used in the frequency range of the fundamental resonance.

   The projected floor vibration is used to estimate the levels of ground-borne noise. The primary factors affecting noise level are the average vibration level of the room surfaces and the amount of acoustical absorption within the room. As discussed above, the radiation adjustment is zero for typical rooms, which gives:

   $$L_A \approx L_v + K_{A-wt}$$

   where L_A is the A-weighted sound level in a 1/3-octave band, L_v is the vibration velocity level in that band, and $K_{A\text{-}wt}$ is the A-weighting adjustment at the center frequency of the 1/3-octave band. The A-weighted levels in the 1/3-octave bands are then combined to give the overall A-weighted sound level.

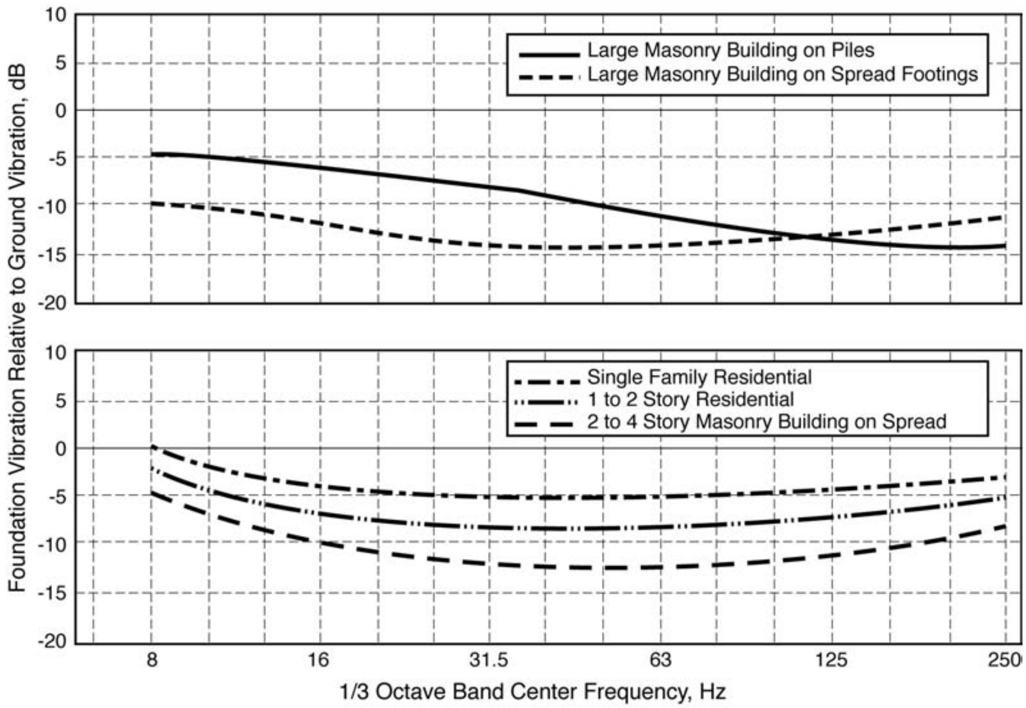

Figure 11-5. Foundation Response for Various Types of Buildings

11.3 MEASURING TRANSFER MOBILITY AND FORCE DENSITY

The test procedure to measure transfer mobility basically consists of dropping a heavy weight on the ground and measuring the force into the ground and the response at several distances from the impact. The goal of the test is to create vibration pulses that travel from the source to the receiver using the same path that will be taken by the transit system vibration. The transfer mobility expresses the relationship between the input force and the ground-surface vibration.

Figure 11-6 illustrates the field procedure for at-grade and subway testing of transfer mobility. A weight is dropped from a distance of 3 to 4 feet onto a force transducer. The responses of the force and vibration transducers are recorded on a multichannel tape recorder for later analysis in the laboratory. An alternative approach is to set up the analysis equipment in the field and capture the signals directly. This complicates the field testing but eliminates the laboratory analysis of tape-recorded data.

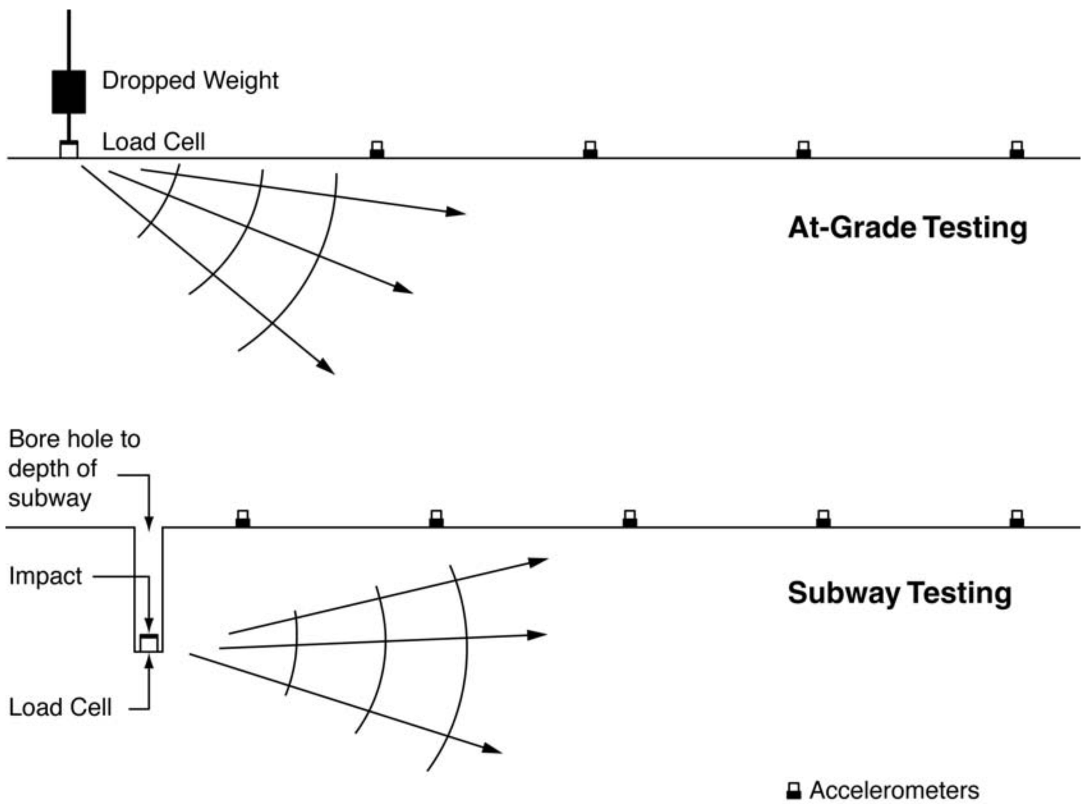

Figure 11-6. Test Configuration for Measuring Transfer Mobility

When the procedure is applied to subways, the force must be located at the approximate depth of the subway. This is done by drilling a bore hole and locating the force transducer at the bottom of the hole. The tests are usually performed at the same time that the bore holes are drilled. This allows using the soil-sampling equipment on the drill rig for the transfer mobility testing. The force transducer is attached to the bottom of the drill string and lowered to the bottom of the hole. A standard soil sampling hammer, which is usually a 140-pound weight dropped 18 inches onto a collar attached to the drill string, is used to excite the ground. The force transducer must be capable of operating under water if the water table is near the surface or a slurry drilling process is used.

11.3.1 Instrumentation

Performing a transfer mobility test requires specialized equipment. Most of the equipment is readily available from commercial sources. A load cell can be used as the force transducer. The force transducer should be capable of impact loads of 5,000 to 10,000 pounds. For borehole testing, the load cell must be hermetically sealed and capable of being used at the bottom of a 30- to 100-foot-deep hole partially filled with water. Typical instrumentation for the field-testing and laboratory analysis of transfer mobility is shown in Figure 11-7. Either accelerometers or geophones can be used as the vibration transducers. The

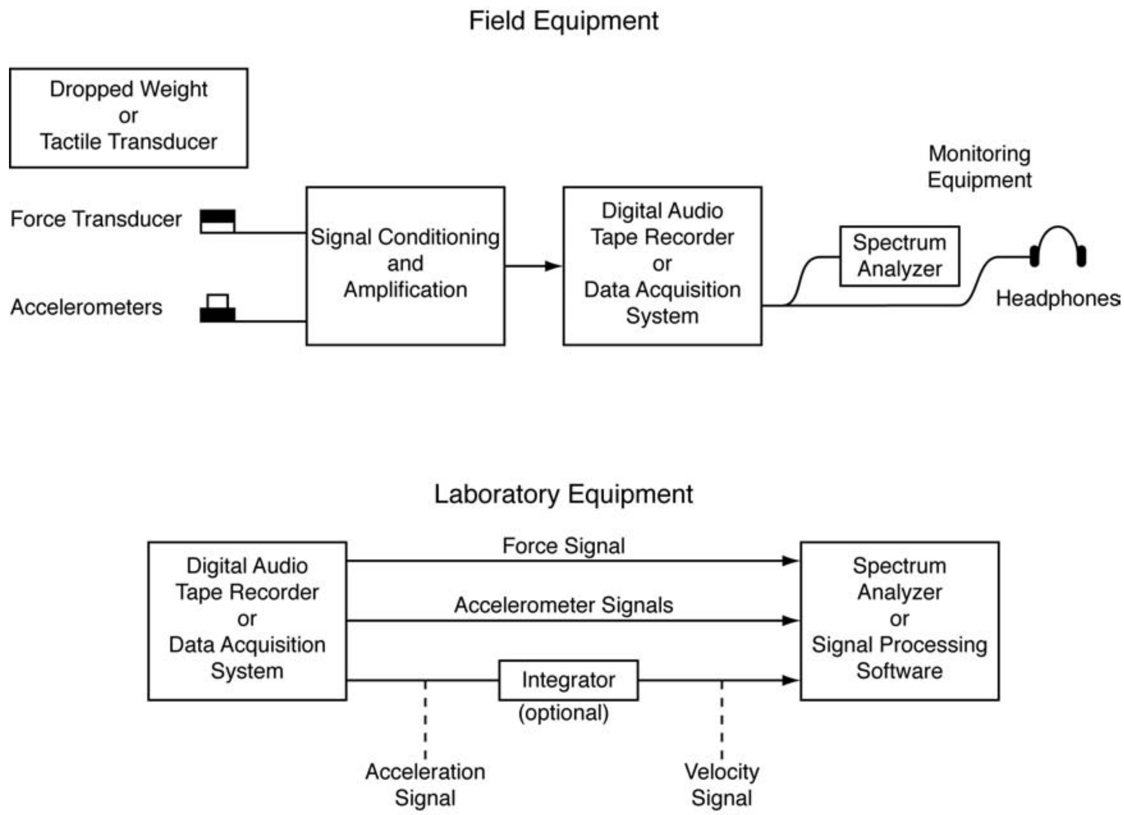

Figure 11-7. Equipment Required for Field Testing and Laboratory Analysis

requirement is that the transducers with the associated amplifiers be capable of accurately measuring levels of 0.0001 in./sec at 40 Hz and have a flat frequency response from 6 Hz to 400 Hz. Data must be acquired (either with digital audio tape or an alternative digital acquisition system) with a flat frequency response over the range of 6 to 400 Hz.

A narrowband spectrum analyzer or signal-processing software can be used to calculate the transfer function and coherence between the force and vibration data. The analyzer must be capable of capturing impulses from at least two channels to calculate the frequency spectrum of the transfer function between the force and vibration channels. All transfer functions should include the average of at least 20 impulses. The averaging of the impulses will provide significant signal enhancement, which is usually required to accurately characterize the transfer function. Signal enhancement is particularly important when the vibration transducer is more than 100 feet from the impact.

Transfer mobility may also be measured using other methods. One such method involves producing maximum-length sequence (MLS) force impulses with a tactile transducer. Signal-processing software is then used to calculate the transfer function from the MLS forces and measured vibrations. The MLS measurement method uses a pseudo-random binary sequence as the signal and has the advantage of increasing the signal-to-noise ratio of the measurement.

The laboratory equipment in Figure 11-7 shows using either a spectrum analyzer or signal-processing software to calculate the transfer function. Specialized multi-channel spectrum analyzers have built-in capabilities for computing transfer functions. The use of a spectrum analyzer has the advantage of being computationally efficient. On the other hand, signal-processing software can offer more flexibility in analyzing data signals and allows the use of different digital signal processing methods such as the MLS. Typical measurement programs involve acquisition of data in the field and later processing of the information in a laboratory. However, recent advances in instrumentation and signal-processing software allow data to be collected and analyzed while in the field.

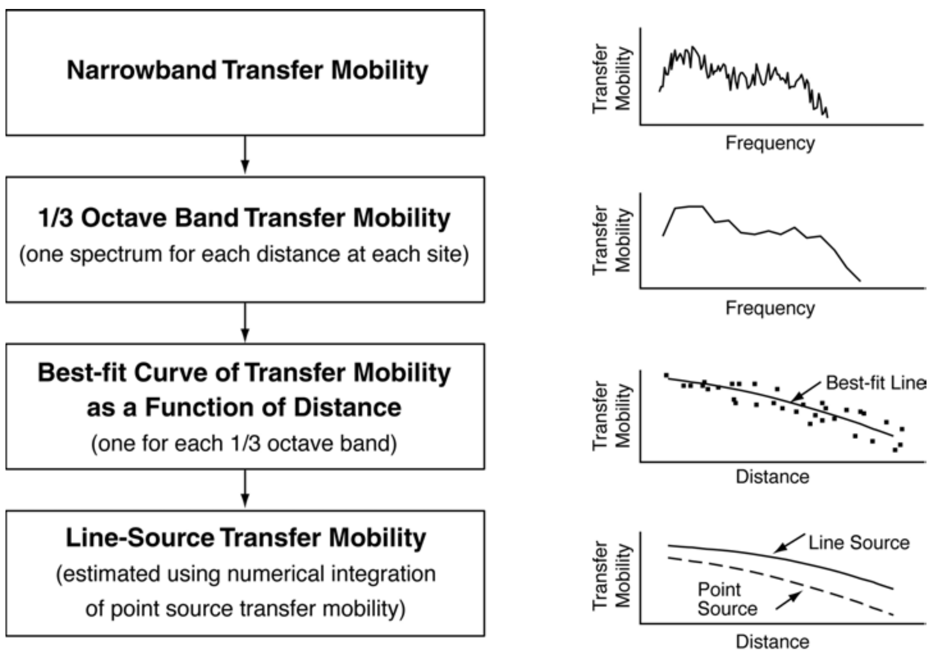

Figure 11-8. Analysis of Transfer Mobility

11.3.2 Analysis of Transfer Mobility Data

Two different approaches have been used to develop estimates of line-source transfer mobility. The first consists of using lines of transducers and the second consists of a line of impact positions. The steps to develop line-source transfer mobility curves from tests using one or more lines of transducers are shown in Figure 11-8. The procedure starts with the narrowband transfer function between source and receiver at each measurement position. There should be a minimum of four distances in any test line. Because of the possibility of local variations in propagation characteristics, if at all possible, two or more lines should be used to characterize a site. A total of 10 to 20 transducer positions are often used to characterize a site.

The first step in the analysis procedure is to calculate the equivalent 1/3-octave band transfer functions. This reduces each spectrum to 15 numbers. As shown in Figure 11-8, the 1/3-octave band spectrum is much smoother than the narrowband spectrum. The next step is to calculate a best-fit curve of transfer mobility as a function of distance for each 1/3-octave band. When analyzing a specific site, the best-fit curve will be based on 10 to 20 points. Up to several hundred points could be used to determine average best-fit curves for a number of sites.

The 1/3-octave band best-fit curves can be directly applied to point vibration sources. Buses can usually be considered to be point-sources, as can columns supporting elevated structures. However, for a line vibration source such as a train, numerical integration must be used to calculate an equivalent line-source transfer mobility. The numerical integration procedures are detailed in Reference 1.

The second procedure for estimating line-source transfer mobility, shown schematically in Figure 11-9, is best for detailed assessment of specific vibration paths or specific buildings. The vibration transducers are located at specific points of interest and a line of impacts is used. For example, a 165-foot train might be represented by a line of 11 impact positions along the track centerline at 15-foot intervals. It is possible to sum the point-source results using Simpson's rule for numerical integration to directly calculate line-source transfer mobility. This is a considerably more direct approach than is possible with lines of vibration transducers.

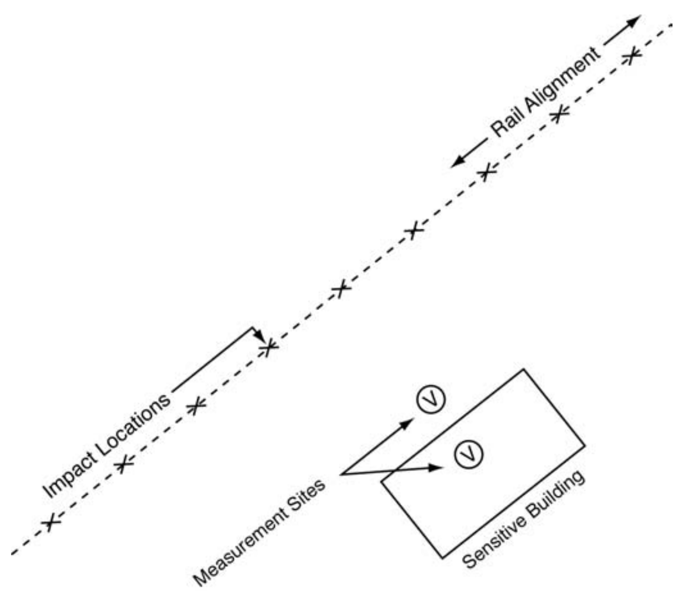

Figure 11-9. Schematic of Transfer Mobility Measurements Using a Line of Impacts

11.3.3 Deriving Force Density

Force Density is not a quantity that can be measured directly; it must be inferred from measurements of transfer mobility and train vibration at the same site. For deriving force density, the best results are achieved by deriving line-source transfer mobility from a line of impacts. The force density for each 1/3-octave band is then simply:

$$L_F = L_v - TM_{line}$$

where L_F is the force density, L_v is measured train ground-borne vibration, and TM_{line} is the line-source transfer mobility. The standard approach is to use the average force density from measurements at three or more positions.

11.4 ASSESSMENT OF VIBRATION IMPACT

The goals of the vibration assessment are to inventory all sensitive land uses that may be adversely impacted by the ground-borne vibration and noise from the proposed project and to determine the mitigation measures that will be required to eliminate or minimize the impact. This requires projecting the levels of ground-borne vibration and noise, comparing the projections with the impact criteria, and developing a list of suitable mitigation measures. Note that the General Assessment is incorporated as an intermediate step in the impact assessment because of its relative simplicity and potential to narrow the areas where Detailed Analysis needs to be done.

The assessment of vibration impact should proceed according to the following steps:

1. Screen the entire proposed transit alignment to identify areas where there is the potential of impact from ground-borne vibration. The vibration screening procedure is described in Chapter 9. If no sensitive land uses are within the screening distances, it is not necessary to perform any further assessment of ground-borne vibration.

2. Define the curves of ground-surface vibration level as a function of distance that can be used with the General Assessment. Usually this will mean selecting the appropriate curve from Chapter 10 for the proposed transit mode. For less common transit modes, it may be necessary to make measurements at an existing facility.

3. Use the General Assessment procedure to estimate vibration levels for specific buildings or groups of buildings. The projected levels are compared with the impact criteria for General Vibration Assessment (Tables 8-1 and 8-2) to determine whether vibration impact is likely. The goal of this step is to develop a reasonably accurate catalog of the buildings that will experience ground-borne vibration or noise levels that exceed the criteria. Applying the impact criteria for the General Assessment will result in a conservative assessment of the impact. That is, it is possible that some buildings that are identified as impacted may not be impacted under a more detailed analysis. However, at this stage it is better to include some buildings that may not be impacted than to

exclude some buildings that are likely to be impacted. In locations where the General Assessment indicates impact, the more refined techniques of Detailed Analysis would be employed.

4. In some cases it will be necessary to perform a vibration survey to characterize existing ambient vibration. As discussed in Section 11.1, although knowledge of the existing ambient vibration is not generally required to evaluate vibration impact, there are times when a survey of existing conditions is valuable. One common example is when a rail transit project will be located in an existing railroad right-of-way shared by freight trains. Chapter 8 includes some guidelines on how to account for existing vibration that is higher than the impact limit for the project vibration.

5. For areas where the General Assessment impact criteria are exceeded, review potential mitigation measures and assemble a list of feasible approaches to vibration control. To be feasible, the measure, or combination of measures, must be capable of providing a significant reduction of the vibration levels, at least 5 dB, while being reasonable from the standpoint of the added cost. The impact assessment and review of mitigation measures are preliminary at this point because vibration control is frequency-dependent, and specific recommendations of vibration control measures can be made only after evaluating the frequency characteristics of the vibration.

6. Use the Detailed Vibration Analysis to refine the impact assessment and to develop detailed vibration mitigation measures where needed. It is usually necessary to project vibration spectra at buildings which will be affected at levels higher than the impact thresholds (refer to Section 8.2). This type of assessment is normally performed as part of final design rather than during the environmental impact assessment stage. Because a Detailed Analysis is more accurate than a General Assessment, there will be times that the Detailed Analysis will show that the ground-borne vibration and noise levels will be below the applicable criteria and that mitigation is not required. If the projected levels are still above the limits, the spectra provided by the Detailed Analysis will be needed to evaluate vibration control approaches.

11.5 VIBRATION MITIGATION

The purpose of vibration mitigation is to minimize the adverse effects that the project ground-borne vibration will have on sensitive land uses. Because ground-borne vibration is not as common a problem as environmental noise, the mitigation approaches have not been as well defined. In some cases it has been necessary to develop innovative approaches to control the impact. Among the successful examples are the floating-slab systems that were developed for the San Francisco and Toronto rapid transit systems. However, the vibration control measures developed for rail transit systems are not effective for freight trains. The heavy axle loads associated with freight rail are outside the range of applicable design parameters for vibration reduction on lighter rail transit systems. Consequently the discussion in this section pertains to rail transit systems, not freight railroads. Any plan to relocate existing railroad tracks closer to vibration-sensitive sites in order to accommodate a new rail transit line in the right-of-way must be carefully considered since the increased vibration impact from freight trains will have to be borne by the community.

Although the focus is on rail systems in this section, there are very infrequent problems caused by buses and in these instances, the solution is rather straightforward. When buses do cause annoying ground-borne vibration, it is usually clear that the source of the problem is roadway roughness or unevenness caused by bumps, pot holes, expansion joints, or driveway transitions. Smoothing the roadway surface will usually solve the problem. In cases where a rubber-tired system runs inside a building, such as an airport people mover, vibration control may involve additional measures besides ensuring a smooth guideway. Loading and unloading of guideway support beams may generate dynamic forces that transmit into the building structure. Special guideway support systems may be required, similar to the discussion below regarding floating slabs.

The importance of adequate wheel and rail maintenance in controlling levels of ground-borne vibration cannot be overemphasized. Problems with rough wheels or rails can increase vibration levels by as much as 20 dB in extreme cases, negating the effects of even the most effective vibration control measures. It is rare that practical vibration control measures will provide more than 15 to 20 dB attenuation. When there are ground-borne vibration problems with existing transit equipment, the best vibration control measure often is to implement new or improved maintenance procedures. Grinding rough or corrugated rail and wheel truing to eliminate wheel flats and restore the wheel contour may provide more vibration reduction than would be obtainable from completely replacing the existing track system with floating slabs.

Given that the track and vehicles are in good condition, the options for further reductions in the vibration levels fit into one of seven categories: (1) maintenance procedures, (2) location and design of special trackwork, (3) vehicle modifications, (4) changes in the track support system, (5) building modifications, (6) adjustments to the vibration transmission path, and (7) operational changes.

Vibration reduction measures incur additional costs to a system. Some of the same treatments for noise mitigation can be considered for vibration mitigation. Costs for noise control measures are documented in a report from the Transit Cooperative Research Program (TCRP).[8] Where applicable to vibration reduction, costs for noise abatement methods from that report are given in the following discussion.

- **Maintenance:** As discussed above, effective maintenance programs are essential for controlling ground-borne vibration. When the wheel and rail surfaces are allowed to degrade the vibration levels can increase by as much as 20 dB compared to a new or well-maintained system. Some maintenance procedures that are particularly effective at avoiding increases in ground-borne vibration are:

    - Rail grinding on a regular basis. Rail grinding is particularly important for rail that develops corrugations. The TCRP report notes that periodic rail grinding actually results in a net savings per year on wheel and rail wear. Most transit systems contract out rail grinding, although some of the larger systems make the investment of approximately $1 million for the equipment and do their own grinding. Contractors typically charge a fixed amount per day for the equipment on site, plus an amount per pass-mile (one pass of the grinding machine for one mile). Typical fixed amounts would be $15,000 per day and $1000 per pass-mile.

- Wheel truing to re-contour the wheel, provide a smooth running surface, and remove wheel flats. The most dramatic vibration reduction results from removing wheel flats. However, significant improvements also can be observed simply from smoothing the running surface. A wheel truing machine costs approximately $1 million. The TCRP report figures a system with 700 vehicles would incur a yearly cost of $300,000 to $400,000 for a wheel truing program.
- Implement vehicle reconditioning programs, particularly when components such as suspension system, brakes, wheels, and slip-slide detectors will be involved. A slip-slide control system costs approximately $5,000 to $10,000 per vehicle, with a maintenance cost of $200 per year.
- Install wheel-flat detector systems to identify vehicles which are most in need of wheel truing. These systems are becoming more common on railroads and intercity passenger systems, but are relatively rare on transit systems. Therefore the costs are yet to be determined.

- **Planning and Design of Special Trackwork:** A large percentage of vibration impact from a new transit facility is often caused by wheel impacts at the special trackwork for turnouts and crossovers. When feasible, the most effective vibration control measure is to relocate the special trackwork to a less vibration-sensitive area. Sometimes this requires adjusting the location by several hundred feet and will not have a significant adverse impact on the operation plan for the system. Careful review of crossover and turnout locations during the preliminary engineering stage is an important step to minimizing potential for vibration impact. Another approach is to use special devices at turnouts and crossovers, special "frogs," that incorporate mechanisms to close the gaps between running rails. Frogs with spring-loaded mechanisms and frogs with movable points can significantly reduce vibration levels near crossovers. According to the TCRP report, a spring frog costs about $12,000, twice the cost of a standard frog. A movable point frog involves elaborate signal and control circuitry resulting in higher costs, approximately $200,000.

- **Vehicle Specifications:** The ideal rail vehicle, with respect to minimizing ground-borne vibration, should have a low unsprung weight, a soft primary suspension, a minimum of metal-to-metal contact between moving parts of the truck, and smooth wheels that are perfectly round. A limit for the vertical resonance frequency of the primary suspension should be included in the specifications for any new vehicle. A vertical resonance frequency of 12 Hz or less is sufficient to control the levels of ground-borne vibration. Some have recommended that transit vehicle specifications require that the vertical resonance frequency be less than 8 Hz.

- **Special Track Support Systems:** When the vibration assessment indicates that vibration levels will be excessive, it is usually the track support system that is changed to reduce the vibration levels. Floating slabs, resiliently supported ties, high-resilience fasteners, and ballast mats have all been used in subways to reduce the levels of ground-borne vibration. To be effective, all of these measures must be optimized for the frequency spectrum of the vibration. Most of these relatively standard procedures have been successfully used on several subway projects. Applications on at-grade and elevated track are less common. This is because vibration problems are less common for at-grade and elevated track; cost of the vibration control measures is a higher percentage of the construction costs of at-grade and elevated track; and exposure to the elements can require significant design modifications.

Each of the major vibration control measures for track support is discussed below. Costs for these treatments are not covered by the TCRP report, but are given as estimates based on transit agency experience.

- Resilient Fasteners: Resilient fasteners are used to fasten the rail to concrete track slabs. Standard resilient fasteners are very stiff in the vertical direction, usually in the range of 200,000 lb/in., although they do provide vibration reduction compared to some of the rigid fastening systems used on older systems (e.g., wood half-ties embedded in concrete). Special fasteners with vertical stiffness in the range of 30,000 lb/in. will reduce vibration by as much as 5 to 10 dB at frequencies above 30 to 40 Hz. Premium fasteners cost approximately $300 per track-foot, about 6 times the cost of standard fasteners.

- Ballast Mats: A ballast mat consists of a rubber or other type of elastomer pad that is placed under the ballast. The mat generally must be placed on a concrete pad to be effective. They will not be as effective if placed directly on the soil or the sub-ballast. Consequently, most ballast mat applications are in subway or elevated structures. Ballast mats can provide 10 to 15 dB attenuation at frequencies above 25 to 30 Hz. Ballast mats are often a good retrofit measure for existing tie-and-ballast track where there are vibration problems. Installed ballast mats cost approximately $180 per track-foot.

- Resiliently Supported Ties: The resiliently supported tie system consists of concrete ties supported by rubber pads. The rails are fastened directly to the concrete ties using standard rail clips. Existing measurement data indicate that resiliently supported ties may be very effective in reducing low-frequency vibration in the 15 to 40 Hz range. This makes them particularly appropriate for transit systems with vibration problems in the 20 to 30 Hz range. A resiliently supported tie system costs approximately $400 per track-foot. Although most commonly used in slab track or subway tunnel applications, another version of a resiliently supported tie system involves attaching thick rubber pads directly to the underside of ties in ballast. This treatment costs approximately the same as a ballast mat, or $180 per track foot.

- Floating Slabs: Floating slabs can be very effective at controlling ground-borne vibration and noise. They basically consist of a concrete slab supported on resilient elements, usually rubber or a similar elastomer. A variant that was first used in Toronto and is generally referred to as the double tie system, consists of 5-foot-long slabs with 4 or more rubber pads under each slab. Floating slabs are effective at frequencies greater than their single-degree-of-freedom vertical resonance frequency. The floating slabs used in

Washington DC, Atlanta, and Boston were all designed to have a vertical resonance in the 14 to 17 Hz range. A special floating slab in San Francisco's BART system uses a very heavy design with a resonance frequency in the 5 to 10 Hz frequency range. The primary disadvantage of floating slabs is that they tend to be the most expensive of the vibration control treatments. A typical double-tie floating slab system costs approximately $600 per track foot.

- Other Marginal Treatments: Changing any feature of the track support system can change the levels of ground-borne vibration. Approaches such as using heavier rail, thicker ballast, or heavier ties can be expected to reduce the vibration levels. There also is some indication that vibration levels are lower with wood ties compared to concrete ties. However, there is little confirmation that any of these approaches will make a significant change in the vibration levels. This is unfortunate since modifications to the ballast, rails, or ties are virtually the only options for normal at-grade, tie-and-ballast track without resorting to a different type of track support system or widening the right-of-way to provide a buffer zone.

- **Building Modifications:** In some circumstances, it is practical to modify the impacted building to reduce the vibration levels. Vibration isolation of buildings basically consists of supporting the building foundation on elastomer pads similar to bridge bearing pads. Vibration isolation of buildings is seldom an option for existing buildings; normal applications are possible only for new construction. This approach is particularly important for shared-use facilities such as office space above a transit station or terminal. When vibration-sensitive equipment such as electron microscopes will be affected by transit vibration, specific modifications to the building structure may be the most cost-effective method of controlling the impact. For example, the floor upon which the vibration-sensitive equipment is located could be stiffened and isolated from the remainder of the building to reduce the vibration. Alternatively, the equipment could be isolated from the building at far less cost.

- **Trenches:** Use of trenches to control ground-borne vibration is analogous to controlling airborne noise with sound barriers. Although this approach has not received much attention in the U.S., there are cases where a trench can be a practical method for controlling transit vibration from at-grade track. A rule-of-thumb given by Richert and Hall[9] is that if the trench is located close to the source, the trench bottom must be at least 0.6 times the Rayleigh wavelength below the vibration source. For most soils, Rayleigh waves travel at around 600 ft/sec which means that the wavelength at 30 Hz is 20 ft. This means that the trench must be approximately 15 ft deep to be effective at 30 Hz.

  A trench can be effective as a vibration barrier if it is either open or solid. The Toronto Transit Commission tested a trench filled with styrofoam to keep it open and reported successful performance over a period of at least one year. Solid barriers can be constructed with sheet piling or concrete poured into a trench.

- **Operational Changes:** The most obvious operational change is to reduce the vehicle speed. Reducing the train speed by a factor of two will reduce vibration levels approximately 6 dB. Other operational changes that can be effective in special cases are:

    - Use the equipment that generates the lowest vibration levels during the nighttime hours when people are most sensitive to vibration and noise.
    - Adjust nighttime schedules to minimize movements in the most sensitive hours.

  While there are tangible benefits from speed reductions and limits on operations during the most sensitive time periods, these types of measures are usually not practical from the standpoint of service requirements. Furthermore, vibration reduction achieved through operating restrictions requires continuous monitoring and will be negated if vehicle operators do not adhere to established policies. As with the options for noise control, FTA does not recommend limits on operations as a way to reduce vibration impacts.

- **Buffer Zones:** Expanding the rail right-of-way sometimes will be the most economical method of reducing the vibration impact. A similar approach is to negotiate a vibration easement from the affected property owners, for example, a row of single-family homes adjacent to a proposed commuter rail line. However, there may be legal limitations on the ability of funding agencies to acquire land strictly for the purpose of mitigating vibration (or noise) impact.

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12. NOISE AND VIBRATION DURING CONSTRUCTION

Construction often generates community noise/vibration complaints, even when it takes place over a limited time frame. In recent years, public concerns about construction noise and vibration have increased significantly, due partly to lengthy periods of heavy construction on some “mega-projects” and also to the increasing prevalence of nighttime construction that is undertaken to avoid disrupting workday road and rail traffic. Noise and vibration complaints typically arise from interference with people's activities, especially when the adjacent community has no clear understanding of the extent or duration of the construction. Misunderstandings can arise when the contractor is considered to be insensitive by the community, even though the contractor believes the work is being performed in compliance with local ordinances. This situation underscores the need for early identification and assessment of potential problem areas.

An assessment of noise and vibration impact during construction can be made by following procedures outlined in this chapter. The type of assessment – qualitative or quantitative – and the level of analysis will be determined based on the scale of the project and surrounding land use. In cases where a full quantitative assessment is not warranted, a qualitative assessment of the construction noise and vibration environment can lead to greater understanding and tolerance in the community. For major projects with extended periods of construction at specific locations, a quantitative assessment can aid contractors in making bids by allowing changes in construction approach and including mitigation costs before the construction plans are finalized.

12.1 CONSTRUCTION NOISE ASSESSMENT

Noise impacts from construction may vary greatly depending on the duration and complexity of the project. The level of detail of a construction noise assessment depends on the scale and the type of project and the stage of environmental review. Many small projects need no construction noise assessment at all.

Examples include installation of safety features like grade-crossing signals, track improvements within the right-of-way, and erecting small buildings and facilities which are similar in scale to the surrounding development. For projects like these, it would suffice to describe the length of time of construction, the loudest equipment to be used, expected truck access routes, and avoidance of nighttime activity.

Other projects involving a limited period of construction time – less than a month in a noise-sensitive area – may warrant a qualitative treatment because of nearby noise-sensitive land uses. In these cases, the assessment may simply be a qualitative description of the equipment to be used, the duration of construction, and any mitigation requirements placed on particularly noisy operations. Where the length of construction in noise-sensitive areas is expected to last for more than several months or particularly noisy equipment will be involved, then construction noise impacts may be determined in considerable detail. In any case, a likely scenario of the planned construction methods should be described in the environmental document. At this early stage it may be possible to describe certain basic measures that would be taken to reduce the potential impact, for example, prohibiting the noisiest construction activities during nighttime. However, it may be prudent to defer final decisions on noise control measures until the project and construction plans are defined in greater detail during final design.

Qualitative Assessments. In cases where a qualitative construction noise assessment is appropriate, the following descriptions would be included:

- Duration of construction (overall and at specific locations)
- Equipment expected to be used, e.g., noisiest operations
- Schedule with limits on times of operation, e.g., daytime use only
- Monitoring of noise
- Forum for communicating with the public
- Commitments to limit noise levels to certain levels, including any local ordinances that apply
- Consideration of application of noise control treatments used successfully in other projects

Community relations will be important in these cases; early information disseminated to the public about the kinds of equipment, expected noise levels and durations will help to forewarn potentially affected neighbors about the temporary inconvenience. In these cases, a general description of the variation of noise levels during a typical construction day may be helpful. The criteria in Section 12.1.3 are not applied to qualitative assessments.

Quantitative Assessments. Factors that influence the decision to perform a quantitative construction noise assessment include the following:

- Scale of the project
- Proximity of noise-sensitive land uses to the construction zones

- Number of noise-sensitive receptors in the project area
- Duration of construction activities near noise-sensitive receptors
- Schedule (the construction days, hours and time periods)
- Method (e.g., cut-and-cover vs. bored tunneling)
- Concern about construction noise expressed in comments by the general public (scoping, public meetings)

A quantitative construction noise assessment requires information about source levels, operations, proximity of noise sensitive locations, and criteria against which the levels will be compared. These elements of assessment are described in the following sections.

12.1.1 Quantitative Noise Assessment Methods

A quantitative construction noise assessment is performed by comparing the predicted noise levels with impact criteria appropriate for the construction stage. The approach requires an appropriate descriptor, a standardized prediction method and a set of recognized criteria for assessing the impact.

The *descriptor* used for construction noise is the L_{eq}. This unit is appropriate for the following reasons:

- It can be used to describe the noise level from operation of each piece of equipment separately and is easy to combine to represent the noise level from all equipment operating during a given period.
- It can be used to describe the noise level during an entire phase.
- It can be used to describe the average noise over all phases of the construction.

The recommended *method* for predicting construction noise impact for major transit projects requires:

- An emission model to determine the noise generated by the equipment at a reference distance.
- A propagation model that shows how the noise level will vary with distance.
- A way of summing the noise of each piece of equipment at locations of noise sensitivity.

The first two components of the method are related by the following equation:

$$L_{eq}(equip) = E.L. + 10\log(U.F.) - 20\log(D/50) - 10G\log(D/50)$$

where: L_{eq} *(equip)* is the L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period

E.L. is the noise emission level of the particular piece of equipment at the reference distance of 50 feet, taken from Table 12-1

G is a constant that accounts for topography and ground effects, taken from Figure 6-5 (Chapter 6)

D is the distance from the receiver to the piece of equipment, and

U.F. is a usage factor that accounts for the fraction of time that the equipment is in use over the specified time period.

The combination of noise from several pieces of equipment operating during the same time period is obtained from decibel addition of the L_{eq} of each single piece of equipment found from the above equation.

General Assessment

The approach can be as detailed as necessary to characterize the construction noise by specifying the various quantities in the equation. For projects in an early assessment stage when the equipment roster and schedule are undefined, only a rough estimate of construction noise levels is practical.

The following assumptions are adequate for a general assessment of each phase of construction:

- Full power operation for a time period of one hour is assumed because most construction equipment operates continuously for periods of one hour or more at some point in the construction period. Therefore, U.F. = 1, and 10 log(U.F.) = 0.
- Free-field conditions are assumed and ground effects are ignored. Consequently, G = 0.
- Emission level at 50 feet, E.L., is taken from Table 12-1.
- All pieces of equipment are assumed to operate at the center of the project, or centerline, in the case of a guideway or highway construction project.
- The predictions include only the two noisiest pieces of equipment expected to be used in each construction phase.

Detailed Assessment

A more detailed approach can be used if warranted, such as when a large number of noise-sensitive sites are adjacent to a construction project or where contractors are faced with stringent local ordinances or heightened public concerns expressed in early outreach efforts. Additional details include:

- Duration. Long-term construction project noise impact is based on a 30-day average L_{dn}, the times of day of construction activity (nighttime noise is penalized by 10 dB in residential areas), and the percentage of time the equipment is to be used during a period of time which will affect U.F. For example, an 8-hour L_{eq} is determined by making U.F. the percentage of time each individual piece of equipment operates under full power in that period. Similarly, the 30-day average L_{dn} is determined from the U.F. expressed by the percentage of time the equipment is used during the daytime hours (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.), separately over a 30-day period. However, to account for increased sensitivity to nighttime noise, the nighttime percentage is multiplied by 10 before performing the computation.

- Site Characteristics. Taking into account the site topography, natural and man-made barriers and ground effects will involve the factor G. Use Figure 6-5 (Chapter 6) to calculate G.

- Noise Sources. Measuring or certifying the emission level of each piece of equipment will refine E.L.

- Site Layout. Determining the location of each piece of equipment while it is working will specify the distance factor D more accurately.

- Combined Sources. Including all pieces of equipment in the computation of the 8-hour L_{eq} and the 30-day average L_{dn} will determine the total noise levels using Table 6-11 (Chapter 6).

12.1.2 Noise from Typical Construction Equipment and Operations

The noise levels generated by construction equipment will vary greatly depending on factors such as the type of equipment, the specific model, the operation being performed, and the condition of the equipment. The equivalent sound level (L_{eq}) of the construction activity also depends on the fraction of time that the equipment is operated over the time period of construction. The dominant source of noise from most construction equipment is the engine, usually a diesel, often without sufficient muffling. In a few cases, such as impact pile-driving or pavement-breaking, noise generated by the process dominates.

For considerations of noise assessment, construction equipment can be considered to operate in two modes, stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or to and from the site (trucks). The movement around the site is handled in the construction noise prediction procedure discussed earlier in this chapter. Variation in power imposes additional complexity in characterizing the noise source level from a piece of equipment. This is handled by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation. Standardized procedures for measuring the exterior noise levels for the certification of mobile and stationary construction equipment have been developed by the Society of Automotive Engineers. [1,2] Typical noise levels from representative pieces of equipment are listed in Table 12-1. These source levels can be used in FHWA's Windows-based screening tool, "Roadway Construction Noise Model" (RCNM), for the prediction of construction noise.[3]

Construction activities are characterized by variations in the power expended by equipment, with resulting variation in noise levels with time. Variation in the power is expressed in terms of the previously mentioned "usage factor" of the equipment, which is the percentage of time during the workday that the equipment is operating at full power. Time-varying noise levels are converted to a single number (L_{eq}) for each piece of equipment during the operation. Besides having daily variations in activities, major construction projects are accomplished in several different phases. Each phase has a specific equipment mix depending on the work to be accomplished during that phase.

As a result of the equipment mix, each phase has its own noise characteristics; some have higher continuous noise levels than others, some have high impact noise levels. The purpose of the quantitative assessment is to determine not only the levels, but also the duration of the noise. The L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase. The impact and the consequent noise mitigation approaches depend on the criteria to be used in assessing impact, as discussed in the next section.

Table 12-1. Construction Equipment Noise Emission Levels

Equipment	**Typical Noise Level (dBA) 50 ft from Source**
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74

Table 12-1. Construction Equipment Noise Emission Levels (continued)

Equipment	Typical Noise Level (dBA) 50 ft from Source
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Table based on an EPA Report,[4] measured data from railroad construction equipment taken during the Northeast Corridor Improvement Project, and other measured data.

12.1.3 Construction Noise Criteria

No standardized *criteria* have been developed for assessing construction noise impact. Consequently, criteria must be developed on a project-specific basis unless local ordinances can be found to apply. Generally, local noise ordinances are not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. While it is not the purpose of this manual to specify standardized criteria for construction noise impact, the following guidelines can be considered reasonable criteria for assessment. If these criteria are exceeded, there may be adverse community reaction.

General Assessment

Estimate the combined noise level in one hour from the two noisiest pieces of equipment, assuming they both operate at the same time. Then identify locations where the level exceeds the following:

Land Use	One-hour L_{eq} (dBA)	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

Detailed Assessment

Where a more refined analysis is needed, predict the noise level in terms of 8-hour L_{eq} and 30-day averaged L_{dn} and compare to criteria in the following table:

Land Use	8-hour L_{eq} (dBA)		L_{dn} (dBA)
	Day	Night	30-day Average
Residential	80	70	75[(a)]
Commercial	85	85	80[(b)]
Industrial	90	90	85[(b)]

[(a)] In urban areas with very high ambient noise levels (L_{dn} > 65 dB), L_{dn} from construction operations should not exceed existing ambient + 10 dB.
[(b)] Twenty-four-hour L_{eq}, not L_{dn}.

12.1.4 Mitigation of Construction Noise

After using the above approaches to locate potential impacts from construction noise, the next step is to identify appropriate control measures. Three categories of noise control approaches, with examples, are given below:

1. *Design considerations and project layout:*
   - Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
   - Re-route truck traffic away from residential streets, if possible. Select streets with fewest homes if no alternatives are available.
   - Site equipment on the construction lot as far away from noise-sensitive sites as possible.
   - Construct walled enclosures around especially noisy activities or clusters of noisy equipment. For example, shields can be used around pavement breakers and loaded vinyl curtains can be draped under elevated structures.

2. *Sequence of operations:*
   - Combine noisy operations to occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately.
   - Avoid nighttime activities. Sensitivity to noise increases during the nighttime hours in residential neighborhoods.

3. *Alternative construction methods:*

   - Avoid use of an impact pile driver where possible in noise-sensitive areas. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use.
   - Use specially-quieted equipment, such as quieted and enclosed air compressors and properly-working mufflers on all engines.
   - Select quieter demolition methods, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower cumulative noise levels than impact demolition by pavement breakers.

If possible, the environmental impact assessment should include descriptions of how each impacted location will be treated with one or more mitigation measures. However, with a large, complex project, the information available during the preliminary engineering phase may not allow final decisions to be made on all specific mitigation measures. In such cases, it is appropriate to describe and commit to a mitigation plan that will be developed during final design. The objective of the plan should be to minimize construction noise using all reasonable (i.e., cost vs. benefit) and feasible (i.e., physically achievable) means available. Components of the plan may include some or all of the following provisions which would be specified in construction contracts:

- *Equipment noise emission limits*. These are absolute noise limits applied to generic classes of equipment at a reference distance (typically 50 feet). The limits should be set no higher than what is reasonably achievable for well-maintained equipment with effective mufflers. Lower limits that require source noise control may be appropriate for certain equipment when needed to minimize community noise impact, if reasonable and feasible. Provisions could also be included to require equipment noise certification testing prior to use on site.
- *Lot-line construction noise limits*. These are noise limits that apply at the lot line of specific noise-sensitive properties. The limits are typically specified in terms of both noise exposure (usually Leq over a 20-30 minute period) and maximum noise level. They should be based on local noise ordinances, if applicable, as well as pre-construction baseline noise levels; limits that are 3-5 decibels above the baseline are often used.
- *Operational and/or equipment restrictions*. It may be necessary to prohibit or restrict certain construction equipment and activities near residential areas during nighttime hours. This is particularly true for activities that generate tonal, impulsive or repetitive sounds, such as back-up alarms, hoe ram demolition and pile-driving.
- *Noise abatement requirements*. In some cases specifications may be provided for particular noise control treatments, based on the results of the design analysis and/or prior commitments made to the public by civic authorities. An example would be the requirement for a temporary noise barrier to shield a particular community area from noisy construction activities.

- *Noise monitoring plan requirements*. Plans can be developed for pre-project noise monitoring to establish baseline noise levels at sensitive locations, as well as for periodic equipment and lot-line noise monitoring during the construction period. The plan should outline the measurement and reporting methods that will be used to demonstrate compliance with the project noise limits.
- *Noise control plan requirements*. For major construction projects, specifications have required the preparation and submission of noise control plans on a periodic basis (e.g., every six months). These plans should predict the construction noise at noise-sensitive receptor locations based on the proposed construction equipment and methods. If the analysis predicts that the specified noise limits will be exceeded, the plan should specify the mitigation measures that will be applied and should demonstrate the expected noise reductions these measures will achieve. The objective of this proactive approach is to minimize the likelihood of community noise complaints by ensuring that any necessary mitigation measures are included in the construction plans.
- *Compliance enforcement program*. If construction noise is a significant issue in the community, it is important that a program be put in place to monitor contractor compliance with the noise control specifications and mitigation plan. It is best that this function be performed by a construction management team on behalf of the public agency.
- *Public information and complaint response procedures*. To maintain positive community relations, the public should be kept informed about the construction plans and efforts to minimize noise, and procedures should be established for prompt response and corrective action with regard to noise complaints during construction.

Most of these provisions are appropriate for very large projects where construction activity will continue for many months, if not years. References 4 and 5 contain details on dealing with construction noise on major transportation projects. [5,6]

12.2 CONSTRUCTION VIBRATION ASSESSMENT

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings founded on the soil in the vicinity of the construction site respond to these vibrations, with varying results ranging from no perceptible effects at the lowest levels, low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels. As expressed previously in this chapter with respect to construction noise, the type of assessment – qualitative or quantitative – and the level of construction vibration analysis will be determined by factors related to the scale of the project and the sensitivity of the surrounding land use. A quantitative analysis should be conducted in cases where construction vibration may result in prolonged annoyance or building damage.

Ground vibrations from construction activities do not often reach the levels that can damage structures, but they can achieve the audible and feelable ranges in buildings very close to the site. A possible exception is the case of fragile buildings, many of them old, where special care must be taken to avoid damage. The construction vibration criteria include special consideration for such buildings. The construction activities that typically generate the most severe vibrations are blasting and impact pile-driving.

In cases where prolonged annoyance or damage from construction vibrations are not expected, a qualitative assessment is appropriate. Such an assessment should include a description of the duration and the type of equipment to be used during the construction, with an explanation of how the ground-borne vibration will be maintained at an acceptable level. For example, if the equipment is of the type that generates little or no ground vibration – air compressors, light trucks, hydraulic loaders, etc. – a simple explanation is sufficient and no quantitative analysis is necessary.

12.2.1 Quantitative Construction Vibration Assessment Methods

Construction vibration should be assessed quantitatively in cases where there is significant potential for impact from construction activities. Such activities include blasting, pile-driving, vibratory compaction, demolition, and drilling or excavation in close proximity to sensitive structures. The recommended procedure for estimating vibration impact from construction activities is as follows:

Damage Assessment

- Select the equipment and associated vibration source levels at a reference distance of 25 feet from Table 12-2.
- Make the propagation adjustment according to the following formula (this formula is based on point sources with normal propagation conditions):

$$PPV_{equip} = PPV_{ref} \text{ x } (25/D)^{1.5}$$

where: PPV (equip) is the peak particle velocity in in/sec of the equipment adjusted for distance

PPV (ref) is the reference vibration level in in/sec at 25 feet from Table 12-2

D is the distance from the equipment to the receiver.

- Apply the vibration damage criteria from Table 12-3.

Annoyance Assessment

- If desired for consideration of annoyance or interference with vibration-sensitive activities, estimate the vibration level L_v at any distance D from the following equation and apply the vibration impact criteria for General Assessment in Chapter 8 for vibration-sensitive sites:

$$L_v(D) = L_v(25 \text{ ft}) – 30\log(D/25)$$

12.2.2 Vibration Source Levels from Construction Equipment

Ground-borne vibration related to human annoyance is generally related to root mean square (rms) velocity levels expressed in VdB. However, a major concern with regard to construction vibration is building damage. Consequently, construction vibration is generally assessed in terms of peak particle velocity (PPV), as defined in Chapter 7.1.2. The relationship of PPV to rms velocity is expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the rms amplitude. Peak particle velocity is typically a factor of 1.7 to 6 times greater than rms vibration velocity.

Various types of construction equipment have been measured under a wide variety of construction activities with an average of source levels reported in terms of velocity as shown in Table 12-2. In this table, a crest factor of 4 (representing a PPV-rms difference of 12 VdB) has been used to calculate the approximate rms vibration velocity levels from the PPV values. Although the table gives one level for each piece of equipment, it should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data provide a reasonable estimate for a wide range of soil conditions.

Table 12-2. Vibration Source Levels for Construction Equipment
(From measured data.[7,8,9,10])

Equipment		**PPV at 25 ft (in/sec)**	**Approximate L_v† at 25 ft**
Pile Driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

† RMS velocity in decibels (VdB) re 1 micro-inch/second

12.2.2 Construction Vibration Criteria

For evaluating potential annoyance or interference with vibration-sensitive activities due to construction vibration, the criteria for General Assessment in Chapter 8 can be applied. In most cases, however, the primary concern regarding construction vibration relates to potential damage effects. Guideline vibration damage criteria are given in Table 12-3 for various structural categories.[10] In this table, a crest factor of 4 (representing a PPV-rms difference of 12 VdB) has been used to calculate the approximate rms vibration velocity limits from the PPV limits. These limits should be viewed as criteria that should be used during the environmental impact assessment phase to identify problem locations that must be addressed during final design.

Table 12-3. Construction Vibration Damage Criteria[11]

Building Category	**PPV (in/sec)**	**Approximate L_v**†
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

† RMS velocity in decibels (VdB) re 1 micro-inch/second

12.2.3 Construction Vibration Mitigation

After using the above methods to locate potential human impacts or building damage from construction vibrations, the next step is to identify control measures. Similar to the approach for construction noise, mitigation of construction vibration requires consideration of equipment location and processes, as follows:

1. *Design considerations and project layout:*
   - Route heavily-loaded trucks away from residential streets, if possible. Select streets with fewest homes if no alternatives are available.
   - Operate earth-moving equipment on the construction lot as far away from vibration-sensitive sites as possible.
2. *Sequence of operations:*
   - Phase demolition, earth-moving and ground-impacting operations so as not to occur in the same time period. Unlike noise, the total vibration level produced could be significantly less when each vibration source operates separately.

- Avoid nighttime activities. People are more aware of vibration in their homes during the nighttime hours.

3. *Alternative construction methods:*

- Avoid impact pile-driving where possible in vibration-sensitive areas. Drilled piles or the use of a sonic or vibratory pile driver causes lower vibration levels where the geological conditions permit their use (however, see cautionary note below).
- Select demolition methods not involving impact, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower vibration levels than impact demolition by pavement breakers, and milling generates lower vibration levels than excavation using clam shell or chisel drops.
- Avoid vibratory rollers and packers near sensitive areas.

Pile-driving is one of the greatest sources of vibration associated with equipment used during construction of a project. The source levels in Table 12-2 indicate that sonic pile drivers may provide substantial reduction of vibration levels. However, there are some additional vibration effects of sonic pile drivers that may limit their use in sensitive locations. A sonic pile driver operates by continuously shaking the pile at a fixed frequency, literally vibrating it into the ground. Vibratory pile drivers operate on the same principle, but at a different frequency. However, continuous operation at a fixed frequency may be more noticeable to nearby residents, even at lower vibration levels. Furthermore, the steady-state excitation of the ground may induce a growth in the resonant response of building components. Resonant response may be unacceptable in cases of fragile buildings or vibration-sensitive manufacturing processes. Impact pile drivers, on the other hand, produce a high vibration level for a short time (0.2 seconds) with sufficient time between impacts to allow any resonant response to decay.

As with construction noise, in many cases the information available during the preliminary engineering phase will not be sufficient to define specific construction vibration mitigation measures. In such cases, it is appropriate to describe and commit to a mitigation plan that will be developed and implemented during the final design and construction phases of the project. The objective of the plan should be to minimize construction vibration damage using all reasonable and feasible means available. The plan should provide a procedure for establishing threshold and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan should also include the development of a vibration monitoring plan during final design and the implementation of a compliance monitoring program during construction.

REFERENCES

1. Society of Automotive Engineers, "Exterior Sound Level Measurement Procedure for Powered Mobile Construction Equipment," SAE Recommended Practice J88a, 1976.

2. Society of Automotive Engineers, "Sound Levels for Engine Powered Equipment," SAE Standard J952b, 1976.

3. U.S. Department of Transportation, Federal Highway Administration. “FHWA Roadway Construction Noise Model User’s Guide,” FHWA-HEP-05-054, January 2006. (Available on Web site: www.rcnm.us)

4. U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment and Home Appliances," NTID300.1, December 31, 1971.

5. E. Thalheimer, “Construction noise control program and mitigation strategy at the Central Artery/Tunnel Project,” Noise Control Eng. J. 48(5), September – October 2000, pp. 157 – 165.

6. U.S. Department of Transportation, Federal Highway Administration. “Highway Construction Noise Handbook,” to be issued mid-year 2006.

7. D.J. Martin, "Ground Vibrations from Impact Pile Driving during Road Construction," Supplementary Report 544, United Kingdom Department of the Environment, Department of Transport, Transport and Road Research Laboratory, 1980.

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9. J.F. Wiss, "Damage Effects of Pile Driving Vibrations," Highway Research Record, No. 155, Highway Research Board, 1967.

10. David A. Towers, "Ground-borne Vibration from Slurry Wall Trench Excavation for the Central Artery/Tunnel Project Using Hydromill Technology," Proc. InterNoise 95, Newport Beach, CA, July 1995.

11. Swiss Consultants for Road Construction Association, "Effects of Vibration on Construction," VSS-SN640-312a, Zurich, Switzerland, April 1992.

13. DOCUMENTATION OF NOISE AND VIBRATION ASSESSMENT

To be effective, the noise and vibration analysis must be presented to the public in a clear, yet comprehensive manner. The mass of technical data and information necessary to withstand scrutiny in the environmental review process must be documented in a way that remains intelligible to the public. Justification for all assumptions used in the analysis, such as selection of representative measurement sites and all baseline conditions, must be presented for review. For large-scale projects, the environmental document contains a condensation of essential information in order to maintain a reasonable size. For these projects, separate technical reports are usually prepared as supplements to the environmental impact statement (EIS) or environmental assessment (EA). For smaller projects, or ones with minimal noise or vibration impact, all the technical information may be presented in the environmental document itself. This chapter gives guidance on how the necessary noise and vibration information should be included in the project's environmental documentation.

13.1 THE TECHNICAL REPORT ON NOISE AND VIBRATION

A separate technical report is often prepared as a supplement to the environmental document (EIS or EA). A technical report is appropriate in cases when the wealth of data can not all be placed in the environmental document. The details of the analysis are important for establishing the basis for the assessment. Consequently, all the details in the technical report should be contained in a well-organized format for easy access to the information. While the technical report is not intended to be a primer on the subject, the technical data and descriptions should be presented in a manner that can be understood by the general public. All the necessary background information should be present in the technical report, including tables, maps, charts, drawings and references that may be too detailed for the environmental document, but which are important in helping to draw conclusions about the project's noise and vibration impacts and mitigation options.

13.1.1 Organization of Technical Report

The technical report on noise/vibration should contain the following major subject headings, along with the key information content described below. If both noise and vibration have been analyzed, it is generally preferable to separate the noise and vibration sections; as shown in this guidance manual, the approaches to the two topics are quite different.

- **Overview**: This section contains a brief description of the project and an overview of the noise/vibration concerns. It sets forth the initial considerations in framing the scope of the study.
- **Inventory of Noise/Vibration-Sensitive Sites**: The approach for selecting noise- and vibration-sensitive sites should be described in sufficient detail to demonstrate completeness. Sites and site descriptions are to be included.
- **Measurements of Existing Noise/Vibration Conditions:** The basis for selecting measurement sites should be documented, along with tables of sites coordinated with maps showing locations of sites. If the measurement data are used to estimate existing conditions at other locations, the rationale and the method should be included. Measurement procedures should be fully described. Tables of measurement instruments should include manufacturer, type, serial number and date of most recent calibration by authorized testing laboratory. Measurement periods, including time of day and length of time at each site should be shown to demonstrate adequate representation of the ambient conditions. The measurement data should be presented in well organized form in tables and figures. A summary and interpretation of measured data should be included.
- **Special Measurements Related to the Project:** Some projects require specialized measurements at sensitive sites, such as outdoor-to-indoor noise level reduction of homes, or transmission of vibrations into concert halls and recording studios. Other projects may need special source-level characterization. Full description of the measurements and the results should be included.
- **Predictions of Noise/Vibration from the Project:** The prediction model used for estimating future project conditions should be fully described and referenced. Any changes or extensions to the models recommended in this manual should be fully described so that the validity of the adjustments can be confirmed. Specific data used as input to the models should be listed. Computed levels should be tabulated and illustrated by contours, cross-sections or shaded mapping. It is important to illustrate noise/vibration impacts with base maps at a scale with enough detail to provide location reference for the reader.
- **Noise/Vibration Criteria:** Impact criteria for the project should be fully described and referenced (refer to Chapters 3 and 8). In addition, any applicable local ordinances should be described. Tables specifying the criteria levels should also be included. If the project involves considerable construction, and a separate construction noise and vibration analysis will be included, then construction criteria should appear in a separate section with its own assessment.
- **Noise/Vibration Impact Assessment:** The impact assessment should be described according to the procedures outlined in this manual. A resulting impact inventory should be presented for each alternative mode or alignment in a format that allows ready comparison among alternatives. The

inventory should be tabulated according to the different types of land uses affected. The results of the assessment may be presented both before and after mitigation.

- **Noise/Vibration Mitigation:** The mitigation section of the technical report should begin with a summary of all treatments considered, even if some are not carried to final consideration. Final candidate mitigation treatments should be considered separately with description of the features of the treatment, costs, expected benefit in reducing impacts, locations where the benefit would be realized and discussion of practicality of implementing alternative treatments. With respect to noise impacts, enough information is to be included to allow the project sponsor and FTA to reach decisions on mitigation prior to issuance of the final environmental document.
- **Construction Noise/Vibration Impacts:** Criteria adopted for construction noise or vibration should be described, if appropriate. According to Chapter 12, these may be adopted on a project-specific basis. The method used for predicting construction noise or vibration should be described along with inputs to the models, such as equipment roster by construction phase, equipment source levels, assumed usage factors and other assumed site characteristics. The predicted levels should be shown for sensitive sites and short-term impacts should be identified. In cases where construction impacts appear to be problematic, feasible abatement methods should be discussed in enough detail such that construction contract documents could include mitigation measures.
- **References:** References should be provided for all criteria, approaches and data used in the analyses, including other reports related to the project which may be relied on for information, e.g., geotechnical reports.

13.2 THE ENVIRONMENTAL DOCUMENT

The environmental document typically includes noise and vibration information in three places: a section of the chapter on the affected environment (existing conditions) and two sections in the chapter on environmental consequences (the long-term impacts from operations and short-term impacts from construction activity). The noise and vibration information presented in the environmental document is a summary of the comprehensive information from the technical report with emphasis on presenting the salient points of the analysis in a format and style which affected property owners and other interested citizens can understand. Smaller projects may have all of the technical information contained within the environmental document, requiring special care in summarizing technical details to convey the information adequately.

The environmental document provides full disclosure of noise and vibration impacts, including identification of locations where impacts cannot be mitigated satisfactorily. An EIS describes significant impacts and tells what the Federal agency intends to do about them. For projects handled with EA’s, completion of the environmental review with a finding of no significant impact (FONSI) may depend on mitigation being incorporated in the proposed project. The specific way mitigation is handled in the environmental document depends on the type of impact (noise or vibration) and the stage of project development and environmental review.

In general, airborne noise impacts can be accurately predicted in the preliminary engineering stage. Since the environmental review for major investment projects is completed during preliminary engineering, it is possible to specify, and commit to implement, any needed noise mitigation measures in the final environmental document (Final EIS or FONSI). With major investments, as well as small projects like bus terminals and garages, it is expected that decisions on noise mitigation will be made before the final document is approved; thus timely development of design, feasibility and cost information needed to reach decisions on noise mitigation is essential. For major investments in the Alternatives Analysis/Draft EIS stage, the emphasis is not on mitigation but rather a broad comparison among the alternatives concerning the magnitude and extent of noise impacts. If it seems likely that mitigation would be required for at least some major investment alternatives, this can be discussed in a general way while touching on the remaining stages of project development and how decisions on mitigation fit in. Finally, there are other projects for which the preferred alternative is identified at the outset in the Draft EIS or EA. With the focus on a single alternative, noise impacts can be accurately identified in the draft document. If mitigation is needed, mitigation options should be explored in the draft; however firm decisions on mitigation can be deferred to the final document.

Predicting vibration impacts accurately is a more complex undertaking because ground-borne vibration may be strongly influenced by subsurface conditions. The geotechnical studies that reveal these conditions are normally undertaken during the final design stage after the NEPA process has been completed. Thus, for ground-borne vibration and noise, the final environmental document will usually not be able to state with certainty whether or not mitigation is needed. The final environmental document will rely on a General Assessment for ground-borne vibration and noise to identify potential problem areas. If there are such areas, there should be a commitment in the final document to conduct a Detailed Analysis during final design to complete the impact assessment and help determine the need for mitigation. The final environmental document should present a preliminary assessment using the vibration impact criteria for the General Assessment. If it appears the criteria cannot be met, the document would discuss various control measures that could be used and the likelihood that the criteria could be met through the use of one or more of the measures. It may be possible to state a commitment in the final environmental document to adhere to the impact criteria for the Detailed Analysis, while deferring the selection of specific vibration control measures until the completion of detailed studies in final design.

After a final environmental document is approved, the described mitigation measures are incorporated by reference in the actual grant agreements signed by FTA and the project sponsor. Thus, they become contractual conditions that must be adhered to by the project sponsor.

13.2.1 Organization of Noise and Vibration Sections of Environmental Documents

Chapter on Affected Environment (Existing Conditions)

This chapter describes the pre-project setting, including the existing noise and vibration conditions, that will likely be affected by one or more of the alternatives. The primary function of this chapter is to establish the focus and baseline conditions for later chapters discussing environmental impacts. Consequently, it is a good place to put basic information on noise and vibration descriptors and effects, as well as describing the characteristics in the vicinity of the project. Again, it is preferable to separate the noise and vibration sections.

- **Description of Noise/Vibration Descriptors, Effects and Typical Levels:** Information from Chapters 2 and 7 of this manual can be used to provide a background for the discussions of noise/vibration levels and characteristics to follow. Illustrative material to guide the reader in understanding typical levels is helpful.
- **Inventory of Noise/Vibration-Sensitive Sites:** The approach for selecting noise/vibration-sensitive sites should be described in sufficient detail to demonstrate completeness. Sites and site descriptions are to be included.
- **Noise/Vibration Measurements:** A summary of the site selection procedure should be included along with tables of sites coordinated with maps showing locations of sites. The measurement approach should be summarized with justification for the measurement procedures used. The measurement data should be presented in well organized form in tables and figures. To save space, the results are often included with the table of sites described above. In some cases, measurements may be supplemented or replaced by collected data relevant to the noise and vibration characteristics of the area. For example, soils information for estimating ground-borne vibration propagation characteristics may be available from other projects in the area. Fundamental to this section is a summary and interpretation of how the collected data define the project setting.

Chapter on Environmental Consequences.

The section on long-term impacts - the impacts due to operation of the project - should be organized according to the following order:

- **Overview of Approach:** A summary of the assessment procedure for determining noise/vibration impacts is provided as a framework for the following sections.
- **Estimated Noise/Vibration Levels:** A general description of prediction models used to estimate project noise/vibration levels should be provided. Any distinguishing features unique to the project, such as source levels associated with various technologies, should be described. The results of the predictions for various alternatives should be described in general terms first, followed by a detailed accounting of predicted noise levels. This information should be supplemented with tables and

illustrated by contours, cross-sections or shaded mapping. If contours are included in a technical report, then it is not necessary to repeat them here.

- **Criteria for Noise/Vibration Impact:** Impact criteria for the project should be fully described and referenced (refer to Chapters 3 and 8). In addition, any applicable local ordinances should be described. Tables listing the criterion levels should be included.
- **Impact Assessment:** The impact assessment can be a section by itself or can be combined with the section above. It is important to provide a description of locations where noise/vibration impact is expected to occur without implementation of mitigation measures, based on the predicted future levels, existing levels and application of the impact criteria. Inventory tables of impacted land uses should be used to quantify the impacts for comparisons among alternatives. The comprehensive list of noise/vibration-sensitive sites identified in the Affected Environment chapter should be included in this inventory table.
- **Noise/Vibration Mitigation Measures:** Perhaps the most significant difference between the technical report and the environmental document is in the area of mitigation. Whereas the technical report discusses options and may make recommendations, the environmental document provides the vehicle for reaching decisions on appropriate mitigation measures with consideration given to environmental benefits, feasibility and cost. This section should begin with a summary of the noise/vibration mitigation measures considered for the impacted locations. The specific measures selected for implementation should be fully described. Reasons for dismissing any abatement measures should also be clearly stated, especially if such non-implementation results in significant adverse effects. In cases where it is not possible to commit to a specific mitigation measure in the final environmental document, it may be possible to commit to a certain level of noise/vibration reduction, for example, adherence to the impact criteria specified in Chapters 3 and 8.
- **Unavoidable Adverse Environmental Effects:** If it is projected that adverse noise/vibration impacts will result after all reasonable abatement measures have been incorporated, these impacts are identified in this section.

Impacts During Construction

The environmental document may have a separate section on short-term impacts due to project construction, depending on the scale of the project. For a major project there may be a special section on construction noise/vibration impacts; this section should be organized according to the comprehensive outline described above. For projects with relatively minor effects, a briefer format should be utilized, with a section included in the chapter on Environmental Consequences.

APPENDICES

APPENDIX A. GLOSSARY OF TERMS[1, 2]

A-weighting – A standardized filter used to alter the sensitivity of a sound level meter with respect to frequency so that the instrument is less sensitive at low and high frequencies where the human ear is less sensitive. Also written as dBA.

Accelerometer – A transducer that converts vibratory motion to an electrical signal proportional to the acceleration of that motion.

Ambient – The pre-project background noise or vibration level.

Amplitude – Difference between the extremes of an oscillating signal.

Alignment – The horizontal location of a railroad or transit system as described by curved and tangent track.

At-grade – Tracks on the ground surface.

Automated Guideway Transit (AGT) – Guided steel-wheel or rubber-tired transit passenger vehicles operating singly or in multi-car trains with a fully automated system on fixed guideways along an exclusive right-of-way. AGT includes personal rapid transit, group rapid transit and automated people mover systems.

Auxiliaries – The term applied to a number of separately driven machines, operated by power from the main engine or electric generation. They include the air compressor, radiator fan, traction motor blower, and air conditioning equipment.

Ballast mat – A 2- to 3-inch-thick elastomer mat placed under the normal track ballast on top of a rigid slab or packed sub-grade.

Ballast – Granular material placed on the trackbed for the purpose of holding the track in line and at surface.

Bus Rapid Transit (BRT) - A type of limited-stop bus operation that relies on technology to help speed up the service. Buses can operate on exclusive transitways, high-occupancy-vehicle lanes, expressways, or ordinary streets.

Catenary – On electric railroad and light rail transit systems, the term describing the overhead conductor that is contacted by the pantograph or trolley, and its support structure.

Commuter rail – Conventional passenger railroad serving areas surrounding an urban center. Most commuter railroads utilize locomotive-hauled coaches, often in push-pull configuration.

Consist – The total number and type of cars, locomotives, or transit vehicles in a trainset.

Continuous welded rail – A number of rails welded together to form unbroken lengths of track without gaps or joints.

Corrugated rail – A rough condition of alternating ridges and grooves which develops on the rail head in service.

Crest factor - The ratio of peak particle velocity to maximum RMS amplitude in an oscillating signal.

Criteria – Plural form of "criterion," the relationship between a measure of exposure (e.g., sound or vibration level) and its corresponding effect.

Cross tie – The transverse member of the track structure to which the rails are spiked or otherwise fastened to provide proper gage and to cushion, distribute, and transmit the stresses of traffic through the ballast to the trackbed.

Crossover – Two turnouts with the track between the frogs arranged to form a continuous passage between two nearby and generally parallel tracks.

Cumulative – The summation of individual sounds into a single total value related to the effect over time.

Cut – A term used to describe a trackbed at a lower level than the surrounding ground.

dB – see Decibel.

dBA – see A-weighting.

Decibel – The standard unit of measurement for sound pressure level and vibration level. Technically, a decibel is the unit of level which denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm of this ratio. Also written as dB.

Descriptor – A quantitative metric used to identify a specific measure of sound level.

DMU – Diesel-powered multiple unit. See Multiple Unit.

DNL – see $L_{dn.}$

Electrification – A term used to describe the installation of overhead wire or third rail power distribution facilities to enable operation of trains.

Embankment – A bank of earth, rock or other material constructed above the natural ground surface.

Equivalent Level – The level of a steady sound which, in a stated time period and at a stated location, has the same sound energy as the time-varying sound. Also written as L_{eq}.

Ferry boat – A transit mode comprised of vessels to carry passengers and/or vehicles over a body of water.

Fixed guideway – A mass transit facility with a separate right-of-way for the exclusive use of public transportation and other high-occupancy vehicles.

Flange – The vertical projection along the inner rim of a wheel that serves, together with the corresponding projection of the mating wheel of a wheel set, to keep the wheel set on the track.

Floating slab – A special track support system for vibration isolation, consisting of concrete slabs supported on resilient elements, usually rubber or similar elastomer.

Frequency – The number of times that a periodically occurring quantity repeats itself in a specified period. With reference to noise and vibration signals, the number of cycles per second.

Frequency spectrum – Distribution of frequency components of a noise or vibration signal.

Frog – A track structure used at the intersection of two running rails to provide support for wheels and passageways for their flanges, thus permitting wheels on either rail to cross the other.

Gage (of track) – The distance between the rails on a track.

Grade crossing – The point where a rail line and a motor vehicle road intersect.

Guideway – Supporting structure to form a track for rolling or magnetically-levitated vehicles.

Head-End Power (HEP) – A system of furnishing electric power for a complete railway train from a single generating plant in the locomotive.

Heavy rail – See Rail Rapid Transit.

Hertz (Hz) -- The unit of acoustic or vibration frequency representing cycles per second.

Hourly Average Sound Level – The time-averaged A-weighted sound level, over a 1-hour period, usually calculated between integral hours. Also written as L_{1h}.

Hybrid Bus – A rubber-tired vehicle that features a hybrid diesel-electric propulsion system. A diesel engine runs an electric generator that powers the entire vehicle including electric drive motors that deliver power to the wheels.

Idle – The speed at which an engine runs when it is not under load.

Intermediate Capacity Transit (ICT) – A transit system with less capacity than rail rapid transit, but more capacity than typical bus operations. Examples of ICT include bus rapid transit (BRT), automated guideway transit (AGT), monorails and trolleys.

Intermodal facility – Junction of two or more modes of transportation where transfers may occur.

Jointed rail – A system of joining rails with steel members designed to unite the abutting ends of contiguous rails.

L_{1h} – see Hourly Average Sound Level

L_{dn} – Day-Night Sound Level. The sound exposure level for a 24-hour day calculated by adding the sound exposure level obtained during the daytime (7 a.m. to 10 p.m.) to 10 times the sound exposure level obtained during the nighttime (10 p.m. to 7 a.m.). This unit is used throughout the U.S. for environmental impact assessment. Also written as DNL.

L_{eq} – see Equivalent Level

Light Rail Transit (LRT) – A mode of public transit with tracked vehicles in multiple units operating in mixed traffic conditions on streets as well as sections of exclusive right-of-way. Vehicles are generally powered by electricity from overhead lines.

Locomotive – A self-propelled, non-revenue rail vehicle designed to convert electrical or mechanical energy into tractive effort to haul railway cars. (see also Power Unit)

Main line – The principal line or lines of a railway.

Maglev – Magnetically-levitated vehicle; a vehicle or train of vehicles with guidance and propulsion provided by magnetic forces. Support can be provided by either an electrodynamic system wherein a moving vehicle is lifted by magnetic forces induced in the guideway, or an electromagnetic system wherein the magnetic lifting forces are actively energized in the guideway.

Maximum Sound Level – The highest exponential-time-average sound level, in decibels, that occurs during a stated time period. Also written as L_{max}. The standardized time periods are 1 second for $L_{max, slow}$ and 0.125 second for $L_{max, fast}$.

Metric – Measurement value, or descriptor.

Monorail – Guided transit vehicles operating on or suspended from a single rail, beam or tube.

Multiple Unit (MU) – A term referring to the practice of coupling two or more diesel-powered or electric-powered passenger cars together with provision for controlling the traction motors on all units from a single controller.

Noise – Any disagreeable or undesired sound or other audible disturbance.

Octave band – A standardized division of a frequency spectrum in which the interval between two divisions is a frequency ratio of 2.

One-third octave band – A standardized division of a frequency spectrum in which the octave bands are divided into thirds for more detailed information. The interval between center frequencies is a ratio of 1.25.

Pantograph – A device for collecting current from an overhead conductor (catenary), consisting of a jointed frame held up by springs or compressed air and having a current collector at the top.

Park-and-ride facility – A parking garage and/or lot used for parking passengers' automobiles while they use transit agency facilities and vehicles.

Peak factor – see Crest factor.

Plan-and-profile – Mapping used by transportation planners that shows two-dimensional plan views (x- and y- axes) on the same page as two-dimensional profiles (x- and z-axes) of a road or track.

Peak Particle Velocity (ppv) – The peak signal value of an oscillating vibration velocity waveform. Usually expressed in inches/second in the United States.

Peak-to-Peak (P-P) Value – Of an oscillating quantity, the algebraic difference between the extreme values of the quantity.

Power unit – A self-propelled vehicle, running on rails and having one or more electric motors that drive the wheels and thereby propel the locomotive and train. The motors obtain electrical energy either from a rail laid near to, but insulated from, the track rails, or from a wire suspended above the track. Contact with the wire is made by a pantograph mounted on top of the unit.

Pure tone – Sound of a single frequency.

Radius of curvature – A measure of the severity of a curve in a track structure based on the length of the radius of a circle that would be formed if the curve were continued.

Rail – A rolled steel shape, commonly a T-section, designed to be laid end to end in two parallel lines on cross ties or other suitable supports to form a track for railway rolling stock.

Rail Rapid Transit – (often called "Heavy Rail Transit") A mode of public transit with tracked vehicles in multiple units operating in exclusive rights-of-way. Trains are generally powered by electricity from a third rail alongside the track.

Receiver/Receptor – A stationary far-field position at which noise or vibration levels are specified.

Resonance frequency – The phenomenon that occurs in a structure under conditions of forced vibration such that any change in frequency of excitation results in a decrease in response.

Right-of-Way – Lands or rights used or held for railroad or transit operation.

Root Mean Square (rms) – The square root of the mean-square value of an oscillating waveform, where the mean-square value is obtained by squaring the value of amplitudes at each instant of time and then averaging these values over the sample time.

RMS Velocity Level (L_V) – See "Vibration Velocity Level."

SEL – see Sound Exposure Level.

Sound Exposure Level – The level of sound accumulated over a given time interval or event. Technically, the sound exposure level is the level of the time-integrated mean square A-weighted sound for a stated time interval or event, with a reference time of one second. Also written as SEL.

Sound – A physical disturbance in a medium that is capable of being detected by the human ear.

Spectrum – See Frequency Spectrum.

Sub-Ballast – Any material of a superior character, which is spread on the finished subgrade of the roadbed and below the top-ballast, to provide better drainage, prevent upheaval by frost, and better distribute the load over the roadbed.

Subgrade – The finished surface of the roadbed below the ballast and track.

Suburban bus – Bus similar to an intercity bus with high-backed seats but no luggage compartment, used in express mode to city centers from suburban locations.

Switch – A track structure used to divert rolling stock from one track to another.

Tangent Track – Track without curvature.

Track – An assembly of rail, ties and fastenings over which cars, locomotives, and trains are moved.

Traction Motor – A specially designed direct current series-wound motor mounted on the trucks of locomotives and self-propelled cars to drive the axles.

Trainset – A group of coupled cars including at least one power unit.

Transducer – Device designed to receive an input signal of a given kind (motion, pressure, heat, etc.) and to provide an output signal of a different kind (electrical voltage, amperage, etc.) in such a manner that desired characteristics of the input signal appear in the output signal for measurement purposes.

Transit center – A fixed location where passengers interchange from one route or vehicle to another.

Trolley bus – A rubber-tired, electrically-powered bus operating on city streets drawing power from overhead lines.

Truck – The complete assembly of parts including wheels, axles, bearings, side frames, bolster, brake rigging, springs and all associated connecting components, the function of which is to provide support, mobility and guidance to a railroad car or locomotive.

Trunk line – See Mainline. The mainline of a commuter railroad where the branch line traffic is combined.

Turnout – An arrangement of a switch and a frog with closure rails, by means of which rolling stock may be diverted from one track to another.

VdB – see Vibration Velocity Level.

Vibration Velocity Level (L_V) – Ten times the common logarithm of the ratio of the square of the amplitude of the RMS vibration velocity to the square of the amplitude of the reference RMS vibration velocity. The reference velocity in the United States is one micro-inch per second. Also written as VdB.

Vibration – An oscillation wherein the quantity is a parameter that defines the motion of a mechanical system.

Wheel Flat – A localized flat area on a steel wheel of a rail vehicle, usually caused by skidding on steel rails, causing a discontinuity in the wheel radius.

Wheel Squeal – The noise produced by wheel-rail interaction, particularly on a curve where the radius of curvature is smaller than allowed by the separation of the axles in a wheel set.

REFERENCES

1. American National Standards Institute, “Acoustical Terminology,” ANSI S1.1-1994

2. American Public Transportation Association, “Public Transportation Factbook,” 55th Edition, March 2004.

APPENDIX B. BACKGROUND FOR TRANSIT NOISE IMPACT CRITERIA

The noise criteria, presented in Chapter 3 of this manual, have been developed based on well-documented criteria and research into human response to community noise. The primary goals in developing the noise criteria were to ensure that the impact limits be firmly founded in scientific studies, be realistically based on noise levels associated with new transit projects, and represent a reasonable balance between community benefit and project costs. This appendix provides the background information.

B.1 RELEVANT LITERATURE

Following is an annotated list of the documents that are particularly relevant to the noise impact criteria:

1. US Environmental Protection Agency "Levels Document":[(1)] This report identifies noise levels consistent with the protection of public health and welfare against hearing loss, annoyance, and activity interference. It has been used as the basis of numerous community noise standards and ordinances.

2. CHABA Working Group 69, "Guidelines for Preparing Environmental Impact Statements on Noise":[(2)] This report was the result of deliberations by a group of leading acoustical scientists with the goal of developing a uniform national method for noise impact assessment. Although the CHABA's proposed approach has not been adopted, the report serves as an excellent resource documenting research in noise effects. It provides a strong scientific basis for quantifying impacts in terms of L_{dn}.

3. American Public Transit Association Guidelines:[(3)] The noise and vibration sections of the APTA Guidelines have been used successfully in the past for the design of rail transit facilities. The APTA Guidelines include criteria for acceptable community noise and vibration. Experience has shown that meeting the APTA Guidelines will usually result in acceptable noise levels. However, there are some problems in using the APTA Guidelines for environmental assessment purposes. The criteria are in terms of L_{max} for conventional rail rapid transit vehicles and they cannot be used to compare among

different modes of transit. Since the APTA Guidelines are expressed in terms of maximum passby noise, they are not sensitive to the frequency or duration of noise events for transit modes other than conventional rail rapid transit operations with 5- to 10-minute headways. Therefore, the APTA criteria are questionable for assessing the noise impact of other transit modes which differ from conventional rapid transit with respect to source emission levels and operating characteristics (e.g., commuter rail, AGT and a variety of bus projects).

4. "Synthesis of Social Surveys on Noise Annoyance":[4] In 1978, Theodore J. Schultz, an internationally known acoustical scientist, synthesized the results of a large number of social surveys, each concerning annoyance due to transportation noise. Remarkable consistency was found in a group of these surveys, and the author proposed that their average results be taken as the best available prediction of transportation noise annoyance. This synthesis has received essentially unanimous acceptance by acoustical scientists and engineers. The "universal" transportation response curve developed by Schultz (Figure 2-7) shows that the percent of the population highly annoyed by transportation noise increases from zero at an L_{dn} of approximately 50 dBA to 100-percent when L_{dn} is about 90 dBA. Most significantly, this curve indicates that for the same increase in L_{dn}, there is a greater increase in the number of people highly annoyed at high noise levels than at low noise levels. In other words, a 5 dB increase at low ambient levels (40 - 50 dB) has less impact than at higher ambient levels (65 - 75 dB). A recent update of the original research, containing several railroad, transit and street traffic noise surveys, confirmed the shape of the original Schultz curve.[5]

5. HUD Standards:[6] The U.S. Department of Housing and Urban Development has developed noise standards, criteria and guidelines to ensure that housing projects supported by HUD achieve the goal of a suitable living environment. The HUD site acceptability standards define 65 dB (L_{dn}) as the threshold for a normally unacceptable living environment and 75 dB (L_{dn}) as the threshold for an unacceptable living environment.

B.2 BASIS FOR NOISE IMPACT CRITERIA CURVES

The lower curve in Figure 3-1 representing the onset of Moderate Impact is based on the following considerations:

- The EPA finding that a community noise level of L_{dn} less than or equal to 55 dBA is "requisite to protect public health and welfare with an adequate margin of safety."[1]

- The conclusion by EPA and others that a 5 dB increase in L_{dn} or L_{eq} is the minimum required for a change in community reaction.

- The research finding that there are very few people highly annoyed when the L_{dn} is 50 dBA, and that an increase in L_{dn} from 50 dBA to 55 dBA results in an average of 2% more people highly annoyed (see Figure 2-10 in Chapter 2).

Consequently, the change in noise level from an existing ambient level of 50 dBA to a cumulative level of 55 dBA caused by a project is assumed to be a minimal impact. Expressed another way, this is considered to be the lowest threshold where impact starts to occur. Moreover, the 2% increment represents the minimum measurable change in community reaction. Thus the curve's hinge point is placed at a project noise level of 53 dBA and an existing ambient noise level of 50 dBA, the combination of which yields a cumulative level of 55 dBA. The remainder of the lower curve in Figure 3-1 was determined from the annoyance curve (Figure 2-10) by allowing a fixed 2% increase in annoyance at other levels of existing ambient noise. As cumulative noise increases, it takes a smaller and smaller increment to attain the same 2% increase in highly annoyed people. While it takes a 5 dB noise increase to cause a 2% increase in highly annoyed people at an existing ambient noise level of 50 dB, an increase of only 1 dB causes the 2% increase of highly annoyed people at an existing ambient noise level of 70 dB.

The upper curve delineating the onset of Severe Impact was developed in a similar manner, except that it was based on a total noise level corresponding to a higher degree of impact. The Severe Noise Impact curve is based on the following considerations:

- The Department of Housing and Urban Development (HUD) in its environmental noise standards defines an L_{dn} of 65 as the onset of a normally unacceptable noise zone.(6) Moreover, the Federal Aviation Administration (FAA) considers that residential land uses are not compatible with noise environments where L_{dn} is greater than 65 dBA (7).

- The common use of a 5 dBA increase in L_{dn} or L_{eq} as the minimum required for a change in community reaction.

- The research finding that the foregoing step represents a 6.5% increase in the number of people highly annoyed (see Figure 2-10 in Chapter 2).

Consequently, the increase in noise level from an existing ambient level of 60 dBA to a cumulative level of 65 dBA caused by a project represents a change from an acceptable noise environment to the threshold of an unacceptable noise environment. This is considered to be the level at which severe impact starts to occur. Moreover, the 6.5% increment represents the change in community reaction associated with severe impact. Thus the upper curve's hinge point is placed at a project noise level of 63 dBA and existing ambient noise level of 60 dBA, the combination of which yields a cumulative level of 65 dBA. The remainder of the upper curve in Figure 3-1 was determined from the annoyance curve (Figure 2-10) by fixing the 6.5% increase in annoyance at all existing ambient noise levels.

Both curves incorporate a maximum limit for the transit project noise in noise-sensitive areas. Independent of existing noise levels, Moderate Impact for land use categories 1 and 2 is considered to occur whenever the <u>transit</u> L_{dn} equals or exceeds 65 dBA and Severe Impact occurs whenever the <u>transit</u> L_{dn} equals or exceeds 75 dBA. These absolute limits are intended to restrict activity interference caused by the transit project alone.

Both curves also incorporate a maximum limit for cumulative noise increase at low existing noise levels (below about 45 dBA). This is a conservative measure that reflects the lack of social survey data on people's reaction to noise at such low ambient levels. Similar to the FHWA approach in assessing the relative impact of a highway project, the transit noise criteria include caps on noise increase of 10 dB and 15 dB for Moderate Impact and Severe Impact, respectively, relative to the existing noise level.

Finally, it should be noted that due to the types of land use included in Category 3, the criteria allow the project noise for Category 3 sites to be 5 decibels greater than for Category 1 and Category 2 sites. This difference is reflected by the offset in the vertical scale on the right side of Figure 3-1. With the exception of active parks, which are clearly less sensitive to noise than Category 1 and 2 sites, Category 3 sites include primarily indoor activities and thus the criteria account for some noise reduction provided by the building structure.

B.3 EQUATIONS FOR NOISE IMPACT CRITERIA CURVES

The noise impact criteria can be quantified through the use of mathematical equations which approximate the curves shown in Figure 3-1. These equations may be useful when performing the noise assessment methodology through the use of spreadsheets, computer programs or other analysis tools. Otherwise, such mathematical detail is generally not necessary in order to properly implement the criteria, and direct use of Figure 3-1 is likely to be adequate and less time-consuming.

A total of four continuous curves are obtained from the criteria: two threshold curves ("Moderate Impact" and "Severe Impact") for Category 1 and 2; and two for Category 3. Note that for each level of impact, the overall curves for Categories 1 and 2 are offset by 5 dB from Category 3. While each curve is graphically continuous, it is defined by a set of three discrete equations which represent three "regimes" of existing noise exposure. These equations are approximately continuous at the transition points between regimes.

The first equation in each set is a linear relationship, representing the portion of the curve in which the existing noise exposure is low and the allowable increase is capped at 10 dB and 15 dB for Moderate Impact and Severe Impact, respectively. The second equation in each set represents the impact threshold over the range of existing noise exposure for which a fixed percentage of increase in annoyance is allowed, as described in the previous section. This curve, a third-order polynomial approximation derived from the Schultz curve,[(4)] covers the range of noise exposure encountered in most populated areas and is used in determining noise impact in the majority of cases for transit projects. Finally, the third equation in each of the four sets represents the absolute limit of project noise imposed by the criteria, for areas with high existing noise exposure. For land use category 1 and 2, this limit is 65 dBA for Moderate Impact and 70 dBA for Severe Impact. For land use category 3, the limit is 75 dBA for Moderate Impact and 80 dBA for Severe Impact.

The four sets of equations corresponding to the curves are given below. Each curve represents a threshold of noise impact, with impact indicated for points on or above the curve.

Threshold of Moderate Impact:

$$L_P = \begin{cases} 11.450 + 0.953L_E & L_E < 42 \\ 71.662 - 1.164L_E + 0.018L_E^{\ 2} - 4.088\times10^{-5}L_E^{\ 3} & 42 \le L_E \le 71 \\ 65 & L_E > 71 \end{cases} \text{Category 1 and 2}$$

$$L_P = \begin{cases} 16.450 + 0.953L_E & L_E < 42 \\ 76.662 - 1.164L_E + 0.018L_E^{\ 2} - 4.088\times10^{-5}L_E^{\ 3} & 42 \le L_E \le 71 \\ 70 & L_E > 71 \end{cases} \text{Category 3}$$

Threshold of Severe Impact:

$$L_P = \begin{cases} 17.322 + 0.940L_E & L_E < 44 \\ 96.725 - 1.992L_E + 3.02\times10^{-2}L_E^{\ 2} - 1.043\times10^{-4}L_E^{\ 3} & 44 \le L_E \le 77 \\ 75 & L_E > 77 \end{cases} \text{Category 1 and 2}$$

$$L_P = \begin{cases} 22.322 + 0.940L_E & L_E < 44 \\ 101.725 - 1.992L_E + 3.02\times10^{-2}L_E^{\ 2} - 1.043\times10^{-4}L_E^{\ 3} & 44 \le L_E \le 77 \\ 80 & L_E > 77 \end{cases} \text{Category 3}$$

where L_E is the existing noise exposure in terms of L_{dn} or L_{eq}(h) and L_P is the project noise exposure which determines impact, also in terms of L_{dn} or L_{eq}(h).

REFERENCES

1. U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA report number 550/9-74-004, March 1974.

2. National Academy of Sciences, "Guidelines for Preparing Environmental Impact Statements on Noise," Report from Committee on Bioacoustics and Biomechanics (CHABA) Working Group 69, February 1977.

3. American Public Transit Association, *1981 Guidelines for Design of Rapid Transit Facilities*, Section 2.7, "Noise and Vibration," 1981.

4. T.J. Schultz, "Synthesis of Social Surveys on Noise Annoyance," Journal of the Acoustical Society of America, Vol. 64, No. 2, pp. 377-405, August 1978.

5. S. Fidell, D.S. Barber and T.J. Schultz, "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise," Journal of the Acoustical Society of America, Vol. 89, No. 1, January 1991.

6. U.S. Department of Housing and Urban Development, "Environmental Criteria and Standards", 24 CFR Part 51,v 12 July 1979; amended by 49 FR 880, 6 January 1984.

7. U.S. Department of Transportation, Federal Aviation Administration, "Federal Aviation Regulations Part 150: Airport Noise Compatibility Planning," January 1981.

APPENDIX C. SELECTING RECEIVERS OF INTEREST

This appendix provides additional detail in selecting receivers of interest for those users desiring such detail. The general approach given in Chapter 6 includes the following guidelines:

- Every major public building or site with noise-sensitive indoor use within the noise study area should be selected as a separate receiver of interest.
- Each isolated residence and small outdoor noise-sensitive area within the noise study area should be selected as a separate receiver of interest in the same manner as for public buildings.
- In contrast, groups of residences and larger outdoor noise-sensitive areas within the noise study area should be "clustered" and a receiver of interest selected from each cluster. Clustering reduces the number of computations later needed, especially for large-scale projects where a great number of noise-sensitive sites may be affected. For this approach to work, however, it is essential that the receiver selected provide an accurate representation of the noise environment of the cluster.

This appendix elaborates on the clustering procedure. In brief: (1) Cluster boundaries are first drawn relative to the proposed project, either running parallel to a linear project or circling major stationary sources. These boundaries approximate contours of equal project noise. (2) Then a separate set of cluster boundaries is drawn parallel to, or circling, major sources of ambient noise to approximate contours of ambient noise. (3) Finally, a third set of cluster boundaries may further subdivide the noise study area, if there are changes in project layout or operations along the corridor.

Following are suggested procedures for drawing cluster boundaries and for selecting a receiver of interest from each cluster:

Boundaries along the proposed project. First draw cluster boundaries along the proposed project, to separate clusters based upon distance from the project. Draw such cluster boundaries for all sources that are listed as "Major" in Table 6-2.

Within both residential and noise-sensitive outdoor areas:

- **Primary project source.** Draw cluster boundaries at the following distances from the near edge of the primary project source: 0 feet, 50 feet, 100 feet, 200 feet, 400 feet, and 800 feet. If the primary project source is a linear source, such as a rail line, draw these boundaries as lines parallel to the proposed right-of-way line. Around major stationary sources, draw these boundaries as approximate circles around the source, starting at the property line. Do not extend boundaries beyond the noise study area, identified in the Screening Procedure of Chapter 4 or the General Assessment of Chapter 5.
- **Remaining project sources**. Repeat this for all other project sources listed as Major in Table 6-2, such as substations and crossing signals. If several project sources are located approximately together, only one need be considered here, since the others would produce approximately the same boundaries. It is good practice to optimize the number of clusters for a project, to avoid needlessly complicating the procedure.

Where rows of buildings parallel the transit corridor:

- Check that cluster boundaries fall between the following rows of buildings, counting back away from the proposed project:

  Between rows 1 and 2

  Between rows 2 and 3

  Between rows 4 and 5

  If not, add cluster boundaries between these rows.

Boundaries along sources of ambient noise. Next, draw cluster boundaries along all major sources of ambient noise, based upon distance from these sources.

- Along all interstates and major roadway arterials, draw cluster boundaries at the following distances from the near edge of the roadway: 0 feet, 100 feet, 200 feet, and 500 feet.
- Along all other roadways that have state or county numbering, draw cluster boundaries at 0 feet and 100 feet from the near edge of the roadway.
- For all major industrial sources of noise, draw cluster boundaries that circle the source, at the following distances from the near property line of the source: 0 feet, 100 feet, 200 feet, 400 feet.

Further boundaries based upon changes in project layout or operations along the corridor. Where proposed project layout or operating conditions change significantly along the corridor, further subdivision is needed to account for changes in project noise. Draw a cluster boundary perpendicular to the corridor, extending straight outward to both sides, at the following locations:

- Where parallel tracks, previously separated by more than 100 feet or so, come closer together
- Approximately where speed and/or throttle is reduced approaching stations and where steady service speed is reached after departing stations.
- Approximately 200 feet up and down the line from grade-crossing bells
- At transitions from jointed to welded rail
- At transitions from one type of cross section to another -- from among these types: on structure, on fill, at grade, and in cut.
- At transitions from open terrain to heavily wooded terrain
- At transitions between areas free of locomotive-horn noise and areas subject to this noise source
- Any other positions along the line where project noise is expected to change significantly -- such as up and down the line from tight curves where wheels may squeal

Selection of a receiver of interest from each cluster. The cluster boundaries divide the land area into clusters of miscellaneous shape. Each of these pieces constitutes an area that will be represented by a single receiver of interest.

- For residential clusters, locate this receiver of interest within the cluster at the house closest to the proposed project. If in doubt, select the one furthest from significant sources of ambient noise.
- For outdoor noise-sensitive clusters, such as an urban park or amphitheater, locate this receiver of interest within the cluster at the closest point of active noise-sensitive use. If in doubt, select the one furthest from significant sources of ambient noise.

In following the foregoing procedures, some clusters may fall between areas with receivers of interest. This could occur, for example, when operational changes or track layouts change in an open undeveloped area. Retain such clusters -- that is, do not merge them with adjacent ones -- but do not select a receiver of interest from them.

Example C-1. Receivers of Interest and Cluster Boundaries

An example of receivers of interest and cluster boundaries is shown in Figure C-1. In this hypothetical situation, a new rail transit line, labeled "new rail line," is proposed along a major urban street with commercial land use. A residential area is located adjacent to the commercial strip, starting about one-half block from the proposed transit alignment. A major arterial, labeled "highway," crosses the alignment.

Following the procedure described in this appendix, the first step is to draw cluster boundaries along the **proposed primary project source** (in this case, the new rail line) at distances of 0 feet from the right-of-way line (edge of the street in this example), 50 feet, 100 feet, 200 feet, 400 feet, and 800 feet. These lines are shown with distances labeled at the top of the figure. This is proposed to be a constant speed section of track, so there are no changes in boundaries due to changes in operations along the corridor. Moreover, no **other project sources** are shown here, although if there had been a station with a parking lot, lines would have been drawn enveloping the station site at the specified distances from the property line. However, this example does show **rows of buildings parallel** to the transit corridor. The first set of lines satisfies the requirement that cluster boundaries fall between rows 1 and 2, and between rows 2 and 3, but there is no line between rows 4 and 5. Consequently, a cluster boundary (labeled "R" at the top of the figure) has been drawn between the 4th and 5th row of buildings.

Next, cluster boundaries are to be drawn along major sources of ambient noise. The roadway arterial (labeled "highway") is the only major source of ambient noise shown. Again following the procedure described in this appendix, cluster boundaries are drawn at 0 feet, 100 feet, 200 feet and 500 feet from the near edge of the roadway, both sides. These lines are shown with distances labeled at the side of the figure.

The foregoing describes the procedures for drawing all the lines defining the cluster boundaries shown in Figure C-1. The next step is to **select a receiver of interest within each cluster**. These are shown as filled circles in the figure. Some receivers of interest are labeled for use as examples in Appendix D. Taking the shaded cluster with "Rec 3" as an example: the cluster is located at the outer edge of influence from the major source ("highway"), where local street traffic takes over from the highway as the dominant source for ambient noise, which would be verified by a measurement. "Rec 3" is chosen to represent this cluster because it is among the houses closest to the proposed project source in this cluster and it is in the middle of the block affected by the dominant local street. Ambient noise levels at one end of the cluster may be influenced more by the highway and the other end may be affected more by the cross street, but the majority of the cluster would be represented by receiver site "Rec 3."

End of Example C-1

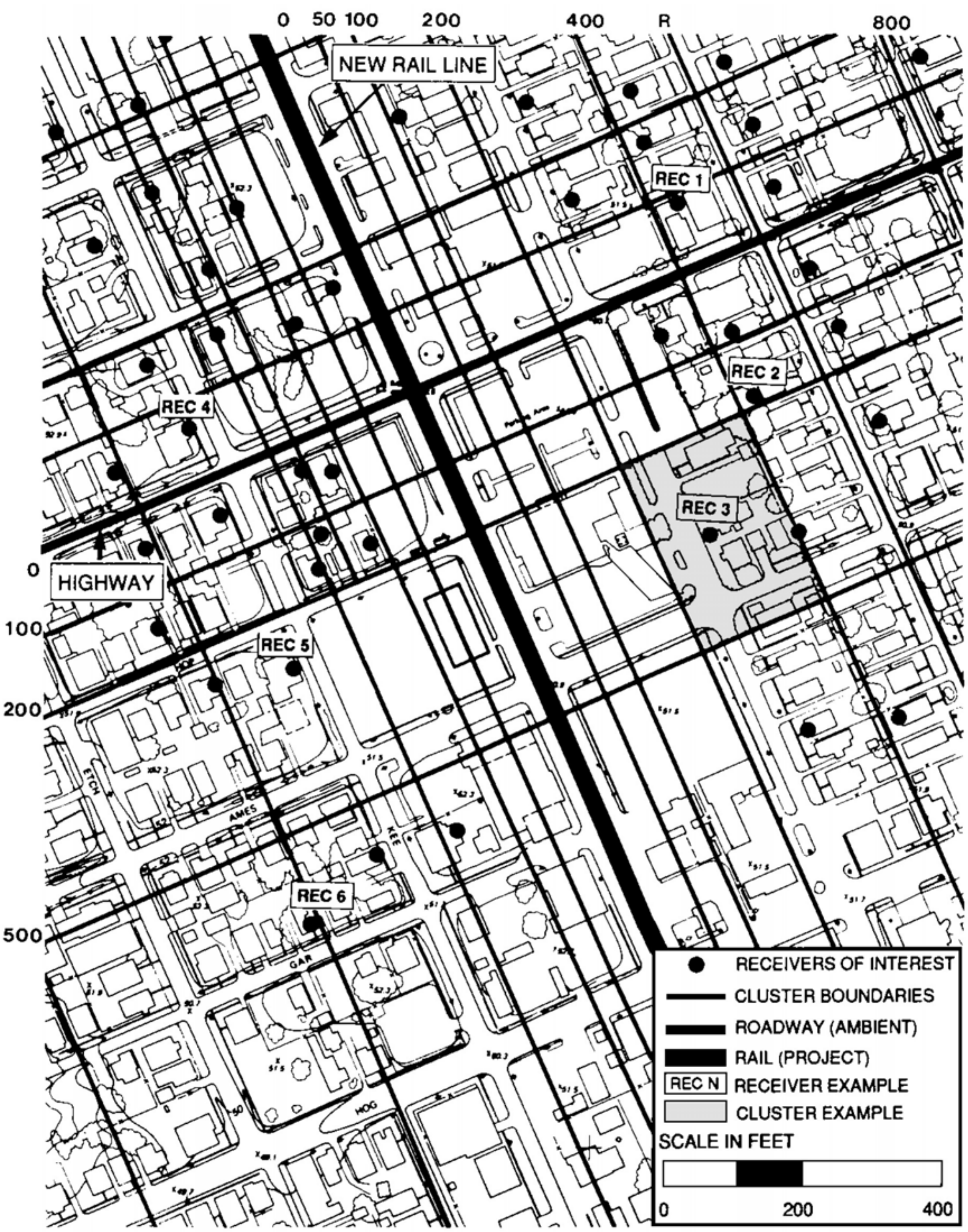

Figure C-1. Example of Receiver Map Showing Cluster Boundaries

APPENDIX D. DETERMINING EXISTING NOISE

This appendix provides additional detail in determining existing noise by: (1) full measurement, (2) computation from partial measurements, and (3) tabular look-up. Note that the words "existing noise" and "ambient noise" are often used interchangeably.

Continuing with the example from Figure C-1, the ambient noise at the selected receivers of interest, labeled "REC 1,2,3...," can be determined according to the following methods.

- Existing noise at REC 1 is due to the highway at the side of this church. L_{eq} during a typical church hour was measured in full. – OPTION 1 below
- Existing noise at REC 2, a residence, is due to a combination of the highway and local streets. L_{dn} was measured in full. – OPTION 2 below
- Existing noise at REC 3 is due to the street in front of this residence. L_{dn} was computed from three hourly L_{eq} measurements. – OPTION 3 below
- Existing noise at REC 4, a residence, is due to the highway. Since the highway has a predictable diurnal pattern, L_{dn} was computed from one hourly L_{eq} measurement. – OPTION 4 below
- Existing noise at REC 5, a residence, is due to Kee Street. L_{dn} was computed from L_{dn} at the comparable REC 3, which is also affected by local street traffic and is a comparable distance from the highway. – OPTION 5 below
- Existing noise at REC 6, a residence, is due to local traffic. L_{dn} was estimated by table look-up, based upon population density along this corridor. – OPTION 6 below

The full set of options for determining existing noise at receivers of interest is as follows:

- For non-residential land uses, measure a full hour's L_{eq} at the receiver of interest, during a typical hour of use on two non-successive days. The hour chosen should be the one in which maximum project activity will occur. The L_{eq} will be accurately represented.-- OPTION 1

- The three options for residential land uses are:
    - Measure a full day's L_{dn}. The L_{dn} will be accurately represented. – OPTION 2
    - Measure the hourly L_{eq} for three typical hours: peak traffic, midday and late night. Then compute the L_{dn} from these three hourly L_{eq}'s. The computed L_{dn} will be slightly underestimated. – OPTION 3
    - Measure the hourly L_{eq} for one hour of the day only, preferably during midday. Then compute the L_{dn} from this hourly L_{eq}. The computed L_{dn} will be moderately underestimated. – OPTION 4
- For all land uses, compute either the L_{eq} or the L_{dn} from a measured value at a nearby receiver – one where the ambient noise is dominated by the same noise source. The computed value will be represented with only moderate precision. – OPTION 5
- For all land uses, estimate either the L_{eq} or the L_{dn} from a table of typical values, depending upon distance from major roadways or upon population density. The resulting values will be significantly underestimated. – OPTION 6

Option 1: For non-residential land uses, measure the hourly L_{eq} for the hour of interest

Full one-hour measurements are the most precise way to determine existing noise for non-residential receivers of interest. Such full-duration measurements are preferred over all other options. The following procedures apply to full-duration measurements:

- Measure a full hour's L_{eq} at the receiver of interest on at least two non-successive days during a typical hour of use. This would generally be between noon Monday and noon Friday, but weekend days may be appropriate for places of worship. On both days, the measured hour must be the same as that for which project noise is computed: the loudest facility hour that overlaps hours of noise-sensitive activity at the receiver.
- At all sites, locate the measurement microphone as shown in Figure 6-9, depending upon the relative orientation of project and ambient sources. Desired is a microphone location that is shielded somewhat from the ambient source. At such locations, ambient noise will be measured at the quietest location on the property for purposes of noise impact assessment so that noise impact will be assessed most critically.
- Undertake all measurements in accordance with good engineering practice.

Option 2: For residential land uses, measure the L_{dn} for a full 24 hours

Full 24-hour measurements are the most precise way to determine ambient noise for residential receivers of interest. Such full-duration measurements are preferred over all other options. The following procedures apply to full-duration measurements:

- Measure a full 24-hour's L_{dn} at the receiver of interest, for a single weekday (generally between noon Monday and noon Friday).
- At all sites, locate the measurement microphone as shown in Figure 6-9, depending upon the relative orientation of project and ambient sources. Desired is a microphone location that is shielded somewhat from the ambient source. At such locations, ambient noise will be measured at the quietest location on the property for purposes of noise impact assessment so that noise impact will be assessed most critically.
- Undertake all measurements in accordance with good engineering practice.

Option 3: For residential land uses, measure the hourly L_{eq} for three hours and then compute L_{dn}

An alternative way to determine L_{dn}, less precise than its full-duration measurement, is to measure hourly L_{eq}'s for three typical hours of the day and then to compute the L_{dn} from these three hourly L_{eq}'s. The following procedures apply to this partial-duration measurement option for L_{dn}:

- Measure the one-hour L_{eq} during each of the following time periods: once during peak-hour roadway traffic, once midday between the morning and afternoon roadway-traffic peak hours, and once during late night between midnight and 5 am.
- Compute L_{dn} with the following equation:

$$L_{dn} \approx 10\log\left[(3)\cdot 10^{\frac{L_{eq}(\text{peakhour})-2}{10}} + (12)\cdot 10^{\frac{L_{eq}(\text{midday})-2}{10}} + (9)\cdot 10^{\frac{L_{eq}(\text{latenight})+8}{10}}\right] - 13.8$$

  This value of L_{dn} will be slightly underestimated due to the subtraction of 2 decibels from each of the measured levels before their combination. As explained previously, this underestimate is intended to compensate for the reduced precision of the computed L_{dn} here, compared to its full-duration measurement.

- At all sites, locate the measurement microphone as shown in Figure 6-9, depending upon the relative orientation of project and ambient sources. Desired is a microphone location that is shielded somewhat from the ambient source. At such locations, ambient noise will be measured at the quietest location on the property for purposes of noise impact assessment so that noise impact will be assessed most critically.
- Undertake all measurements in accordance with good engineering practice.

Option 4: For residential land uses, measure the hourly L_{eq} for one hour and then compute L_{dn}

The next level down in precision is to determine L_{dn} by measuring the hourly L_{eq} for one hour of the day and then to compute L_{dn} from this hourly L_{eq}. This method is useful when there are many sites in a General

Assessment, or when checking whether a particular receiver of interest represents a cluster in a Detailed Analysis. The following procedures apply to this partial-duration measurement option for L_{dn}:

- Measure the one-hour L_{eq} during any hour of the day. The loudest hour during the daytime period is preferable. If this hour is not selected, then other hours may be used with less precision.
- Convert the measured hourly L_{eq} to L_{dn} with the applicable equation:

$$\text{For measurements between 7am and 7pm}: L_{dn} \approx L_{eq} - 2$$
$$\text{For measurements between 7pm and 10pm}: L_{dn} \approx L_{eq} + 3$$
$$\text{For measurements between 10pm and 7am}: L_{dn} \approx L_{eq} + 8$$

  The resulting value of L_{dn} will be moderately underestimated due to the use of the adjustment constants in these equations. As explained previously, this underestimate is intended to compensate for the reduced precision of the computed L_{dn} here, compared to the more precise methods of determining L_{dn}.
- At all sites, locate the measurement microphone as shown in Figure 6-9, depending upon the relative orientation of project and existing sources. Desired is a microphone location that is shielded somewhat from the ambient source. At such locations, ambient noise will be measured at the quietest location on the property for purposes of noise impact assessment so that noise impact will be assessed most critically.
- Undertake all measurements in accordance with good engineering practice

Option 5: For all land uses, compute either L_{eq} or L_{dn} from a nearby measured value

A computation method comparable in precision to Option 4 is to determine the ambient noise, either $L_{eq}(h)$ or $L_{dn,}$ from a measured value at a nearby receiver – one where the ambient noise is dominated by the same noise source. This method is used to characterize noise in several neighborhoods by using a single representative receiver. Care must be taken to ensure that the measurement site has a similar noise environment to all areas represented. If measurements made by others are available, and the sites are equivalent, they can be used to reduce the amount of project noise monitoring. The following procedures apply to this computation of ambient noise at the receiver of interest:

- Choose another receiver of interest, called the "comparable receiver," at which:
  - The same source of ambient noise dominates.
  - The ambient $L_{CompRec}$ was measured with either OPTION 1 or OPTION 2 above.
  - The ambient measurement at the comparable receiver was made in direct view of the major source of ambient noise, unshielded from it by noise barriers, terrain, rows of buildings, or dense tree zones.

- From a plan or aerial photograph, determine: (1) the distance $D_{CompRec}$ from the comparable receiver to the near edge of the ambient source, and (2) the distance $D_{ThisRec}$ from this receiver of interest to the near edge of the ambient source.
- Also determine N, the number of rows of buildings that intervene between the receiver of interest and the ambient source.
- Compute the ambient level at this receiver of interest with the applicable equation:

If roadway sources dominate:
$$L_{ThisRec} \approx L_{CompRec} - 15\log\left(\frac{D_{ThisRec}}{D_{CompRec}}\right) - 3N$$

If other sources dominate:
$$L_{ThisRec} \approx L_{CompRec} - 25\log\left(\frac{D_{ThisRec}}{D_{CompRec}}\right) - 3N$$

The resulting value of $L_{ThisRec}$ will be moderately underestimated. As explained previously, this underestimate is intended to compensate for the reduced precision of the computed L_{dn} here, compared to the more precise methods of determining ambient noise levels.

Option 6: For all land uses, estimate either $L_{eq}(h)$ or L_{dn} from a table of typical values

The least precise way to determine the ambient noise is to estimate it from a table. A tabular look-up can be used to establish baseline conditions for a General Noise Assessment if a noise measurement can not be made. It should not be used for a Detailed Noise Analysis. For this estimate of ambient noise:

- Read the ambient noise estimate from the relevant portion of Table 5-7. These tabulated estimates depend upon distance from major roadways, rail lines or upon population densities. In general, these tabulated values are significant underestimates. As explained previously, underestimates here are intended to compensate for the reduced precision of the estimated ambients, compared to the options that incorporate some degree of measurements.

APPENDIX E. COMPUTING SOURCE REFERENCE LEVELS FROM MEASUREMENTS

This appendix contains the procedures for computing source reference levels (SEL_{ref}) from source measurements in cases where the Source Reference Tables in Chapter 6 indicate measurements are preferred.

For vehicle passbys, the closeby source measurements may be either of the vehicle's sound exposure level (SEL) or of its maximum noise level (L_{max}). Both these descriptors can be measured directly by commonly available sound level meters. L_{max}'s are allowed here for several reasons. Often L_{max} measurements are available from transit-equipment manufacturers. For some transit systems, equipment specifications will limit closeby L_{max}'s to some particular value. And in some situations, closeby source measurements may be taken as part of the environmental study for more precision than is possible with the reference-level table.

For non-passby sources, the closeby source measurements must be of the source's SEL over one source "event." The source "event" duration may be chosen for measurement convenience; it will subtract out of the computation when the measured value is converted to reference operating conditions later in this section.

This manual does not specify elaborate methods for undertaking such closeby source measurements, nor that these measurements be at the reference conditions discussed in the main text. Required are measurements that conform to good engineering practice, guided by the standards of the American National Standards Institute and other such organizations (see References 2, 3 and 4 of Chapter 6).

For passbys of both highway and rail vehicles, the following conditions are required in addition to good engineering practice:

- Measured vehicles must be representative of project vehicles in all aspects, including representative acceleration and speed conditions for buses.

- Track must be relatively free of corrugations and train wheels relatively free of flats, unless these conditions are typical of the proposed project.
- Road surfaces must be smooth and dry, unless these conditions are typical of the proposed project.
- Perpendicular distance between the measurement position and the source's centerline must be 100 feet or less.
- Vehicle speed must be 30 miles per hour or greater, unless typical project speeds are less than that.
- No noise barriers, terrain, buildings, or dense tree zones may break the lines-of-sight between the source and the measurement position.

For sources other than vehicle passbys, the following conditions are required in addition to good engineering practice:

- Measured source operations must be representative of project operations in all aspects.
- The following ratio must be 2 or less:

  distance to the furthest source component
  divided by
  distance to the closest source component

  In addition, the distance to the closest source component must be 200 feet or less. If both these conditions cannot simultaneously be met, then separate closeby measurements must be made of individual components of this source, for which these distance conditions can be met.

- The following ratio must be 2 or less:

  lateral length of the source area, measured perpendicular to the general line-of-sight between source and measurement position
  divided by
  distance to the closest source component

  If this condition cannot be met, then separate closeby measurements must be made of individual components of this source, for which this condition can be met.

- No noise barriers, terrain, buildings, or dense tree zones may break the lines-of-sight between the source and the measurement position.

When closeby source measurements are made under non-reference conditions, the equations in Table E-1 are used to convert the measured values to Source Reference Levels. Detailed procedures follow. Note that each vehicle type must be measured and converted separately. Note that this computation requires that all measured vehicles be of the same type. For trains of mixed consists, see Appendix F. For rail vehicles, measure/convert a group of locomotives **or** a group of cars separately.

<u>If SEL was measured for a highway-vehicle passby, or a passby of a group of identical rail vehicles:</u>

- Collect the following input information:
  - SEL_{meas}, the measured SEL for the vehicle passby
  - N, the consist of the measured group of rail cars or group of locomotives
  - T, the average throttle setting of the measured diesel-powered locomotive(s)
  - S_{meas}, the measured passby speed, in miles per hour
  - D_{meas}, the closest distance between the measurement position and the source, in feet
- Compute the Source Reference Level -- SEL_{ref} -- from the **first** equation in Table E-1.

Example E-1. Computation of SEL_{ref} from SEL Measurement of Fixed-Guideway Source

A passby of two diesel-powered locomotives was measured at

SEL_{meas} = 90 dBA.

For this measurement,

N = 2
T = 6
S_{meas} = 55 miles per hour, and
D_{meas} = 65 feet.

The resulting SEL_{ref} = 86.5 dBA.

End of Example E-1

<u>If SEL was measured for a stationary noise source:</u>

- Collect the following input information:
  - SEL_{meas}, the measured SEL for the noise source, for whatever source "event" is convenient to measure
  - E_{meas}, the event duration, in seconds
  - D_{meas}, the closest distance between the measurement position and the source, in feet
- Compute the Source Reference Level -- SEL_{ref} -- from the **second** equation in Table E-1.

Example E-2. Computation of SEL_{ref} from SEL Measurement of Stationary Source

A signal crossing was measured for a 10-second "event" at

SEL_{meas} = 70.

For this measurement,

E_{meas} = 10 seconds and
D_{meas} = 25 feet.

The resulting SEL_{ref} = 89.5 dBA.

End of Example E-2

If L_{max} was measured for a passby of a group of identical rail vehicles:

- Collect the following input information:
  - L_{max}, measured for the group passby
  - N, the consist of the measured group of rail cars or group of locomotives
  - T, the average throttle setting of the measured diesel-powered locomotive(s)
  - S_{meas}, the measured passby speed, in miles per hour
  - D_{meas}, the closest distance between the measurement position and the source, in feet
  - L_{meas}, the total length of the measured group of locomotives or group of rail cars, in feet

- Compute the Source Reference Level -- SEL_{ref} -- from the **third or fourth** equations in Table E-1, depending on whether the sources are locomotives or rail cars.

Example E-3. Computation of SEL_{ref} from L_{max} Measurement of Fixed-Guideway Source

A passby of a 4-car consist of 70-ft long rail cars was measured at

L_{max} = 90.

For this measurement,

N = 4
S_{meas} = 70 miles per hour
D_{meas} = 65 feet, and
L_{meas} = 280 feet.

Using the fourth equation in Table E-1,

$\propto$ = 1.14

and the resulting SEL_{ref} = 86.7 dBA.

End of Example E-3

<u>If L_{max} was measured for a highway-vehicle passby:</u>

- Collect the following input information:
  - L_{max}, measured for the highway-vehicle passby
  - S_{meas}, the vehicle speed, in miles per hour
  - D_{meas}, the closest distance between the measurement position and the source, in feet
- Compute the Source Reference Level -- SEL_{ref} -- from the **fifth** equation in Table E-1.

Example E-4. Computation of SEL_{ref} from L_{max} Measurement of Highway Vehicle Source

A bus was measured at

L_{max} = 78 dBA.

For this measurement,

S_{meas} = 40 miles per hour and
D_{meas} = 80 feet.

Using the fifth equation in Table E-1, the resulting SEL_{ref} = 87.8 dBA.

End of Example E-4

Table E-1. Conversion to Source Reference Levels at 50 feet for Transit Noise Sources

Measured Quantity	Noise Source	Equation
SEL	Vehicle passby	$SEL_{ref} = SEL_{meas} + 10\log\left(\frac{S_{meas}}{50}\right) + 10\log\left(\frac{D_{meas}}{50}\right) + C_{consist} + C_{emissions}$
	Stationary noise source	$SEL_{ref} = SEL_{meas} - 10\log\left(\frac{E_{meas}}{3600}\right) + 20\log\left(\frac{D_{meas}}{50}\right)$
L_{max}	Rail-vehicle passby, locomotives only	$SEL_{ref} = L_{\max} + 10\log\left(\frac{L_{meas}}{50}\right) + 10\log\left(\frac{D_{meas}}{50}\right) - 10\log(2\propto) + C_{consist} + C_{emissions} + 3.3$
	Rail-vehicle passby, cars only	$SEL_{ref} = L_{\max} + 10\log\left(\frac{L_{meas}}{50}\right) + 10\log\left(\frac{D_{meas}}{50}\right) - 10\log[2\propto + \sin(2\propto)] + C_{consist} + C_{emissions} + 3.3$
	Highway-vehicle passby	$SEL_{ref} = L_{\max} + 20\log\left(\frac{D_{meas}}{50}\right) + C_{emissions} + 3.3$

Vehicle Type	Expression for $C_{consist}$	Expression for $C_{emissions}$
Locomotives	-10 log (N)	0 For T<6 -2(T-5) For T ≥ 6
Rail Cars	-10 log (N)	$-30\log\left(\frac{S_{meas}}{50}\right)$
Buses	0	$-25\times\log\left(\frac{S_{meas}}{50}\right)$
Automobiles	0	$-38.1\times\log\left(\frac{S_{meas}}{50}\right)$

N = consist, (number of locomotives *or* rail cars in the measured group)
T = average throttle setting of measured diesel – electric locomotive(s)
D_{meas} = closest distance between measurement position and source, in feet
E_{meas} = event duration of measurement, in seconds
L_{meas} = total length of measured group of locomotives *or* rail cars, in feet
S_{meas} = speed of measured vehicle(s), in miles per hour

$\propto = \arctan\left(\frac{L_{meas}}{2D_{meas}}\right)$, in radians

APPENDIX F. COMPUTING MAXIMUM NOISE LEVEL (L_{max}) FOR A SINGLE TRAIN PASSBY

This appendix provides procedures for the computation of L_{max} for a single train passby, for those readers desiring such procedures. Table F-1 contains the equations to compute L_{max}. The procedure is summarized as follows.

- Collect the following input information:
  - o SEL_{ref}'s from Chapter 6, specific to both the locomotive type and car type of the train
  - o N_{locos}, the number of locomotives in the train
  - o N_{cars}, the number of cars in the train
  - o L_{locos}, the total length of the train's locomotive(s), in feet (or N_{locos}(unit length)
  - o L_{cars}, the total length of the train's set of rail car(s), in feet (or N_{cars}(unit length)
  - o S, the train speed, in miles per hour
  - o D, the closest distance between the receiver of interest and the train, in feet

- Compute $L_{max,locos}$ from the locomotive(s) using the first equation in Table F-1.
- Compute $L_{max,cars}$ from the rail car(s) using the second equation in Table F-1.
- Choose the larger of the two L_{max}'s as the L_{max} for the total train passby.

Table F-1. Conversion to L_{max} at the Receiver, for a Single Train Passby	
Source	**Equation**
Locomotives	$L_{\max,locos} = SEL_{locos} + 10\log\left(\frac{S}{50}\right) - 10\log\left(\frac{L}{50}\right) + 10\log(2\propto) - 3.3$
Rail Cars	$L_{\max,cars} = SEL_{cars} + 10\log\left(\frac{S}{50}\right) - 10\log\left(\frac{L}{50}\right) + 10\log\left[2\propto + \sin(2\propto)\right] - 3.3$
Total Train	$L_{\max,total} = \max\left[L_{\max,locos}\, or\, L_{\max,cars}\right]$

D = closest distance between receiver and source, in feet

L = total length of measured group of locomotive(s) *or* rail car(s), in feet

S = vehicle speed, in miles per hour

$\propto = \arctan\left(\frac{L}{2D}\right)$, in radians

Example F-1. Computation of L_{max} for Train Passby

A commuter train will pass by a receiver of interest and its L_{max} is desired. For this train, the following conditions apply:

SEL_{ref}	=	92 dB for locomotives and
	=	82 dB for rail cars
N_{locos}	=	1
N_{cars}	=	6
S	=	43 miles per hour
D	=	125 feet.

The locomotive and rail cars each have a unit length of 70 feet. Therefore,

L_{locos}	=	70 feet
L_{cars}	=	420 feet

Using the equations in Table F-1,

$\propto_{locos}$	=	0.27
$\propto_{cars}$	=	1.03

and the resulting Lmax's are as follows:

$L_{max,locos}$	=	84 dBA
$L_{max,cars}$	=	74 dBA
$L_{max,total}$	=	84 dBA.

End of Example F-1

Federal Transit Administration
U.S. Department of Transportation
http://www.fta.dot.gov

Riverside County Integrated Project

EXISTING SETTING REPORT

by LSA Associates, Inc.

Revised March 2000

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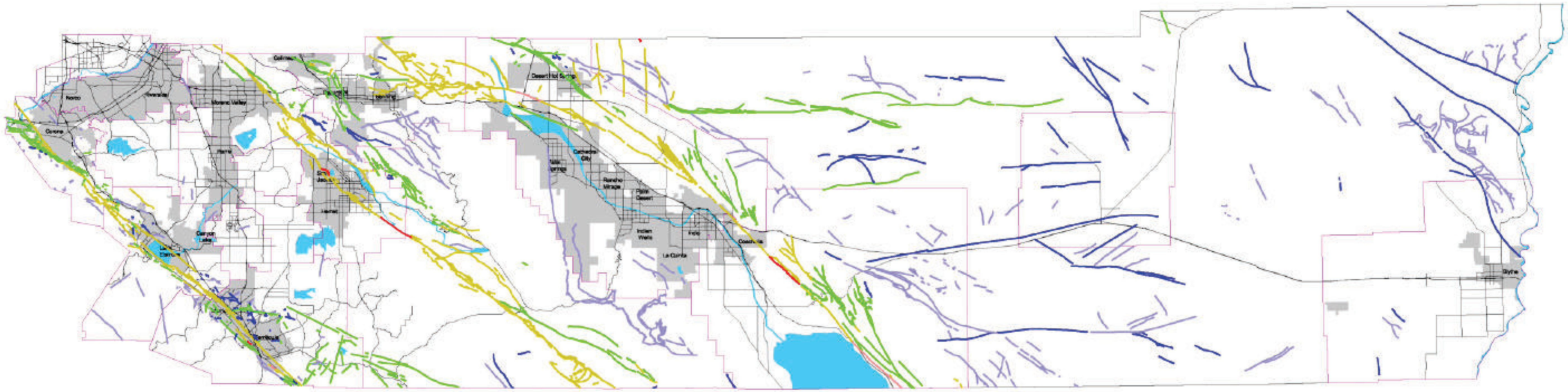

Faults Activity

- Historic
- Historic (Creep)
- Holocene
- Late Quaternary
- Quaternary
- Pre-Quaternary

- Major Roads & Highways
- Area Plan Boundaries
- Cities

Figure5.2.1

Source: EarthConsultantsInternational.

MAPPED FAULTING IN RIVERSIDE COUNTY

Scaleisapproximate

0 6 12Miles

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The strength of seismic ground shaking at any given site is a function of many factors. Of primary importance are the size of the earthquake, its distance, the paths the waves take as they travel through the earth, the rock or soils underlying the site, and topography (particularly whether a site sits in a valley, or atop a hill). The amount of damage also depends on the size, shape, age, and engineering characteristics of the affected structures.

Table 5.2.A - Abridged Modified Mercalli Intensity Scale And Relation to Other Parameters

	Intensity Value and Description	Average peak Velocity (centimeters per second)	Average peak acceleration (g is gravity = 9.80 meters per second squared)
I.	Not felt except by a very few under especially favorable circumstances (I Rossi-Forel)		
II.	Felt only by a few persons at rest, especially on upper floors of high-rise buildings. Delicately suspended objects may swing. (I to II Rossi-Forel scale)		
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated. (III Rossi-Forel scale)		
IV.	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like a heavy truck striking building. Standing automobiles rocked noticeably. (IV to V Rossi-Forel scale)	1-2	0.015g-0.02g
V.	Felt by nearly everyone, many awakened. Some dishes, windows, and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop. (V to VI Rossi-Forel scale)	2-5	0.03g-0.04g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved, a few instances of fallen plaster and damaged chimneys. Damage slight. (VI to VII Rossi-Forel scale)	5-8	0.06g-0.07g
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars. (VIII Rossi-Forel scale)	8-12	0.10g-0.15g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. (VIII+ to IX Rossi-Forel scale)	20-30	0.25g-0.30g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. (IX+ Rossi-Forel scale	45-55	0.50g-0.55g
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks (X Rossi-Forel scale)	More than 60	More than 0.60g
XI.	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.		
XII.	Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown into air.		

Primary Source: Bolt (1993)

The interaction of ground motion and human-made structures is complex. Governing factors include a structure's height, construction, and stiffness, a soil's strength and resonant period, and the period of high-amplitude seismic waves. Waves come in different lengths and thus repeat their motions with varying frequency. Long waves are called long period or low frequency. Short waves are called short period or high frequency. In general, long period seismic waves, which are characteristic of large earthquakes, are most likely to damage long period structures such as high-rise buildings and bridges. Shorter period seismic waves, which tend to die out quickly, will most often cause damage in nearby earthquakes, and they will damage shorter period structures such as one- and two-story buildings. Very short period waves are most likely to cause non-structural damage, such as to equipment. In different situations, ground displacement, velocity, and acceleration can cause damage.

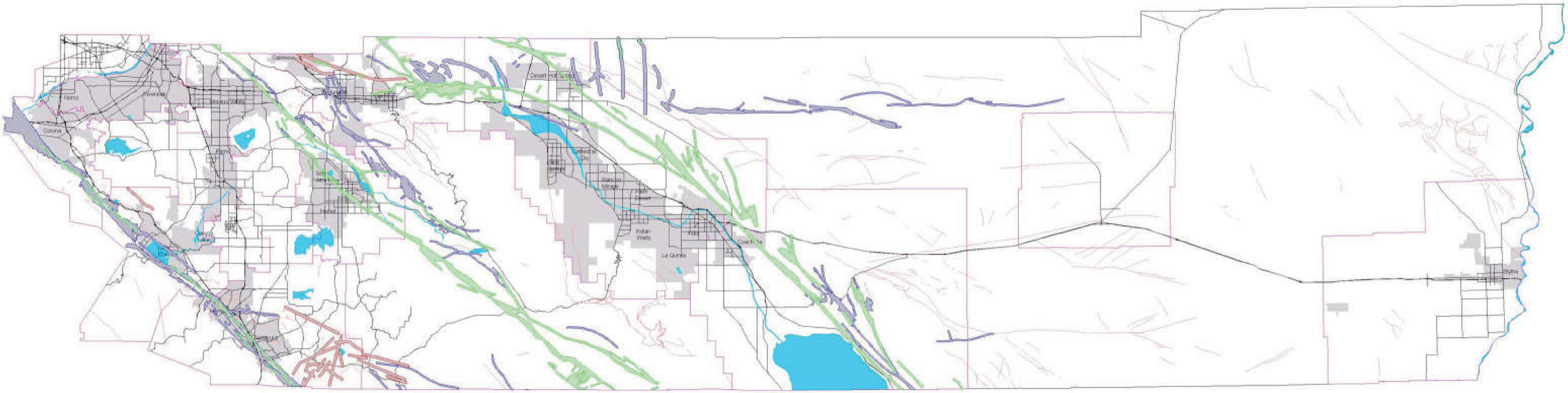
Planning and Design Earthquakes: The largest earthquake expected in an area under the current tectonic environment is termed the ***maximum credible*** (MCE) or characteristic earthquake. A ***maximum probable earthquake*** (MPE) is the earthquake most likely to occur in a specified period of time, such as 30 to 500 years. Generally, the longer the time period (recurrence interval) between earthquakes, the larger the earthquake will be, because there has been time to store more strain energy. The recurrence interval of concern will depend on the planned use, lifetime, or importance of a facility. The more critical the structure, the longer the recurrence interval chosen and the larger the ***design earthquake.***

Geologists, seismologists, engineers, and urban planners typically use maximum credible and maximum probable earthquakes to evaluate the seismic hazard of a region. Buildings and other structures must meet seismic design parameter values. They must withstand a certain peak acceleration, a given duration of strong shaking, or a particular period of seismic waves. When these values are derived from maximum credible earthquakes (MCE), they help to establish safety margins.

Although earthquakes occur often in Southern California, hundreds or thousands of years can elapse between earthquakes on any particularly portion of a fault. Many Southern California faults have not caused earthquakes in historic times, and fewer yet have caused a MCE in historic times. Therefore, estimates of maximum credible and maximum probable earthquakes for a given fault are based on the length of the fault, style of faulting, and other characteristics. Earthquake size often depends on how many segments of a fault give way at one time. The more segments that rupture, the greater the energy release and the bigger the earthquake.

When a fault has not ruptured in historic times, data obtained from trenching excavations across the fault (paleoseismic studies) provide valuable insight into how often the fault ruptures, and how big its earthquakes get.

Fault Activity: The State of California, under the guidelines of the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 1997), classifies faults according to the following criteria:



Fault Zones

- Alquist-Priolo Zone
- Existing County Zone
- Recommended Zone
- Faults
- Major Roads & Highways
- Area Plan Boundaries
- Cities

Figure 5.2.2

Source Information: Earth Consultants International

ALQUIST-PRIOLO EARTHQUAKE HAZARD ZONE MAP

Scale is approximate

0 6 12 Miles

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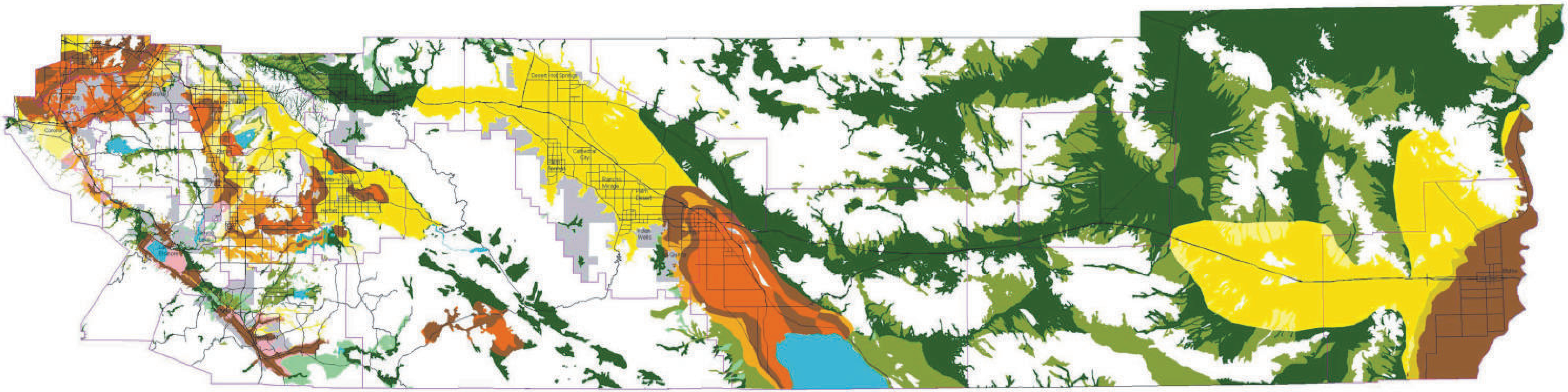

Liquefaction Susceptibility

Shallow Groundwater
Susceptable Sediments

- Very High
- High
- Moderate
- Low
- Very Low

Deep Groundwater
Susceptable Sediments

- Moderate
- Low
- Very Low

No Groundwater Data
Susceptable Sediments

- Moderate
- Low
- Very Low

- Major Roads & Highways
- Area Plan Boundaries
- Cities

Figure 5.2.5

Source:EarthConsultantsInternational.

AREAS SUSCEPTIBLE TO LIQUEFACTION

Scaleisapproximate
0 6 12Miles

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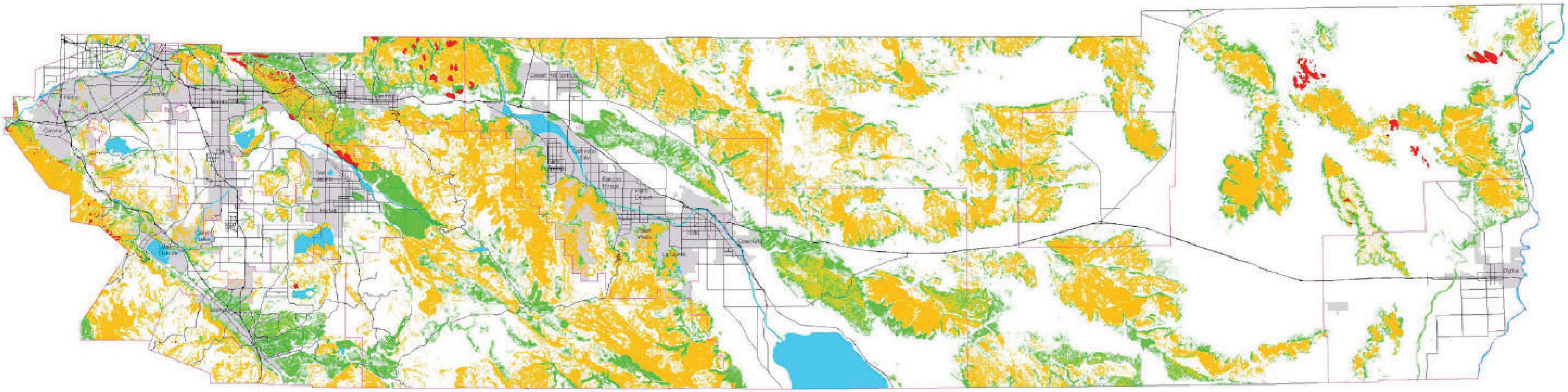

Existing Landslides

High susceptibility to seismically induced landslides and rockfalls.

Low to locally moderate susceptibility to seismically induced landslides and rockfalls.

Major Roads & Highways

Area Plan Boundaries

Cities

Figure5.2.6

Source:EarthConsultantsInternational.

EARTHQUAKE-INDUCED SLOPE INSTABILITY MAP

N

Scaleisapproximate

0 6 12Miles

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2.3.2 Community Plans Adopted as Part of the Riverside County Comprehensive General Plan

The concept of "Community Plans" was developed as part of the Riverside County General Plan to look at the unique aspects of unincorporated communities, as well as to provide a traditional General Plan land use map. Community Plans present policies for preserving, enhancing or developing unincorporated areas in a manner compatible with the values, resources, and aspirations of the community. These plans are developed though citizen input, and are intended to reflect community needs and desires. Community Plan boundaries are identified in Figure 2.4.

2.3.2.1 Jurupa Community Plan

The Jurupa Community Plan area consists of approximately 63 square miles (40,320 acres) in the northeastern corner of Riverside County. The Jurupa Community Plan area, is for the most part, separated from the cities of Riverside, Norco, and Corona by the Santa Ana River located to the east and south. The predominant features of the area are the Jurupa Hills, along the northerly boundary, the Pedley Hills, and the Santa Ana River. The remainder of the Jurupa Community Plan area consists of alluvial plains. Over 80 percent of the area has a natural slope of less than 12 percent.

2.3.2.2 Northside Community Plan

The Northside Community Plan encompasses approximately 3square miles (1,904 acres) of City and County lands generally bounded by I-215 on the east, SR-60 on the south, the Santa Ana River of the west, and San Bernardino County and the City of Colton on the north. Approximately 20 percent of the community plan area lies within San Bernardino County due to that area's strong physical relationship to properties in the City and County of Riverside.

2.3.2.3 Highgrove Community Plan *(Adopted March 28, 2000)*

The Highgrove Community Plan area contains approximately 3.5 square miles (2,250 acres) of unincorporated land on the east side of I-215, located immediately south of the San Bernardino County line. The community plan stretches eastward to the Box Springs Mountains and southward to the Riverside City limits.

The major concerns of Highgrove residents relate to the changing character of the community. A rural community whose economic focus was citrus production, Highgrove is today a community split between residents who want to keep the area the way it has always been, those who have sought to promote Highgrove's potential, and others who recognize that changes will occur in Highgrove, but are concerned about the effect of these changes on their traditional lifestyle.

- Places where surface runoff of water is channeled, such as along roadways and below culverts.

Where one debris flow has occurred, others will inevitably follow. Much of the County of Riverside is underlain by alluvial fans, deposits that have been shed from streams exiting mountain ranges. These fans and stream washes are evidence of many debris flows in the recent geologic record. In the smallest, most common events, the impact to the County is from boulders transported onto roadways and improvements.

Numerous man-made controls have been constructed to reduce the impact of these events on the County. The County operates more than 40 dams, and several hundred miles of levees and storm drains (Riverside County Flood Control and Water Conservation District, 2000).

Without the presence of extensive flood control devices, including large debris catchment basins, the areas downgradient or downstream from unstable slope areas may be subject to catastrophic debris flow inundation.

5.6.6 Expansive Soils

Expansive soils have a significant amount of clay particles, which can give up water (shrink) or take on water (swell). The change in volume exerts stress on buildings and other loads placed on these soils. These soils are often associated with geologic units having marginal stability. The distribution of expansive soils can be widely dispersed, and they can occur in hillside areas as well as low-lying alluvial basins.

Expansion testing and mitigation are required by the current grading and building codes. Active enforcement, peer review and homeowners' involvement are required to maintain these standards.

Although expansive soils are now routinely alleviated through the County Building Code, problems related to past, inadequate codes constantly appear. Expansive soils are not the only cause of structural distress in existing structures. Poor compaction and construction practices, settlement and landslides can cause similar damage, but require different mediation efforts. Once expansion has been verified as the source of the problem, mitigation can be achieved through reinforcement of the existing foundation, or through the excavation and removal of the expansive soils in the affected area.

5.6.7 Collapsible Soils

Hydroconsolidation, or soil collapse, typically occurs in recently deposited, Holocene (less than 10,000 years old) soils that were deposited in an arid or semi-arid environment. Soils prone to collapse are commonly associated with man-made fill, wind-laid sands and silts, and alluvial fan and mudflow sediments deposited during flash floods.

The soils typically contain minute pores and voids. The soil particles may be partially supported by clay or silt, or chemically cemented with carbonates. When saturated, collapsible soils undergo a rearrangement of their grains and the water removes the cohesive (or cementing) material. Rapid, substantial settlement results. An increase in surface water infiltration, such as from irrigation, or a rise in the groundwater table, combined with the weight of a building or structure, can initiate settlement and cause foundations and walls to crack.

In the County of Riverside, collapsible soils occur predominantly at the base of the mountains, where Holocene-age alluvial fan and wash sediments have been deposited during rapid runoff events. In addition, some windblown sands may be vulnerable to collapse and hydroconsolidation. Typically, differential settlement of structures occurs when lawns or plantings are heavily irrigated in close proximity to the structure's foundation. Forensic indications of collapsible soils include the following:

- Tilting floors
- Cracking or separation in the structure.
- Sagging floors.
- Non-functional windows/doors.

5.6.8 Ground Subsidence

Ground subsidence is typically a gradual settling or sinking of the ground surface with little or no horizontal movement, although fissures (cracks and separations) are common. Subsidence can range from small or local collapses to broad regional lowering of the earth's surface. While subsidence typically occurs throughout a susceptible valley, additional displacement and fissures occur at or near the valley margin. Susceptible valleys are predominantly filled with unconsolidated sand, and silty sand that includes thin layers of silt and clayey silt. Fine-grained alluvium and organic matter often underlie the fissure areas (Kupferman, 1995). Two types of fissures associated with subsidence. The first are generally straight and correspond to the traces of faults, while the second are more curvilinear on the surface and appear to correspond to the alluvium-bedrock contact at valley margins.

The causes of subsidence are as diverse as the forms of failure, and include dewatering of peat or organic soils, dissolution in limestone aquifers, first-time wetting of moisture-deficient low-density soils (hydrocompaction), natural compaction, liquefaction, crustal deformation, subterranean mining, and withdrawal of fluids (groundwater, petroleum, geothermal). Most of the damaging levels of subsidence are induced by the extraction of oil, gas or groundwater from below the ground surface, or the organic decomposition of peat deposits, with a resultant loss in volume. Ground subsidence can also occur as a response to natural forces such as earthquake movements, and the evolution of a sedimentary basin as it folds and subsides. Earthquakes can cause abrupt elevation changes of several feet.

Ground subsidence can disrupt surface drainage, reduce aquifer system storage, form earth fissures (cracks and separations), and damage wells, buildings, roads and utility infrastructure. Regional subsidence generally damages structures that are sensitive to slight changes in elevations, such as canals, sewers, and drainages. In the County of Riverside, risk due to regional subsidence is greatest at valley margins.

In Riverside County, subsidence and fissuring have been caused by falling groundwater tables and by hydrocollapse when groundwater tables rise (Shlemon and Hakakian, 1992). In addition, many fissures have occurred along active faults that bound the San Jacinto Valley and Elsinore Trough.

Figure 5.6.5 shows regions of documented subsidence and regions that may be susceptible to subsidence. The latter include all alluvial valley regions. Subsidence has only been documented in three areas:

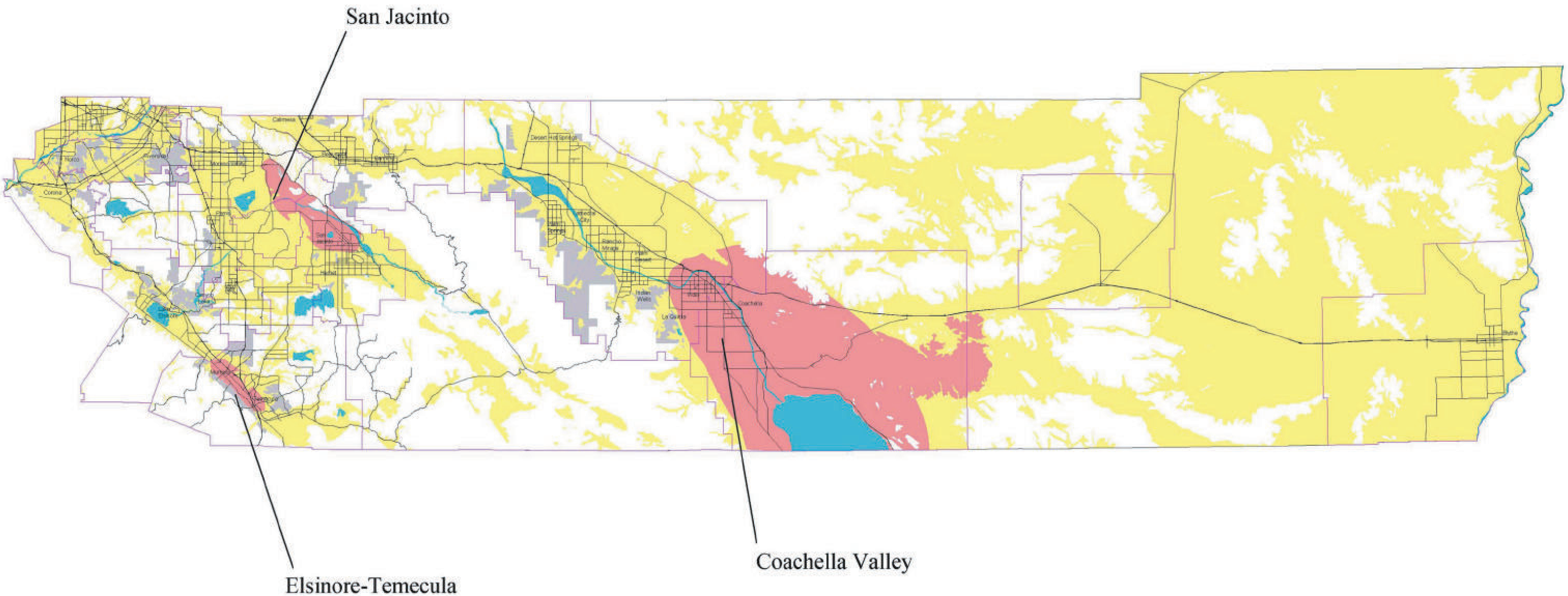
- Elsinore Trough, including Temecula and Murrieta.
- San Jacinto Valley from Hemet to Moreno Valley.
- Southern Coachella Valley.

These areas are all potentially sensitive to the withdrawal of groundwater. Depending on the depth and mechanical properties of the aquifer and the overlying sediments, they can subside if groundwater resources are not managed properly. Mitigation of ground subsidence usually requires a regional approach to groundwater conservation and recharge. Such mitigation measures are difficult to implement if the geology of the aquifer and overlying sediment are not well understood. Furthermore, conservation efforts can be quickly offset by rapid growth and attendant heavy water requirements (golf courses, for example, consume about 8 acre-feet of water per acre per year). Further, it is not uncommon for several jurisdictions to utilize a continuous groundwater aquifer, and then mitigation requires regional cooperation among all agencies.

5.6.8.1 Elsinore Trough

Two separate areas of active subsidence are known in the Elsinore Trough (Shlemon and others, 1995), a broad structural depression called a graben, which has been formed by active faulting in the Elsinore fault system. Subsidence in the two areas, near the communities of Temecula and Murrieta, was caused by different mechanisms.

Temecula: The Temecula fissures first appeared in 1987. Short, parallel ground fissures advanced across 7 miles from Wolf Valley in the south to the Temecula-Murrieta valleys in the north. By 1991, alleged damages to residential and commercial structures exceeded $50 million (Corwin and others, 1981). The Temecula-area fissures occur in northwest-trending valleys informally designated as the Murrieta, Temecula, and Wolf Valley grabens (low areas bounded by faults). In this case, the grabens are approximately one mile wide and bounded by faults of the Elsinore fault system. Studies of the Temecula fissures led to the discovery of two previously



Subsidence Zones

- Areas with Documented Subsidence
- Susceptible Areas
- Stream, River, Canal or Ditch
- Major Roads & Highways
- Area Plan Boundaries
- Cities

Figure 5.6.5

Source: EarthConsultantsInternational.

Scaleisapproximate
0 6 12Miles

AREAS OF DOCUMENTED OR SUSCEPTIBLE TO SUBSIDENCE

R:\SVC931-Graphics\ExistingSetting\subsidence.cdr(7/5/02) unrecognized active faults, the Wolf Valley and the Murrieta Creek. These two faults primarily control the distribution of the Temecula fissures (Shlemon and Hakakian, 1992). Many hypotheses have been proposed to explain the generation of the Temecula fissures. The two most often preferred are:

1. Accelerated pumping of groundwater caused deep compaction. Tensile stresses (which pull ground apart) concentrated along nearby, graben-bounding faults.

2. A seismic creep (fault movement that does not produce earthquakes) occurred along the Wolf Valley and Murrieta Creek faults.

Groundwater pumping is now the favored hypothesis (Shlemon and Davis, 1992), due to the observation that, in the days and weeks prior to subsidence, several new wells began pumping. Since the cessation of pumping, the fissures have not increased in number or size.

Murrieta: The Murrieta fissures first occurred in 1990, primarily in the "California Oaks" subdivision. About 50 discrete fissure areas have formed in and around the 10,000-home development. In litigation, damages associated with the Murrieta fissures were alleged to exceed $100 million by 1992 (Shlemon and Hakakian, 1992). These fissures are similar in appearance to the Temecula fissures, however, they occur within stream-filled channels. They occur primarily at the transition between bedrock and alluvium (stream deposits). In places, the alluvium thickness locally exceeds 75 feet, and as much as 60 feet of alluvium was left in-place after site grading. These stream sediments were then surcharged with about 10 feet of compacted fill, and residential structures were built over the fill. Subsequent geotechnical studies (Shlemon and Hakakian, 1992) indicate that groundwater levels have risen as much as 50 feet. The rise is attributed to irrigation of a golf course and residential lots.

5.6.8.2 San Jacinto Valley

In the San Jacinto Valley, the groundwater table has declined more than 120 feet (Lofgren, 1976), and has resulted in about three feet of maximum surface subsidence between 1939 and 1959 (Proctor, 1962). It is estimated that most of the subsidence (70 to 80 percent) resulted from groundwater withdrawal, with the remainder from subsidence of the sedimentary basin due to local tectonic forces associated with movement of the San Jacinto fault system (Holzer, 1984).

5.6.8.3 Coachella Valley

The Coachella Valley is filled with more than 10,000 feet of sediments, of which the upper 2,000 feet are water-bearing deposits. The most important source of groundwater recharge to the lower Coachella Valley is the Colorado River (Tyley, 1974). Minor sources of recharge include groundwater inflow from adjacent areas, infiltration of

7. CONSERVATION ELEMENT

7.1 BIOLOGICAL RESOURCES

7.1.1 Background

The native habitats within the study area have undergone considerable modification over the years. The majority of the valley floor was cultivated in the past, which resulted in the removal of native plants. Introduced grasses became established when cultivation ended. Introduced grasses and native plant and wildlife species were progressively removed as the area urbanized. Animal species currently found in urbanized areas are limited to those capable of adapting to living in close proximity to man.

Many of the species that once inhabited the valley remain in nearby natural areas. There are several such areas within or adjacent to the planning area. The San Jacinto Wildlife Area, located at the southeast corner of the planning area was established in 1983. This 12,000-acre wildlife preserve is noted its diversity of migratory birds. There are three additional large areas where natural habitat is retained in public ownership: Lake Perris Recreation Area, adjacent to the southern city limits, Norton Younglove Park, east of the city limits, and the Box Springs Mountain Park, located northwest of the city limits. A considerable amount natural habitat is in private ownership in the hillsides situated at the northern and eastern end of the planning area.

Due to wide variations in soil types, terrain, and micro-climates, several different plant communities occur. Grasslands are predominant in the undeveloped portions of the valley floor. Unless cultivated, they contain grasses, annuals, shrubs, and thistle, including foxtail grass (*Hordeum*), cheatgrass (*Bromus*), mustards (*Brassica*), lupines (*Lupinus*), and Russian thistle (*Salsola kali*).

Another plant community within the study area is the Chamise Chaparral, found on steep northerly slopes within the study area. Chamise (*Adenostoma fasciculatum*) is the dominant member of this community. Other common plants in this zone include whitehorn brush (*Ceanothus crassifolius*), sugar sumac (*Rhus ovata*), yucca (*Yucca whipplei*), and black sage (*Salvia mellifera*).

The third common plant community found within the study area is Coastal Sage Scrub, generally found on hillsides. Coastal sage brush (*Artemesia californica*) is the dominant species on the north slopes while Brittlebrush (*Encelia farinosa*) dominates the south facing slopes. Other species commonly associated with this zone are: black sage (*Salvia mellifera*), white sage (*Salvia apiana*), Yucca (*Yucca shidigera*), sugar sumac (*Rhus ovata*) and California buckwheat (*Eriogonum fasciculatum*).

Coastal sage scrub vegetation

Springs and drainage courses support water-oriented, riparian species. They include elderberry (Sambucus mexicanus), sunflower (Helianthus), willows (Salix), mulefat (Baccharis viminalis), horseweed (Conyza coulteri), and wild rhubarb (Rumex hymenosepalum). The larger drainage courses also support sycamore and cottonwood trees.

Riparian vegetation

According to the California Department of Fish and Game, there is no record of any plant that has been given Federal or State status as endangered, threatened, or rare within the study area. However, the absence of listed plants does not mean that they do not exist within the study area, only that no occurrence data has been entered in the database.

The wide variations in topography and vegetation within the undeveloped portions of the study area resulted in a rich diversity of wildlife species. Mammals include animals such as mule deer can be found in the Box Springs Mountains and in the Badlands. Large carnivores, such as coyotes, bobcats, badgers, and gray fox also exist in the undeveloped portions of the study area. Opossums, raccoons, skunks, cottontail rabbits and many rodent species are common to the study area.

A wide variety of reptiles are found in the study area. Well over one hundred species of birds, including owls, hawks and other birds of prey, can be seen at various times throughout the year, either as residents or during migration periods.

According to the California Department of Fish and Game's Natural Diversity Data Base (NDDB), there are recorded occurrences of species listed as endangered or threatened within the study area as well as potentially listed species. Listed species are protected under the federal Endangered Species Act and/or the California Endangered Species Act. It is unlawful to harm an endangered or threatened species or to damage the habitat that it occupies. As such, development of property occupied by listed species is subject to serious obstacles.

The listed species include the Stephens' kangaroo rat (*Dipodomys stephensi*), the California gnatcatcher (*Polioptila californica*) and the Least bells vireo (*Vireo belli pusilus*). The potentially listed species include the Orange Throated whiptail, the San Diego horned lizard and the Short nosed pocket mouse. The absence of certain species from the Natural Diversity Data Base does not mean that they do not exist within the study area, only that no occurrence data had been entered in the database.

The Stephen's kangaroo rat (SKR), a small nocturnal rodent related to the squirrel family, is listed as an endangered species under federal law and threatened under state law. It prefers sparse cover and relatively level or gently sloping coastal sage scrub and adjoining grasses.

Development of habitat occupied by the SKR is allowed pursuant to permits from the U.S. Fish and Wildlife Service and the California Department of Fish and Game. Permits were issued to the Riverside County Habitat Conservation Agency (RCHCA), an agency formed by several jurisdictions within western Riverside County, including Moreno Valley. The permits require the RCHCA to implement a long-term habitat conservation plan (HCP) for the conservation of SKR habitat within five core reserves.

The California gnatcatcher is a small gray songbird that prefers coastal sage scrub plant communities. It can also be found in other plant communities adjacent to sage scrub habitat. The California gnatcatcher was listed as a threatened federal species in 1993.

The least bells vireo is an insectivorous bird listed as a state and federal endangered species. It is a summer resident of dense riparian habitats in Central and Southern California and thought to winter in Mexico. Riparian portions of San Timoteo Canyon in the northeastern corner of the study area are considered suitable habitat for the least bells vireo.

7.1.2 Issues and Opportunities

Future urban development will result in the loss of natural vegetation and wildlife habitats as development spreads over the valley floor and into the surrounding hills. The vegetative and wildlife communities present in the hillside areas will be impacted to the extent that development occurs in the hillsides.

Riparian vegetation along drainage ways will also be impacted as existing flood control plans are implemented, and natural drainage courses are replaced with man-made features. While it may be possible to preserve some drainage courses in a natural condition, it will require revisions to existing master drainage plans and maintenance mechanisms.

The listing of threatened and endangered species in western Riverside County prompted the private sector and public agencies to work together toward a long-term solution to wildlife conservation. Riverside County assumed the lead role in the effort to develop a Multi-Species Habitat Conservation Plan (MSHCP) for western Riverside County, which was approved in 2003. The MSHCP is a comprehensive, multi-jurisdictional effort that includes the County and fourteen cities. Rather than deal with endangered species on a one-by-one basis, this Plan focuses on the conservation of 146 species. The MSHCP consists of a reserve system of approximately 500,000 acres of which approximately 347,000 acres were public ownership and 153,000 acres was in private ownership. The MSHCP provides landowners, developers, and those who build public infrastructure with certainty, a streamlined regulatory process, and identified project mitigation.

7.2 CULTURAL AND HISTORICAL RESOURCES

7.2.1 Background

Ancestors of the Luiseno and Cahuilla Indian tribes were the first inhabitants of Moreno Valley. They hunted game and gathered seeds and plants. They left evidence in rocks that they used to grind seeds. They also left primitive rock paintings.

Early settlers traveled through the area from northern Mexico to various mission settlements along a trail charted in 1774 by Juan Bautista de Anza. The trail passed through the San Jacinto Valley, the Perris Valley and southwest Moreno Valley.

Moreno Valley and the rest of California became part of the United States in 1850. John Butterfield operated a stagecoach line between Tucson, San Diego, Los Angeles and San Francisco. A separate stage line went through Moreno Valley from Perris Valley to Pigeon Pass and Reche Canyon.

An irrigation district was formed in 1891 for the purpose of importing water from a reservoir in the San Bernardino Mountains. Most of the valley was subdivided and two town sites were established in anticipation of the new water supply. The town of Moreno was established at the intersection of Alessandro and Redlands Boulevards. Alessandro was located along the Southern California Railway line at the intersection of Iris Avenue and Elsworth Street.

The road circulation system in Moreno Valley was established with the original subdivision map. The major north-south streets were established at one-half mile intervals with names in alphabetical order from west to east. The avenues, oriented east to west, were established at one-quarter mile intervals. The names of the avenues were also established in alphabetical order; tree names north of Alessandro Boulevard; botanical names south of Alessandro Boulevard.

Water deliveries began in 1891 from a new aqueduct that terminated at the northeast corner of the valley. The flow of water was soon interrupted by a period of drought and a legal dispute over water rights. Crops failed and most of the residents left the area by the turn of the century. Many of the original homes were relocated to other areas.

Development interest in the western side of the valley was renewed with activation of March Air Force Base in 1918. The base closed in 1922 and reopened as a flight training school in 1927.

Well drilling in the 1920's allowed local groundwater to be developed. Mutual water companies were formed, land was subdivided and people began to settle in the communities the Edgemont and Sunnymead. Development activity slowed during the depression era until March Air Force Base was reactivated during World War II.

The Cultural Preservation Advisory Board was created in 1987 to advise the City in all matters relating to the preservation of the heritage and culture of Moreno Valley. The Board was later renamed the Cultural Preservation Advisory Committee. Moreno Valley Historical Society is a private organization dedicated to the appreciation and preservation of the history of Moreno Valley.

7.2.2 Archaeological and Historical Sites

There are no sites within the Moreno Valley study area listed as a state landmark, nor are there any sites on the National Register of Historic Places. The Old Moreno Schoolhouse was designated a city landmark in 1988.

The schoolhouse was built in 1928 at the northeast corner of Alessandro Boulevard and Wilmot Street. The schoolhouse, built in the mission revival style of architecture, replaced the building constructed on the site in 1892. The City purchased the schoolhouse in 1988 with the intent of restoring the structure and grounds for public use. The restoration cost was later determined to be excessive. As a result, the building was sold and the new owners converted the structure into a residence in 2005.

The First Congregational Church of Moreno was the first church built in Moreno Valley. The church building was constructed in 1891 at the northeast corner of Alessandro Boulevard and Sterling Street in the town of Moreno. In 1943, the building was moved to 24215 Fir Avenue, east of Heacock Street. The Moreno Valley Congregation Church still uses the structure, but it was no longer used as the main sanctuary.

Moreno Valley Congregational Church

In 1987, the Archaeological Research Unit of the University of California conducted an inventory of archaeological sites within the City of Moreno Valley. A total of 168-recorded sites were located. The majority of the sites are in the hillsides and most of the identified artifacts relate to milling and food processing by native peoples. Rock art sites and the remains of an adobe structure were identified as well. The report contains recommendations for recordation, protection or excavation.

The Archaeological Research Unit also prepared a report and a map of paleontological sensitivity. The sedimentary formations of the Badlands were determined to have high potential of containing vertebrate fossils. The report recommended monitoring of the area during excavation to protect and preserve any important fossils that might be uncovered.

In the 1980's, the State of California Department of Parks and Recreation conducted an inventory of historic resources in Moreno Valley. The inventory identified 26 structures of historical interest. Most of the structures were residences. Several of the structures no longer exist.

7.2.3 Issues and Opportunities

Rapid urban development in Moreno Valley has led to a loss of several buildings of historical interest. Continued development could result in the loss of historical and cultural resources unless mitigation is undertaken prior to grading and construction. Many old structures are in poor condition and in some cases restoration may not be feasible.

7.3 SOLID WASTE

California and the region are faced with a long-term solid waste disposal problem. Existing landfills are filling up and there is a shortage of new landfills. The amount of solid waste continues to grow in step with growth in population, commerce and industry.

Locally generated solid waste is deposited in several local landfills, including the Badlands Sanitary Landfill at the eastern end of Ironwood Avenue. The Badlands Sanitary Landfill is owned and operated by the Riverside County Waste Resources Management District.
Recognizing the severity of the waste disposal problem, the state legislature enacted the California Integrated Waste Management Act of 1989 (AB939). The purpose of the Act was to reduce the amount of solid waste that must be disposed of in landfills.

The City Council adopted a "Source Reduction and Recycling Element" in 1992, describing how Moreno Valley plans to meet the goals mandated by AB939. The element includes strategies to address various components of the solid waste challenge, including the character of the waste stream, source reduction, recycling, composting, special waste (e.g. construction debris, auto bodies, medical waste, tires and appliances), education and public information, disposal facility capacity, funding and integration of the various components.

Moreno Valley works in concert with the local waste hauling company to meet its waste diversion requirements. Residential customers place recyclable materials at the curb for collection by the waste hauler, Waste Management of the Inland Empire. The waste hauler separates and markets the recyclable materials, including cardboard, paper, tin/metal, aluminum cans, plastics and glass. In 2004, fifty-one percent of the solid waste generated in Moreno Valley was diverted from landfills.

7.4 SOILS

7.4.1 Background

The United States Soils Conservation Service (SCS) mapped soils within Western Riverside County. A general classification used in soil mapping is called a soil association. An association is a landscape that has a distinctive pattern of soil types. Identification of soil associations is helpful to 1) get a general idea of the soils in an area, 2) identify large areas of land suitable for a particular purpose, and 3) to identify general areas with potential constraints.

Five soil associations are found within the Moreno Valley study area. The Monserate - Arlington - Exeter Association is found on terraces and on old alluvial fans adjacent to and within the eastern half of March Air Reserve Base. It consists of well-drained soils that developed in alluvium from predominantly granitic materials. This association is found on nearly level to moderately steep slopes from 0 to 25 percent with a surface layer of sandy loam and a shallow to deep sandy clay loam hardpan.

The Hanford - Tujunga - Greenfield Association occurs on alluvial fans and flood plains. It is common in the central portion of Moreno Valley, generally extending northeast to southeast of March Air Reserve Base. This association consists of well-drained to somewhat excessively drained soils, developed in granitic alluvium. These soils are found on nearly level to moderately steep slopes of 5 to 15 percent. They have a good topsoil layer of coarse sandy loam texture with underlying layers that are coarse sandy loam and loamy sand.

Cieneba - Rock Land - Fallbrook Association is found on uplands located in the Box Springs Mountains area, extending east to Reche Canyon as well as the Mount Russell area. These soils are formed in coarse-grained igneous rock. This association consists of somewhat excessively drained soils on undulating to steep slopes ranging from 5 to 50 percent. They generally have a poor topsoil layer of sandy loam above a layer of gravelly coarse sand and a third layer of weathered granodiorite. Rock outcrop areas are present along with weathered rock close to the surface.

The San Emigdio - Grangeville - Metz Association is found on alluvial fans and floodplains. The soils along the western side of Gilman Springs Road comprise this association. These soils are well-drained and found on nearly level to very steep slopes ranging from 0 to 50 percent. They have good topsoil and an underlying layer consisting of fine sandy loam.

The Badlands - San Timoteo Association soils occupy the area along the northern side of Gilman Springs Road into the Badlands region. This association consists of well-drained soils found on steep to very steep slopes ranging from 30 to 70 percent. The soils are variable, consisting of soft sandstone, siltstone, and beds of gravel. These soils also range in texture from sandy loam to clay loam, having poor topsoil characteristics. The very shallow depth to bedrock severely limits the use of septic tank sewage disposal systems in this area. Soil stability is considered poor to fair with significant potential for erosion.

In general, prime agricultural soils are found on the alluvial deposits of the valley floor, while the soils subject to the greatest limitations for agriculture and development are located in the Box Springs Mountains, Reche Canyon area, the Badlands and the Mount Russell area.

7.4.2 Issues and Opportunities

With exception of the Cieneba - Rock Land - Fallbrook Association and the Badlands - San Timoteo Association, soils within the study area present few limitations for development. Conditions of shallow depth to bedrock and rock outcroppings generally occur on the steeper slopes and are the most significant physical constraint to development. Ripping may be required in order to loosen weathered rock and blasting of hard rock may be required. Although intense urban and agricultural development of these soils would be constrained, low intensity, large lot development is feasible.

As development of the study area proceeds, soils will be exposed during grading operations. During this time, soils may become susceptible to water erosion and wind erosion. The extent that erosion would occur depends on the particular soil, the extent of area being exposed, the slope, the time of year grading operations occur and erosion control methods that are used.

The use of septic tanks for sewage disposal is standard practice in the eastern portion of the Moreno Valley study area. The soils of the valley portion of the study area generally have only slight limitations for use with subsurface sewage disposal systems. However, the steeper slopes and floodplains are less suitable.

None of the soil associations in the Moreno Valley study area are significantly limited by soil corrosiveness or shrink-swell characteristics that could affect the construction of roads, foundations of structures, or other urban uses.

While the State of California and local agencies have advocated the preservation of prime agricultural soils for agricultural use, the retention of agricultural land is far more complicated than identifying prime agricultural soils and requiring that they used for agricultural purposes only. Agriculture is a business that exists only where economics and area land use are favorable toward animal and crop production. The issues affecting the potential success of an agricultural preservation program include the availability and cost of water, land use competition, urban/rural land use conflicts and the economics of agricultural production.

7.5 WATER RESOURCES

7.5.1 Background

The early history of water in Moreno Valley began with the creation of the Alessandro Irrigation District in 1891. The irrigation district was formed for the purpose of importing water from a reservoir in the San Bernardino Mountains. The reservoir was originally built for the community of Redlands.

The community of Moreno was founded at the intersection of Alessandro Boulevard and Redlands Boulevard in advance of the new water supply. An aqueduct was completed, but the flow of water ended quickly due to drought and because there was not enough water for both Redlands and Moreno. The courts decreed that City of Redlands had priority water rights. By the turn of the century most of the early farmers and settlers left the area. The farmers that remained in the area relied on winter rains and local wells.

In 1919, the Moreno Mutual Irrigation Company acquired wells in Moreno Valley and San Timoteo Canyon. Water was delivered from San Timoteo Canyon through the old aqueduct system until the 1954. Water agencies in the Yucaipa/Beaumont area successfully challenged the company's right to well water from that area.

Groundwater no longer provides a significant percentage of the local water supply. There are two hydrological groundwater basins in the planning area. The Perris Basin is on the western side of Moreno Valley. The San Jacinto Basin is on eastern side of the study area.

Box Springs Mutual Water Company serves a small portion of the community, while the primary purveyor of water in Moreno Valley since the 1950's is Eastern Municipal Water District (EMWD). EMWD, incorporated in 1950, became a member of the Metropolitan Water District in 1951. The original district boundary encompassed most of the San Jacinto Valley and Perris Valley and a small portion of Moreno Valley. Additional territory in Moreno Valley was annexed in 1953. At that time the primary water source was the Colorado River. The water was imported though the Metropolitan Water District's Colorado River Aqueduct.

EMWD completed a major water supply line along Perris Boulevard in 1954 through which water became available in 1955. The existing water companies were responsible for connecting to the main water supply system, including the Edgemont Gardens Mutual Water Company and the Sunnymead Mutual Water Company.

Up until the time that EMWD provided imported water, the local mutual water companies drew their water from local wells. Eventually, two of the mutual water companies turned over their operations to EMWD; Sunnymead Mutual Water Company did so in 1990; Edgemont Gardens (Moreno Valley) Mutual Water Company in 1997.

Water tank

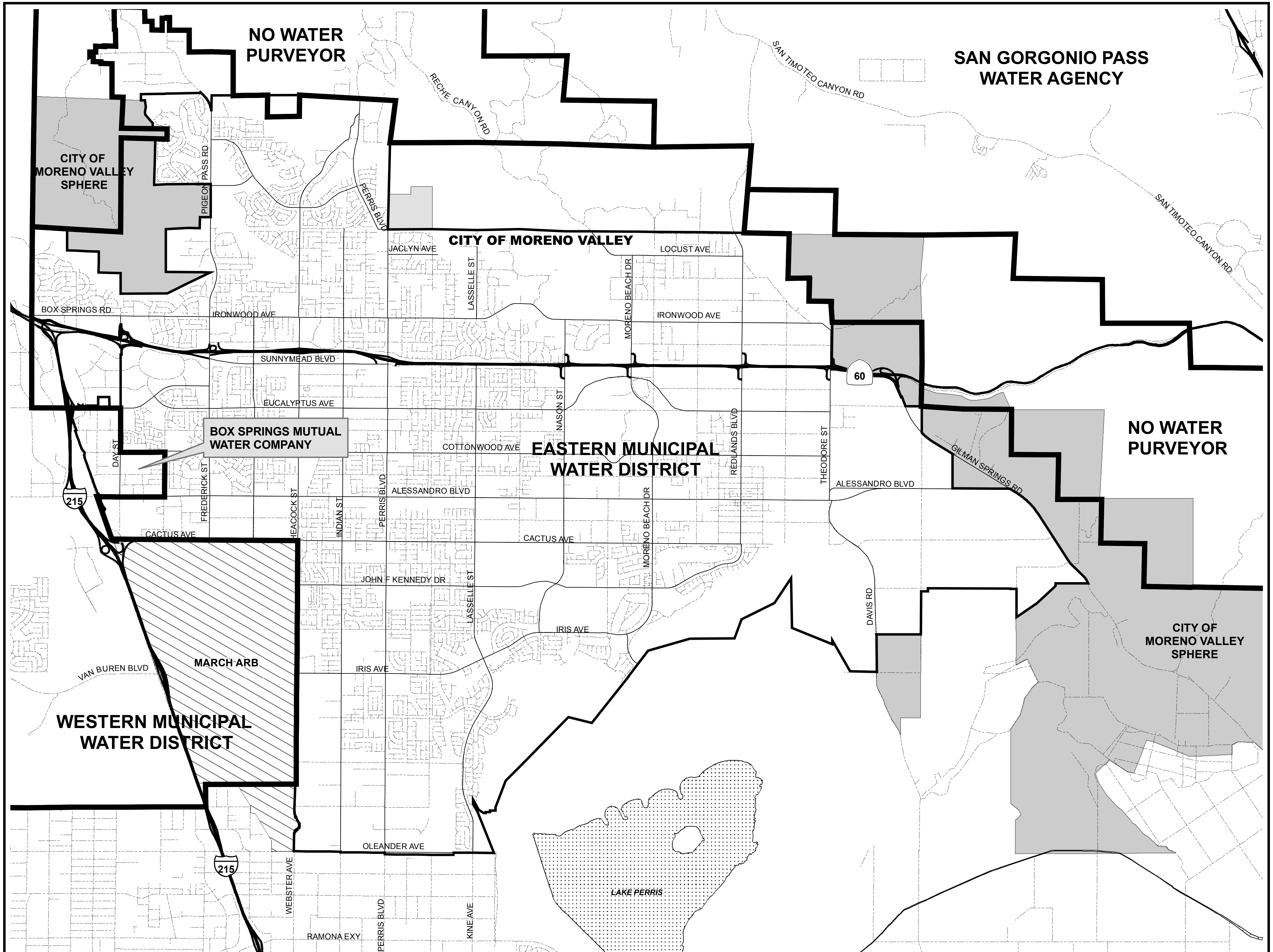
The State Water Project brought additional imported water to Moreno Valley and EMWD's service area. It brought water from the rivers of northern California through a series of aqueducts, pipelines and reservoirs, including Lake Perris. Lake Perris was completed in 1973. An underground segment of the aqueduct runs from the northwest corner of Moreno Valley to Lake Perris. Water from Lake Perris is pumped to the Mills Filtration Plant in the City of Riverside before it is distributed to Moreno Valley customers.

Water from the State Water Project was needed to supplement water supplies from the Colorado River. The water supply available to California from the Colorado River will diminish as Arizona uses its legally established allocation of water. In addition, the quality of untreated water from the Colorado River is lower than the quality of State Water Project water.

The Metropolitan Water District constructed another major reservoir, the Diamond Valley Lake, in the Domenigoni Valley area south of Hemet. The reservoir holds 800,000 acre-feet of water. The water in Diamond Valley Lake improves the reliability of the water supply. It stores water that is available during wet years for use during periods of drought.

7.5.2 Issues and Opportunities

Even with the development of the Diamond Valley Reservoir, water supply, storage and conservation will be needed to meet the long-term water demands of region. EMWD has several such programs in place. For example, prior to issuance of landscape irrigation meters, new public and private developments must install landscaping and irrigation systems that operate at high levels of water use efficiency. In addition, increasing amounts of water reclaimed from sewage treatment plants is being used for landscape irrigation and agriculture. EMWD is also recharging groundwater basins and desalinating saline groundwater to protect and increase the supply of water.



MORENO VALLEY

FIGURE 7-1
WATER PURVEYOR SERVICE AREA MAP

- Streets
- Major Streets
- Highways
- Service Areas
- Moreno Valley
- Moreno Valley Sphere
- March ARB
- Waterbodies

N

5,000 2,500 0 5,000 Feet

0.5 0.25 0 0.5 1 Miles

Date: July 11, 2006
State Plane NAD83 Zone 6
File: G:\arcmap\planning\gen_plan_updates\water_serv_area.mxd

GEOGRAPHIC INFORMATION SYSTEMS

The information shown on this map was compiled from the Riverside County GIS and the City of Moreno Valley GIS. The land base and facility information on this map is for display purposes only and should not be relied upon without independent verification as to its accuracy. Riverside County and City of Moreno Valley will not be held responsible for any claims, losses or damages resulting from the use of this map.

The EMWD's 2000 Urban Water Management Plan predicts that supplies will meet demand through the year 2010 even under worst-case conditions. Supply reliability after 2010 depends on the outcome of the CAL-FED process, a collaborative effort of multiple state and federal agencies to resolve conflicts between urban, agricultural and environmental water interests. The goal is ensure that there will be a reliable long-term supply of water for California.

The Urban Water Management Plan contains the following statement on Page 19 regarding future water supply: "based on the regional progress to date in developing off-stream storage for surplus imported water, coupled with the local plans for resource development, the District is confident of its ability to meet the water demands of its customers through 2020."

7.6 ENERGY RESOURCES

7.6.1 Background

Modern society depends on energy resources, including electricity, natural gas and other types of fuel. Energy is used for transportation, heating, cooling, lighting and manufacturing purposes. Continued development within the study area and the nation will consume additional energy resources.

Moreno Valley is dependent on outside sources of energy, including electricity and fossil fuels. State and federal institutions and the private sector are responsible for the supply and price of electricity. Electricity used within the study area is generated in the region and at distant locations in the western United States. Electricity is derived from nonrenewable fossil fuels, such as natural gas, renewable wind energy and waterpower, and other sources. The City and Southern California Edison distribute electricity within the planning area.

The State experienced a period of supply unreliability and price volatility during 2000. The demand for electricity in California exceeded the supply generated by power plants within the state. The average price of electricity was among the highest in the nation.

As with electricity, the City does not have direct control over the supply of natural gas and gasoline. Natural gas is delivered to the area from out of state sources. The national supply of gasoline is derived from both domestic and foreign sources. Both natural gas and gasoline are nonrenewable energy sources, meaning that they cannot be replenished.

7.6.2. Issues and Opportunities

Increasing demands upon America's supply of energy has led to an increased reliance on foreign energy supplies and energy price escalation. The use of energy resources is also closely correlated with air quality.

Air pollution is generated when fossil fuels are burned to produce electricity. Emissions are released when natural gas is used for space heating and manufacturing. Motor vehicle emissions are the result of the combustion of gasoline, diesel fuels and natural gas.

Energy conservation is a way to control energy costs, reduce reliance on foreign energy supplies and minimize air pollution. Energy efficiency can be derived in the arrangement of land uses, in the design of developments and the architecture of individual buildings.

The amount of energy consumed in automobile travel can be reduced if commercial and recreational opportunities are located near residential uses. Commuter travel can be minimized if there is a reasonable balance between jobs and housing within the area. Placing high intensity uses along transit corridors can also reduce automobile travel.

Reducing residential street width can affect microclimates and reduce the summer cooling needs of adjacent homes. The orientation of buildings can be arranged to affect the amount of heat gain. Shade trees can also cool microclimates and aid in energy conservation.

Building construction options are available to reduce energy consumption. Building construction methods include, but are not limited to, insulation of walls and ceilings, insulated windows and solar water heating systems. Many building energy conservation measures have been incorporated into Title 24 of the California Administrative Code and are required of all residential structures.

AGRICULTURAL RESOURCES

7.7.1 Background

Open space devoted to agriculture encompasses a minor portion of the City's total land area. The area devoted to agricultural production diminished over time as urban development encroached on agricultural lands.

Agricultural land within the study area is generally leased to farm operators. Few, if any of the farms within the valley are owner-operated. Four major types of agriculture take place in Moreno Valley: grazing, fruit orchards, dry grain farming, potato and fruit crop farming and poultry production. Nearly all of the remaining agricultural use occurs in the rural eastern portion of Moreno Valley.

To provide an economic incentive to preserve agricultural lands, the State of California passed the California Land Conservation Act, commonly referred to as the Williamson Act, in 1965. Under this act, agricultural lands are taxed at their agricultural value rather than their value for higher valued uses. In exchange, the landowner enters into a contract to retain the land in agricultural use for at least 10 years. The contract is automatically renewed annually for one year at the end of the term; therefore, once a "Notice of Nonrenewal" is filed, it is ten years until the contract expires. A Notice of Nonrenewal was filed for the land within the city limits that was under Williamson Act contract and the contract has since expired. There is a Williamson Act contract in effect on a site within the City’s sphere of influence, located on the south side of Gilman Springs Road, east of Jack Rabbit Trail.

For many years the major agricultural enterprise within the study area was the University of California Field Station, located between Lasselle and Nason Streets and south of Brodiaea Avenue. Since the 1960’s, the Field Station was used to raise experimental crops suited to dry and semi-dry climates.

The University decided to replace the Field Station with a research station in the Coachella Valley. The Moreno Valley Field Station Specific Plan, a mixed-use plan, was adopted for the property in 1999.

7.7.2. Issues and Opportunities

Preservation of prime agricultural land is an important state and national goal and many of the soils in Moreno Valley are well suited for agricultural production. However, soil alone does not guarantee the success of an agricultural enterprise. The high cost of land, the high cost of water and energy, fragmented ownership patterns and market conditions limit the potential return on investment. These economic factors are a disincentive to continued farming in Moreno Valley. It is, however, a viable interim use.

Sometimes nearby residents are affected by the dust, spray drift and odors associated with agricultural production. The ability to farm in close proximity to residential land uses will continue to be a community concern.

7.7 SCENIC RESOURCES

7.8.1 Background

The City of Moreno Valley lies on a relatively flat valley floor surrounded by rugged hills and mountains. The topography of the study area is defined by the Box Springs Mountains and Reche Canyon area to the north, the "Badlands" to the east, and the Mount Russell area to the south. These features provide the City with outstanding vistas.

The major aesthetic resources within the study area include views of the mountains and southerly views of the valley. The man-made environment is equally important in terms of scenic values. Buildings, landscaping and signs often dominate the view. Agricultural uses such as citrus groves are less common, but visually pleasing features.

The major scenic resources within the Moreno Valley study area are visible from State Route 60, the major transportation route in the area. Upon entering the Moreno Valley from the west, the dominant view is of the Box Springs Mountains to the immediate north and the Mount Russell foothills to the south. Both mountain ranges display numerous rock outcroppings and boulders that add visual character to these landforms.

Moreno Peak is part of a prominent landform located south of State Route 60 along Moreno Beach Drive. This landform only rises a few hundred feet above the valley floor but has a unique location near the center of the valley. Moreno Beach Drive, the main route to Lake Perris from State Route 60, offers views of Moreno Peak and a panoramic view of Moreno Valley.

Hills Adjacent to Moreno Peak

Panoramic views of the valley can be seen from elevated segments of some local roads and from hillside residences. The views are particularly attractive on clear days and at night when the glow of city lights can be seen.

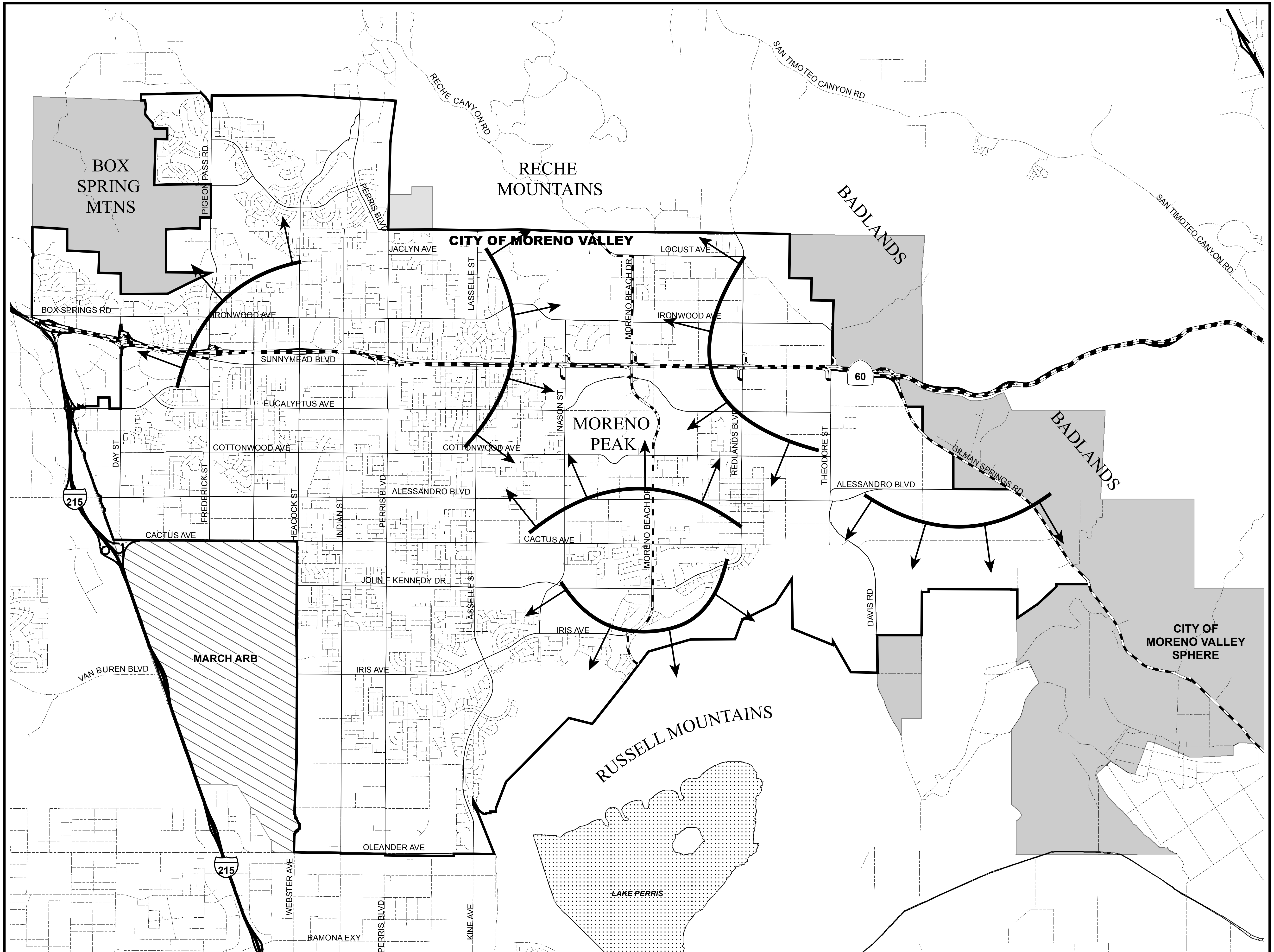
As State Route 60 traverses east through Moreno Valley, it passes through the Badlands area. Characterized by steep and eroded hillsides, the Badlands form the eastern boundary of the study area and provide a sweeping range of hills that act as a visual backdrop to the valley.

Expanses of open land are found throughout the eastern portion of the study area. These tracts of land allow for uninterrupted scenic vistas from State Route 60, Gilman Springs Road and other roadways and provide views of the San Jacinto Valley and the ephemeral Mystic Lake.

Views of the San Bernardino and San Gabriel mountains are evident at times from the valley floor. Winter snows in the San Bernardino and San Jacinto Mountains often provide a striking view.

7.8.2 Issues and Opportunities

Scenic resources contribute to the overall desirability of a community. The distinctive physical setting of Moreno Valley creates much of the City's appeal as a place in which to live and do business. Thus, Moreno



MORENO VALLEY

FIGURE 7-2 MAJOR SCENIC RESOURCES

- Streets
- Major Streets
- Highways
- Scenic Route
- Moreno Valley
- Moreno Valley Sphere
- March ARB
- Waterbodies
- View Corridor

N

5,000 2,500 0 5,000 Feet

0.5 0.25 0 0.5 1 Miles

Date: July 11, 2006
State Plane NAD83 Zone 6
File: G:\arcmap\planning\gen_plan_updates\mjr_scenic.mxd

GEOGRAPHIC INFORMATION SYSTEMS

Valley's visual resources are also of economic value to the community.

The City of Moreno Valley has the opportunity to designate scenic routes as the basis for preserving outstanding scenic views. Special attention to the location and design of buildings, landscaping and other features should be made to protect and enhance views from scenic roadways.

7.8 MINERAL RESOURCES

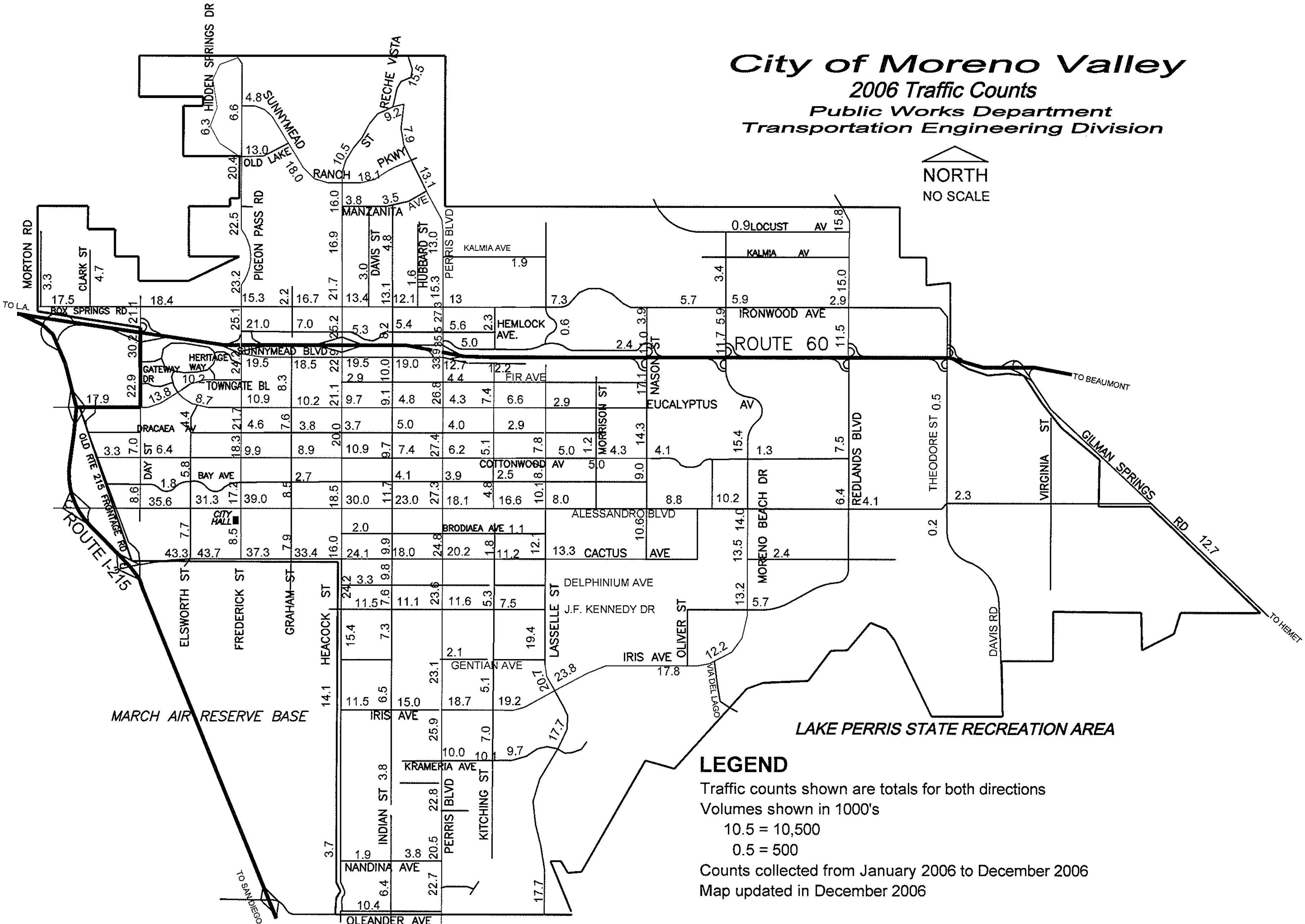
The mineral resources known to be located within the study area are common materials: sand, gravel and rock. Sand and gravel is used to make concrete and as road base. There was one recently active sand and gravel quarry on record within the City's sphere of influence: the Jack Rabbit Canyon Quarry. It was inactive as of 2001. It is in a drainage course located at the northeast corner of Jack Rabbit Trail and Gilman Springs Road, adjacent to the Quail Ranch Golf Course. The extent of the associated sand and gravel deposit is very limited.

Surface mining operations are regulated in accordance with the Surface Mining and Reclamation Act of 1975. No person may conduct surface mining operations without first obtaining a surface mining permit. Surface mining permits also including mining and reclamation plans. The purpose of surface mining permits is to ensure that mining of valuable minerals can continue while the adverse environmental impacts of mining activities are minimized and mined lands are reclaimed properly.

City of Moreno Valley

2006 Traffic Counts

Public Works Department
Transportation Engineering Division



LEGEND

Traffic counts shown are totals for both directions
Volumes shown in 1000's
10.5 = 10,500
0.5 = 500
Counts collected from January 2006 to December 2006
Map updated in December 2006

The information on this map is provided as a courtesy and deemed reliable based on samples taken by the City.

Mineral Resources On-Line Spatial Data

Mineral Resources > Online Spatial Data > Mineral Resource Data System (MRDS)

Nason Street Pit

Past Producer in Riverside county in California, United States with commodity Stone, Crushed/Broken

[View location using Google Earth]

Sections of this page: [Geologic] - [Economic] - [Reference]

Geologic Information

Identification information

Deposit ID	**10188990**
MRDS ID	**W024561**
MAS/MILS ID	**0060650410**
Record type	**Site**
Current site name	**Nason Street Pit**
Related records	**10077122**

Geographic coordinates

Point of reference	**Main Entrance**
Geographic coordinates:	**-117.206470, 33.940330 (WGS84)**
Elevation	**539**
Location accuracy	**10** *(meters)*
Geographic context:	*Political divisions (FIPS codes)*

Riverside (county)
California (state)
United States (country)
North America (continent)
Land (continent)

USGS map quadrangles

Sunnymead (quadrangle 1:24,000 scale)
Santa Ana (quadrangle 1:100,000 scale)

Santa Ana (quadrangle 1:250,000 scale)

Hydrologic units (watersheds)

San Jacinto (hydrologic unit)

Santa Ana (hydrologic accounting unit)

Southern California Coastal (hydrologic subregion)

California (hydrologic region)

Geographic areas

Country	*State*	*County*
United States	California	Riverside

Public Land Survey System information

Meridian	*Township*	*Range*	*Section*	*Fraction*	*State*
San Bernardino	003 S	003 W	03		California

Commodities

Commodity	*Importance of the commodity*
Stone, Crushed/Broken	Primary

Geologic units near the site, calculated from the appropriate geologic map

Main Entrance (1) **Quaternary alluvium and marine deposits**

Economic Information

Economic information about the deposit and operations

Operation type **Surface**

Development status **Past Producer**

Commodity type **Non-metallic**

Significant **No**

Land status

Ownership category **Unknown**

Reference information

Links to other databases

Agency	*Database name*	*Acronym*	*Record ID*	*Notes*
U.S. Bureau of Mines (no longer exists)	Minerals Availability System	MAS	0060650410	
USGS	Mineral Resources Data System	MRDS	W024561	MAS references MRDS

Bibliographic references

Subject category	*Reference*
Deposit	CALIF. DIV. MINES AND GEOL. OPEN-FILE REPORT 77-14, 1977,
Deposit	TABULATED LIST, NO. 416, 290.

Reporter information

Type	*Date*	*Name*	*Affiliation*	*Comment*
Reporter	31-MAR-1991	Ridenour, James	U.S. Bureau of Mines	

Date and time this information drawn from the master database: **2012-01-17 14:49:42**

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Mineral Resources On-Line Spatial Data

Nason Street Pit

Producer in Riverside county in California, United States with commodity Granite

[View location using Google Earth]

Sections of this page: [Geologic] - [Economic] - [Reference]

Geologic Information

Identification information

Deposit ID	**10077122**
MRDS ID	**W024561**
Record type	**Site**
Current site name	**Nason Street Pit**
Related records	**10188990**

Geographic coordinates

Geographic coordinates: **-117.206430, 33.940310 (WGS84)**

Elevation **539**

Geographic context: *Political divisions (FIPS codes)*

Riverside (county)
California (state)
United States (country)
North America (continent)
Land (continent)

USGS map quadrangles

Sunnymead (quadrangle 1:24,000 scale)
Santa Ana (quadrangle 1:100,000 scale)
Santa Ana (quadrangle 1:250,000 scale)

Hydrologic units (watersheds)

San Jacinto (hydrologic unit)
Santa Ana (hydrologic accounting unit)
Southern California Coastal (hydrologic

subregion)
California (hydrologic region)

Geographic areas

Country	*State*	*County*
United States	California	Riverside

Public Land Survey System information

Meridian	*Township*	*Range*	*Section*	*Fraction*	*State*
	003S	003W	03		California

Commodities

Commodity	*Importance of the commodity*
Granite	Primary

Geologic units near the site, calculated from the appropriate geologic map

(1) **Quaternary alluvium and marine deposits**

Economic Information

Economic information about the deposit and operations

Development status **Producer**
Commodity type **Non-metallic**
Significant **No**

Reference information

Links to other databases

Agency	*Database name*	*Acronym*	*Record ID*	*Notes*
USGS	Mineral Resources Data System	MRDS	W024561	

Bibliographic references

Subject category *Reference*

Subject category	*Reference*
Deposit	CALIF DIV OF MINES RIVERSIDE CO REPT UNPUB

Reporter information

Type	*Date*	*Name*	*Affiliation*	*Comment*
Reporter	01-JUL-1976	Unknown	U.S. Geological Survey	

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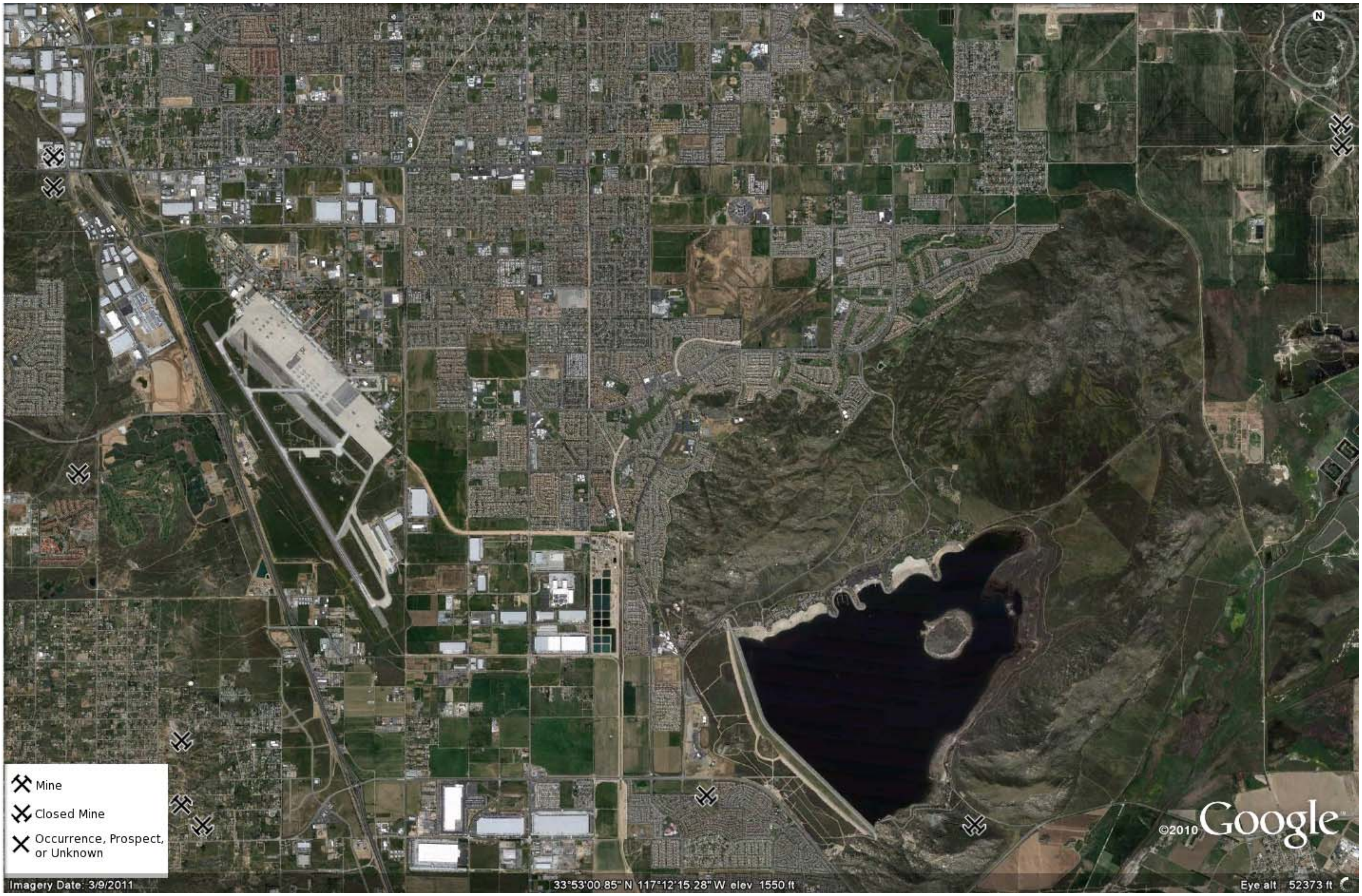
Mine
Closed Mine
Occurrence, Prospect, or Unknown
Imagery Date: 3/9/2011
33°53'00.85" N 117°12'15.28" W elev 1550 ft
Eye alt 52373 ft
©2010 Google

COUNTY OF VENTURA

CONSTRUCTION NOISE THRESHOLD CRITERIA AND CONTROL PLAN

Adopted November 2005
Amended July 2010

Prepared By:

Advanced Engineering Acoustics
663 Bristol Avenue
Simi Valley, CA 93065
(805)-583-8207

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APPENDICES

Construction and Noise

A distinct difference between the construction industry and other industries is that construction is, in the vast majority of cases, a temporary activity. There are very few construction projects that last several years. Even very large buildings and roads are under construction in a particular area for only a reasonably short time period, seldom more than two years. As the construction project progresses, the noise from such a project changes as the different phases of the construction are undertaken. Noise mitigation programs that take a long time to implement or officials that are very slow to act usually find that the problem is gone by the time the remedies are in place. Often a construction contractor can avoid most community complaints simply by notifying the potentially affected residents and other sensitive receptors regarding the purpose of the project and the expected completion schedule. People want to know how soon the construction will be finished and what are the project benefits to the neighborhood.

Thus, rather than being a continuous problem, construction noise is always a temporary site-specific problem. As such, there are many factors that contribute to the potential impacts due to construction noise, including the location of sensitive receptors, the type or phase of construction, the combination of equipment used, the site layout, and the construction methods employed. The noise created by construction equipment will vary greatly during a project, depending on such factors as the type of equipment, the specific equipment models, the operation being performed, the care employed by equipment operators and the condition of the equipment being used.

Fundamentals of Sound

A brief introduction to the fundamentals of sound may be useful. Physically, sound magnitude is measured and quantified in terms of the decibel (dB), which is a unit on a logarithmic scale based on the ratio of the measured sound pressure to the reference sound pressure of 20 micropascal ($20\ \mu Pa = 20 \times 10^{-6}\ N/m^2$). The decibel system can be very confusing to people since it is logarithmic and not arithmetic. For example, doubling or halving the number of sources of equal sound (a 2-fold change in acoustic *energy*) changes the receptor sound by only 3 dB, which is a barely perceptible sound loudness change for humans. On the other hand, a doubling or halving the sound *loudness* at the receiver results from a 10 dB change, which also represents a 10-fold change in the acoustic *energy*.

In addition, the human hearing system exhibits a slow time response and also is not equally sensitive to the same sound pressure level at low, middle and high acoustic frequencies. Because of this variability, a frequency-dependent, adjustment called “A-weighting” has been devised so that sound may be measured in a manner similar to the way the human hearing system responds. The A-weighted sound level is abbreviated "dBA". Figure 1 gives typical A-weighted sound levels for various noise sources and the typical reactions to these levels. All sound levels referred to in this document are A-weighted, slow response, sound pressure levels.

The two acoustical metrics most frequently used to provide a single number sound level for time-varying sounds over a given time period are the energy equivalent or energy average sound level (L_{eq}) and the “slow response” maximum sound level (L_{max}). The long-term A-weighted energy average sound level, called the 24-hour equivalent sound level, $L_{eq}(24h)$, is the logarithmic average of the individual 24 hourly equivalent sound levels, $L_{eq}(h_i)$. Since it has been found that noise is more disturbing in the evening and nighttime when the ambient noise is generally quieter, modifications to the 24-hour L_{eq} have been adopted. The Day-Night sound level (DNL or L_{dn}) is a 24-hour energy average noise level based on the daytime and nighttime hourly average L_{eq}(h) noise levels, with a 10 dB penalty added to each hourly nighttime average

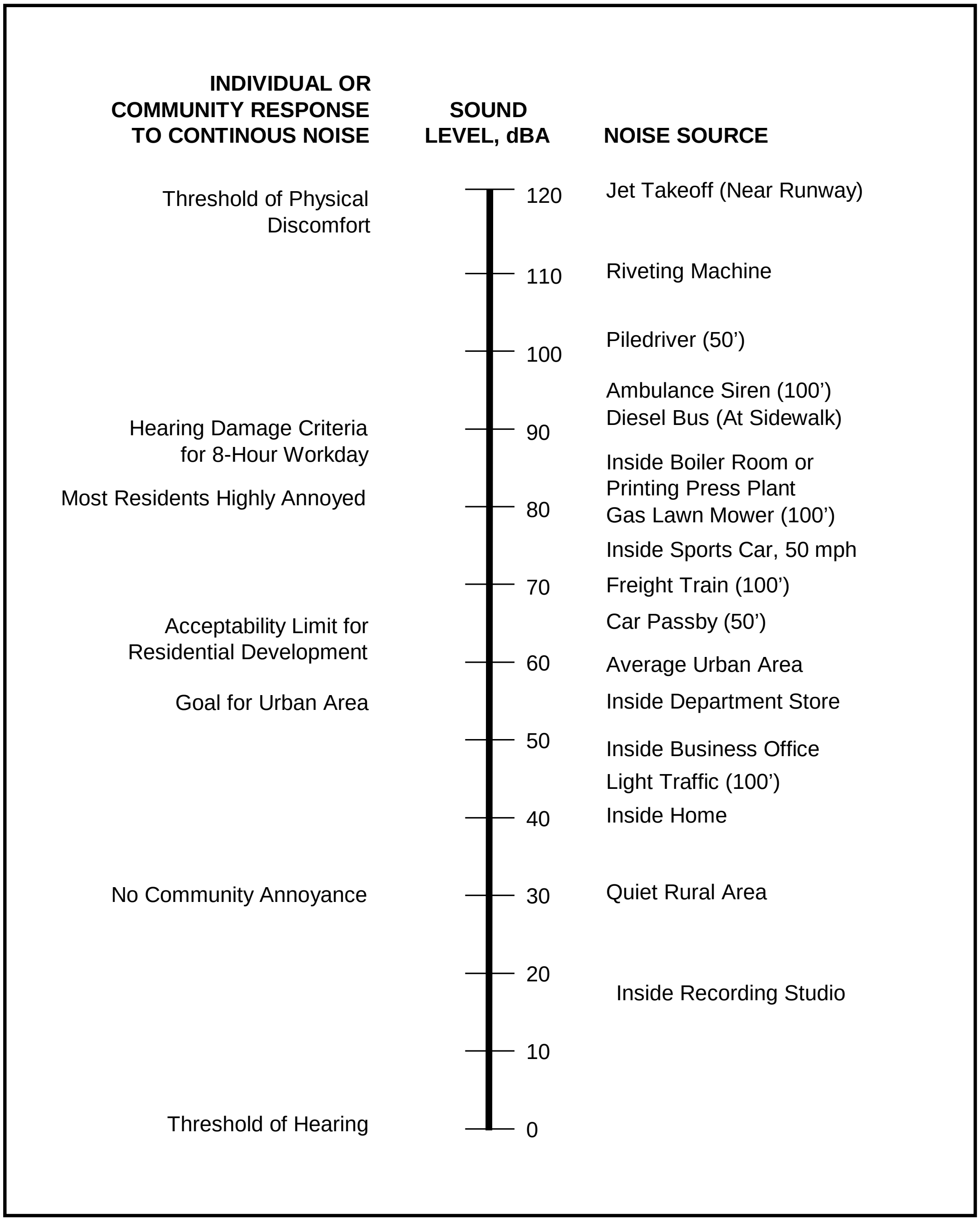

Figure 1. Typical Sound Levels of Noise Sources and Expected Reactions

noise level. Another long-term noise descriptor is the Community Noise Equivalent Level (CNEL or L_{den}). The CNEL is a 24-hour average noise level based on the daytime, evening and nighttime hourly average noise levels, with a 5 dB penalty added to each of the three evening hourly average noise levels and a 10 dB penalty added to each of the nine hourly nighttime average noise levels. The CNEL is used primarily in the State of California.

Noise from Typical Construction Equipment and Operations

The equivalent sound level (L_{eq}) as it relates to construction activity depends on several factors including machine power, the manner of operation and the amount of time the equipment is operated over a given time period. The following provides information on typical levels generated by various construction equipment and provides guidance on determining the noise from construction activities.

The most dominant source of noise for the majority of construction equipment is the engine exhaust, which is usually a diesel engine. However, for some construction work, such as impact pile driving or pavement breaking, the noise produced by the work process is the dominant source. Similar construction activities can create different noise impacts, depending on the location of the construction site, the terrain and other intervening features and the type of receptor populations in the vicinity of the construction site.

For most construction activities, different construction equipment operate in one of two modes, *stationary* and *mobile*. *Stationary* equipment are those that operate in one small area for one or more days at a time, with either a steady power cycle operation (e.g., pumps, generators, compressors, etc.) or a periodic impulsive operation (e.g., pile drivers, pavement breakers, etc.). *Mobile* equipment are those that frequently move around a much larger area of the construction site with power applied in a rapidly changing, non-steady fashion (e.g., bulldozers, loaders, etc.), or move to and from the construction site (e.g., haul trucks, material trucks, etc.). These variations in operating power and location add a great deal of complexity in characterizing the source noise level of a given piece of construction equipment. This complexity can be simplified by determining the equipment noise level at a 50-foot reference distance from the equipment operating at full power and adjusting its full power noise level according to the duty cycle or “usage factor” of the particular construction activity and project phase to determine the characteristic noise level of the operation during each phase.

The Society of Automotive Engineers has developed standardized procedures for measuring reference noise levels for the certification of mobile and stationary construction equipment. For informational purposes, typical 50-foot reference noise levels from representative pieces of construction equipment are listed in Figure 2. The major noise producing construction activities within the County would likely be pile driving, pavement breaking, demolition, excavation, earth moving, and haul trucking.

Noise-sensitive receptors that would be affected by such construction activities within the County are listed in Figure 3, along with their periods of greatest sensitivity to construction noise.

Construction activity noise is characterized by the combined duty cycle and resulting noise emission of each piece of equipment. The duty cycle is expressed in terms of the "usage factor" of the equipment, which is the percentage of time during the work period that the equipment is operating under load or at near full power. In addition to the minute-by-minute variations in noise producing activities, construction projects are carried out in several different phases.

Figure 2. Typical Construction Equipment Noise

Equipment Type Noise Source	Dominant Noise Components[1]	50-Foot Noise Level (L_{eq}) dBA[2, 3]	Noise Level Range (L_p) dBA[2, 3]	50-Foot Maximum Noise Level (L_{max}) dBA[2 3]
Air Compressor (portable)[4]	E, C, H, I	81	76-89	89
Air Compressor (stationary)	E, C, H, I	82	76-89	89
Auger, Drilled Shaft Rig	E, C, F, I, W	82	76-89	89
Backhoe	E, C, F, I, H, W	85	81-90	90
Bar Bender	E, P, W	82	78-88	85
Chain Saw	E, W, C	85	72-88	88
Compactor	E, C, F, I, W	82	81-85	85
Concrete Batch Plant	W, E, C	92	80-96	96
Concrete Mixer (small trailer)	W, E, C	67	65-68	68
Concrete Mixer Truck	E, C, F, W, T	85	69-89	89
Concrete Pump Trailer	E, C, H	82	74-84	84
Concrete Vibrator	W, E, C	76	68-81	81
Crane, Derrick	E, C, F, I, T	88	79-90	90
Crane, Mobile	E, C, F, I, T	83	80-85	85
Dozer (Bulldozer)	E, C, F, I, H	80	77-90	90
Excavator	E, C, F, I, H, W	87	83-92	92
Forklift	E, C, I, W	84	81-86	86
Front End Loader	E, C, F, I, H	79	77-90	90
Generator	E, C	78	71-87	87
Gradall	E, C, F, I, W	82	78-85	85
Grader	E, C, F, I, W	85	79-89	89
Grinder	W	80	75-82	82
Hydraulic Hammer	W, E, C, H	102	99-105	105
Impact Wrench	W, P	85	75-85	85
Jack Hammer	P, W, E, C	82	75-88	88
Paver	E, D, F, I	89	82-92	92
Pile Driver (Impact/ Sonic/ Hydraulic)	W, P, E	101 / 96 / 65	94-107 / 90-99 / 65	107 / 99 / 65
Pavement Breaker	W, E, P	82	75-85	85
Pneumatic Tool	P, W, E, C	85	78-88	88
Pump	E, C	76	68-80	80
Rock Drill	W, E, P	98	83-99	99
Roller	E, C, F, I, W	74	70-83	83
Sand Blaster	W, E, C, H, I	85	80-87	87
Saw, Electric	W	78	59-80	80
Scraper	E, C, F, I, W	88	82-91	91
Shovel	E, C, F, I, W	82	77-90	90
Tamper	W, E, C	86	85-88	88
Tractor	E, C, F, I, W	82	77-90	90
Trencher		83	81-85	85
Trucks (Under Load)	E, C, F, I, T	88	81-95	95
Water Truck	W, E, C, F, I, T	90	89-94	94
Other Equipment with Diesel	E, C, F, I	82	75-88	88

Note 1. Ranked noisy components. C=Casing, E=Exhaust, F=Fan, H=Hydraulics, I=Intake air, P=Pneumatic exhaust, T=Transmission, W=Work tool.
Note 2. Table based on EPA studies and measured data from various construction equipment and manufacturer's data.
Note 3. Equipment noise levels are at 50 feet from individual construction equipment and with no other noise contributors.
Note 4. Portable air compressor rated at 75 cfm or greater and operating at greater than 50 psi.

Each phase has a different equipment mix depending on the work to be accomplished. Some have more continuous noise, while others may have more impact type noise. Typical construction phases and equipment usage factors are given in Appendix A. Construction phase equipment usage factors, combined with receptor distances and equipment noise emissions, can be used in estimating future project noise. Such methods are discussed in Appendix B.

Figure 3. Noise-Sensitive Receptors

Receptor Description	Typical Sensitive Time Period
Hospitals, Nursing Homes (quasi-residential)	24 hours
Single-Family and Multi-Family Dwellings (residential)	Evening/Night
Hotels/Motels (quasi-residential)	Evening/Night
Schools, Churches, Libraries (when in use)	Daytime/Evening

Construction Noise Threshold Criteria

Standardized federal or state criteria have not been adopted for assessing construction noise impacts. Therefore, municipal planning criteria are generally developed and applied on a project-specific basis. Construction project noise criteria take into account the existing noise environment, the time-varying noise during the various phases of construction activities, the duration of the construction, and the adjacent land use.

Specific construction noise limits for noise-sensitive locations are not currently specified in the General Plan or administrative code of the County of Ventura. This document, therefore, is intended to establish construction noise thresholds and standard noise monitoring and control measures. These threshold criteria, monitoring and control measures shall be applied to all discretionary development projects (public projects, PD Permits, Conditional Use Permits) and should be applied to ministerial development permits by amending the county building code (including excavation and grading). Construction noise monitoring methods are discussed in Appendix C. Construction projects that exceed the noise threshold criteria at sensitive receptor sites, shall implement effective noise mitigation measures recommended by the manufacturers, considering the guidelines of Appendix D. The permitting agency/department shall review the construction noise mitigation measures and confirm compliance with the noise threshold criteria.

During daytime hours, construction work should comply with the County of Ventura construction noise threshold criteria (NTC), defined hereafter. Normally, no evening or nighttime construction activity is permitted in areas having noise-sensitive receptors. However, in the event such activity is deemed necessary and is permitted, reduced noise threshold criteria are provided for construction that must occur during evening and/or nighttime hours. Emergency construction work is exempt from these construction noise thresholds.

<u>Daytime Construction</u>[1] - Daytime (7:00 a.m. to 7:00 p.m. Monday through Friday, and from 9:00 a.m. to 7:00 p.m. Saturday, Sunday and local holidays) generally means any time period not

[1] These criteria only apply to the noise-sensitive receptors that are sensitive to noise impacts during the daytime. See Figure 3 (above).

specifically defined as a more noise-sensitive time period. The daytime construction noise threshold criteria are given in Figure 4. Depending on project duration, the daytime noise threshold criteria shall be the greater of the fixed L_{eq}(h) limit (which includes non-construction evening and nighttime noise) or the measured ambient L_{eq}(h) plus 3 dB.

Evening Construction[2] - Evening hours (7:00 p.m. to 10:00 p.m.) are more noise-sensitive time periods. Therefore, evening construction noise threshold criteria differ from the daytime criteria. Overall project construction noise, for the noise-sensitive hours specified, shall not exceed the noise threshold criteria listed in Figure 5, at the nearest noise-sensitive receptor area or 10 feet from the façade of the nearest noise-sensitive building.

Nighttime Construction[3] - Nighttime hours (10:00 p.m. to 7:00 a.m. Monday through Friday, and from 10:00 p.m. to 9:00 a.m. Saturday, Sunday and local holidays) are the most noise-sensitive time periods. Therefore, nighttime and holiday construction noise threshold criteria differ from the daytime and evening criteria. Overall project construction noise, for the noise-sensitive hours specified, shall not exceed the noise threshold criteria listed in Figure 6, at the nearest noise-sensitive receptor area or 10 feet from the façade of the nearest noise-sensitive building.

Maximum Construction Noise - In addition, the construction-related, slow response, instantaneous maximum noise (L_{max}) shall not exceed the noise threshold criteria by 20 dBA more than eight times per daytime hour, more than six times per evening hour and more than four times per nighttime hour.

Determination of Compliance - The construction noise at sensitive receptor locations for each construction phase is due to the contributions of each piece of noise producing equipment used in each construction phase. The resulting construction phase noise must be compared to the construction noise threshold criteria to determine whether noise mitigation measures are required. The construction noise monitoring methods are discussed in Appendix C and typical noise mitigation measures are given in Appendix D. During periods of greater construction noise activity, the construction noise shall be monitored by a designated person trained in the use of a sound meter in accordance with the methods of Appendix C. When construction noise fails to comply with the appropriate noise threshold criteria, or falls out of compliance during use, the designated noise monitor shall immediately identify the non-compliant activity or equipment. Either the non-compliant activity must be stopped and the equipment removed from service or effective remedial action must be taken, similar to the noise mitigation measures of Appendix D, to restore compliance with the respective noise threshold criteria.

[2] These criteria apply to all noise-sensitive receptors. See Figure 3 (above).

[3] These criteria only apply to the noise-sensitive receptors that are sensitive to noise impacts during the nighttime. See Figure 3 (above).

Figure 4. Daytime Construction Activity Noise Threshold Criteria

Construction Duration Affecting Noise-sensitive Receptors	Noise Threshold Criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building	
	Fixed Leq(h), dBA	Hourly Equivalent Noise Level (L_{eq}), dBA[1, 2]
0 to 3 days	75	Ambient L_{eq}(h) + 3 dB
4 to 7 days	70	Ambient L_{eq}(h) + 3 dB
1 to 2 weeks	65	Ambient L_{eq}(h) + 3 dB
2 to 8 weeks	60	Ambient L_{eq}(h) + 3 dB
Longer than 8 weeks	55	Ambient L_{eq}(h) + 3 dB

Note 1. The instantaneous L_{max} shall not exceed the NTC by 20 dBA more than 8 times per daytime hour.
Note 2. Local ambient Leq measurements shall be made on any mid-week day prior to project work.

Figure 5. Evening Construction Activity Noise Threshold Criteria

Receptor Location	Evening Noise Threshold Criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building	
	Fixed Leq(h), dBA	Hourly Equivalent Noise Level (L_{eq}), dBA[1, 2]
Residential	50	Ambient L_{eq}(h) + 3 dB

Note 1. The instantaneous L_{max} shall not exceed the NTC by 20 dBA more than 6 times per evening hour.
Note 2. Hourly evening local ambient noise measurements shall be made on a typical mid-week evening prior to project work.

Figure 6. Nighttime Construction Activity Noise Threshold Criteria

Receptor Location	Nighttime Threshold Criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building	
	Fixed Leq(h), dBA	Hourly Equivalent Noise Level (L_{eq}), dBA[1, 2]
Resident, Live-in Institutional	45	Ambient L_{eq}(h) + 3 dB

Note 1. The instantaneous L_{max} shall not exceed the NTC by 20 dBA more than 4 times per nighttime hour.
Note 2. Hourly nighttime local ambient noise measurements shall be made on a typical mid-week night prior to project work.

Construction Noise Complaints

The daytime noise threshold criteria for construction activity are provided in Figure 4. When evening and nighttime construction is necessary, evening and nighttime construction operations (except for emergency construction) must comply with the evening and nighttime noise threshold criteria listed in Figures 5 and 6, respectively. If these respective construction noise threshold criteria are exceeded, there would likely be strong adverse community reaction. However, noise complaints are possible, even when construction work complies with the criteria.

The project, therefore, must be prepared to appropriately respond to complaints and keep a "Complaint Log," noting date, time, complainant's name, nature of the complaint, and any corrective action taken. The project manager shall publish and distribute to the potentially affected community, a "Hot Line" telephone or pager number, that is attended during active construction working hours, for use by the disturbed public to register complaints.

Since noise complaints are still possible, even when construction work complies with the noise threshold criteria. Noise characteristics other than loudness (e.g., squeals, incessant banging, etc.) can result in complaints. An unusual number of construction noise complaints may require that additional noise mitigation be undertaken. Careful identification of the specific conditions of activity responsible for the noise complaints would be necessary to determine additional appropriate mitigation measures. Appendix D suggests typical measures to be considered for greater mitigation than previously implemented. Proper measures shall be applied before continuing the activity responsible for the unusual number of complaints. For especially difficult cases, the assistance of a qualified construction noise control consultant may be required.

APPENDICES

A. Typical Equipment Noise, Construction Phases and Use Factors

B. Estimating Construction Equipment and Project Noise

C. Construction Noise Monitoring

D. Construction Noise Mitigation Measures

Appendix A

Typical Equipment Noise, Construction Phases and Use Factors

Figure A-1. Typical Construction Equipment Noise

Equipment Type Noise Source	Dominant Noise Components[1]	50-Foot Noise Level (L_{eq}) dBA[2, 3]	Noise Level Range (L_p) dBA[2, 3]	50-Foot Maximum Noise Level (L_{max}) dBA[2 3]
Air Compressor (portable)[4]	E, C, H, I	81	76-89	89
Air Compressor (stationary)	E, C, H, I	82	76-89	89
Auger, Drilled Shaft Rig	E, C, F, I, W	82	76-89	89
Backhoe	E, C, F, I, H, W	85	81-90	90
Bar Bender	E, P, W	82	78-88	85
Chain Saw	E, W, C	85	72-88	88
Compactor	E, C, F, I, W	82	81-85	85
Concrete Batch Plant	W, E, C	92	80-96	96
Concrete Mixer (small trailer)	W, E, C	67	65-68	68
Concrete Mixer Truck	E, C, F, W, T	85	69-89	89
Concrete Pump Trailer	E, C, H	82	74-84	84
Concrete Vibrator	W, E, C	76	68-81	81
Crane, Derrick	E, C, F, I, T	88	79-90	90
Crane, Mobile	E, C, F, I, T	83	80-85	85
Dozer (Bulldozer)	E, C, F, I, H	80	77-90	90
Excavator	E, C, F, I, H, W	87	83-92	92
Forklift	E, C, I, W	84	81-86	86
Front End Loader	E, C, F, I, H	79	77-90	90
Generator	E, C	78	71-87	87
Gradall	E, C, F, I, W	82	78-85	85
Grader	E, C, F, I, W	85	79-89	89
Grinder	W	80	75-82	82
Hydraulic Hammer	W, E, C, H	102	99-105	105
Impact Wrench	W, P	85	75-85	85
Jack Hammer	P, W, E, C	82	75-88	88
Paver	E, D, F, I	89	82-92	92
Pile Driver (Impact/ Sonic/ Hydraulic)	W, P, E	101 / 96 / 65	94-107 / 90-99 / 65	107 / 99 / 65
Pavement Breaker	W, E, P	82	75-85	85
Pneumatic Tool	P, W, E, C	85	78-88	88
Pump	E, C	76	68-80	80
Rock Drill	W, E, P	98	83-99	99
Roller	E, C, F, I, W	74	70-83	83
Sand Blaster	W, E, C, H, I	85	80-87	87
Saw, Electric	W	78	59-80	80
Scraper	E, C, F, I, W	88	82-91	91
Shovel	E, C, F, I, W	82	77-90	90
Tamper	W, E, C	86	85-88	88
Tractor	E, C, F, I, W	82	77-90	90
Trencher		83	81-85	85
Trucks (Under Load)	E, C, F, I, T	88	81-95	95
Water Truck	W, E, C, F, I, T	90	89-94	94
Other Equipment with Diesel	E, C, F, I	82	75-88	88

Note 1. Ranked noisy components. C=Casing, E=Exhaust, F=Fan, H=Hydraulics, I=Intake air, P=Pneumatic exhaust, T=Transmission, W=Work tool.
Note 2. Table based on EPA studies and measured data from various construction equipment and manufacturer's data.
Note 3. Equipment noise levels are at 50 feet from individual construction equipment and with no other noise contributors.
Note 4. Portable air compressor rated at 75 cfm or greater and operating at greater than 50 psi.

Figure A-2
Typical Domestic Housing Construction Equipment and Use Factors

Equipment Item	50-Foot Leq, dBA	Mitigated1 Leq, dBA	Highest Hourly Use Percentage per Construction Phase				
			Clear	Excavate	Base	Build	Finish
Air Compressor	81	75	--2	10	--	--	25
Backhoe	85	75	2	4	--	--	2
Concrete Mixer	85	75	--	--	4	8	16
Concrete Pump	82	75	--	--	--	--	--
Concrete Vibrator	76	75	--	--	--	--	--
Crane, Derrick	88	75	--	--	--	--	--
Crane, Mobile	83	75	--	--	--	10	4
Dozer	80	75	4	8	--	--	4
Generator	78	75	4	--	--	--	--
Grader	85	75	5	--	--	--	2
Jack Hammer	82	75	--	--	--	--	3
Loader	79	75	4	8	--	--	4
Paver	89	80	--	--	--	--	3
Pile Driver	101	95	--	--	--	--	--
Pneumatic Tool	85	80	--	--	4	10	4
Pump	76	75	--	4	7	--	--
Rock Drill	98	80	--	1	--	--	0.5
Roller	74	74	--	--	--	--	4
Saw, Electric	78	75	--	--	4 (2) 3	10 (2)	4 (2)
Scraper	88	80	5	--	--	--	1
Shovel	82	75	--	2	--	--	--
Truck	88	75	16	40	--	--	16

Note 1. Estimated level obtainable by quieter methods or equipment and implementing feasible noise controls.
Note 2. "--" indicates typically zero or very little use during construction phase.
Note 3: Numbers in parentheses are greatest multiple number of same items in use.

Figure A-3
Typical Large Building and Institutional Construction Equipment and Use Factors

Construction Equipment	50-Foot Leq, dBA	Mitigated1 Leq, dBA	Highest Hourly Use Percentage per Construction Phase				
			Clear	Excavate	Base	Build	Finish
Air Compressor	81	75	--2	100 (2) 3	100 (2)	100 (2)	40 (2)
Backhoe	85	75	04	16	--	--	4
Concrete Mixer	85	75	--	--	40	40	16
Concrete Pump	82	75	--	--	40	8	8
Concrete Vibrator	76	75	--	--	40	10	4
Crane, Derrick	88	75	--	--	--	16	4
Crane, Mobile	83	75	--	--	--	16 (2)	4 (2)
Dozer	80	75	16	40	--	--	16
Generator	78	75	40 (2)	100 (2)	--	--	--
Grader	85	75	8	--	--	--	2
Jack Hammer	82	75	--	10	4	4	4
Loader	79	75	16	40	--	--	16
Paver	89	80	--	--	--	--	10
Pile Driver	101	95	--	--	4	--	--
Pneumatic Tool	85	80	--	--	4	16 (2)	4 (2)
Pump	76	75	--	100 (2)	100 (2)	40	--
Rock Drill	98	80	--	4	--	--	0.5
Roller	74	74	--	--	--	--	--
Saw, Electric	78	75	--	--	4 (3)	100 (3)	--
Scraper	88	80	55	--	--	--	--
Shovel	82	75	--	40	--	--	--
Truck	88	75	16 (2)	40	--	--	16

Note 1. Estimated level obtainable by quieter methods or equipment and implementing feasible noise controls.
Note 2. “--“ indicates typically zero or very little use during construction phase.
Note 3: Numbers in parentheses are greatest number of same items in use during any hour.

Figure A-4
Typical Commercial and Industrial Construction Equipment and Use Factors

Construction Equipment	50-Foot Leq, dBA	Mitigated1 Leq, dBA	Highest Hourly Use Percentage per Construction Phase				
			Clear	Excavate	Base	Build	Finish
Air Compressor	81	75	--2	100	40	40	40
Backhoe	85	75	4	16	--	--	4
Concrete Mixer	85	75	--	--	40	16	16
Concrete Pump	82	75	--	--	40	--	8
Concrete Vibrator	76	75	--	--	--	--	--
Crane, Derrick	88	75	--	--	--	4	2
Crane, Mobile	83	75	--	--	--	8	4
Dozer	80	75	4	16	--	--	4
Generator	78	75	40	40	--	--	--
Grader	85	75	5	--	--	--	2
Jack Hammer	82	75	--	10	4	4	4
Loader	79	75	16	16	--	--	4
Paver	89	80	--	--	--	--	12
Pile Driver	101	95	--	--	4	--	--
Pneumatic Tool	85	80	--	--	4	10 (3) 3	4 (3)
Pump	76	75	--	40	100 (2)	40	--
Rock Drill	98	80	--	4	--	--	5
Roller	74	74	--	--	--	--	10
Saw, Electric	78	75	--	--	4 (2)	10 (2)	--
Scraper	88	80	14	--	--	--	8
Shovel	82	75	--	20	--	--	6
Truck	88	75	16 (2)	16 (2)	--	--	16

Note 1. Estimated level obtainable by quieter methods or equipment and implementing feasible noise controls.
Note 2. "--" indicates typically zero or very little use during construction phase.
Note 3: Numbers in parentheses are greatest number of same items in use during any hour.

Figure A-5
Typical Public Works and Roadway Construction Equipment and Use Factors

Construction Equipment	50-Foot Leq, dBA	Mitigated1 Leq, dBA	Highest Hourly Use Percentage per Construction Phase				
			Clear	Excavate	Base	Build	Finish
Air Compressor	81	75	--2	100 (2)3	40	40	40 (2)
Backhoe	85	75	4	40	--	--	16
Concrete Mixer	85	75	--	--	16 (2)	40 (2)	16 (2)
Concrete Pump	82	75	--	--	--	--	--
Concrete Vibrator	76	75	--	--	--	--	--
Crane, Derrick	88	75	--	10	4	4	--
Crane, Mobile	83	75	--	--	--	16	--
Dozer	80	75	4	40	--	--	16
Generator	78	75	100 (2)	40 (2)	40 (2)	40	40 (2)
Grader	85	75	8	--	--	20	8
Jack Hammer	82	75	--	--	--	4	10 (2)
Loader	79	75	4	40	--	--	16
Paver	89	80	--	--	--	--	--
Pile Driver	101	95	--	--	--	--	--
Pneumatic Tool	85	80	--	--	4 (2)	10	4
Pump	76	75	--	40 (2)	100 (2)	40 (2)	--
Rock Drill	98	80	--	4	--	--	--
Roller	74	74	--	--	100	--	--
Saw, Electric	78	75	--	--	4 (2)	--	--
Scraper	88	80	8		20	8	8
Shovel	82	75	4	40	4	--	4
Truck	88	75	16 (2)	16	40 (2)	--	16 (2)

Note 1. Estimated level obtainable by quieter methods or equipment and implementing feasible noise controls.
Note 2. “--“ indicates typically zero or very little use during construction phase.
Note 3: Numbers in parentheses are greatest number of same items in use during any hour.

Appendix B
Estimating Construction Project Noise

For project planning purposes, where the potential for noise impacts exist, it is possible to estimate the potential construction noise impacts in advance by developing an inventory of noisy construction equipment and processes for the various stages and phases of the project. Such screening methods assist construction project managers and estimators in planning for the potential need for noise mitigation.

Construction Equipment Inventory

An inventory of the number and type of noisy construction equipment to be used during planned daytime, evening and nighttime construction activities, their associated noise emissions, and other relevant information can be included on Figure B-2, Construction Phase Receptor Noise Estimation Worksheet. Using this form, construction noise levels for the various phases of construction can be estimated using the phase's equipment inventory, the typical 50-foot equipment noise levels (listed in Figure A-1 of Appendix A) along with typical by-phase construction equipment use factors, provided in Figures A-1 through A-5 of Appendix A.

Construction Noise Estimates

Calculations can be performed to estimate the daytime, evening and nighttime maximum (L_{max}) and one-hour energy average (L_{eq}) noise levels expected at the noise-sensitive location, based on the typical maximum equipment noise levels listed in Figure A-1 in Appendix A. The calculations are to be made for the various activities and locations where project construction noise will result in the greatest noise impact (*noise levels at other sensitive locations can also be calculated, if necessary*). The calculations and results should be entered on a form similar to Figure B-2, the Construction Phase Receptor Noise Estimation Worksheet. The result of a sample construction noise calculation is provided in Figure B-1.

The following calculation procedures may be used to estimate the construction noise by phase.

1. Calculate each phase's L_{max} according to the following method:

   $$L_{max}\text{ [equipment type]} = ML - 20 \log_{10} (D/50)$$

   where:

   ML = Typical single equipment maximum noise level (L_{max}) at 50 feet, in dBA. (*This may be replaced by a measured, under-load, maximum noise level*).

   D = Distance from the equipment to the noise-sensitive location, in feet.

   Repeat the above calculation for each item of potentially noisy equipment. Then, select the noisiest individual pieces of equipment that operate in their loudest mode at the very same time and combine them logarithmically to estimate the overall maximum construction noise level (L_{max}) at the noise-sensitive location(s) for each project phase, as follows:

   $$L_{max}\text{ [overall project at receptor]} = 10 \log_{10}(\Sigma 10^{(L_{max}\text{ [equipment type]} / 10)})$$

2. Calculate each phase's one-hour L_{eq} according to the method recommended by the U.S. Federal Highway Administration ("Highway Construction Noise: Measurement, prediction and mitigation," U.S. Department of Transportation, Federal Highway Administration Special Report, March 1977), as follows:

   First, the construction phase's one-hour L_{eq} is to be calculated at the sensitive receptor location for each item of potentially noisy equipment using the following equation:

   L_{eq}(h) [equipment type] = ML – 20 $\log_{10}$ (D/50) + 10 $\log_{10}$ (N x HP/100)

   where:

   ML = Typical single equipment maximum noise level (L_{max}) at 50 feet, in dBA. (*This may be replaced by a measured, under-load, maximum noise level*).

   D = Shortest distance (feet) from the equipment type to the nearest noise-sensitive location, or if a more sensitive receptor is further away, to the noise-sensitive receptor with the greatest impact. If the distance is measured in meters, use the ratio D/15 instead of D/50.

   N = Maximum number of the same equipment type operating hourly on the project during the construction phase.

   HP = "Hourly percentage," expressed as the greatest nominal percent of time that the equipment is operated under load at the project site. This factor is based on EPA values or is estimated based on past experience with similar projects. Thus, the effective usage factor is (EUF) = N x HP/100.

   Repeat the above calculations for each item of potentially noisy equipment. Then, the individual contribution of every item of equipment are to be combined logarithmically to obtain the overall construction hourly L_{eq} at the noise-sensitive location(s) for each project phase, as follows:

   L_{eq}(h) [overall project at receptor] = 10 $\log_{10}$ ($\Sigma 10^{\text{(one-hour Leq [equipment type] / 10)}}$)

3. The calculated L_{max} and L_{eq}(h) levels can then be compared with the construction noise threshold criteria. Where it is estimated that the criteria would be exceeded, noise mitigation planning can be undertaken.

Figure B-1.
Example of Construction Phase Receptor Noise Estimation Worksheet

A	B	C	D	E	F	G	H	I	J	K
Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA	Dist. to Recptr.	Item Usage Percent	Usage Factor	Dist. Adj., dB	Usage Adj., dB	Recptr. Item Lmax, dBA	Recptr. Item Leq, dBA	**Log_{10} Sums of Receptor Item L_{eq} Yield the Combined Receptor L_{eq}, dBA**
1. DOZER	**1**	**90**	**100**	**70**	**0.70**	**-6**	**-1.6**	**84.0**	**82.4**	**82.4** **83.3**
2. GRADER	**1**	**89**	**200**	**75**	**0.75**	**-12**	**-1.2**	**77.0**	**75.7**	**84.4**
3. SCRAPER	**2**	**91**	**150**	**20**	**0.40**	**-6**	**-4.0**	**81.5**	**77.5**	**86.0**
4. WATER TRUCK	**1**	**94**	**50**	**5**	**0.05**	**-6**	**-13.0**	**94.0**	**81.0**	
5.										
6.										
							Log Sum	**94.7**	**86.0**	

Figure B-2.
Construction Phase Receptor Noise Estimation Worksheet

A	B	C	D	E	F	G	H	I	J	K
Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA	Dist. to Recptr.	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Recptr. Item Lmax, dBA	Recptr. Item Leq, dBA	**Log10 Sums of Receptor Item Leq** **Yield the Combined Receptor Leq, dBA**
1.										
2.										
3.										
4.										
5.										
6.										
							Log Sum			

Appendix C
Construction Noise Monitoring

This appendix outlines the noise measurement instrumentation and monitoring procedures.

Noise Measurement Instruments

1. Noise measurements shall be performed with an instrument that is in compliance with or exceeds the criteria for a Type 2 (General Purpose) Sound Level Meter, as defined in the most recent revision of ANSI Standard S1.4.2.

2. Sound level meters shall be capable of measuring the slow response L_{max} and one-hour L_{eq} on the A-Weighted scale, as required by the construction noise threshold criteria and construction project noise limits. Where possible, integrating-type instruments may monitor the percentile (L_1, L_{50}, etc.) noise levels, as well, to show construction noise statistics.

3. Sound level meters, microphones, and field calibrators shall be calibrated by a certified laboratory at least once a year. A valid certificate of calibration conformance shall be obtained and be available for each instrument before using sound level meters. Updated certificates shall be maintained following subsequent yearly calibrations and upon the completion of repairs to noise monitoring instruments.

Noise Measurement Procedure

1. The sound level meter shall be calibrated using an acoustic calibrator, according to the manufacturer's specifications, just before each measurement.

2. Except as otherwise indicated, measurements shall be performed using the A-weighting network and the slow response setting of the sound level meter.

3. Impulsive or impact noises shall be measured using the C-weighting network and the fast response setting of the sound level meter.

4. The measurement microphone shall be fitted with an appropriate windscreen and the sound level meter shall be placed at the location of the sensitive receptor with the microphone approximately 5 feet above the ground or floor and at least 10 feet away from any vertical surfaces.

5. Ambient noise measurements shall be taken during periods of the least noise-producing activity in the vicinity of noise sensitive locations that may be impacted by the construction operations. Ambient noise measurements shall be conducted for at least 20 minutes at representative locations for potentially impacted receptors.

6. Construction noise measurements shall be taken during periods of greatest noise-producing activity at noise sensitive locations in the vicinity of the construction site a minimum of once each shift and also after a sustained perceptible change in noise-producing construction activity or location. Noise measurements shall be conducted for at least 20 minutes each monitoring session.

7. Construction noise measurements shall coincide with daytime, evening and nighttime daily time periods of maximum noise-generating construction activity and shall be taken or repeated during the construction phase or activity that has the greatest potential to create annoyance or to exceed applicable noise regulations and restrictions.

8. If, in the estimation of the person performing the measurements, non-project related noise sources contribute significantly to the measured noise level, additional measurements (with the same non-project noise source contributions) shall be repeated when project construction is inactive to determine the non-project ambient background noise level.

9. Noise data shall be logged using the Noise Measurement Report Form and maintained for at least six months following the completion of the construction project. The type of measurement (e.g. baseline ambient, on-going construction, major change, etc.) shall be noted on the form.

10. Monitoring locations shall be clearly identified and sketched on the Noise Measurement Report Form along with the locations of and monitoring site distances to the noise-sensitive receptors.

11. Construction equipment operating during the noise monitoring period and their locations shall be identified and sketched on the Noise Measurement Report Form, along with the locations of and equipment distances to the noise sensitive receptors.

Figure C-1
Noise Measurement Report Form - Part A

Project: ____ Contract No(s): ________________

Date: ____________________ Day of Week: _________________________ Time: _______________

Monitoring Site Number: _____ Monitoring Site Address: ____

Measurement Taken By: ______________________________ of ______________________________

Approximate Wind Speed: __________ mph [km/hr]. Approximate Wind Direction: From the ___________

Approximate distance of Sound Level Meter from Receptor Location: ________________________________

Approximate distance of Sound Level Meter from Construction Site: ________________________________

(Leave Blank for Baseline Ambient)

Receptor Land Use (Check One): ☐ Residential / Institutional ☐ Commercial / Recreational

Sound Level Meter: Make and Model: ___________________________ Serial Number ________________

Meter Setting: ☐ A-Weighted Sound Level (SLOW) ☐ C-Weighted Sound Level (FAST) for Impacts

Duration of Measurement: ______________________ (at least 20 Minutes)

Check the measurement purpose:

☐ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results:

Measurement Type	Measured Level	Noise Criteria Threshold	Exceedance
CALIBRATION		n/a	n/a
L_{eq}			
L_{max}			
L_1		n/a	n/a
L_8 or L_{10} (circle which)		n/a	n/a
L_{25}		n/a	n/a
L_{50}		n/a	n/a
L_{90}		n/a	n/a

Field Notes:

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

Complete all that apply below:

Active Equipment: ______________________________

(List construction equipment that contribute to measured noise)

Complaint Response: ______________________________

(Describe complaint; include log-in number)

Complaint Mitigation Measure(s): ______________________________

(Describe complaint response mitigation)

Figure C-2
Noise Measurement Report Form - Part B

Project: ____ Contract No(s): ________________

Date: __________________ Day of Week: _______________________ Time: ______________

Monitoring Site Number: _____ Monitoring Site Address: ____________________________________

Site Map

Field Notes:

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____

Noise Monitor’s Signature: ______________________ Date: __________

Appendix D
Construction Noise Mitigation Measures

Construction noise is to be monitored at the most affected sensitive receptor location (10 feet from the construction activity side of a noise-sensitive receptor building or at the outdoor living area). Noise measurements are to be conducted using the procedures in this Appendix and the measurement results logged in a format similar to that of the Construction Noise Mitigation Form in this Appendix. Where the construction noise threshold criteria are exceeded, at noise-sensitive locations, noise abatement measures, such as those in this Appendix, are to be implemented and adequate noise reduction achieved to bring the construction activities into compliance with the construction noise threshold criteria.

Construction noise mitigation may be achieved using various combinations of equipment source noise reduction, propagation path noise reduction and sensitive receptor noise reduction.

Construction Equipment Source Noise Reduction Methods

Feasible and reasonable equipment noise mitigation measures may need to be implemented to meet the construction noise threshold criteria. Examples of equipment source noise reduction methods to reduce construction noise impacts at sensitive receptor locations are listed in this section. The implementation of one or more of these measures, along with those of the other sections, may be necessary to achieve compliance with the construction noise threshold criteria.

<u>Equipment Noise Reduction:</u>

1. Minimize the use of impact devices, such as jackhammers, pavement breakers, and hoe rams. Where possible, use concrete crushers or pavement saws rather than hoe rams for tasks such as concrete or asphalt demolition and removal.

2. Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.

3. Provide impact noise producing equipment, i.e. jackhammers and pavement breaker(s), with noise attenuating shields, shrouds or portable barriers or enclosures, to reduce operating noise.

4. Line or cover hoppers, conveyor transfer points, storage bins, and chutes with sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).

5. Provide upgraded mufflers, acoustical lining or acoustical paneling for other noisy equipment, including internal combustion engines.

6. Avoid blasting and impact-type pile driving.

7. Use alternative procedures of construction and select a combination of techniques that generate the least overall noise and vibration. Such alternative procedures could include the following:

   a. Use electric welders powered by remote generators.

b. Mix concrete at non-sensitive off-site locations, instead of on-site.

c. Erect prefabricated structures instead of constructing buildings on-site.

8. Use construction equipment manufactured or modified to reduce noise and vibration emissions, such as:

   a. Electric instead of diesel-powered equipment.

   b. Hydraulic tools instead of pneumatic tools.

   c. Electric saws instead of air- or gasoline-driven saws.

9. Turn off idling equipment when not in use for periods longer than 30 minutes.

Operations Noise Reduction Methods:

In no case shall the following mitigation measures alter the project's responsibility for compliance with applicable Federal, state, and local safety ordinances and regulations, as well as project-specific construction specifications.

1. Operate equipment so as to minimize banging, clattering, buzzing, and other annoying types of noises, especially near residential and other noise sensitive areas during the evening and nighttime hours.

2. To the extent feasible, configure the construction site in a manner that keeps noisier equipment and activities as far as possible from noise sensitive locations and nearby buildings.

3. All back-up alarms should be disarmed at 8:00 p.m. and not reactivated until 7:00 a.m. on weekdays and 9:00 a.m. on weekends and local holidays. Signal persons and strobe lights must be used during periods when the back-up alarms are disarmed.

4. Maximize physical separation, as far as practicable, between noise generators and noise receptors. Separation includes following measures:

   a. Provide enclosures for stationary items of equipment and noise barriers around particularly noisy areas at the project site.

   b. Locate stationary equipment to minimize noise and vibration impacts on community.

5. Minimize noise-intrusive impacts during most noise sensitive hours.

   a. Plan noisier operations during times of highest ambient noise levels.

   b. Keep noise levels relatively uniform; avoid excessive and impulse noises.

   c. Turn off idling equipment.

   d. Phase in start-up and shut-down of project site equipment.

6. Select truck routes for material delivery and spoils disposal so that noise from heavy-duty trucks will have a minimal impact on noise sensitive receptors. Proposed truck haul routes are to be submitted to the County Transportation Division for approval.

    a. Conduct truck loading, unloading, and hauling operations so noise and vibration are kept to a minimum.

    b. Route construction equipment and vehicles carrying soil, concrete or other materials over streets and routes that will cause the least disturbance to residents in the vicinity of construction sites and haul roads.

    c. Do not operate haul trucks on streets within 250 feet of school buildings during school hours or hospitals and nursing homes at any time, without a variance.

    d. Submit haul routes and staging areas to the County Transportation Division for approval, at least 30 days before the required usage date.

A summary of equipment noise control methods is given in Figure D-1. Incorporating the construction noise mitigation methods and techniques would reduce construction noise and vibration impacts.

Construction Noise Propagation Path Reduction Methods

Feasible and reasonable propagation path mitigation measures may need to be implemented to help meet the construction noise threshold criteria. Examples of propagation path noise reduction methods to reduce construction noise impacts at sensitive receptor locations are listed in this section. The implementation of one or more of these measures, along with those of the other sections, may be necessary to achieve compliance with the construction noise threshold criteria.

<u>Construction Site Noise Barriers</u>

Moveable noise barriers can be positioned and relocated along a construction corridor, while fixed noise barriers can be located at a fixed construction site.

<u>Moveable Construction Noise Blankets</u>

1. For lesser noise reduction, install moveable frame-mounted noise curtains, blankets or enclosures adjacent to or around noisy equipment where required to meet the project noise limits. Noise control shields shall be made of a durable, flexible composite material featuring a noise barrier layer bonded to a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.

2. Provide readily removable and moveable noise shields so that they may be repositioned, as necessary, to provide noise abatement for non-stationary and stationary processes along a construction corridor as the construction process moves.

Figure D-1
Some Construction Equipment Noise Sources and Typical Mitigation Measures

Construction Equipment	Source(s) of noise	Possible mitigation measures (may need to be discussed with equipment manufacturer)		Possible alternative construction methods[1]
Impact Pile Driver	Pneumatic/diesel hammer or steam winch vibrator driver	Enclose hammer head and top of pile in an acoustical screen or acoustical blankets, apply acoustical damping to sheet steel piles to reduce vibration and resonant noise		(1) Use alternative methods of pile driving, e.g. drill and drop, poured in place, hydraulic driver, etc. (2) Alternative methods of soil retention and ground improvement, e.g. retaining walls, ground anchors, shafts formed of pre-cast concrete segments sunk into the ground, etc.
	Impact on pile	Use resilient pad between pile and hammer head.		
	Crane cables, pile guides and attachments	Careful alignment of pile and rig, lubricate screeching cables, guides and pulleys.		
	Power unit	Install more efficient exhaust silencer; apply acoustical damping and protected internal noise absorption layers to vibrating panels and covers. Manufacturer's access panels should be kept closed. Use properly ventilated acoustical enclosures where possible.		
Bulldozer Compactor Crane Dump truck Excavator Grader Loader Scraper Shovel	Engine	Install more efficient exhaust silencer. Apply acoustical damping and protected internal noise absorption layers to vibrating panels and covers. Enclosure panels should be kept closed. Operate without excessive engine revving.		
Compressor	Engine	Install more efficient exhaust silencer.	Locate the compressor or generator within an acoustical enclosure or behind an absorptive, three-sided sound wall.	Use electric motors instead of diesel or gasoline engines to drive compressors. If there is no electrical supply, use a reduced noise compressor or generator. A remote electrical generator can be used to supply power to several pieces of equipment.
Generator	Compressor or generator	Apply acoustical damping and protected noise absorption layers to internal of vibrating panels and covers. Enclosure panels should be kept closed		

Construction Noise Threshold Criteria

Pneumatic concrete breaker and tools	Tool	Install a muffler and acoustic shroud to reduce noise without impairing efficiency	Operate equipment inside a portable acoustical enclosure	Use rotary drill and buster. Use hydraulic and electric equipment. A thermal lance can be used to burn holes in concrete and to cut through large sections of concrete. For breaking large areas of concrete, use equipment which breaks concrete by bending it.
	Bit	Use a damped bit to eliminate "bit ringing." Noise drops as surface is broken through		
	Air line	Stop all air line leaks.		
	Motor	Install muffler to pneumatic saws		
Power saws	Vibration of blade and cut material	Keep saw blades sharp. Use a damped blade. Use blades with random tooth spacing. Tightly clamp material during cutting, if possible		
Rotary drills, diamond drilling and boring	Drive motor and bit	Use equipment inside an acoustical enclosure.		Use thermal lance
Construction Equipment	**Source(s) of noise**	**Possible mitigation measures (may need to be discussed with equipment manufacturer)**		**Possible alternative construction methods[1]**
Riveters	Impact on rivets	Enclose working area with acoustic barriers.		Use high tensile steel bolts instead of rivets
Cartridge gun	Cartridge blast	Use a muffled cartridge gun.		Drilled attachments
Pump	Engine or motor, pulsing, cavitation	Use an acoustical enclosure (allow for engine cooling and exhaust) or use motor suction and girdle mutes.		
Batch plant	Engine	Install more efficient silencer on diesel or gasoline engine. Enclose engine.	Locate batch or mixing plant as far as possible from noise-sensitive receptors.	Use electric motor instead of diesel or gasoline engine
	Filling	Keep aggregate from falling from an excessive height		
Concrete mixer	Cleaning	Do not hammer the drum.		
Hammer	Impact on nail			Use screw attachment
Impact chisel	Impact on stock			Use rotary hand milling machine
Materials handling	Impact of material	Prevent high material drops. Shield drop areas, especially for conveyor systems		Cover surface with resilient material or unload remotely
Steam cleaning	Escaping jet of steam, interaction with surface	Pass escaping steam through silencer or screen the cleaning area and use quieter nozzles.		

Note 1. Care should be taken when selecting a quieter process, so that ancillary equipment noise sources, such as cranes and compressors, are mitigated so they do not become new dominant noise sources.

3. Installation and Maintenance:

    a. Install noise blanket shields with sound-absorptive surfaces facing the noise source.

    b. Maintain the moveable noise shields and repair damage that occurs, including, but not limited to, keeping noise shields clean and free from graffiti, and maintaining structural integrity. Promptly repair or replace gaps, holes, and weaknesses in the noise shields, and openings between, or under the noise shield blankets.

<u>Moveable Construction Noise Barriers</u>

1. For greater noise reduction, install moveable paneled noise shields, barriers or enclosures adjacent to or around noisy equipment where required to meet the project noise limits. Noise control shields shall be made of panels featuring a solid panel with a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.

2. Provide readily removable and moveable noise shields so that they may be repositioned, as necessary, to provide noise abatement for non-stationary and stationary processes along a construction corridor as the construction process moves.

3. Installation and Maintenance:

    a. Install paneled noise shields with sound-absorptive surfaces facing the noise source.

    b. Maintain the moveable noise shields and repair damage that occurs, including, but not limited to, keeping noise shields clean and free from graffiti, and maintaining structural integrity. Promptly repair or replace gaps, holes, and weaknesses in the noise shields, and openings between, or under the noise shield panels.

<u>Fixed Construction Noise Curtains</u>

1. For lesser noise reduction, install frame-mounted sound noise control curtains or noise control blankets in locations adjacent to or around noisy equipment as required to meet the noise limits specified in this document and to shield the public from excessive construction noise. Noise control curtains shall be made of a durable, flexible composite material featuring a noise barrier layer bonded to a weather-protected, sound-absorptive material on one or both sides. The supporting structure shall be engineered and erected according to applicable codes.

2. Noise control curtains shall be installed, as necessary, to provide greater noise abatement for non-stationary and stationary processes.

3. Installation, Maintenance and Removal

    a. Noise control curtains shall be installed without any gaps and with the sound absorptive side facing the construction activity area.

    b. Maintain the noise control curtains and promptly repair any damage that may occur. Gaps, holes or weaknesses in the curtain, or openings between the curtain and the ground shall be promptly repaired.

c. The fixed noise control curtains and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.

<u>Fixed Noise Control Barriers</u>

1. For greater noise reduction, install solid noise control panels or enclosures in locations adjacent to or around noisy equipment as required to meet the noise threshold criteria specified in this document and to shield the public from excessive construction noise. Noise control panels shall be made of a solid, heavy noise barrier material with a weather-protected, sound-absorptive material on the construction-activity side of the barrier. The supporting structure shall be engineered and erected according to applicable codes.

2. Noise control panels shall be erected, as necessary, to provide greater noise abatement for non-stationary and stationary processes.

3. Installation, Maintenance, and Removal

   a. Solid noise control panels shall be installed without any gaps and with the sound absorptive side facing the construction activity area.

   b. Maintain the noise control panels and promptly repair any damage that may occur. Gaps, holes or weaknesses in the panels or openings between the panels and the ground shall be promptly repaired.

   c. The fixed noise control panels and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.

Sensitive Receptor Construction Noise Reduction Methods

Feasible and reasonable receptor noise mitigation measures may be implemented to meet the construction noise threshold criteria. Examples of receptor noise reduction methods to reduce construction noise impacts at sensitive receptor locations are listed in this section. The implementation of one or more of these measures, along with those of the other sections, may be necessary to achieve compliance with the construction noise threshold criteria.

<u>Receptor Building Interior Noise Control Measures</u>

1. For noise reduction at fixed, mid-term construction sites, install removable secondary acoustic window inserts (i.e., Quiet Window, or equal) to existing windows in sensitive receptor buildings as required to meet the noise threshold criteria specified in this document.

2. For noise reduction at fixed, long-term construction sites, install permanent replacement acoustic windows with an STC rating 5 dB greater than the construction noise reduction needed. Where sliding doors are exposed to excessive construction noise, acoustic sliding patio doors may also need to be installed. Careful attention must be taken to seal the frame airtight to the existing structure.

3. Install properly fitted, tubular compression-type weather strip gasketing around the door frames (jamb and head) and install automatic drop thresholds and threshold plates to exposed swinging doors. Careful attention must be taken to seal the existing door frame airtight to the existing structure.

Construction Noise Threshold Criteria

Moveable Exterior Receptor Noise Control Barriers

1. For construction along a construction corridor, install moveable paneled noise shields or barriers at noise sensitive receptor sites. Noise control shields shall be made of panels featuring a solid panel with a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.

2. Provide readily removable and moveable noise shields so that they may be repositioned, as necessary, to provide greater noise abatement along a construction corridor as the construction process moves.

3. Installation and Maintenance:

   a. Install paneled noise shields with sound-absorptive surfaces facing the noise source.

   b. Maintain the moveable noise shields and repair damage that occurs, including, but not limited to, keeping noise shields clean and free from graffiti, and maintaining structural integrity. Promptly repair or replace gaps, holes, and weaknesses in the noise shields, and openings between, or under the noise shield panels.

Fixed Exterior Receptor Noise Control Barriers

1. For noise reduction at fixed construction sites, install solid noise control panels at sensitive receptor locations as required to meet the noise threshold criteria specified in this document and to shield the sensitive receptor from excessive construction noise. Noise control panels shall be made of a solid, heavy noise barrier material with a weather-protected, sound-absorptive material on the construction-activity side of the barrier. The supporting structure shall be engineered and erected according to applicable codes.

2. Noise control panels shall be erected, as necessary, to provide greater noise abatement for non-stationary and stationary processes at fixed construction sites.

3. Installation, Maintenance, and Removal

   a. Solid noise control panels shall be installed without any gaps and with the sound absorptive side facing the construction activity area.

   b. Maintain the noise control panels and promptly repair any damage that may occur. Gaps, holes or weaknesses in the panels or openings between the panels and the ground shall be promptly repaired.

   c. The fixed noise control panels and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.

Figure D-2. Construction Noise Mitigation Form

Part A –Construction Equipment Mitigation Measures

Project: ____Contract No(s):_______________ Construction Phase: _________________________

Measured By: _____________________________________ of ___________________________ Date: _____________ Time: ____________

IMPORTANT: Attach construction equipment noise measurement location sketches (also identify other noise sources in area).

Construction Phase Equipment Inventory: Overall Project Phase Noise Reduction Requirement[1] = ________ dBA.

Code Letter (a)	Equipment				Typical 50-Foot Noise Level (dBA) (f)	Measured 50-Foot Noise Level (dBA) (g)	Equipment Noise Mitigation Measure (h)	Measured 50-Foot Mitigated Noise (dBA) (i)
	Category (b)	Make & Model (c)	ID# (d)	HP (e)				
Example	Front End Loader	Caterpillar 988	50W043xxx	375	85	91	Critical muffler	79

Notes:
Note 1. The noise reduction requirement is the exceedance between the overall construction phase noise from Appendix C and the sensitive receptor noise threshold criteria.
Column (a): Code letter in sketch to indicate position of equipment during noise measurement.
Column (b): Equipment type from Table B-1.
Column (c): Equipment manufacturer and model.
Column (d): Unique identifier (ID), such as VIN or registration number.
Column (e): Equipment rated horsepower.
Column (f): Equipment typical noise level from Table B-1.
Column (q): Estimated noise level at 50 ft. If greater than the level in Column (f), mitigation measures (e.g. mufflers, lower throttle, etc.) shall be implemented.
Column (h): Noise mitigation measure(s) implemented to help achieve compliance with the noise threshold criteria at the sensitive receptor location.
Column (i): Estimated or measured mitigated noise level at 50 ft

Figure D-3. Construction Noise Mitigation Form

Part B – Propagation Path Mitigation Measures

Project: ____Contract No(s):_______________ Construction Phase: _________________________

Measured By: _____________________________________ of ___________________________ Date: _____________ Time: ____________

(Attach Construction Vicinity Sketch)

Sensitive Receptor Measurement Location during Construction Activities <u>Without</u> Mitigation	**Measured Noise Level at Receptor Location, (dBA)***			
	Ambient L_{eq} (dBA)	**L_{eq} w/ Project (dBA)**	**Ambient L_{max} (dBA)**	**L_{max} w/ Project (dBA)**
Noise Threshold Criteria >	n/a		n/a	
1.				
2.				
3.				
4.				

<u>Propagation Path Noise Abatement Measures</u>

1. ____
2. ____
3. ____
4. ____

<u>Anticipated Results</u>

1. ____
2. ____
3. ____
4. ____

Sensitive Receptor Measurement Location during Construction Activities With Additional Mitigation	Measured Noise Level at Receptor Location, (dBA)*			
	Ambient L_{eq} (dBA)	**L_{eq} w/ Project (dBA)**	**Ambient L_{max} (dBA)**	**L_{max} w/ Project (dBA)**
Noise Threshold Criteria >	n/a		n/a	
1.				
2.				
3.				
4.				

Figure D-4. Construction Noise Mitigation Form

Part C – Sensitive Receptor Measures

Project: ______________________________Contract No(s):____________ Construction Phase: ____________________

Measured By: ____________________________ of _____________________ Date: __________ Time: _________

(Attach Construction Vicinity Sketch)

Sensitive Receptor Measurement Location during Construction Activities Without Mitigation	Measured Noise Level at Receptor Location, (dBA)*			
	Ambient L_{eq} (dBA)	**L_{eq} w/ Project (dBA)**	**Ambient L_{max} (dBA)**	**L_{max} w/ Project (dBA)**
Noise Threshold Criteria >	n/a		n/a	
1.				
2.				
3.				
4.				

Sensitive Receptor Noise Abatement Measures

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

Anticipated Results

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

Sensitive Receptor Measurement Location during Construction Activities With Additional Mitigation	Measured Noise Level at Receptor Location, (dBA)*			
	Ambient L_{eq} (dBA)	**L_{eq} w/ Project (dBA)**	**Ambient L_{max} (dBA)**	**L_{max} w/ Project (dBA)**
Noise Threshold Criteria >	n/a		n/a	
1.				
2.				
3.				
4.				