

8.1 Monitoring Site Descriptions

The Los Peñasquitos watershed management area includes two hydrologic areas: Miramar Reservoir (HA 906.10) and Poway (HA 906.20). Los Peñasquitos Lagoon lies at the mouth of Los Peñasquitos Creek and is part of the northern border of the City of San Diego. The Los Peñasquitos watershed management area covers an area of over 60,400 acres and its major population center is the City of Poway to the east (Figure 8-1). The majority of the watershed management area is highly urbanized and is located mainly west of Interstate 15. The largest area of the Los Peñasquitos watershed management area lies within the City of San Diego, with other areas located within Del Mar, Poway, and unincorporated areas of San Diego County. Land use within the watershed management area is primarily parks (29%), residential (25%) and undeveloped (20%) with a total population of over 232,000 in 2002.

This watershed management area supports a variety of ecosystems and provides many beneficial uses (Table 8-1). Major impacts to the Los Peñasquitos watershed management area include surface water quality degradation, beach closures, sedimentation, habitat degradation and loss, invasive species, and eutrophication (San Diego County 2002). Three water bodies within the watershed management area have been placed on the SWRCB 2002 303(d) list for sedimentation and bacterial indicators, respectively (Table 8-2). Urban runoff, sewage spills, and reduced tidal flushing are factors that may be impairing water quality within the Los Peñasquitos watershed management area. In addition, restricted or intermittent tidal flushing as a result of sediment accumulation at the mouth of the Los Peñasquitos Lagoon limits the transfer of pollutants to the Pacific Ocean.

Table 8-1. Beneficial uses within the Los Peñasquitos watershed.

Beneficial Uses	Inland Surface Waters	Coastal Waters	Reservoirs and Lakes	Ground Waters
Municipal and Domestic Supply			●	●
Agricultural Supply	●			●
Industrial Service Supply	●		●	●
Industrial Process Supply				
Hydropower Generation			●	
Navigation				
Contact Water Recreation	●	● ¹	● ¹	
Non-Contact Water Recreation	●	●	●	
Commercial and Sport Fishing				
Warm Freshwater Habitat	●		●	
Cold Freshwater Habitat	●			
Biological Habitats of Special Significance		●		
Estuarine Habitat		●		
Wildlife Habitat	●	●	●	
Rare, Threatened, or Endangered Species	●	●		
Marine Habitat		●		
Migration of Aquatic Organisms		●		
Shellfish Harvesting		●		
Aquaculture				
Spawning, Reproduction and/or Early Development				

¹ Shore and boat fishing only. Other RECI uses prohibited.

Source: Basin Plan September 8, 1994 (Tables 2-2, 2-3, 2-4, 2-5)

Penasquitos WMA

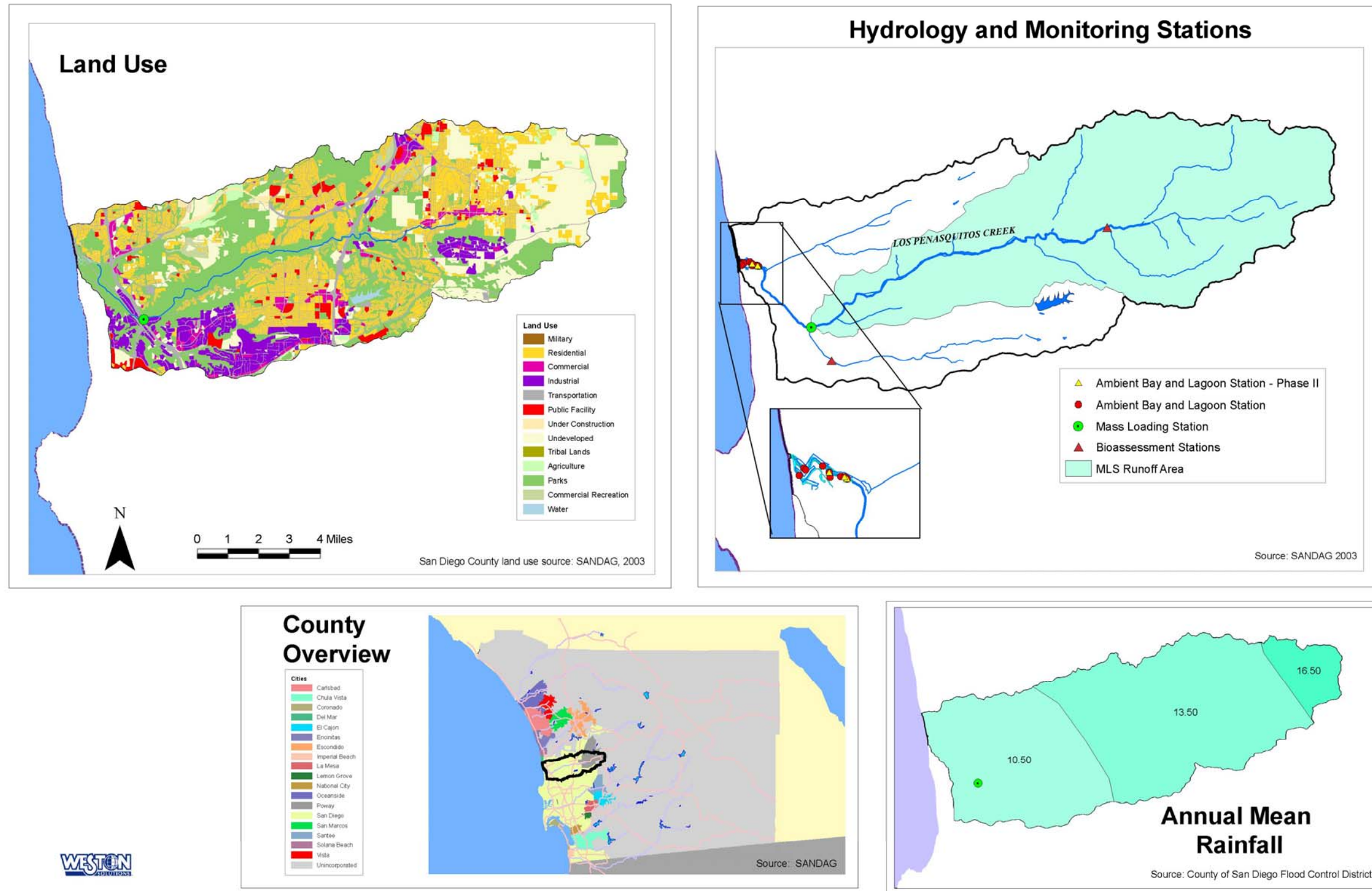


Figure 8-1. Los Peñasquitos Watershed Management Area.

Los Peñasquitos Creek WMA

Table 8-2. Water bodies on the SWRCB 303(d) list in the Los Peñasquitos watershed.

Water Body Name	Hydrologic Sub Area (HSA)	HSA #	Pollutant/Stressor
Los Peñasquitos Lagoon	Miramar Reservoir	906.10	Sediment/Siltation
Pacific Ocean Shoreline	Miramar Reservoir	906.10	Bacteria Indicators

Source: SWRCB 2003

Annual rainfall over the watershed management area ranges from 10.5 inches near the coast to 16.5 inches over the eastern portion of the watershed (Figure 8-1).



The Los Peñasquitos Creek (PC) mass loading station is located in San Diego, at the North end of Sorrento Valley Court, under the Sorrento Valley Court Bridge. This Creek has an earthen bottom, and rip-rap along the sides of the channel. The contributing runoff area consists of over 36,700 acres and comprises approximately 60% of the Los Peñasquitos watershed management area. The major land uses within the contributing runoff area are parks (29%), residential (28%), and undeveloped (24%).

Stream bioassessment in the Los Peñasquitos WMA has been performed at three urban affected sites. The farthest upstream site is in the City of Poway at Cobblestone Creek Road. The instream habitat at this site is dominated by large stable cobblestone with a riparian zone that is only lightly impacted by low density housing. Another site has been monitored that is downstream of the Black Mountain Road crossing in the Los Peñasquitos Canyon Preserve. This monitoring reach has a fairly low gradient and although the stream bed and riparian zone are unimpaired, the in-stream substrate is dominated by compacted clay and lacks stable rocky substrate. For this reason, upstream monitoring is now focused on the Cobblestone Creek Road site. The downstream site is located along Sorrento Valley Road near the Interstate 805 exit. The habitat quality is fairly good, with thick riparian vegetation and a cobble dominated substrate. The cobble, however, is generally small and unconsolidated, and substantial disruption occurs during periods of high flow. At the upper end of the reach, some large stable rip rap is present, and sampling has incorporated this to complement the unstable portions of the reach.

Los Peñasquitos Creek flows into Los Peñasquitos Lagoon. The Lagoon is located at the northwestern border of the City of San Diego within the Torrey Pines State Reserve. There are approximately 630 acres of wetland habitat in the Lagoon system, but only 30 acres that are classified as open water (Coastal Conservancy 2000). Most of the open water habitat lies within two main arms of the Lagoon situated between Torrey Pines Road (Highway 1) and Carmel Valley Road. The arms are interconnected by a series of narrow, sinuous channels. All three of the Ambient Bay and Lagoon monitoring sites were located within the northern arm (Figure 8-1). The main source of fresh water to Los Peñasquitos Lagoon is Los Peñasquitos Creek and Carmel Creek. In addition, eight storm drains empty directly to the Lagoon. The ocean inlet to the Lagoon is located on Torrey Pines State Beach. Tidal influence is restricted by the Highway 1 crossing and without mechanical clearing would be blocked with sediment for extended periods. Historically, treated sewage was discharged to the Lagoon from 1962 to 1972. Currently, the Lagoon is crossed by sewage pipelines, but the adjacent land use is primarily residential and open space. Los Peñasquitos Lagoon is listed on the SWRCB's 2002 303(d) list for sediment/siltation (Table 8-2).

8.2 Storm Water Monitoring Summary

8.2.1 2004-2005 Results

The Los Peñasquitos Creek mass loading station was monitored for the fourth consecutive year for a total of 12 storms since 2001. For the 2004-2005 wet season events, monitoring took place on October 17, 2004 and February 11 and 18, 2005. The results for all 12 storms were compared to water quality objectives to identify potential water quality concerns during storm flow (Table 8-3).

During the October 17, 2004 storm event, fecal coliform, chemical oxygen demand (COD) and TDS exceeded the water quality objectives (Table 8-3). The values for COD and TDS were much higher during this storm event than the majority of the other events monitored since 2001. High TDS during storm events is common at this and other sites that are monitored throughout San Diego County and has exceeded the water quality objective in every storm monitored since 2001. Fecal coliform densities exceeded WQO during all storm events in 2004-2005. During the October 17, 2004 storm, there were exceedances in total suspended solids and turbidity, both of which were much higher than previously monitored storm events. None of the objectives for pesticides, hardness, total metals, and dissolved metals were exceeded in the 2004-2005 season at the Los Peñasquitos Creek mass loading station.

None of the samples from Los Peñasquitos Creek caused toxicity to any of the three test species during any of the storm events monitored in 2004-2005 (Table 8-3) (See Section 3.1.6.2 for details on toxicity testing).

Table 8-3. Analytes measured at the Los Peñasquitos Creek mass loading station.

ANALYTE	UNITS	WQO	SOURCE	2001-02			2002-03			2003-04			2004-05			Frequency Above WQO	Mean Ratio to WQO	
				11/29/01	2/17/02	3/17/02	11/8/02	12/16/02	2/11/03	11/12/03	2/3/04	2/18/04	10/17/04	2/11/05	2/18/05			
General / Physical / Organic																		
Electrical Conductivity	umhos/cm			2640	2700	1590	1827	1939	2600	2470	3060	3540	3270	2690	1213			
Oil And Grease	mg/L	15	USEPA Multi-Sector General Permit	<1	1	<1	3.24	<1.00	1.39	<1	<1	<1	<1	<1	<1	0%	0.06	
pH	pH Units	6.5-8.5	Basin Plan	7.7	7.8	7.5	7.46	7.63	7.78	6.91	7.83	8.29	7.76	7.48	6.85	0%	0.00	
Bacteriological																		
Enterococci	MPN/100 mL			500	1,700	3,000	230,000	500	22,000	700	1,700	500	1,112	3,000	8,000			
Fecal Coliform	MPN/100 mL	400	Basin Plan	130	500	300	30,000	500	1,700	1,300	130	130	500	500	2,200	67%	7.89	
Total Coliform	MPN/100 mL			1,700	3,000	500	500,000	1,400	50,000	5,000	13,000	230	17,000	13,000	50,000			
Wet Chemistry																		
Ammonia As N	mg/L			0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.1			
Un-ionized Ammonia as N	µg/L	25 (a)	Basin Plan				<0.84	<1.13	<1.35	0.11	0.73	2.02	0.9	0.3	0.1	0%	0.03	
Biological Oxygen Demand	mg/L	30	USEPA Multi-Sector General Permit	3.1	5.6	21.3	5.55	<2.0	8.31	3.28	28.6	5.28	23.7	3.75	2.31	0%	0.31	
Chemical Oxygen Demand	mg/L	120	USEPA Multi-Sector General Permit	<25	50	54	73	53	115	47	108	56	143	62	36	8%	0.56	
Dissolved Organic Carbon	mg/L						16.8	11.0	11.2	14	6.41	77.2	27.2	4.44	4.66			
Dissolved Phosphorus	mg/L	2	USEPA Multi-Sector General Permit	0.9	<0.05	0.15	0.52	0.40	0.28	0.21	0.13	0.11	0.14	0.1	0.51	0%	0.14	
Nitrate As N	mg/L	10	Basin Plan	0.2	0.3	0.3	1.32	0.98	0.60	0.28	0.11	<0.05	0.09	0.6	1.06	0%	0.05	
Nitrite As N	mg/L	1	Basin Plan	<0.05	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0%	0.03	
Surfactants (MBAS)	mg/L	0.5	Basin Plan	<0.5	<0.5	<0.5	0.2	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0%	0.43	
Total Dissolved Solids	mg/L	500	Basin Plan by watershed	1580	1590	1010	955	1280	997	1380	1890	2040	2120	1500	804	100%	2.86	
Total Kjeldahl Nitrogen	mg/L			1.7	1	1.2	1.9	0.8	1.2	1.2	2.5	2.1	1.6	1.9	0.8			
Total Organic Carbon	mg/L						22.7	57.4	13.6	10.5	8.86	95.6	29.9	9.51	10.8			
Total Phosphorus	mg/L	2	USEPA Multi-Sector General Permit	0.1	0.15	0.23	0.73	0.60	0.39	0.23	0.2	0.17	0.14	0.28	0.69	0%	0.16	
Total Suspended Solids	mg/L	100	USEPA Multi-Sector General Permit	<20	<20	<20	35	58	38	27	<20	<20	<20	<20	108	8%	0.28	
Turbidity	NTU	20	Basin Plan	3.8	3.33	5.05	17.1	45.4	29.9	7.53	8.98	2.74	7.89	9.05	56.4	25%	0.82	
Pesticides																		
Chlorpyrifos	µg/L	0.02	CA Dept. of Fish & Game	<0.03*	<0.03*	<0.03*	0.055	0.067	<0.03*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	17%	0.88	
Diazinon	µg/L	0.08	CA Dept. of Fish & Game	0.12	0.06	0.13	0.231	0.040	0.077	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	25%	0.72	
Malathion	µg/L	0.43	CA Dept. of Fish & Game				<0.10	<0.10	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0%	0.05	
Hardness																		
Total Hardness	mg CaCO3/L			808	815	551	428	602	602	692	805	880	1000	707	379			
Total Metals																		
Antimony	mg/L	0.006	Basin Plan	<0.002	<0.002	<0.002	<0.002	0.005	0.009	<0.005	<0.005	<0.006	<0.005	<0.005	<0.005	8%	0.47	
Arsenic	mg/L	0.34/0.05	40 CFR 131/ Basin Plan	0.002	0.002	0.003	0.012	0.005	0.003	<0.002	0.006	0.005	0.005	0.004	<0.002	0%	0.08	
Cadmium	mg/L	0.0046	40 CFR 131	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0%	0.01	
Chromium	mg/L	0.016	CTR (Cr VI)	<0.005	<0.005	<0.005	0.008	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0%	0.00	
Copper	mg/L	0.0135	40 CFR 131	<0.005	<0.005	0.008	0.021	0.004	0.010	<0.005	0.008	0.006	<0.005	<0.005	<0.005	0%	0.08	
Lead	mg/L	0.082	40 CFR 131	<0.002	<0.002	0.003	0.011	0.004	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	0.002			
Nickel	mg/L	0.47/0.1	40 CFR 131/ Basin Plan	<0.002	<0.002	<0.002	0.026	<0.002	0.002	0.003	<0.002	<0.002	0.003	0.002	0.002	0%	0.00	
Selenium	mg/L	0.02	40 CFR 131	<0.002	<0.002	<0.002	<0.004	<0.004	<0.004	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0%	0.10	
Zinc	mg/L	0.122	40 CFR 131	<0.020	<0.020	0.020	0.058	0.006	<0.020	0.028	<0.02	<0.02	<0.02	<0.02	<0.02	0%	0.03	
Dissolved Metals																		
Antimony	mg/L	(e)	40 CFR 131	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.005	<0.005	<0.006	<0.005	<0.005	<0.005			
Arsenic	mg/L	0.34 (c)	40 CFR 131	0.002	<0.001	0.003	0.004	0.003	0.003	0.002	0.004	0.004	<0.002	<0.002	<0.002	0%	0.00	
Cadmium	mg/L	(b)	40 CFR 131	<0.001	<0.001	<0.001	0.0002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0%	0.01	
Chromium	mg/L	(b)	40 CFR 131	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0%	0.00	
Copper	mg/L	(b)	40 CFR 131	<0.005	<0.005	<0.005	0.007	<0.005	0.027	<0.005	0.005	0.005	<0.005	<0.005	<0.005	0%	0.07	
Lead	mg/L	(b)	40 CFR 131	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002			
Nickel	mg/L	(b)	40 CFR 131	<0.002	0.003	<0.002	0.003	<0.002	0.002	0.002	0.002	0.002	<0.002	0.003	0.002	0.002	0%	0.00
Selenium	mg/L	0.02 (d)	40 CFR 131	<0.002	<0.002	<0.002	<0.004	<0.004	<0.004	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0%	0.10	
Zinc	mg/L	(b)	40 CFR 131	<0.020	<0.020	<0.020	<0.020	0.020	0.106	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0%	0.03	

Table 8-3. Analytes measured at the Los Peñasquitos Creek mass loading station.

ANALYTE	UNITS	WQO	SOURCE	2001-02			2002-03			2003-04			2004-05		
				11/29/01	2/17/02	3/17/02	11/8/02	12/16/02	2/11/03	11/12/03	2/3/04	2/18/04	10/17/04	2/11/05	2/18/05
Toxicity															
<i>Ceriodaphnia</i> 96-hr	LCSO (%)	100		>100	>100	>100	>100	>100	>100	>100	>100	>100	>100	>100	>100
<i>Ceriodaphnia</i> 7-day survival	NOEC (%)	100		100	100	100	100	100	100	100	100	100	100	100	100
<i>Ceriodaphnia</i> 7-day reproduction	NOEC (%)	100		100	100	100	100	100	100	100	100	100	100	100	100
<i>Hyalella</i> 96-hr	NOEC (%)	100		100	100	100	100	100	100	100	100	100	100	100	100
<i>Selenastrum</i> 96-hr	NOEC (%)	100		100	100	100	100	100	100	100	100	100	100	100	100

Frequency Above WQO	Mean Ratio to WQO
0%	0.00
0%	0.00
0%	0.00
0%	0.00
0%	0.00

Blank spaces have been verified and no data is available due to changes in the monitoring program.

- (a) Un-ionized Ammonia is a calculated value, non-detectable values calculated at the detection limit. Basin Plan WQO is 0.025 mg/L; values shown here have been converted to $\mu\text{g/L}$.
- (b) Water Quality Objective for dissolved metal fractions are based on total hardness and are calculated as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000
- (c) Water Quality Objectives for dissolved metal fractions are based on water effects ratios (WER) and are calculated as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000
- (d) Water Quality Objective is based on the total recoverable form as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000.
- (e) USEPA has not published an aquatic life criterion value.

Shaded text – exceeds water quality objective.

* Indicates detection limit exceeds water quality objective.

Sources

USEPA National Pollutant Discharge Elimination System (NPDES) Storm Water Multi-Sector General Permit for Industrial Activities, 65 Federal Register (FR) 64746, Final Reissuance, October 30, 2000. Table 3 - Parameter benchmark values.

Siepmann and Finlayson 2000.
Basin Plan, September 8, 1994.

Assembly Bill 411 - Title 17 of the California Code of Regulations, Section 7958.

USEPA Federal Register Document 40 CFR Part 131, May 18, 2000.

8.2.2 Relationships/Analyses

As with many other watersheds in San Diego County, high concentrations of total dissolved solids appear to characterize water quality in the Los Peñasquitos Creek watershed. The Basin Plan water quality objective for TDS (500 mg/L) has been exceeded for this WMA during all of the 12 storm events since 2001 with values ranging from 804 to 2,120 mg/L. Residential irrigation may be a major contribution to total dissolved solids through the importation of water high in dissolved solids and through the leaching of minerals from the soil. The water quality objective for fecal coliform bacteria was exceeded during 8 of the 12 (66%) storm events monitored since 2001. Other water quality concerns such as TSS, turbidity, Diazinon, and Chlorpyrifos have exceeded water quality objectives only sporadically in storm water runoff since 2001. However, there is a significant decreasing trend in Diazinon concentrations ($R^2=0.45$).

Toxicity testing has been performed on storm water for the past four years or 12 events (See Section 3.1.6.2 for details on toxicity testing). During that time, none of the storm water samples have been toxic to any of the test organisms.

In order to illustrate the magnitude of the water quality exceedances for 2004-2005, the ratio of water quality results to the WQOs were plotted for several of the most common constituents of concern. The results are shown in Figure 8-2. The largest single exceedance was for fecal coliform, which exceeded the WQO by 5.5 times during the February 18, 2005 storm. TDS also exceeded the WQO by 4.2 times during the October 17, 2004 storm event, by 3 times during the February 11, 2005 storm event and by 1.5 times during the February 18, 2004 storm. There was also a noticeable single exceedance for turbidity (2.8 times the WQO). The average magnitude of water quality exceedances was also determined for each constituent by calculating the mean ratio of water quality results to the WQOs from all storm events from October 2001 through April 2004. Mean ratios are illustrated in Figure 8-2. The largest average exceedance for the period of record was for fecal coliform (9.6 times the WQO) followed by TDS, which exceeded the WQO by 2.8 times.

In addition to the wet weather monitoring discussed above, there are 22 sites in the Los Peñasquitos Creek WMA where water quality is monitored during dry weather. Of these, 14 are located upstream of the mass loading station on Los Peñasquitos Creek. The dry weather data for this site is useful, but it is important to remember that it represents only one year of monitoring. Most of the dry weather data were collected from concrete channels or outfalls (See Section 3.4 for details on dry weather sampling).

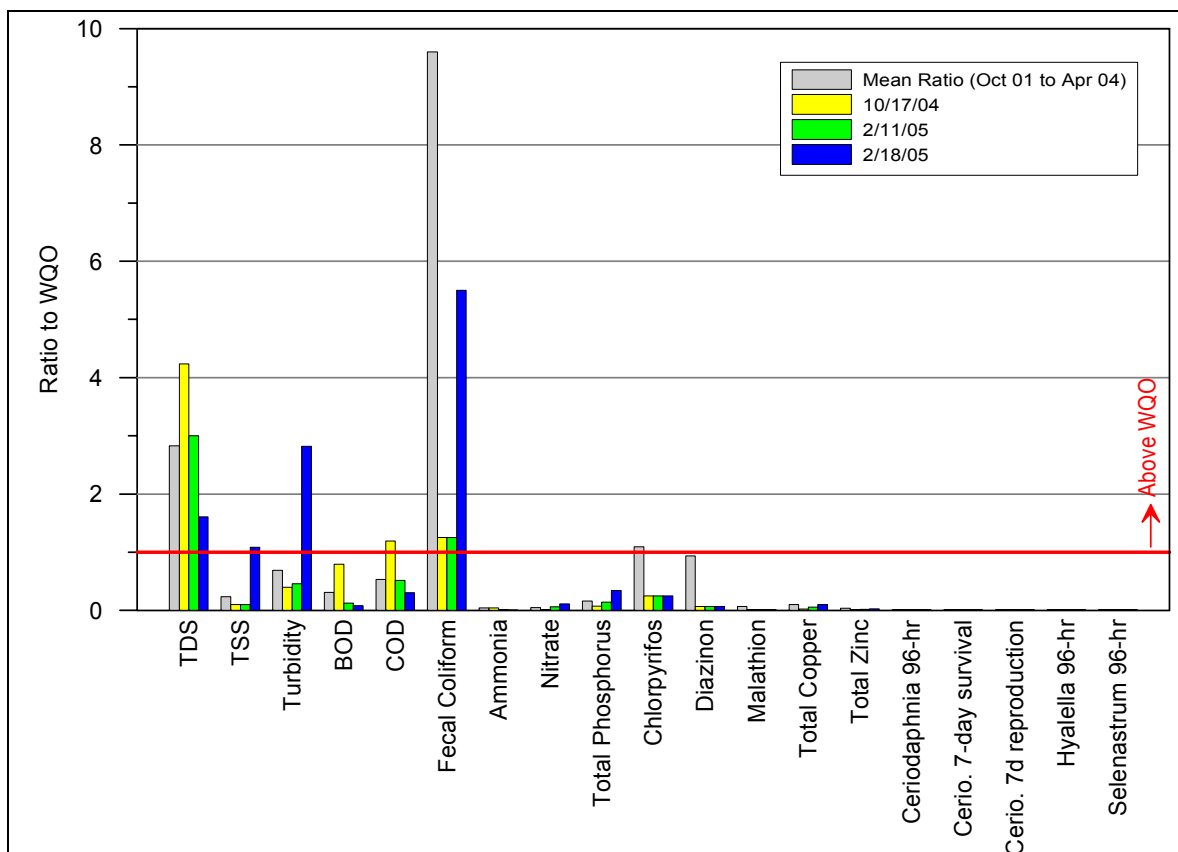


Figure 8-2. Los Peñasquitos Creek water quality ratios.

Table 8-4 shows exceedances and ratios of exceedances for constituents that were measured during the 2004 dry weather monitoring program. During dry weather sampling, there were exceedances of water quality criteria at the monitoring sites located above the mass loading station for turbidity, conductivity, ammonia, phosphorus, dissolved copper, total coliform, and enterococcus. Of these, turbidity and total coliform had ratios of exceedance greater than one. A

Table 8-4. Los Peñasquitos WMA 2004 Dry Weather Exceedance Matrix.

Constituent	Number of Exceedances	Number of Samples Collected	Average Ratio of Exceedance*	St. Dev. Ratio of Exceedance
Turbidity	3	13	1.69	3.98
Conductivity	1	13	0.36	0.35
Ammonia	2	12	0.66	1.66
Phosphorus	2	13	0.58	0.62
Dissolved Copper	1	14	0.17	0.43
Total Coliform	4	14	2.27	4.70
Enterococcus	3	14	1.00	1.82

* Average ratio of exceedance is equal to the average concentration for all samples collected divided by the Water Quality Objective.

A map for the WMA showing DWS exceedances is found in Figure 8-3. Pie symbols appear at dry weather stations that have had water quality exceedances. The colored slices of the pie show the different constituent groups that contributed to the exceedances. The only COC that was common between the wet and dry weather monitoring program was turbidity.

No toxicity has been found for any test at Los Peñasquitos Creek; therefore no significant relationships with COC were found in the chi-square test.

8.2.3 Third Party Data

Third party data was collected from three locations in 2002 within Los Peñasquitos watershed under the Surface Water Ambient Monitoring Program (SWAMP) and was provided by the San Diego Regional Water Quality Control Board. Sampling sites were located on Los Peñasquitos Creek, Soledad Canyon Creek and Poway Creek. Grab samples were collected from each station during dry weather once in March, April, June and September, 2002 (12 total observations). Results are presented in Table H-2 in Appendix H. Data collected from Los Peñasquitos Creek were compared to the mass loading station and dry weather data results to provide qualitative assessments with current wet and dry weather results. The other two stations within the watershed were too spatially disconnected from the MLS to correlate the data with any of the wet and dry weather monitoring results, however, exceedances were noted.

One station, 906LPLC6, was located on Los Peñasquitos Creek in the same vicinity as the mass loading station. There were water quality objective exceedances for turbidity, pH, sulfate, Diazinon, methyl parathion and toxicity. Sulfate concentrations exceeded objectives during three out of four sampling events, while turbidity, pH, Diazinon and methyl parathion each exceeded objectives during one event. Toxicity at Los Peñasquitos Creek was evident for *Selenastrum* growth during three events and *Ceriodaphnia* reproduction during one sampling event. All other constituents were below their respective water quality objectives. Comparing the third party data with wet weather MLS data and dry weather data collected upstream of the MLS, the only common exceedances were for turbidity during wet and dry weather and Diazinon during wet weather, however these exceedances were not persistent. Turbidity and Diazinon concentrations exceeded objectives during 3 out of 12 storm events, and during dry weather, turbidity exceeded objectives during 3 out of 13 events.

Exceedances observed at the other two stations within Los Peñasquitos watershed were similar to exceedances that were found in Los Peñasquitos Creek. Sulfate, manganese and toxicity consistently exceeded objectives at all sites: manganese exceeded objectives during all sampling events at both stations; sulfate exceeded objectives in all but two events; and there was toxicity to at least one test organism during all sampling events at both stations. Turbidity and Diazinon concentrations only exceeded objectives during one sampling event at one station.

8.2.4 TIEs

TIE testing was not performed on Los Peñasquitos Creek samples. This mass loading station has not been identified as a TIE candidate site based upon the Triad Decision Matrix. Toxicity was not observed in any of the three storm events in 2004-2005.

8.2.5 Summary and Conclusions

Elevated levels of TDS during wet weather continues to be the primary water quality concern in the watershed. High levels of other constituents, particularly fecal coliform bacteria, occur occasionally and do not appear to be consistently problematic. There were 14 dry weather monitoring sites located upstream of the mass loading station. The data from these sites suggested that there were several constituents that exceeded the water quality objectives, but there was no clear link between dry and wet weather constituents. There has been no toxicity associated with storm water in any of the 12 storms assessed since 2001. Third party data collected in 2002 indicated that sulfate, manganese and toxicity were consistent problems throughout Los Peñasquitos watershed.

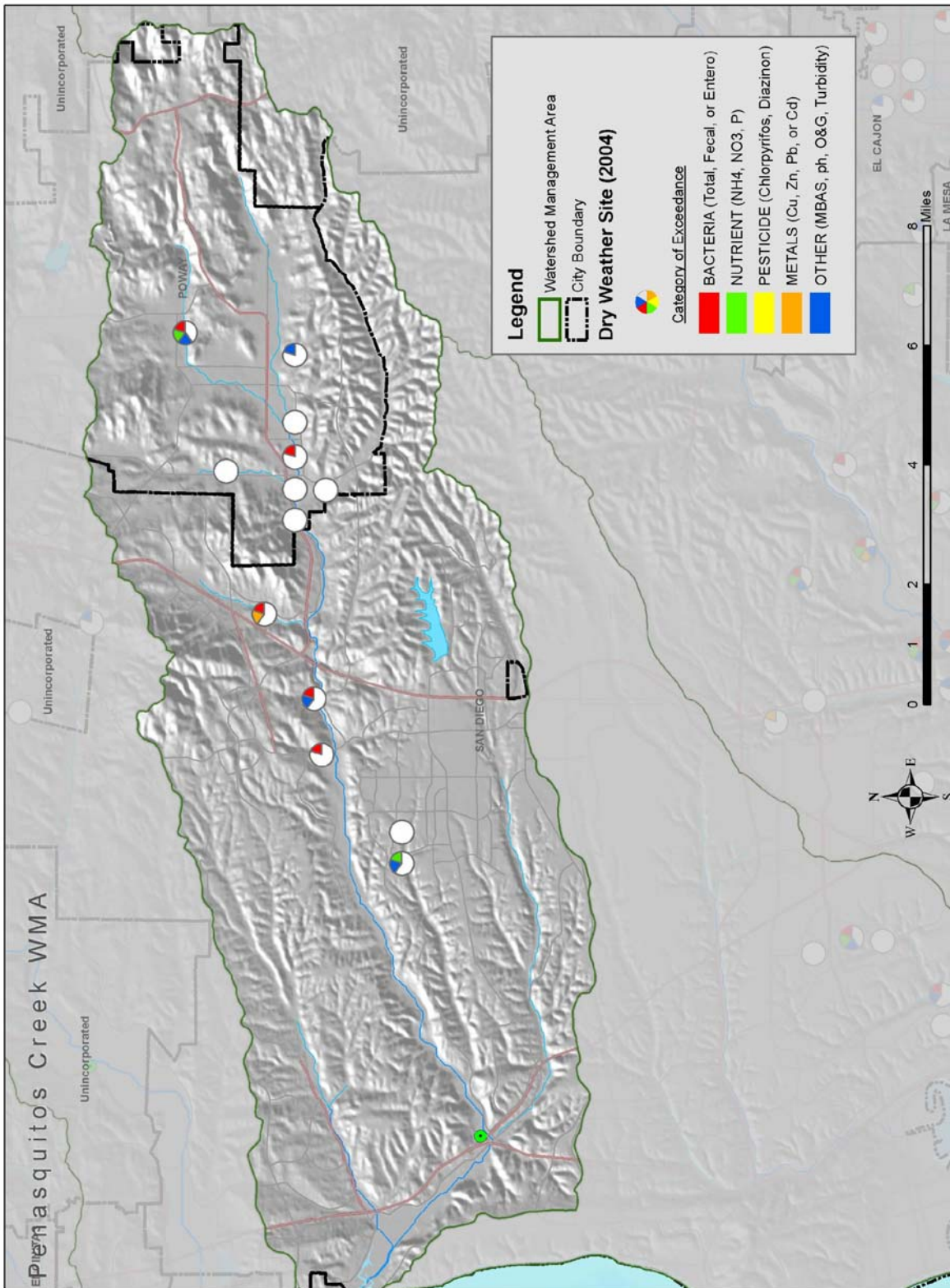


Figure 8-3. Los Peñasquitos WMA dry weather exceedance map.

8.3 Stream Bioassessment

Stream bioassessment in the Los Peñasquitos WMA included two urban affected monitoring sites. The upstream site was in Los Peñasquitos Canyon Creek at Cobblestone Creek Road, on the downstream side of the city of Poway. The downstream site was in Carroll Canyon Creek near the Highway 805 overcrossing in Sorrento Valley.

8.3.1 Results and Discussion

Los Peñasquitos Canyon Creek Monitoring Site: LPC-CCR

The Los Peñasquitos Canyon Creek monitoring site had a benthic macroinvertebrate community with an Index of Biotic Integrity rating of Very Poor for both the October and May surveys (Table 8-5) (See Section 3.2 for details on the sampling approach). Taxa richness for the two surveys was moderate, with 20 and 14 unique taxa collected, with 3 and 2 EPT taxa in October and May, respectively. There were no organisms collected that are highly intolerant to impairment, and the occurrence of organisms highly tolerant was fairly low, comprising 12% and 3% of the community in October 2004 and May 2005, respectively.

The physical habitat of the site was near optimal, with a substrate primarily of layered cobble, and there was a good oak and sycamore riparian zone. There was some development in close proximity to the monitoring reach, consisting of low density residential use. Specific conductance was fairly low, measuring 1.636 mS/cm in October and 0.962 mS/cm in May (Table 8-5). pH values were 7.4 and 7.6 for the October and May surveys, respectively.

The benthic community was dominated by the mayflies, *Fallceon quilleri* and *Baetis*, and the black fly, *Simulium* (Table 8-6). The damselfly, *Argia*, made up 10% of the community in the October survey, following a typical San Diego seasonal pattern of increased predator taxa collected during fall surveys.

The Los Peñasquitos Creek mass loading station was too spatially disconnected from the bioassessment site to correlate any of the storm water information with the benthic community.

Table 8-5. Selected Biological Metrics and Physical Measures of the Los Peñasquitos WMA.

Los Peñasquitos Watershed Management Area	Los Peñasquitos Creek at Cobblestone Creek Road (LPC-CCR)		Carroll Canyon Creek at Highway 805 (CCC-805)	
	Oct-04	May-05	Oct-04	May-05
Survey	Oct-04	May-05	Oct-04	May-05
Index of Biotic Integrity/ Qualitative Rating	12 Very Poor	9 Very Poor	18 Poor	9 Very Poor
Metrics				
Taxa Richness	20	14	21	14
EPT Taxa (mayflies, stoneflies, and caddisflies)	3	2	2	3
% Intolerant Taxa	0%	0%	0%	0%
% Tolerant Taxa	12%	3%	64%	2%
Average Tolerance Value	5.4	5.8	7	5.6
% Collector Filterers + Collector Gatherers	85%	98%	53%	99%
Physical Measures				
Elevation	440		80	
Physical Habitat Score	160	158	119	126
Riffle Velocity (ft/sec)	2.7	2.1	1.6	2
Substrate Composition				
Silt			20%	
Sand	5%	2%		7%
Gravel	22%	13%	10%	35%
Cobble	68%	75%	70%	58%
Boulder	5%	2%		
Bedrock/Solid		8%		
Water Quality				
Temperature °C	15.1	18.3	23.7	18.5
pH	7.4	7.6	8.2	7.8
Specific Conductance (ms/cm)	1.636	0.962	3.738	2.263
Relative Chlorophyll (µg/L)	6.2	6.5	6.2	2.7

Table 8-6. Los Peñasquitos WMA Community Summary.

		Taxon	Common Name	Percent Composition	Tolerance Value	Functional Feeding Group
Los Peñasquitos Creek at Cobblestone Creek Road (LPC-CCR)	Oct-04	<i>Fallceon quilleri</i>	minnow mayfly	34%	4	Collector Gatherer
		Oligochaeta	earthworm	17%	5	Collector Gatherer
		<i>Argia</i>	dancer damselfly	10%	7	Predator
		<i>Baetis</i>	minnow mayfly	7%	5	Collector Gatherer
		<i>Hyalella</i>	amphipod	7%	8	Collector Gatherer
	May-05	<i>Simulium</i>	black fly	59%	6	Collector Filterer
		<i>Baetis</i>	minnow mayfly	16%	5	Collector Gatherer
		Chironomidae	non-biting midges	11%	6	Collector Gatherer/Filterer
		Oligochaeta	earthworm	4%	5	Collector Gatherer
		<i>Hyalella</i>	amphipod	2%	8	Collector Gatherer
Carroll Canyon Creek at Highway 805 (CCC-805)	Oct-04	Ostracoda	seed shrimp	32%	8	Collector Gatherer
		Prostoma	tongue worm	17%	8	Predator
		Turbellaria	flatworm	17%	4	Predator
		Caloparyphus/ Euparyphus	soldier fly	9%	8	Collector Gatherer
		<i>Sperchon</i>	mite	7%	5	Predator
	May-05	<i>Baetis</i>	minnow mayfly	43%	5	Collector Gatherer
		Chironomidae	non-biting midges	26%	6	Collector Gatherer/Filterer
		<i>Simulium</i>	black fly	25%	6	Collector Filterer
		<i>Fallceon quilleri</i>	minnow mayfly	2%	4	Collector Gatherer
		Oligochaeta	earthworm	1%	5	Collector Gatherer

Carroll Canyon Creek Monitoring Site: CCC-805

The Carroll Canyon Creek monitoring site had a benthic macroinvertebrate community with Index of Biotic Integrity ratings of Poor and Very Poor in October 2004 and May 2005, respectively (Table 8-5). Taxa richness for the two surveys was 21 and 14, with 2 and 3 different EPT taxa collected in October 2004 and May 2005, respectively. There were no organisms collected that are highly intolerant to impairment, and the occurrence of organisms highly tolerant was variable, comprising 64% of the community in October, and 2% of the community in May.

The physical habitat of the site was sub-optimal, with a substrate primarily of smooth layered cobble. The willow dominated riparian zone was disturbed in some portions of the reach due to the proximity of commercial development. Specific conductance was fairly high, measuring 3.738 ms/cm in October and 2.263 ms/cm in May. pH values were 8.2 and 7.8 in the October and May surveys, respectively. Field biologists noted in the October survey that the site had very heavy deposits of fine sediment.

The benthic community was seasonally variable. In October the community was dominated by Ostracods, Nemertean (tongue worms), and flatworms (Table 8-6). Also collected in October were two species of water scavenger beetle, *Tropisternus* and *Uvarus*. In May, the community was dominated by the mayfly, *Baetis*, Chironomid midges, and the black fly, *Simulium*.

The Los Peñasquitos Creek mass loading station was located approximately one mile away from the bioassessment station on Carroll Canyon Creek, and water quality measures from storm water may have

contained constituents that were not present in the bioassessment site. The ubiquity of total dissolved solids in all of the storm water samples in the region may imply that this was also a constituent of concern at the bioassessment site. Pesticides, metals, and toxicity to *Ceriodaphnia* and *Hyalella* from storm water were generally undetectable at the MLS.

8.3.2 Summary and Conclusions

The Los Peñasquitos WMA was sampled at two sites. The upstream site was in Los Peñasquitos Creek in Poway, and the downstream site was in Carroll Canyon Creek in Sorrento Valley. Both of the sites had Index of Biotic Integrity ratings that were in the upper range of Very Poor or lower Poor categories. The Carroll Canyon Creek site was rated slightly higher than the upstream site on Los Peñasquitos Creek, possibly due to different watershed areas contributing to the different streams.

8.4 Ambient Bay and Lagoon Monitoring

8.4.1 Results and Discussion

8.4.1.1 Phase I Results and Discussion

Sediment samples were collected in Los Peñasquitos Lagoon for the ABLM Program on June 3, 2004 (See Section 3.3 for details on the sampling approach). The nine sites sampled as part of the Phase I assessment are shown in Figure 8-4. The median grain size at Los Peñasquitos Lagoon ranged from 5 μm at Sites 2L-4 and 2R-1 in the middle Lagoon, to 138 μm at Site 1L-1 in the outer Lagoon (Table 8-7). The grain size characteristics of the sediments in the three outer Lagoon sites (Sites 1L-1, 1M-1 and 1R-2) were distinctly different from those at the other sites in the Lagoon. Sites in the outer Lagoon were composed primarily of sand (91.5% to 94.0%) and had a much smaller proportion of fine grained sediments than the other sites. These three sites also had a much lower TOC content (0.19% to 0.24%) compared to the other sites in the Lagoon (1.51% to 2.41%).

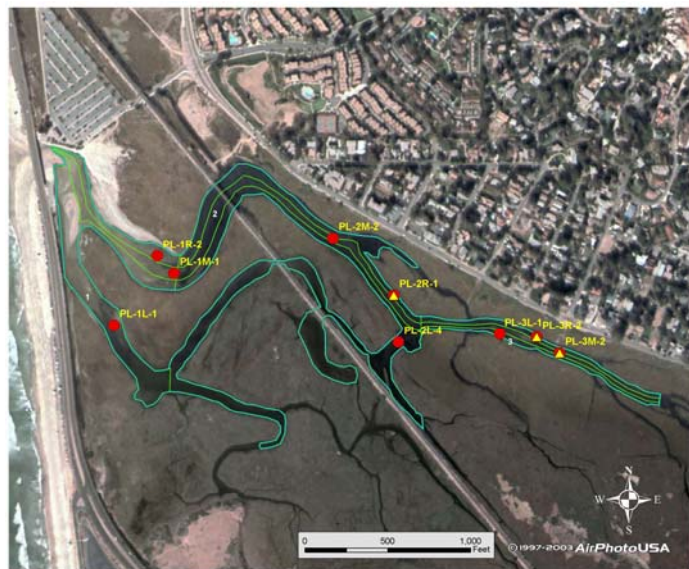


Figure 8-4. Map of Phase I site locations in Los Peñasquitos Lagoon. Sites with yellow triangles were selected for Phase II assessment.

The areas in Los Peñasquitos Lagoon with the highest proportion of fine grained sediments and high TOC content were found at Site 2R-1 in the middle stratum and Sites 3R-2 and 3M-2 in the inner stratum (Table 8-7). These sites were thus selected for Phase II assessment.

Table 8-7. Results of Phase I sediment analyses and subsequent ranking for Phase II site selection at Los Peñasquitos Lagoon.

Sampling Site	TOC and Grain Size Distribution in Phase I								Ranking for Phase II				
	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Median (µm)	Mean (µm)	Fines (%)	TOC (%)	Fines Rank	TOC Rank	Rank Sum	Highest Rank	Phase II
LPL-1L-1	0.10	94.0	2.90	2.97	138	139	5.88	0.19	1	2	3		
LPL-1M-1	0.00	92.2	4.27	3.49	132	130	7.75	0.17	2	1	3		
LPL-1R-2	0.00	91.5	4.49	3.97	116	112	8.46	0.24	3	3	6		
LPL-2L-4	6.77	15.5	30.06	47.72	5	NC	77.78	1.51	5	4	9		
LPL-2M-2	0.41	19.7	34.6	45.3	7.1	NC	79.86	1.52	6	5	11		
LPL-2R-1	3.32	8.4	39.9	48.4	5	NC	88.33	2.41	9	9	18	*	Yes
LPL-3L-1	15.57	11.9	32.1	40.4	8.29	18.04	72.52	1.90	4	8	12		
LPL-3M-2	1.40	17.8	34.3	46.5	5.3	4.69	80.77	1.72	8	6	14	*	Yes
LPL-3R-2	0.32	19.5	34.5	45.7	5.7	NC	80.22	1.84	7	7	14	*	Yes
Mean of all Sites	3.10	41.17	24.12	31.61	46.93	80.76	55.73	1.28					
St. Dev.	5.19	38.72	15.41	21.22	61.57	64.25	36.51	0.85					

NC = Not calculable (%silt + %clay > 84%)

8.4.1.2 Phase II Results and Discussion

The three sites selected in Los Peñasquitos Lagoon as part of Phase I were sampled in Phase II on July 16, 2004. Sediments from Sites 2R-1, 3M-2 and 3R-2 were composited and analyzed for chemistry, toxicity, and benthic community structure. The results are summarized in Table 8-8.

Sediment Chemistry. Sediments from each of the 12 coastal embayments in the ABLM Program were analyzed for four basic constituents: metals, PCBs, PAHs, and pesticides. Of these, seven metals were detected above the detection limit in Los Peñasquitos Lagoon: arsenic, chromium, copper, lead, nickel, selenium and zinc (Table 8-8). This suite of metals, with the exception of selenium, was also found in all the other embayments assessed in the ABLM Program.

Concentrations of metals were low in Los Peñasquitos Lagoon and none exceeded their respective ERM values. However, the concentration of arsenic exceeded the ERL value. With the exception of selenium, the same metals were detected above the detection limit during the 2003 ABLM program. All metal concentrations were low and did not exceed the ERM value during 2003, however copper and zinc did exceed their respective ERLs. There were no PAHs, PCBs, or pesticides found above the detection limit in Los Peñasquitos Lagoon during the 2004 program.

The mean ERM quotient, which is a measure of the cumulative effects of the COC for which ERMs are available, was 0.111. This value exceeded the threshold of 0.10. Sediments with mean ERM-Q values above this threshold have a higher probability of producing adverse biological effects than those with mean ERM-Qs below the threshold (Long et al. 1998). This is similar to the 2003 results where the mean ERM quotient was 0.109.

Table 8-8. Summary of chemistry, toxicity, and benthic community structure in Los Peñasquitos Lagoon.

CHEMISTRY*					TOXICITY*	BENTHIC COMMUNITY						
Analyte	ERL	ERM	Result	ERM-Q		Percent Survival	Index	2R-1	3M-2	3R-2	Mean	St. Dev.
METALS (mg/kg)					95.8% Not Significantly Different from control	Abundance	1171	614	648	811	312	2433
Antimony	NA	NA	<1.74	NA		Richness	32	31	25	29.3	3.79	49
Arsenic	8.2	70	9.39	0.134		Diversity	1.19	2.27	1.29	1.58	.060	--
Cadmium	1.2	9.6	<0.174	NA		Evenness	0.34	0.66	0.40	0.47	0.17	--
Chromium	81	370	21.8	0.059		Dominance	2	5	2	3	1.73	--
Copper	34	270	14.4	0.053								
Lead	46.7	218	17.7	0.081								
Nickel	20.9	51.6	8.1	0.157								
Selenium	NA	NA	1.98	NA								
Zinc	150	410	75.6	0.184								
Mean ERM-Q				0.111								

* Analysis performed on composite samples from the three sites.

NA-Not applicable

Bold – exceeds ERL or ERM value

Toxicity. The percent survival of *E. estuarius* exposed to Los Peñasquitos Lagoon sediments in a 10-day acute toxicity test was 95.8% (Table 8-8). Percent survival was not significantly different from that of the Control (99%), suggesting that Los Peñasquitos Lagoon sediments were not significantly toxic to the test organisms. During the 2003 ABLM program toxicity was observed, but the source of toxicity was unknown.

Benthic Community Structure. A total of 2433 organisms were collected from Los Peñasquitos Lagoon, representing 49 taxa (Table 8-8). During the 2003 ABLM program a total of 547 organisms were collected, representing 13 taxa. Total taxa abundance and richness were relatively high, fourth only to Mission Bay, Oceanside Harbor and Sweetwater. Site 2R-1 in the middle stratum had greater abundance and taxa richness than the inner stratum sites 3M-2 and 3R-2. However, diversity, evenness, and dominance were greatest at Site 3M-2, near the inner portion of the lagoon. Based on these indices, the benthic community structure in Los Peñasquitos Lagoon had a rank of 6, where 1 represents the healthiest community with the lowest combined index score and 12 the least-healthy community.

The crustacean, *Grandidierella japonica*, dominated the benthic community in the Los Peñasquitos Lagoon, accounting for 43.7% of all the animals collected (Table 8-9). This was the most common taxon found in all of the embayments monitored in the ABLM Program. The second most abundant species were the Phoronids, which accounted for 29.6% of the benthic community. Classified as minor Phyla, members of this phyla can form immense beds with as many as 1,200 individuals per m². The barley snail, *Barleeia* sp., was the third most abundant, accounting for 6.7% of the total abundance, which differs from the 2003 ABLM program where *Barleeia* sp. dominated the benthic community accounting for 52.1% of all animals collected.

Table 8-9. Dominant infaunal species found in the Los Peñasquitos Lagoon during the 2004 ABLM Program.

Embayment	Taxa (Species)	Higher Taxa	Abundance	Percent Composition
LPL	<i>Grandidierella japonica</i>	Crustacean	1063	43.7
	<i>Phoronida</i>	Minor phyla	721	29.6
	<i>Barleeia sp</i>	Mollusca	755	6.7

* Values were calculated from the total of all sites assessed.

Relative Ranking. The results of the chemistry, toxicity, and benthic community assessments for Los Peñasquitos Lagoon were ranked against the same parameters for the other embayments monitored in the ABLM Program (see Section 3.3.5 for a complete discussion). For chemistry, a rank of 1 represents the lowest ERM-Q and 12 represents the highest. For toxicity, a rank of 1 represents the highest percent survival of test organisms and 12 represents the lowest. For benthos, a rank of 1 represents the highest species diversity, abundance and richness and a rank of 12 represents the lowest species diversity, abundance and richness. The results are presented in Figure 8-5. For Los Peñasquitos Lagoon, the relative ranks were four for chemistry, three for toxicity, and six for benthic community structure.

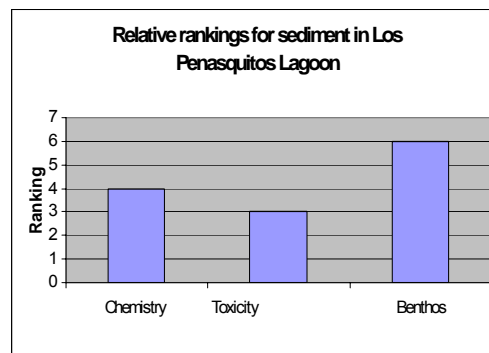


Figure 8-5. Relative rankings for sediment in the Los Peñasquitos Lagoon.

8.4.1.3 Summary and Conclusions

Sediments in Los Peñasquitos Lagoon were monitored as part of the 2004 ABLM Program to assess the potential for adverse effects from the watershed and to compare sediment quality with other coastal embayments in San Diego County. In Phase I, a stratified random approach was used to identify the three sites where COC were most likely to be found (i.e., those with the highest TOC and smallest grains size): Site 2R-1 in the middle stratum and sites 3M-2 and 3R-2 in the inner stratum. These sites were sampled in Phase II of the assessment and analyzed for sediment chemistry, toxicity, and benthic community structure. The results of the chemistry assessment indicated that seven of the nine metals assessed were found in Los Peñasquitos sediments. The mean ERM-Q for Los Peñasquitos Lagoon was 0.111, which was slightly above the published threshold value of 0.10 and therefore suggests the potential for increased toxicity. No ERM's were exceeded. There were no PAHs, PCBs, or pesticides found above the detection limit in Los Peñasquitos Lagoon during the 2004 program. The percent survival of test organisms exposed to Los Peñasquitos Lagoon sediments was the fourth highest (i.e., lowest toxicity) of any of the embayments assessed and not significantly different from that of the Control. The benthic community indices suggested that the biotic community in the Los Peñasquitos Lagoon had a rank of six, therefore intermediate compared to other embayments in the ABLM Program. The infaunal community was dominated by the crustacean, *Grandidierella japonica*, followed by members of the Phoronida phyla and the barley snail, *Barleeia sp*. The relative ranks for the Los Peñasquitos Lagoon compared to the other embayments of the ABLM Program were four for chemistry, three for toxicity, and six for benthic community structure. Compared to the other embayments in the 2004 ABLM program, Los Peñasquitos Lagoon had an overall rank of two. During the 2003 ABLM program the Lagoon had an overall rank of six. A decrease in overall ranking indicates an increase in relative quality compared with last year's ranking. More data will need to be collected before any definitive trends can be identified.

8.5 WMA Assessment

The Los Peñasquitos watershed management area was assessed using data from both dry and wet weather monitoring efforts. One mass loading station located on Los Peñasquitos Creek collected chemistry and toxicity data during storm events. Chemistry data was collected from 14 dry weather monitoring sites upstream of the MLS. Two bioassessment sites were assessed and given an Index of Biotic Integrity score. The watershed management area assessment methods presented in Section 3.4 were applied to these data in order to determine any constituents of concern (COC), as well as to develop a water quality objective (WQO) exceedance frequency for each of these constituents. Constituent WQO exceedances in wet and dry weather, as well as the IBI scores of the bioassessment sites in the watershed, are summarized in Table 8-10. Using the evaluation criteria discussed in Section 3.4, constituents were assigned zero (no frequency), one (low frequency), two (medium frequency), or three diamonds (high frequency). Data from the constituent exceedance table were evaluated for this watershed using the triad decision matrix, the results of which are presented in Table 8-11.

Several constituents exceeded their water quality objectives in the Los Peñasquitos watershed management area, including bacteria, nutrients, and conventionals. One constituent was identified as having a high frequency of occurrence and was assigned three diamonds based on Criterion No. 1 (MLS results exceeded WQO in 100% of the samples). This constituent includes:

- Total dissolved solids

One constituent had a medium frequency of occurrence and received two diamonds based on Criterion No. 5. This constituent includes:

- Fecal Coliform

Five constituents were identified as having a low frequency of occurrence and are listed below. All constituents were assigned one diamond based on Criterion No. 8.

- Turbidity
- Total Coliform
- Enterococcus
- Ammonia
- Orthophosphate

In addition to TDS, which had a high frequency of occurrence in the Los Peñasquitos Watershed based on the triad decision matrix above, several other constituents have been identified as concerns because they are listed on the SWRCB 303(d) List. These include indicator bacteria associated with the Pacific Ocean shoreline and sediment and siltation associated with Los Peñasquitos Lagoon.

There is no evidence of persistent toxicity associated with wet weather runoff at the Los Peñasquitos Creek MLS. Toxicity tests conducted on *Ceriodaphnia*, *Hyalella* and *Selenastrum* since 2001 have not shown a single incidence of toxicity.

The IBI rating was very poor at the Cobblestone Creek site throughout the monitoring period. The Sorrento Valley Rd. site was rated as very poor during 2001-2002 and poor during 2002-2003, 2003-2004, and 2004-2005. These scores suggest evidence of benthic alteration within Los Peñasquitos Creek watershed.

Table 8-10. Constituent exceedances in the Los Peñasquitos WMA.

Constituents With Any Wet Weather (MLS) WQO or Dry Weather Action Level Exceedance	MLS (Wet Weather) Results										Dry Weather Results *		Frequency of Occurrence	Criterion No.
	2001/2002		2002/2003		2003/2004		2004/2005		CUMULATIVE		2004			
	#/3	%	#/3	%	#/3	%	#/3	%	#/12	%	#	%		
Conventional Parameters														
COD	0	0	0	0	0	0	1	33	1	8	NA	NA	-	-
Total Dissolved Solids	3	100	3	100	3	100	3	100	12	100	NA	NA	◆◆◆	1
Total Suspended Solids	0	0	0	0	0	0	1	33	1	8	NA	NA	-	-
Turbidity	0	0	2	67	0	0	1	33	3	25	3	23	◆	8
Nutrients														
Ammonia	0	0	0	0	0	0	0	0	0	0	2	17	◆	8
Orthophosphate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	15	◆	8
Bacteriological														
Total Coliform	0	0	2	67	0	0	1	33	3	25	4	29	◆	8
Fecal Coliform	1	33	3	100	1	33	3	100	8	67	0	0	◆◆	5
Enterococcus	0	0	2	67	0	0	0	0	2	17	3	21	◆	8
Pesticides														
Chlorpyrifos	0	0	2	67	0	0	0	0	2	17	0	0	-	-
Diazinon	2	67	1	33	0	0	0	0	3	25	0	0	-	-
Total Metals														
Antimony	0	0	1	33	0	0	0	0	1	8	NA	NA	-	-
Dissolved Metals														
Copper	0	0	0	0	0	0	0	0	0	0	1	7	-	-
Bioassessment	IBI Rating											EVIDENCE OF BENTHIC ALTERATION?		
Los Peñasquitos Creek, at Cobblestone Creek Rd.	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	NA	NA	Yes	
Los Peñasquitos Creek, at Sorrento Valley Rd. (DS)	Very Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	NA	NA		

* = Total number of observations varied among constituents.

NA = Not assessed

- = Constituent results are below the defined requirements for a Low Frequency of Occurrence rating.

◆ = Low Frequency of Occurrence rating.

◆◆ = Medium Frequency of Occurrence rating.

◆◆◆ = High Frequency of Occurrence rating.

DS = Downstream of MLS

Table 8-11. Decision matrix results for the Los Peñasquitos WMA.

Chemistry	Toxicity	Benthic Alteration	Possible Conclusion(s)	Possible Actions or Decisions
No persistent exceedances	No persistent evidence of toxicity	Indications of alteration	Benthic impact due to habitat disturbance, not toxicity. Test organisms not sensitive to problem pollutants.	1) Continue monitoring to gather long-term trend information. 2) No action necessary based on toxic chemicals. 3) Consider whether different test organisms should be evaluated. 4) Consider potential role of physical habitat disturbance.

Figure 8-6 summarizes the number of MLS water quality exceedances for six categories of constituents and displays how water quality concerns are changing over time. Categories include conventionals, nutrients, bacteria, pesticides, metals, and toxicity. The average exceedance frequency (including constituents that had no exceedances) was computed from values in Table 8-10 for each constituent category.

The overall frequency of exceedances of the WQOs at the Los Peñasquitos Creek MLS has remained low during the last four monitoring seasons. Only two COC groups emerged from the 2004-2005 sampling season, including bacteriological and conventional parameters.

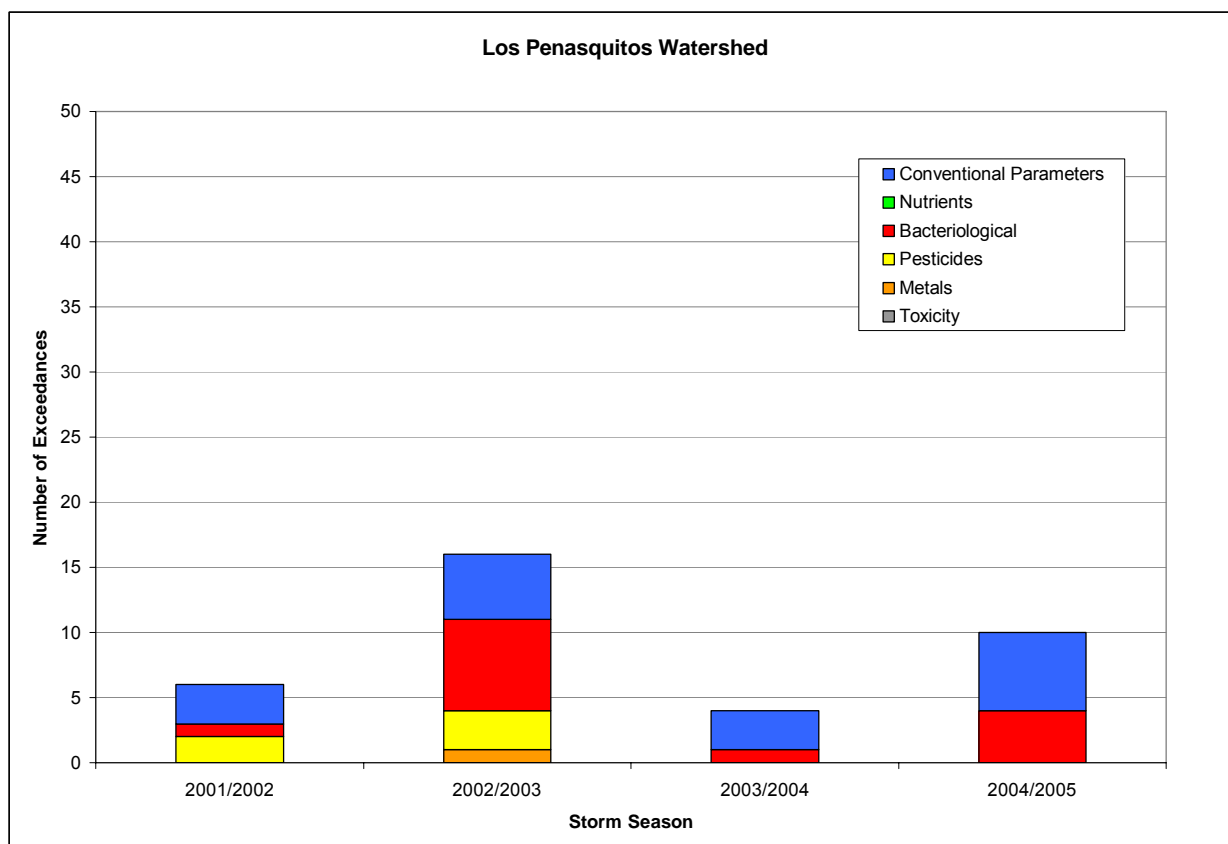


Figure 8-6. Stacked bar chart of the number of wet weather exceedances of constituent groups in Los Peñasquitos Creek.

Triad Decision Matrix

The triad decision matrix combines the occurrence of COC with the toxicity and bioassessment results to draw potential conclusions about the watershed and provide possible actions for future monitoring or assessment. Table 8-11 summarizes the results and lists possible conclusions and actions.

Only total dissolved solids was identified as having a high frequency of occurrence. However, TDS is not considered in the triad decision making process since the water quality objectives for this parameter as defined in the Basin Plan are established for municipal drinking water and do not necessarily reflect

Los Peñasquitos Creek WMA

impacts on the ecology of the watersheds (See Section 3.4 for more complete details). Therefore, based on the triad decision matrix, there was no evidence of persistent water quality objective exceedances, no evidence of persistent toxicity, and indications of benthic alteration.

Therefore, the recommended actions within this watershed are to continue monitoring to gather long-term trend information, consider evaluating different test organisms and to investigate the potential role of physical habitat disturbance.

Baseline Long-Term Effectiveness Assessment (BLTEA) Ratings for the Los Peñasquitos WMA

The water quality priority ratings presented in Table 8-12 are based on the methodology presented in BLTEA report (WESTON, MOE, & LWA 2005) and are presented in the Methods Section 3.4. Constituent groups and stressor groups are given a ranking from A to D with A being the highest priority rating and D the lowest priority rating. Items ranked with a D indicate that the constituent group or stressor is a low priority or does not have sufficient data to support a higher ranking. The ratings were based on current results presented in this 2004-2005 annual report and data from the following programs:

- Storm water Mass Loading Monitoring (MLS) – Wet Weather Data
- Co-permittee Dry Weather Data Monitoring
- Ambient Bay, Lagoon, and Coastal Receiving Water Monitoring (ABLM)
- Urban Stream Bioassessment Monitoring
- Triad Assessment – Toxicity Testing of Storm water
- 303d Listing

Table 8-12. Baseline Long-Term Effectiveness Assessment (BLTEA) Ratings for the Los Peñasquitos WMA

Watersheds/ Sub-watersheds	Percentage of Total Area	Priority Ratings*									
		Constituent Groups								Stressor Groups	
		Heavy Metals	Organics	Oil and Grease	Sediments	Pesticides	Nutrients	Gross Pollutants	Bacteria/ Pathogens	Benthic Alterations	Toxicity
Los Peñasquitos WMA	100%	C	D	D	A	C	D	D	A	B	D
Miramar Reservoir HA (906.10)	55%	C	D	D	A	C	C	D	A	B	D
Poway HA (906.20)	45%	C	D	C	B	C	D	D	B	C	D

Notes:

* = Rating Calculated Based on Area Weighted Averages of Score Value from the sub-watershed areas.

** = Priority Level (Highest-A to Lowest-D)

The purpose of the BLTEA ratings is to identify water quality priorities within a watershed based on weighted averages of the sub-watershed ratings. Because it is a weighted average, larger sub-watersheds will have a greater influence in the overall watershed rating.

Sediments and bacteria were the highest priority (A rated) constituents for the Los Peñasquitos WMA followed by benthic alteration which was given a B rating. All other constituents were given either a C or D rating.

The Miramar Reservoir sub-watershed which accounts for 55% of the Los Peñasquitos WMA, had high priority (A) ratings for sediments and bacteria followed by benthic alteration which was given a B rating. Although the Poway sub-watershed, which accounts for 45% of the Los Peñasquitos WMA, had no A rated constituents, the highest priority constituents were sediments and bacteria which were given B ratings.

A regional evaluation and description of the BLTEA is presented in the Regional Assessment Section 13. The complete tables used to calculate the ratings are presented in Appendix G.

8.6 Conclusions and Recommendations

The Los Peñasquitos Creek run-off area accounts for approximately 60% of the Los Peñasquitos watershed management area. The major land uses within the contributing runoff area are parks (29%), residential (28%), and undeveloped (24%). For the Los Peñasquitos Creek WMA, only TDS was identified as a high frequency of occurrence COC, fecal coliform was identified as a medium frequency of occurrence COC, and turbidity, ammonia, orthophosphate, total coliform, and enterococcus were identified as low frequency of occurrence COC. Third party data collected in 2002 under SWAMP indicated that sulfate, manganese and toxicity were consistent problems throughout Los Peñasquitos watershed. The in-stream benthic community appears to be limited by unknown factors, and while high TDS levels may be enough of a stress to insects, other constituents not monitored in the Los Peñasquitos Creek MLS watershed may also be affecting the benthic invertebrate community. In Los Peñasquitos Lagoon, the final receiving waters for Los Peñasquitos Creek, relative rankings were four for chemistry, three for toxicity, and six for benthic community structure. Compared to the other embayments in the 2004 ABLM program, Los Peñasquitos Lagoon had an overall rank of two. The relative quality within the lagoon increased compared to the 2003 ranking.

In addition to the WMA assessment findings, the BLTEA ratings found sediments and bacteria to be the highest priority (A rated) constituents for the Los Peñasquitos WMA followed by benthic alteration which was given a B rating.

The information provided from the triad matrix results used in conjunction with the BLTEA ratings can assist the jurisdictions in making informed decisions in developing their WURMP programs. The two reports also allow for an evaluation of where data gaps exist and where efforts should be targeted.

Utilizing the BLTEA rating methods for future data evaluations would also allow for long-term BMP effectiveness assessment. Incorporation of additional useable data from other third party sources such as POTWs and non-profit organizations would also help to increase the confidence of the BLTEA ratings and overall WMA assessments.

Recommendations for this watershed are to continue monitoring to gather long-term trend information and to investigate the potential role of physical habitat disturbance.