MONITORING PROGRAM OBJECTIVES

The major objectives of the Monitoring Program outlined in the Municipal Storm Water Permit are to:

- Assess compliance with the Los Angeles County Municipal Storm Water Permit No. CAS004001;
- Measure and improve the effectiveness of the Stormwater Quality Management Plans (SQMPs);
- Assess the chemical, physical, and biological impacts of receiving waters resulting from urban runoff;
- Characterize storm water discharges;
- Identify sources of pollutants; and
- Assess the overall health and evaluate long-term trends in receiving water quality.

The Monitoring Program, developed to address these objectives, has several elements: core monitoring, which includes mass emission monitoring, water column toxicity monitoring, tributary monitoring, shoreline monitoring, and trash monitoring; regional monitoring, which includes estuary sampling and bioassessment; and three special studies, which include the new development impacts study in the Santa Clara watershed, the peak discharge impact study, and the Best Management Practice (BMP) effectiveness study.

SUMMARY OF MONITORING RESULTS

CORE MONITORING

Mass Emission Monitoring

The purpose of mass emission monitoring is to estimate the mass emissions from the Municipal Separate Storm Sewer System (MS4), assess trends in the mass emissions over time, and determine if the MS4 is contributing to exceedances of water quality standards by comparing results to applicable standards in the Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan), the California Ocean Plan (Ocean Plan), or the California Toxics Rule (CTR), and with emissions from other discharges.

During the 2002-2003 monitoring season, flows were measured and water quality samples were taken at the following seven mass emission monitoring sites: Ballona Creek, Malibu Creek, Los Angeles River, Coyote Creek, San Gabriel River, Dominguez Channel, and Santa Clara River. All mass emission sites, except the Santa Clara River site, are equipped with automated samplers with integral flow meters for collecting flow-composite samples. Four storm events and two dry weather events were sampled at each mass emission site. Total Suspended Solids (TSS) were

collected from five storm events at the Santa Clara mass emission site, six storm events at Malibu Creek, San Gabriel River, and Dominguez Channel mass emission sites, seven storm events at Ballona Creek and Coyote Creek mass emission sites, and from eight storm events at the Los Angeles River mass emission site.

Based on results of the mass emission monitoring, three different water quality analyses, i.e., a comparison to appropriate water quality standards, an analysis of pollutant loadings and trends, and an evaluation of the correlation between metals/polycyclic aromatic hydrocarbons (PAHs) and total suspended solids (TSSs), were conducted.

Summaries of the analyses are as follows:

Comparison Study

A comparison of the monitoring results to the applicable water quality standards in the Basin Plan, the Ocean Plan, or the CTR was conducted. The lowest possible standard of the three documents was used for the comparison study. The California Department of Fish and Game provided fresh water final acute criteria water quality standards for chlorpyrifos and diazinon. The Basin Plan is designed to enhance water quality and protect the beneficial uses of all regional waters. The Ocean Plan is applicable to point source discharges to the ocean. The CTR promulgates criteria for priority toxic pollutants in the State of California for inland surface waters and enclosed bays and estuaries.

The following conclusions were drawn from the mass emission comparison study:

Wet Weather

- The monitoring program has identified the nearly ubiquitous existence of bacteria in wet weather for all seven of the mass emission monitoring stations. Densities of total coliform, fecal coliform, and fecal enterococcus exceeded the public health criteria of the Basin Plan for each storm at each monitoring station 100% of the time, with the exception of Malibu Creek, which only exceeded the total coliform objective half of the time. As during the 2001-2002 storm season, the Malibu Creek station shows generally lower indicator bacteria counts than the other mass emission stations.
- The ratio of fecal coliform to total coliform Basin Plan standard was exceeded 75% of the time in all watersheds, except in Ballona Creek and Dominguez Channel where it was exceeded 100% of the time.
- For all monitoring stations, there was no clear trend between bacteria densities and storm events. However, Ballona Creek, Malibu Creek, San Gabriel River, Dominguez Channel, and Santa Clara River monitoring stations each had the highest total coliform density during the March 15, 2003 storm.
- For all monitoring stations except Malibu Creek, 50-100% of the total copper samples exceeded the Ocean Plan water quality standard.
- Coyote Creek, San Gabriel River, and Santa Clara River exceeded the California Department of Fish and Game's water quality criteria for diazinon 50% of the time.

- 50% of the dissolved copper samples taken at the Los Angeles River and Coyote Creek monitoring stations and 100% of the dissolved copper samples taken at the Dominguez Channel monitoring station exceeded the CTR water quality standard.
- 50% of the dissolved lead samples collected at the Dominguez Channel monitoring station exceeded the CTR water quality standard. This is the only monitoring station that showed exceedances.
- San Gabriel River exceeded the cyanide Ocean Plan water quality standard in 75% of the samples. Ballona Creek, Los Angeles River, Coyote Creek, and Santa Clara River exceeded the standard in 50% of the samples.
- 75% of the total zinc samples from the Dominguez Channel monitoring station exceeded the Ocean Plan water quality standard. All the other stations except Ballona Creek had exceedances in 25% of the samples. Dominguez Channel also exceeded the CTR water quality standard for dissolved zinc in 50% samples.
- Sulfate and TDS were each exceeded in 50% of the samples at the Malibu Creek monitoring station. No other monitoring stations had any exceedances for these constituents.
- The Ocean Plan water quality standard for turbidity was exceeded in 50% of the samples at the San Gabriel River monitoring station.
- 50% of the total aluminum samples at the Santa Clara River monitoring station exceeded the Basin Plan water quality standard.
- Nitrite-N exceeded the Basin Plan water quality standard in 50% of the samples at the Coyote Creek monitoring station.

Dry Weather

Since the Municipal Storm Water Permit requires only two dry weather samples at each mass emission monitoring station, a 50% exceedance indicates that only one sample exceeded the water quality standard and a 100% exceedance indicates that both samples exceeded the water quality standard.

- There were no exceedances for any of the dissolved metals or diazinon during dry weather.
- Overall, there were a smaller percentage of exceedances for total coliform, fecal coliform, and fecal enterococcus during dry weather at all seven of the monitoring stations. Also, for most of the dry weather samples, the coliform densities were significantly lower than the densities for the wet weather samples. The total coliform criteria set in the Basin Plan was exceeded in 100% of the samples at the San Gabriel River and Dominguez Channel monitoring stations and in 50% of the samples at the Malibu Creek and Los Angeles River monitoring stations. No other monitoring station exceeded the total coliform criteria. The fecal coliform criteria was exceeded in 50% of the samples for all of the monitoring stations except San Gabriel River which exceeded the criteria in 100% of the samples. Fecal enterococcus criteria was exceeded in 100% of the samples at the Los Angeles River, Coyote Creek, and Dominguez Channel monitoring stations and in 50% of the samples at the other four monitoring stations.

- The ratio of fecal coliform to total coliform Basin Plan standard was exceeded in 50% of the samples at all of the monitoring stations except at Los Angeles River and Dominguez Channel, which had no exceedances.
- Unlike the wet weather samples, the Basin Plan water quality criteria for chloride was exceeded at three of the mass emission stations during dry weather. San Gabriel River and Dominguez Channel exceeded in 50% of the samples and Santa Clara River exceeded in 100% of the samples.
- 50% of the total copper samples exceeded the Ocean Plan water quality standard at the Ballona Creek, Malibu Creek, Los Angeles River, and Dominguez Channel monitoring stations. The San Gabriel River exceeded the standard in 100% of the samples.
- Ballona Creek, Malibu Creek, Los Angeles River, and Dominguez Channel were not within the pH water quality standard limits for 50% of the samples and Coyote Creek was not within the pH water quality standard limits for 100% of the samples. All of samples not within the pH limits showed high alkalinity. During wet weather, only 25% of the pH samples showed exceedances at Ballona Creek and Los Angeles River monitoring stations.
- The Ocean Plan water quality standard for total zinc was exceeded in 50% of the samples at the Malibu Creek, Los Angeles River, Coyote Creek, and Dominguez Channel monitoring stations.
- 100% of the total nickel samples exceeded the Ocean Plan water quality standard at the San Gabriel River monitoring station. 50% of the total nickel samples exceeded the standard at Ballona Creek, Los Angeles River, and Santa Clara River monitoring stations.
- Los Angeles River, Coyote Creek, and San Gabriel River exceeded the Ocean Plan water quality standard for cyanide in 50% of the samples.
- 50% of the dissolved oxygen samples at the Santa Clara River monitoring station were below the minimum water quality objective in the Basin Plan.
- Malibu Creek exceeded the Basin Plan water quality objective for sulfate in 50% of the samples.

Loading and Trend Analysis

An estimation was made of the total pollutant loads due to storm water and urban runoff for each mass emission station. An analysis of trends in storm water or receiving water quality was also conducted.

The following conclusions were deduced from the loading analysis:

- The total runoff volume at the Los Angeles River monitoring station was consistently higher than at the other monitoring stations. Los Angeles River also has approximately two times or more surface runoff area than the other watersheds. This creates more potential for surface runoff pollution and likely explains, in part, the increased loading of constituents at the Los Angeles

River monitoring station when compared to the other monitoring stations.

- The storm on March 15, 2003 at the Ballona Creek, Malibu Creek, and Los Angeles River monitoring stations produced TSS loadings of 9,619 tons, 5,236 tons, and 53,027 tons, respectively. Ballona Creek and Los Angeles River also produced loadings of 6,395 tons and 12,181 tons, respectively, during the February 11, 2003 storm. The loading during all other storm events at all the monitoring stations was below 4,000 tons.
- The Los Angeles River is the largest contributor of TSSs out of the seven mass emission stations monitored.

- San Gabriel River, Dominguez Channel, and Santa Clara River had generally lower TSS and metals loadings than the other monitoring sites.
- The February 11, 2003 storm produced the highest TDSs loadings at the Malibu Creek, Coyote Creek, Dominguez Channel, and Santa Clara River monitoring stations. The storm on December 16, 2002 produced the lowest TDS loading at all stations.
- Metal loading was the greatest for the Los Angeles River.
- Total and dissolved zinc appear to have the greatest loading during the February 11, 2003 storm at all of the monitoring stations except San Gabriel River.

The following conclusions were drawn from the trend analysis:

- The high levels of zinc found at monitoring stations between 1994-2000 were not present in the samples taken during the 2001-2002 storm season. During the 2002-2003 storm season the high levels of zinc were not present again, except for several exceedances at the Dominguez Channel monitoring station.
- The rainfall during the 2002-2003 storm season was only 0.06 inches below the annual rainfall average. However, it was about three times higher than amount of rainfall recorded during the 2001-2002 storm season. This may explain, in part, the increased loading as compared to the 2001-2002 storm season.

Correlation Study

An analysis of the correlation between metals/PAHs and TSS levels was performed. The study focused on metals because the PAH samples at all of the mass emission monitoring stations were non-detects.

A trend line was projected on each of the metals-versus-TSS plots and the coefficient of determination (R^2) was calculated to see if there was any correlation between the concentrations for each metal and TSSs. The closer the value of R^2 is to the number one, the stronger the correlation of the two variables.

The following conclusions were deduced from the correlation study analysis:

- Unlike other watersheds, the Malibu Creek and San Gabriel River watersheds showed no strong correlation between metals and TSSs, except for dissolved arsenic and in the case of Malibu, dissolved zinc. Besides the R^2 values for dissolved arsenic and dissolved zinc, all of Malibu Creek's and San Gabriel River's R^2 values were below 0.3852 and below 0.5823, respectively.
- There were no strong correlations from any of the watersheds for the following constituents: total arsenic, total chromium, dissolved lead, and total nickel.
- Excluding Malibu Creek and San Gabriel River, all of the monitoring sites showed a strong correlation between total copper and TSSs, with R^2 values ranging from 0.4445 to 0.9856 (most of them closer to the upper range).
- Three of the mass emission monitoring sites, Ballona Creek, Coyote Creek, and Dominguez Channel, showed a correlation between total aluminum and TSSs, with R^2 values of 0.9158, 0.8199, and 0.8294, respectively.
- Five of the mass emission stations showed a strong correlation between dissolved antimony and TSSs. Ballona Creek and Los Angeles River showed a negative correlation, with R^2 values of 0.5347 and 0.799, respectively. Coyote Creek, Dominguez Channel, and Santa Clara River showed positive correlations, with R^2 values of 0.8151, 0.9777, and 0.7409, respectively.

Water Column Toxicity Monitoring

The purpose of water column toxicity monitoring is to evaluate the extent and causes of toxicity in receiving waters and to modify and utilize the SQMP to implement practices that eliminate or reduce sources of toxicity in storm water.

Composite samples were taken at all mass emission monitoring stations. In total, four samples were analyzed for toxicity at each site. Dry weather samples were collected on October 9, 2002, and April 23, 2003. Wet weather samples were collected during the first rain event of the season on November 8, 2002, and also on December 12, 2002.

A minimum of one freshwater and one marine species was used for toxicity testing, specifically Ceriodaphnia dubia (water flea) 7-day survival/reproduction and Strongylocentrotus purpuratus (sea urchin) fertilization. The sea urchin fertilization test could not be performed on the October 9, 2002 wet weather sample because the purple sea urchin did not spawn due to seasonal variability.

Results calculated from the Ceriodaphnia dubia and sea urchin tests included the No Observed Effect Concentration (NOEC), 50% Lethal Concentration (LC50), 50% Inhibitory Concentration (IC50), and toxicity unit (TU). NOEC is the highest concentration causing no effect on the test organisms. LC50 is the concentration that produces a 50% reduction in survival. IC50 is the concentration causing 50% inhibition in growth or reproduction. TU is defined in the permit as 100/(LC50 or IC50). A TU value greater than or equal to one is considered substantially toxic and requires a toxicity identification evaluation (TIE).
The following conclusions were deduced from water column toxicity testing:

- Ceriodaphnia dubia survival was only significantly affected by exposure to the wet weather samples collected from the Coyote Creek and Dominguez Channel mass emission stations on November 8, 2002. These samples from Coyote Creek and the Dominguez Channel had a TU value equal to 4.40 and 1.33, respectively. In accordance with the Permit, a TIE was performed on these samples. The TIE for the sample collected from Coyote Creek found that the toxicity was due to one or more non-polar organic compounds as well as metabolically-activated organophosphates. The TIE for the sample collected from the Dominguez Channel found that the toxicity was due to one or more non-polar organic compounds and cationic metals as well as metabolically-activated organophosphates. The remaining samples were not substantially toxic to Ceriodaphnia dubia survival.
- Ceriodaphnia dubia reproduction was only significantly affected by exposure to the wet weather samples collected from the Coyote Creek and Dominguez Channel mass emission stations on November 8, 2002. These samples from Coyote Creek and the Dominguez Channel had a TU value equal to 3.65 and 1.33, respectively. In accordance with the Permit, a TIE was performed on these samples. The TIE for the sample collected from Coyote Creek found that the toxicity was due to one or more non-polar organic compounds as well as metabolically-activated organophosphates. The TIE for the sample collected from the Dominguez Channel found that the toxicity was due to one or more non-polar organic compounds and cationic metals as well as metabolically-activated organophosphates. The remaining samples were not substantially toxic to Ceriodaphnia dubia reproduction.
- Sea urchin fertilization was only significantly affected by exposure to the wet weather samples collected from the Coyote Creek and Ballona Creek mass emission stations on November 8, 2002. These samples from Coyote Creek and Ballona Creek had TU values equal to 1.16 and 1.45, respectively. In accordance with the Permit, a TIE was performed on these samples. The TIE for the sample collected from Coyote Creek found that the toxicity was due to one or more non-polar organic compounds and cationic metals as well as metabolically-activated organophosphates. The TIE for the sample collected from Ballona Creek found that the toxicity was due to particulate-bound toxicants, one or more non-polar organic compounds and cationic metals. The remaining samples were not substantially toxic to sea urchin fertilization.

Tributary Monitoring

The purpose of tributary monitoring is to identify sub-watersheds where storm water discharges are causing or contributing to exceedances of water quality standards, and to prioritize drainage and sub-drainage areas that need management actions.

Sampling for the 2002-2003 season was conducted at six tributary monitoring stations in the Los Angeles River Watershed. The tributaries monitored included Aliso Creek, Bull Creek, Burbank Western System Channel, Verdugo Wash, Arroyo Seco Channel, and Rio Hondo Channel. Five storm events and one dry event were sampled at each tributary monitoring site.

In order to identify the sub-watersheds where storm water discharges are causing or contributing to exceedances of water quality standards, a comparison was made between tributary water quality results and the water quality objectives outlined in the Ocean Plan, the Basin Plan, and the CTR. The freshwater final acute criteria set by the California Department of Fish and Game

was also used to provide water quality standards for chlorpyrifos and diazinon. Since the tributary monitoring stations collect samples from sub-watersheds within the Los Angeles River watershed, the results from the Los Angeles River mass emission station were also used in the analysis. It was not possible to accurately identify any problems based on the dry weather results since only one sample was taken at each tributary monitoring station, as required by the Municipal Storm Water Permit.

The following conclusions were drawn from the wet weather tributary comparison study:

- As with the mass emission monitoring program, the tributary monitoring program identified the nearly ubiquitous existence of bacteria during wet weather at all six stations. Densities of total coliform, fecal coliform, and fecal enterococcus exceeded the public health criteria of the Basin Plan for each storm at each monitoring station 100% of the time. This corresponds to the results obtained from the Los Angeles River mass emission station.
- The ratio of fecal coliform to total coliform Basin Plan water quality standard was exceeded 80-100% of the time in all sub-watersheds, except Bull Creek which only exceeded in 40% of the samples.
- Bull Creek and Verdugo Wash exceeded the Ocean Plan water quality standard for turbidity in 80% of the samples. Rio Hondo exceeded the turbidity standard in 40% of the samples.
- Diazinon criteria was exceeded at each tributary monitoring station. 60% of the samples were exceeded at Aliso Creek monitoring station, 40% of the samples were exceeded at Arroyo Seco Channel and Rio Hondo Channel monitoring stations, and 20% of the samples were exceeded at Bull Creek, Burbank Western Channel, and Verdugo Wash monitoring stations. Los Angeles River only exceeded the diazinon criteria in 25% of the samples.
- 60% of the samples at the Verdugo Wash monitoring station exceeded the Basin Plan water quality standard for total aluminum. There were no exceedances at Los Angeles River monitoring station.
- Total Copper exceeded the Ocean Plan water quality standard in more than 60% of the samples at all of the tributary stations except Bull Creek, which exceeded the standard in 20% of the samples.
- Total Zinc exceed the Ocean Plan water quality standard in 40-60% of the samples at Burbank Western Channel, Verdugo Wash, Arroyo Seco Channel, and Rio Hondo Channel.
- 80%, 50%, and 40% of the total lead samples exceeded the Ocean Plan water quality standard at Verdugo Wash, Arroyo Seco Channel, and Burbank Western Channel, respectively.
- Rio Hondo Channel exceeded the CTR water quality standard for dissolved copper in 100% of the samples. Burbank Western Channel exceeded in 80% of the samples, Aliso Creek exceeded in 50% of the samples, and Arroyo Seco Channel exceeded in 25% of the

samples. The other tributary monitoring stations exceeded the standard in 20% of the samples.

- 40% of the samples at Burbank Western System and Rio Hondo Channel exceeded the Ocean Plan water quality standard for cyanide.
- Though there were no dissolved oxygen or nitrite-N exceedances at Los Angeles River monitoring station, 20% of the samples at Burbank Western Channel and Arroyo Seco Channel exceeded the Basin Plan criteria for each constituent.
- Burbank Western Channel and Verdugo Wash exceeded the CTR water quality standard for dissolved lead in 40% of the samples and Rio Hondo Channel exceeded in 20% of the samples. There were no exceedances at the Los Angeles River monitoring station.

Shoreline Monitoring

The City of Los Angeles is required to monitor shoreline stations to evaluate the impacts to coastal receiving waters and the loss of recreational beneficial uses resulting from storm water/urban runoff. Also, the Municipal Storm Water Permit requires the City of Los Angeles to annually assess shoreline water quality data and submit it to the Principal Permittee for inclusion in the monitoring report. Therefore, the City of Los Angeles' assessment is included in Appendix D of this monitoring report.

Trash Monitoring

The objectives of trash monitoring are to assess the quantities of trash in receiving waters after storm events and to identify areas impaired for trash. Visual observations of trash were made and a minimum of one photograph at each mass emission station was taken after four storm events including the first storm event.

In addition, a minimum of ten representative sites for each land use monitored were sampled. On average, each sampling site contained a minimum of five catch basins fitted with inserts with a total of 256 inserts within the Los Angeles Watershed Management Area (WMA) and 309 inserts within the Ballona Creek WMA. Three structural full capture devices were installed downstream of three separate sampling sites within the Ballona Creek WMA. All of the upstream catch basins were fitted with inserts. Each insert and the full capture devices were emptied within 72 hours of every rain event of 0.25 inches or greater.

For each catch basin insert and Continuous Deflective System (CDS) devices, the anthropogenic trash was separated from the sediment and vegetation and weights were recorded per device. The land uses monitored were commercial, high density single family residential, industrial, low density single family residential, and open space/parks. Three CDS units were installed during the 2002-2003 storm season and monitoring of two additional CDS units will commence during the 2003-2004 storm season.

The following conclusions were drawn from the sampling results for anthropogenic trash:

- The amount of trash collected for the first storm event of the season constituted 39.4% of the total trash collected during the entire season for the Los Angeles River and the Ballona Creek watersheds combined.

- In the Los Angeles River watershed, the commercial landuse was the largest contributor of trash during the first storm of the season with 40.5%. The industrial landuse was the second largest contributor with 35.8% of the total trash collected. Open Space/Parks, High Density Single Family Residential, and Low Density Single Family Residential combined to produce 23.7 % of the trash with Low Density Single Family Residential producing only 2.6%.
- In the Ballona Creek watershed, the Low Density Single Family Residential was the largest contributor of trash during the first storm of the season with 32.1%. The remaining landuses combined for the remaining 67.9% with a relatively even distribution of approximately 17% each, on average.
- Based on the total amount of trash collected for the Los Angeles River watershed during the 2002-2003 storm season, the largest contributors by landuse were the industrial and the commercial landuses with 46.4%, and 33.9 %, respectively, for a combined 80.3% of the total trash collected. High Density Single Family Residential and Open Space/Parks contributed 8.6% and 8.8%, respectively. Low Density Single Family Residential produced only 2.3%.
- Based on the total amount of trash collected for the Ballona Creek watershed during the 2002-2003 storm season, the Low Density Single Family Residential and the commercial landuses combined to produce about half of the total trash collected. Low Density Single Family Residential produced 26.0% and the commercial landuse produced 25.1%. Open Space/Parks and industrial produced 17.8% and 16.5%, respectively. High Density Single Family Residential produced the least trash with 14.5% of the total.

REGIONAL MONITORING

Estuary Sampling

The LACDPW is participating in the coastal ecology committee of the Bight 2003 project coordinated by the Southern California Coastal Waters Research Project (SCCWRP). The two primary objectives of Bight '03 are to estimate the extent and magnitude of ecological change in the Southern California Bight (SCB) and to determine the mass balance of pollutants that currently reside within the SCB. The goal of the estuary monitoring program is to sample estuaries for sediment chemistry, sediment toxicity, and benthic macroinvertebrate diversity to determine the spatial extent of sediment fate from storm water, and the magnitudes of its effects. In Los Angeles County, the estuaries being sampled are those of: Malibu Creek, Ballona Creek, Los Angeles River, San Gabriel River, and Dominguez Channel.

Since the beginning of 2003, LACDPW staff has been involved in the design of the sampling program through regular attendance of the Bight '03 Coastline Ecology Committee meetings. To date, SCCWRP and the Committee have developed a work plan, which includes the following schedule:

- Collect samples by September 2003
- Submit data by September 2004

- Submit reports to SCCWRP by September 2006
- SCCWRP to complete executive summary no later than December 2006

Bioassessment

The LACDPW must perform annual bioassessments on streams in Los Angeles County beginning in October 2003. On May 22, 2003, a list of 20 stream sampling sites was approved by the Los Angeles Regional Water Quality Control Board (RWQCB). The sampling sites are located in each of the six major watersheds throughout Los Angeles County.

SPECIAL STUDIES

New Development Impacts Study in the Santa Clara Watershed

The objective of the New Development Impacts Study in the Santa Clara watershed is to evaluate the effectiveness of the Standard Urban Storm Water Mitigation Plan (SUSMP) Best Management Practices at reducing pollutants in storm water runoff. This evaluation will be accomplished by comparing the water quality of runoff from a new development constructed in accordance with SUSMP requirements to a development similar in size and land use constructed prior to the adoption of SUSMP requirements.

On August 1, 2002, with the assistance of the City of Santa Clarita, LACDPW submitted a work plan for the study to the Los Angeles RWQCB for approval. Following discussions and revisions to the proposal, the RWQCB accepted a revised work plan on April 10, 2003. Sampling will begin in the 2003-04 storm season, and results will be included in the 2003-2004 storm water monitoring report.

Peak Discharge Impact Study

The goal of this study is to assess the potential cause and effect relationships between stream erosion and urbanization in watersheds in Los Angeles County and to create, if possible, an Index of Biological Indicators with data from surrounding counties. The Southern California Coastal Waters Research Project (SCCWRP) is managing the project on behalf of the County and Flood Control District. A committee comprised of members of the Southern California Stormwater Monitoring Coalition is overseeing progress of the study.

In March, 2003, the contractor developed a set of site-selection criteria in coordination with the Stormwater Monitoring Coalition. As of July 2003, the contractor reported having tentatively selected three out of the ten required test sites. A draft work plan is scheduled for submission to the Stormwater Monitoring Coalition in September 2003. Final report submittal is scheduled for Spring 2004.

BMP Effectiveness Study

The Flood Control District is participating in the Santa Monica Bay Restoration Commission's (SMBRC) "Performance Evaluation of Structural BMPs for Stormwater Pollution Control in the

Santa Monica Bay Watershed" study to fulfill this requirement. The SMBRC's study is in the site selection stage.

Recommendations

New monitoring components conducted during the 2002-2003 monitoring season included tributary monitoring and trash monitoring at mass emission stations. The Santa Clara River mass emission monitoring station was also added to the monitoring program. In addition, all required samples were taken, including dry weather and toxicity samples. Below are some recommendations that were identified based on results from the 2002-2003 monitoring season.

The Municipal Storm Water Permit requires only one dry weather sample to be taken at each tributary monitoring station. Although it was possible to see the various concentrations from each subwatershed, these values may not be entirely reliable due to the inherent variability of many constituents, especially bacteria. LACDPW recommends taking at least two dry weather samples at each tributary station to better characterize the concentrations of each constituent and verify the accuracy of the results of the first sample.

Many of the polychlorinated biphenyls, SOVs, and chlorinated pesticides cannot be compared to the water quality standards because there are no standards listed in the Basin Plan, Ocean Plan, or CTR. However, even if there were water quality standards, all of these constituents were not detected at any of the mass emission or tributary monitoring stations. We recommend sampling for these constituents for one more year. If they are not detected, we recommend to discontinue sampling for these constituents, except during the first storm event of every year.

Some constituents sampled at the tributary stations showed exceedances of water quality standards. The Municipal Storm Water Permit requires the initiation of a focused effort to identify sources of pollutant within that subwatershed when a constituent exceeds a water quality standard in three out of four samples. We recommend looking at the landuse make up of the watersheds and use water quality data collected from the landuse monitoring stations to begin identifying possible trends or correlations based on landuse. We also recommend using water quality data collected by SCCWRP in their landuse studies.

We collected valuable data from the first year of the tributary monitoring in the Los Angeles River Watershed. We believe that one year worth of data is not sufficient as there can be variability from year to year. Based on discussions with staff from the RWQCB, we recommend performing a second year of monitoring in the Los Angeles River Watershed in order to make better use of the data we collect in order to assist us in prioritizing drainage and sub-drainage areas that need management actions.

In order to identify and better understand the source(s) of pollution, mass emission monitoring, toxicity monitoring, trash monitoring, and tributary monitoring will be continued in the future in addition to the regional monitoring and special studies, as required by the Municipal Storm Water Permit.