SURFACE WATER AMBIENT MONITORING PROGRAM
(SWAMP)
FY 2003-04 WORKPLAN

DRAFT*

California Regional Water Quality Control Board, San Diego Region
January, 04

*** some budget allocations still to be finalized**

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1.0 Introduction

Monitoring and assessment of water quality and beneficial uses is essential in order to measure the success of the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) in achieving their mission. Ultimately, the only meaningful measure of the success of the SWRCB and of the RWQCBs is the condition of water quality and beneficial uses. This can be determined only by monitoring and assessment - not by the long-standing practice of counting program activities, i.e., "beans."

More importantly, monitoring and assessment is essential in order for the RWQCBs and the SWRCB to be successful in achieving their mission. Monitoring and assessment of ambient water quality and beneficial uses is necessary in order to:

(a) Identify and characterize water quality and beneficial use problems and threats;
(b) Identify trends in water quality and beneficial uses;
(c) Determine whether water quality standards are met;
(d) Evaluate the uniqueness or pervasiveness of problems;
(e) Evaluate the severity of problems;
(f) Make decisions about which problems and which locations should be prioritized for action; and
(g) Make decisions about what actions should be taken.

The absence of information is not the same as the absence of a problem. Likewise, the availability of more information about a problem in a particular location does not necessarily mean that particular problem is more severe than a problem at another location about which less information is available.

In accordance with Clean Water Act section 305(b), the SWRCB and RWQCBs periodically compile an inventory of the state's major waters and the water quality condition of those waters, using monitoring data and other pertinent information. This inventory is known as the Water Quality Assessment. Waters are categorized as good, intermediate, impaired, or of unknown quality. Impaired waters are categorized in accordance with requirements of various Clean Water Act sections [e.g. 131.11, 303(d), 304(m), 304(s), 304(l), 314, and 319].

The Water Quality Assessment is the foundation upon which the TMDL Program is built. Although considerable funding has been devoted to the TMDL program recently, the Water Quality Assessment Program has long been and continues to be inadequately funded. Clearly, this makes no sense. It is impossible to make sound decisions about whether and where TMDLs are needed, about which TMDLs should be done, and about when various TMDLs should be done, without adequate monitoring and assessment.

There is a great need for more extensive and more thorough monitoring and assessment of the waters of the San Diego region. Monitoring and assessment, for both status and trends, needs to be planned, ongoing, and continuous. Despite its importance, ambient monitoring and assessment do not receive the attention they should and tend to fall through the cracks. This must change. Obtaining adequate funding to conduct a robust Water Quality Assessment Program is now one of the top priorities of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB). SDRWQCB is also evaluating how to assign and structure ambient monitoring and assessment work so as to make the most of available resources. The SWRCB and RWQCBs have received resources to continue the Surface Water Ambient Monitoring Program (SWAMP). Although SWAMP resources (particularly for staff) are not nearly adequate to do what needs to be done, the funding that has been provided is a significant step in the right direction. SDRWQCB intends to use SWAMP resources so as to ensure that monitoring is conducted in each hydrologic unit once in every five-year period. Although all hydrologic units will be monitored, current funding will enable only cursory monitoring and assessment to be done. Particularly since funding is so limited, selecting

locations to be monitored, performing site reconnaissance, and deciding what to monitor for is an important task for staff. Initially, staff intends to prioritize monitoring that is indicative of effects (e.g., toxicity testing, bioassessment, and benthic community analyses) rather than monitoring that simply indicates the presence and amount of a particular pollutant or class of pollutants.

Ambient monitoring is not and does not need to be conducted only by SWRCB / RWQCB staff. Academic and other research groups, dischargers, and other stakeholders all have a role in monitoring and assessment. Although there is certainly a need for more extensive and more thorough monitoring of the region's waters, better coordination of monitoring efforts and better management of information is also needed in order to increase the value, usefulness, accessibility, and use of information obtained from past, ongoing, and future monitoring efforts.

Coordination of monitoring efforts is needed to ensure that appropriate and useful information is acquired, to enable sharing of such information, and to avoid both information gaps and duplicative monitoring. Since monitoring is conducted by various agencies and as part of various programs, communication and cooperation between agencies and programs is necessary in order to coordinate monitoring efforts. A monitoring coordination program will be initiated in July 2004 to identify and evaluate regulatory and non-regulatory monitoring efforts (many of these have already been identified in Table 4) in the San Diego Region and to coordinate the SWAMP monitoring efforts with these programs.

The more accessible information is, the more useful it is, and the more likely it is to be used. Since monitoring information (and other information pertinent to water quality and beneficial uses) is location specific, a geographic information system (GIS) would be an extremely useful tool for managing and retrieving monitoring information and other information pertinent to water quality and beneficial uses. SDRWQCB will pursue development and implementation of a statewide GIS for managing and retrieving such information, as well as the funding to make use of it.

2.0 Monitoring Sites

There are eleven hydrologic units in the San Diego region. SDRWQCB plans to focus SWAMP monitoring efforts on two hydrologic units in each of four fiscal years and three hydrologic units in a fifth fiscal year. This approach will ensure that SWAMP monitoring is conducted in each hydrologic unit in the region over a five-year period. The planned schedule for rotation of SWAMP monitoring among San Diego Region hydrologic units is summarized in Table 1. Depending on the results of monitoring in any given year, it may be appropriate to conduct follow-up monitoring before completion of the five-year cycle. If/when sufficient funding is available in the future, the schedule may be revised to shorten the rotation cycle (e.g., to a three-year period.)

Given the anticipated FY 2003-04 SWAMP funding allocation for the San Diego region (~$260,000), a probability-based, regional approach for selecting monitoring sites does not appear to be feasible. Consequently, for FY 2003-04, SDRWQCB plans a targeted, site-specific approach with "pre-selected" monitoring sites in the San Luis Rey and San Diego Hydrologic Units. If/when sufficient funding is available in the future, a probability-based, regional approach may be used to select some or all-monitoring sites.

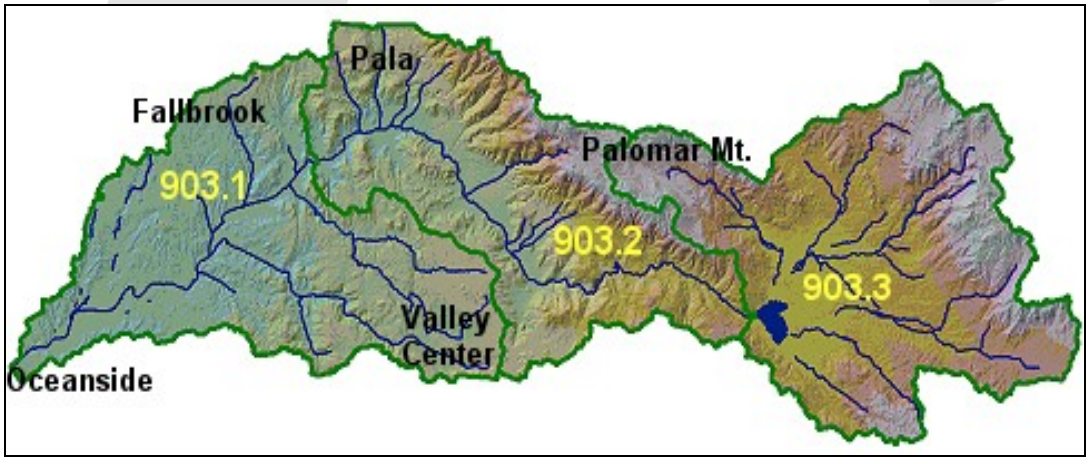
Planned SWAMP monitoring sites in all San Diego region hydrologic units are identified in Table 2. Locations of monitoring sites are subject to revision. The exact locations of monitoring sites will be selected to enable information to be obtained on each of the selected indicators. The number of sites, the frequency of sampling, and/or the suite of analyses to be conducted may increase or decrease, depending on the availability of SWAMP funding. Due to decreasingly predictable flows in many streams, alternate sites have been identified and will be prioritized in order to ensure a full complement of samples is collected throughout the watershed in any given year. The alternate sites

were selected using the same criteria discussed above. Prior to sampling, a detailed reconnaissance will be performed at each selected site. The reconnaissance will include identification of access issues, a habitat assessment, photo-documentation, and mapping of the site. For sites in the Carlsbad and Los Penasquitos Hydrologic Units, the reconnaissance was completed in December 2001. For sites in the San Juan Creek Hydrologic Unit and Otay Hydrologic Units, the reconnaissance was completed in August 30, 2002. Reconnaissance for sites in the Santa Margarita and San Dieguito Hydrologic Units were completed in January 2003. For sites in the San Luis Rey and San Diego Hydrologic Units reconnaissance was completed in April 2003. Tables 2 and 3 have been updated to include available reconnaissance information.

2.1 Watershed Characteristics

2.1.1 San Luis Rey

The San Luis Rey River Watershed is located along the northern border of the County of San Diego, California.. The watershed is bordered to the north by the Santa Margarita River Watershed and to the south by the Carlsbad and San Dieguito River Watersheds. The SLR River originates in the Palomar and Hot Springs Mountains, both over 6,000 feet above mean sea level (MSL), as well as several other mountain ranges along the western border of the Anza Borrego Desert Park. The river ultimately discharges to the Pacific Ocean at the City of Oceanside. The river extends over 55 miles across northern San Diego County forming a watershed with an area of approximately 360,000 acres or 562 square miles. Of the nine watersheds in the San Diego region, the SLR River Watershed is the third largest (SANDAG 1998).



Local jurisdictions occurring within the watershed include the cities of Oceanside, Vista, and Escondido, and the counties of San Diego and Riverside. A number of other governmental agencies also administer lands within the unincorporated areas of San Diego County. Federal government jurisdiction applies to military lands (predominately the Camp Pendleton Marine Corps Base), Forest Service lands (Cleveland National Forest), and miscellaneous Bureau of Land Management holdings. Several Indian reservations also occur within the watershed (La Jolla, Pala, Rincon and San Pasqual) . In addition, the State of California manages lands within the watershed including state parks, state roadways, and some miscellaneous holdings.

The San Luis Rey Hydrologic Unit (903.00) is comprised of the following three hydrologic areas, which have been delineated by the SDRWQCB based on drainage patterns: Lower San Luis (HA 903.1), Monserate (HA 903.2), and Warner Valley (HA 903.3).

Existing land uses in the watershed are described in the table below:

Land Uses	Acres	Percent of Total
Residential	25,270	7.0
Commercial / Industrial	12,321	3.4
Schools	451	0.1
Recreation	2,154	0.6
Freeways / Roads	12,698	3.5
Parks / Open Space	23,011	6.4
Agriculture	85,548	23.4
Vacant / Undeveloped	197,790	55.0
County of Riverside (land use data not available)	649	0.2
Total	**359,893**	

There are numerous land uses within the SLR River Watershed, however, the majority of the watershed has remained undeveloped. Agriculture is the dominant land use in the watershed and the agricultural uses vary from cattle grazing to croplands. In general, the quantity of undeveloped lands and agricultural uses
in the watershed decrease and the residential and commercial uses increase as one moves west through the watershed.

Although the SLR River Watershed is the third largest of the San Diego region watersheds, its population is one of the smallest. The population of the SLR River Watershed was estimated at 141,492 for 1999 and148,201 for 2000. However, the population is expected to increase approximately 45% by 2020, which is the third largest percent increase of the San Diego County watersheds. This growth is expected to occur mostly within vacant land in the unincorporated areas of the watershed, however, the City of Oceanside will also contribute significantly to the growth. Within the unincorporated areas of the watershed, the communities of Fallbrook and Valley Center are anticipated to produce the greatest population increases (SLR Watershed Council 2002).

Existing beneficial uses for the San Luis Rey Watershed include MUN, AGR, IND, FRSH, POW, REC1, REC2, WARM, COLD, WILD, and RARE.[1]

2.1.2 San Diego River

With a land area of approximately 440 square miles, the San Diego River watershed is the second largest hydrologic unit (HU) in San Diego County. It also has the highest population (~475,000) of the County's watersheds and contains portions of the cities of San Diego, El Cajon, La Mesa, Poway, and Santee and several unincorporated jurisdictions. Important hydrologic resources in the watershed include five water storage reservoirs, a large groundwater aquifer, extensive riparian habitat, coastal wetlands, and tide pools. Approximately 58.4% of the San Diego River watershed is currently undeveloped. The majority of this undeveloped land is in the upper, eastern portion of the watershed, while the lower reaches are more highly urbanized with residential (14.9%), freeways and roads (5.5%), and commercial/ industrial (4.2%) land uses predominating.

The five reservoirs in the San Diego River watershed supply water to as many as 760,000 residents in the region.

The mouth of the river discharges into the Pacific Ocean at the community of Ocean Beach. Beach postings and closures from elevated levels of coliform bacteria more than doubled between 1996 and

1999 due to urban runoff and sewage spills. Discharge from the San Diego River outlet may also influence water quality in other nearby coastal areas including Sunset Cliffs, Pacific Beach, and Mission Beach. The extensive groundwater resources beneath the San Diego River provide a cost effective and reliable water supply to four local water districts and the City of San Diego. Excessive extraction, increasing total dissolved solids, and MTBE contamination now threatens this resource.

The major features of the watershed are outlined below:

- Major Water Bodies: San Diego River, Boulder Creek, Santee Lakes, 5 Drinking Water Reservoirs (Cuyamaca, El Capitan, Lake Jennings, San Vicente, Lake Murray)
- Major Creeks: Forester, Los Coches, Alvarado, San Vicente, Boulder, King, Conejos, Sand
- CWA 303(d) List: Pacific Ocean at San Diego River mouth: coliform bacteria
- Major Impacts: Surface water quality degradation, habitat degradation and loss, sediment, invasive species, eutrophication, and flooding
- Constituents of Concern: Coliform bacteria, TDS, nutrients, petroleum chemicals, toxics, and trash
- Sources / Activities: Urban runoff, agricultural runoff, mining operations, sewage spills, and sand mining
- Mission Valley flood plain has been extensively developed
- Altered course of river (lower SD river w of I-5 straightened by Corps. Of Engineers, once drained to false bay complex now known as Mission Bay) currently drains to Pacific Ocean at Dog Beach)
- Famosa Slough (last remaining extent of false bay estuary complex)

The political boundaries of the watershed are outlined below:

- Cities - City of San Diego, ½ La Mesa, Santee, El Cajon
- Unincorporated Areas – Lakeside, S. Ramona, San Diego Country Estates, Julian, NW Alpine

The major aquifers in the watershed are outlined below:

- Mission Valley (source for Sierra Springs – deep bedrock > 1000 ft)
- Lakeside (source for several water districts and Sparkletts)
- Julian Schist (sole source for Julian)

The beneficial uses of the watershed are listed in the table below.

Beneficial Uses	**Inland Surface Water**	**Coastal Waters**	**Reservoirs and Lakes**	**Ground Water**
Municipal and Domestic Supply	**X**		**X**	**X**
Agricultural Supply	**X**			**X**
Industrial Service Supply	**X**	**X**	**X**	**X**
Industrial Process Supply	**X**		**X**	**X**
Navigation		**X**		
Contact Water Recreation	**X**	**X**	**X**	
Non-Contact Water Recreation	**X**	**X**	**X**	
Commercial and Sport Fishing		**X**		
Warm Freshwater Habitat	**X**		**X**	
Cold Freshwater Habitat	**X**		**X**	
Estuarine Habitat		**X**		
Wildlife Habitat	**X**	**X**	**X**	
Biological Habitats		**X**		
Rare, Threatened, or End.		**X**	**X**	
Marine Habitat		**X**		
Migration of Aquatic		**X**		

Organisms				
Aquaculture		**X**		
Shellfish Harvesting		**X**		
Spawning, Reprod. and/ or Early Develop.		**X**		
Hydropower Generation			**X**	

There are several major wildlife habitats in the watershed. Mission Valley Wildlife Preserve, Mission Trails Regional Park, and the river flood plain near Lakeside represent important undeveloped areas that host a wide variety of intact habitats and endangered species like the arroyo toad, least bell's vireo, and the southwestern pond turtle. In addition, Famosa Slough, near the mouth of the San Diego River contains extremely productive wetlands habitat. Other areas include Lakeside Cuyamaca Reservoir, Famosa Slough, reservoirs and lakes, SD River tributaries (Alvarado, San Vicente, Boulder, etc.)

Sensitive Species in the watershed include the following:

- Animals – arroyo toad, least bell's vireo, southwestern pond turtle, homeless
- Plant communities – coastal sage scrub, vernal pool complexes, salt marsh

3.0 Objectives

SWAMP monitoring in the San Diego region is intended to provide reliable, high quality information necessary to produce water quality assessment [305(b)] and impaired waters [303(d)] lists that are more comprehensive and more defensible than those of past years. At this time, the primary objectives for SWAMP monitoring in the San Diego region are those identified as numbers 9, 10, and 11 in the "Site Specific Monitoring" section of the SWRCB Report to the Legislature (See table).

Number	Primary Objectives for SWAMP Monitoring
9	At sites influenced by point sources (e.g., storm drains, publicly owned treatment works, etc.) or nonpoint sources of pollutants, identify specific locations of degraded water or sediments in rivers, lakes, near shore waters, enclosed bays, or estuaries using several critical threshold values of toxicity, water column or epibenthic community analysis, habitat condition, and chemical concentration.
10	At sites influenced by point sources (e.g., storm drains, publicly owned treatment works, etc.) or nonpoint sources of pollutants, identify specific locations of degraded sediment in rivers, lakes, near shore waters, enclosed bays, or estuaries using several critical threshold values of toxicity, water column or epibenthic community analysis, habitat condition, and chemical concentration.
11	Identify the areal extent of degraded sediment locations in rivers, lakes, near shore waters, enclosed bays, and estuaries using several critical threshold values of toxicity, benthic community analysis, habitat condition, and chemical concentration.

These objectives are related to the question of whether aquatic populations, communities, and habitats are protected. There are a number of other questions and objectives pertinent to other beneficial uses of surface waters in the San Diego region. Those questions are being, will be, or should be addressed by other entities and/or other monitoring programs and/or may be included in the SDRWQCB objectives for SWAMP monitoring in the future if/when additional SWAMP funding is available.

3.1. General Study Design

3.1.1. Overview of General Approach

Given the anticipated funding constraints mentioned above, SDRWQCB staff plans to focus SWAMP monitoring efforts on main stem rivers and streams and major tributaries within the various hydrologic units. If/when additional funding is available in the future, SDRWQCB staff plans to expand SWAMP monitoring efforts to include estuaries, coastal lagoons, bays, harbors, ocean waters, and other waters of the region.

In general, SDRWQCB plans to locate monitoring sites on:
a. Main stem rivers and streams, just above tidal influence;
b. Main stem rivers and streams just above the confluence with major tributaries, and
c. Major tributaries just above the confluence with the main stem rivers and streams.

For various reasons, locations of certain stations may not fit these general rules. The site reconnaissance, which provides assessment beyond the reach scale, will provide the necessary information to support site selection or identify alternate sites that better support the primary objectives discussed above.

All San Diego region SWAMP sampling and analyses will be performed under the SWRCB statewide master contract with the Department of Fish and Game. This arrangement will make use of the monitoring expertise of the Department of Fish and Game and avoid the need for SDRWQB staff to manage a region-specific contract. SDRWQCB staff will conduct site reconnaissance as indicated in Tables 1, 2, and 3.

Stream flow conditions in the San Diego region vary substantially seasonally (and from year to year). The four planned sampling periods are intended to cover different stream flow conditions, i.e.,

February – between storm events
April – high base flow rates
May / June – declining base flow rates (and bioassessment index period)
September / October – minimum base flow rates (and bioassessment index period)

There are no surface water flows in some San Diego region streams at certain times of the year. Streams with varying flow regimes drain the Santa Margarita and San Dieguito watersheds. In these watersheds, monitoring efforts will be tiered with an emphasis on Winter (February) and Spring (April) monitoring with fully integrated monitoring limited to selected streams and rivers. As discussed above in Section 1.0, partnerships with other agencies, non-governmental organizations, and Tribal Nations will be sought in January 2003 to expand the planned monitoring in these watersheds.

3.1.2. Water Quality Indicators

In general, SDRWQCB staff plans to use the same suite of indicators at all monitoring sites in the first years of SWAMP. SDRWQCB staff plans to transition to a tiered approach in which SWAMP monitoring at sites lower in a watershed emphasizes integrative measures/indicators and some sites are monitored for only a subset of parameters

In order accomplish the SWAMP monitoring objectives identified above, SDRWQCB plans to use the indicators (described in the SWRCB Report to the Legislature) listed in the table below. This table also shows the link between the monitoring objectives, indicators and beneficial uses. These indicators will be used in all waterbodies sampled in the Santa Margarita and San Dieguito Hydrologic Units.

Additional indicators may be used if/when additional SWAMP funding is available.

LIST OF INDICATORS FOR SWAMP MONITORING

Beneficial Use	Monitoring Objectives[1]	Category	Indicator
Fish and Shellfish Contamination	9 & 10	Contaminant exposure	Fish tissue chemistry Shellfish tissue chemistry Coliform bacteria in shellfish Fecal coliform bacteria in water
Aquatic Life	9, 10 & 11	Biological response	Sediment toxicity Water toxicity
		Pollutant exposure	Shellfish or fish tissue chemistry Nutrients Inorganic and organic water chemistry
		Habitat	Sediment grain size and gradations Hydrogen sulfide (sediment) Ammonia (water)

[1] The number refers to the monitoring objective discussed previously under Section 3.0

4.0 Activities Planned for FY 2003-04

4.1. List of Water Bodies to be Sampled in FY 2003-04

Water bodies in the San Diego region where SWAMP monitoring is planned in FY 2003-04 are identified in Table 3.

4.2. Review of Available Information

SDRWQCB recognizes the need to make better use of information produced by monitoring efforts other than SWAMP and to coordinate and integrate SWAMP monitoring with other monitoring efforts. These non-SWAMP monitoring efforts include:

a. Other SWRCB/RWQCB monitoring programs (e.g., State Mussel Watch Program, Toxic Substances Monitoring Program, and Bioasssessment);
b. Monitoring conducted in accordance with SWRCB/SDRWQCB regulatory requirements (e.g., receiving water monitoring required by municipal storm water permits);
c. Monitoring conducted in accordance with regulatory requirements of other agencies; and
d. Monitoring conducted independent of regulatory requirements.

At any given level of combined expenditures on monitoring ambient surface waters, better coordination and integration of SWAMP monitoring with these other monitoring efforts will result in more comprehensive information (with respect to space, time, and parameters) about the condition of waters in the San Diego region

Table 4 summarizes some (but not necessarily all) of the ongoing or recent monitoring (other than SWAMP monitoring) in the San Luis Rey and San Diego hydrologic units (i.e., the two hydrologic units where FY2003-04 SWAMP monitoring will be conducted in the San Diego region).

4.3 Specific Sampling Design / Sample Collection

4.3.1 Site Reconnaissance

Site reconnaissance has been identified as an important tool in effective assessment of ambient water quality monitoring programs. SDRWQCB will conduct sample site reconnaissance that will:

a. Document local watershed characterization and features;
b. Document instream habitat conditions;
c. Document near stream habitat conditions;
d. Measure and characterize flow regime;

e. Identify land ownership and access issues;
f. Establish a California Stream Bioassessment Protocol (CSBP) Reach;
g. Perform a Physical Habitat Assessment;
h. Determine if the site meets reference site criteria for bioassessment;
i. Provide photo-documentation of the site;
j. Record on the ground GPS coordinates for the site;
k. Map the site on both a watershed and reach scale;
l. Identify and prioritize nearby alternate sites for contingency or follow-up monitoring.

For sites in the San Luis Rey and San Diego Hydrologic Units, the reconnaissance was completed in April 2003. Tables 2 and 3 have been updated to include available reconnaissance information.

Field location of sample collection sites
The field crew will collect samples at sites where the latitude and longitude (and GPS coordinates) were previously recorded during reconnaissance of these stations. If a new station is being sampled, the latitude and longitude, as well as GPS coordinates and cross-referenced photographs, will be provided for future reference. Any confusion about locating a site or proceeding to a prioritized alternate site will be resolved in consultation with a SDRWQCB staff member present in the field or via phone contact.

4.3.2. Media types and volumes
The numbers of samples of each media type (water, sediment, benthos, and tissue) to be collected are shown in Table 5.

A sufficient quantity of water, sediment, benthos, or tissue will be collected in order to perform the analyses to be conducted at each station, as well as to allow for archiving of samples for future analysis, as shown in Table 5. Sample collection and subsequent processing and testing will be performed according to the most recent version of the SWAMP QAPP.

Sediment samples will contain at least 90% fines (silt, mud, and/or clay). The field crew will endeavor to collect enough sediment at sediment collection sites to conduct the grain size, hydrogen sulfide, and toxicity testing (*Hyalella sp.*) on the same sample.

4.3.3. Bioassessment
Samples for bioassessment will be collected using bioassessment protocols found in the San Diego Region Ambient Bioassessment Program. These protocols will be in use until SWAMP has established it's own protocols. Samples will be collected two (2) times (in May/June and October) at twelve (12) monitoring sites, as shown in Table 3. Each bioassessment site will be surveyed during reconnaissance to select a length of stream that contains at least three (3) [preferably five (5)] riffle-pool sequences. One (1) BMI sample will be collected along a transect in each of three (3) randomly selected riffles, or if only one riffle is available, along three (3) randomly selected transects. Regional Board staff will conduct all bioassessment sample collection. The California Department of Fish and Game (CDFG) will perform only the analysis of the samples.

The bioassessment samples will have a Quality Assurance/Quality Control (QA/QC) done at a frequency of five percent (5%).

The SDRWQCB has required bioassessment monitoring in several programs that is compatible with the monitoring that will be performed in its SWAMP efforts. This data will be evaluated and may be incorporated in the SWAMP data set.

4.3.4. Conventional Water Chemistry
Samples for conventional water chemistry analyses will be collected four (4) times (February, April, May/June, and September/October) at each monitoring site. The conventional chemistry samples will be collected simultaneously with the "biotic effects" (water toxicity, sediment toxicity, grain size, hydrogen sulfide) samples. This will allow better understanding of the possible causes or nature of any biotic effects observed in the toxicity testing.

4.3.5. Sediment/Water Toxicity Testing (biotic effects)
Samples for "biotic effects" analyses will be collected four (4) times (February, April, May/June, September/October) at eleven (11) monitoring sites, as shown in Table 3. The "biotic effects samples will be collected simultaneously with the conventional chemistry samples at each site.

The "biotic effects" samples will be analyzed for sediment grain size, hydrogen sulfide, and toxicity (*Hyalella sp.*), and freshwater toxicity (*Ceriodaphnia sp.* and, *Selenastrum sp.*). The sample used for freshwater toxicity testing (*Ceriodaphnia sp.* and *Selenastrum sp.*) will be collected near (or within as close a proximity as feasible to) the sediment collection site.

Sediment samples will contain at least 90% fines (silt, mud, and/or clay). The field crew will endeavor to collect enough sediment at sediment collection sites to conduct the grain size, hydrogen sulfide, and toxicity testing (*Hyalella sp.*) on the same sample.

4.3.6. Toxic Substances Monitoring (TSM)
TSM samples will be collected one (1) time (June) at four (4) monitoring sites, as shown in Table 3.

4.4 Laboratory Analysis
Laboratory analyses will be conducted in accordance with standard methods specified in the SWRCB statewide master contract with the Department of Fish and Game. In general, SDRWQCB staff does not anticipate needing special analytical techniques or detection limits. However, detection limits of 0.05µg/L for diazinon and 0.014 µg/l for chlorpyrifos are needed.

Planned laboratory analyses to be performed on samples collected at each planned FY 2002-03 San Diego region SWAMP monitoring site are summarized in Table 3.

4.5 Data Quality Evaluation and Data Reporting
Data quality evaluation and data reporting will be as specified in the SWAMP QAPP. Quality control will include a 5% field duplicate level for all parameters. SDRWQCB staff does not anticipate needing additional special data quality evaluation or data reporting procedures.

4.6 Deliverable Products
Deliverable products will be as specified by Task Order. SDRWQCB does not anticipate needing special deliverable products.

4.7 Significant dates for sample collection and reporting
As indicated previously, stream flow conditions in the San Diego region vary substantially seasonally (and from year to year). The four planned sampling periods are intended to cover different stream flow conditions, i.e.,

February – between storm events
April – high base flow rates
June – declining base flow rates (and bioassessment index period which may require sampling in May)
September / October – minimum base flow rates (and bioassessment index period)

There are no surface water flows in some San Diego region streams at certain times of the year. The selected monitoring sites in the San Luis Rey and San Diego Hydrologic Units are expected to have surface water flows during all of the planned sampling periods. However, the sampling design for watersheds characterized by ephemeral and intermittent streams will emphasize Winter (February) and Spring (April) sampling followed by Summer (May / June) and Fall (September / October) at sites that support perennial flow.

Reconnaissance for the San Luis Rey and San Diego Watersheds has been completed. It is hoped that sampling will begin sometime late in 2004.

4.8 "Sample Throughput Schedule"
The sample throughput schedule will be as specified in the SWRCB statewide master contract with the Department of Fish and Game. Although a short turn-around time is desirable, SDRWQCB staff does not want to reduce sampling frequency, the number of sampling sites, and/or the number of parameters in order to reduce turn-around time. SDRWQCB does not anticipate needing a special sample throughput schedule.

4.9 Budget
The planned FY2003-04 SWAMP budget for the San Diego region is summarized in Table 5. This table has been updated to reflect the revised costs and available resources. It is expected that some funds from FY 2002-03 were not fully expended due to dry conditions. These funds should roll over to the current task order. The final task order will be amended to reflect the final amount of FY 2002-03 funds that roll over.

5.0 Working Relationships
The decision matrix shown in the SWRCB SWAMP Guidance for Site-Specific Monitoring Workplans is appropriate for the SWAMP monitoring to be conducted in the San Diego region. It is reproduced below and describes the general relationships for implementing the regional monitoring portion of SWAMP.

Task	Responsible Organization		
	SWRCB	RWQCBs	Contractors
Develop contract(s) for monitoring services.	●	●	●
Identify water bodies or sites of concern and clean sites to be monitored.		●	
Identify site-specific locations with potential beneficial use impacts or unimpacted conditions that will be monitored.		●	
Decide if concern is related to objectives focused on location or trends of impacts.		●	
Select monitoring objective(s) based on potential beneficial use impact(s) or need to identify baseline conditions.		●	

Task	Responsible Organization		
	SWRCB	RWQCBs	Contractors
Identify already-completed monitoring and research efforts focused on potential problem, monitoring objective, or clean conditions.		●	●
Make decision on adequacy of available information.		●	●
Prepare site-specific study design based on monitoring objectives, the assessment of available information, sampling design, and indicators.	● (Work Plan (Review Role)	●	●
Implement study design. (Collect and analyze samples.)			●
Track study progress. Review quality assurance information and make assessments on data quality. Adapt study as needed.	● (Review Role)	●	●
Report data through SWRCB web site.	●	● (Coordination Role)	●
Prepare written report of data.	●	●	●

6.0 List of Attachments

Table 1 San Diego Region Planned SWAMP Monitoring Rotation Schedule
Table 2 San Diego Region Planned SWAMP Monitoring Sites
Table 3 San Diego Region Planned SWAMP Monitoring FY 2003-04
Table 4 San Diego Region Monitoring (Other Than SWAMP) in San Luis Rey (903) and San Diego (907) Hydrologic Units
Table 5 San Diego Region Planned SWAMP Monitoring Budget FY 2003-04

Note:
Tables 3, 4 and 5 are attached in file "03-04 Tables 3 to 5.xls"

Table 1 – San Diego Region Planned SWAMP Monitoring Rotation Schedule

HU #	HYDROLOGIC UNIT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
		2000-01	2001-02	2002-03	2003-04	2004-05
901	San Juan HU	x	9 sites	x	x	x
902	Santa Margarita HU	x	x	5 sites	x	x
903	San Luis Rey HU	x	x	x	6 sites	x
904	Carlsbad HU	9 sites	x	x	x	x
905	San Dieguito HU	x	x	5 sites	x	x
906	Peñasquitos HU	6 sites	x	x	x	x
907	San Diego HU	x	x	x	9 sites	x
908	Pueblo San Diego HU	x	x	x	x	2 sites
909	Sweetwater HU	x	x	x	x	10 sites
910	Otay HU	x	2 sites	x	x	x
911	Tijuana HU	x	x	x	x	12 sites
	Totals	15	11	10	15	24

Number of sites represents identified sites including alternates.
x = not sampled in that year

Table 2 - San Diego Region SWAMP Monitoring Sites

SWAMP Year 1 (FY 2000-01)	Rain Year Sampled 2001-02
Los Penasquitos Watershed	**(6 Stations)**
Los Penasquitos Creek	1
Tecolote Creek	1
Rose Creek	1
Poway Creek (Alternate)	1
Soledad Canyon Creek	1
Rattlesnake Creek	1
Carlsbad Watershed	**(9 Stations)**
Escondido Creek	2
Loma Alta Creek	1
San Marcos Creek	1
Encinitas Creek	1
Cottonwood Creek	1
Aqua Hedionda Creek	1
Buena Vista Creek	1
Buena Creek	1

Sampling Design: Fully Integrated.
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: None.
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish, Ambient Bioassessment Monitoring Program.

SWAMP Year 2 (FY 2001-02)	Rain Year Sampled 2002-03
San Juan Watershed	**(9 Stations)**
Aliso Creek	1
San Juan Creek	2
Arroyo Trabuco	1
Oso Creek	1
Bell Canyon Creek	1
Laguna Canyon Creek	1
Moro Canyon Creek	1
English Creek	1
Otay Watershed	**(2 Stations)**
Jamul Creek	1
Poggi Canyon Creek	1

Sampling Design: Fully Integrated
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: City of San Diego, County of San Diego, County of Orange, Otay Water District.
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish, Ambient Bioassessment Monitoring Program.

SWAMP Year 3 (FY 02/03)	Rain Year Sampled (03/04)
Santa Margarita Watershed	**(5 Stations)**
Deluz Creek	1
Rainbow Creek	1
Santa Margarita River	2
Sandia Creek	1
San Dieguito River Watershed	**(5 Stations)**
Cloverdale Creek	1
Green Valley Creek	1
Santa Ysabel Creek	2
San Dieguito River	1

Sampling Design: Tiered
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: Santa Margarita River Watershed Monitoring Framework, City of San Diego, County of San Diego, County of Riverside, Mission Resource Conservation District (RCD), San Diego County Water Authority, San Dieguito Municipal Water District, Tribes (?).
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish

SWAMP Year 4 (FY 03/04)	Rain Year Sampled (04/05)
San Luis Rey River Watershed (903)	**(6 Stations)**
Gird Creek	1
Iron Springs Creek	1
Keys Creek	1
Moosa Creek	1
San Luis Rey River	2
San Diego River Watershed (907)	**(9 Stations)**
Alpine Creek	1
Alvarado Creek	1
Boulder Creek	1
Chocolate Creek	1
Forester Creek	1
Los Coches Creek	1
San Diego River	2
San Vicente Creek	1

Stream	Latitude	Longitude	Sampling Periods
San Luis Rey			
Gird Creek (GIR 2)	33°20'07.77713	117°11'18.43239	February, April, May/June, Sep/Oct
Iron Springs (IRN 2)	33°19'59.74	116°52'17.89611	February, April, May/June, Sep/Oct
Keys Creek (KEY 3)	33°17'20.68777	117°04'16.90936	February, April, May/June, Sep/Oct
Moosa Creek (MSA 2)	33°17'08.11281	117°12'31.42008	February, April, May/June, Sep/Oct
San Luis Rey River (SLR 2)	33°15'42.86192	116°48'32.03907	February, April, May/June, Sep/Oct
San Luis Rey (SLR 8)	33°12'53.81476	117°22'06.16224	February, April, May/June, Sep/Oct
San Diego River			
Alpine Creek (ALC 3)	32°50'09.58640	116°47'12.07524	February, April, May/June, Sep/Oct
Alvarado Creek (ALV 3)	32°46'59.13394	117°04'29.19641	February, April, May/June, Sep/Oct
Boulder Creek (BDC 2)	32°57'48.72497	116°39'50.62777	February, April, May/June, Sep/Oct
Chocolate Creek (CHC 2)	32°50'31.19911	116°48'20.51240	February, April, May/June, Sep/Oct
Forester Creek (FRR 2)	32°50'22.03446	117°00'03.86840	February, April, May/June, Sep/Oct
Los Coches (LCO 2)	32°50'56.89282	116°51'32.63751	February, April, May/June, Sep/Oct
San Diego River (SDR 9)	32°45'54.58205	117°10'08.38634	February, April, May/June, Sep/Oct
San Diego River (SDR 10)	32°45'43.14511	117°12'26.21366	February, April, May/June, Sep/Oct
San Vicente Creek (SNC 4)	32°59'36.32811	116°50'59.23917	February, April, May/June, Sep/Oct

Sampling Design: Tiered
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM.
Partners: City of San Diego, Mission RCD, Vista Irrigation District, USFS, and Tribes (?).
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish.

SWAMP Year 5 (04/05)	Rain Year Sampled (05/06)
Tijuana River Watershed	**(12 Stations)**
Cottonwood Creek	2
Tijuana River	2
Pine Creek	1
Scove Creek	1
Troy Creek	1
La Posta Creek	2
Kitchen Creek	1
Campo Creek	1
Potrero Creek	1
Sweetwater Watershed	**(10 Stations)**
Sweetwater River	4
Cold Creek	1
Lawson Creek	1
Harbinson Canyon Creek	1
Taylor Creek	1
Harper Creek	1
Descanso Creek	1
Pueblo Watershed	**(2 Stations)**
Chollas Creek	1
Paradise Creek	1

Sampling Design: Tiered
Major Parameters: Physicochemical, Conventional Water Chemistry (Metals, Nutrients, Pesticides), Bioassessment, Aquatic Toxicity, Sediment Toxicity, TSM, Mussel Watch Parameters.
Partners: City of San Diego, Sweetwater Authority, USFS, and Tribes (?)
NPDES Permit Coverage? Yes
Other Programs: TSMP, Coastal Fish, Mussel Watch.