

Santa Ana River Bacteria Monitoring Program

Project Work Plan

The Santa Ana River (SAR) Bacteria Monitoring Program implements the surveillance and monitoring program required by the recently approved Basin Plan Amendment (BPA) and other bacteria monitoring requirements in the watershed to support the protection of recreational uses. The Santa Watershed Project Authority (SAWPA), which oversees this monitoring program, retained CDM Smith to fulfill the program's implementation requirements. This Project Work Plan briefly describes the project background, project organization and responsibilities, monitoring sites and schedule, data management, and reporting requirements of the SAR Bacteria Monitoring Program. Additional detail is provided in this Program's Monitoring Plan and Quality Assurance Project Plan (QAPP).

1.0 Background

The SAR Bacteria Monitoring Program establishes the requirements for bacteria sampling to support the following objectives:

- Fulfill the monitoring and surveillance requirements for the 2012 adopted BPA to *Revise Recreation Standards for Inland Freshwaters in the Santa Ana Region* (approved by the U.S. Environmental Protection Agency in 2015);
- Conduct sampling to support implementation of the Middle Santa Ana River (MSAR) Bacterial Indicator Total Maximum Daily Load (TMDL) ("MSAR Bacteria TMDL"); and
- Support any additional bacterial indicator monitoring that may be conducted in the watershed to support regional regulatory activities.

To meet these objectives, a Monitoring Plan and QAPP were developed in coordination with watershed stakeholders and submitted to the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) for review and approval on February 5, 2016. After a period of public review, the Santa Ana Water Board approved the SAR Monitoring Program Monitoring Plan and QAPP on March 11, 2016.

2.0 Project/Task Organization

The approved Monitoring Plan identifies a number of agencies responsible for implementation of the SAR Bacteria Monitoring Program under the direction of a Project Director (SAWPA) and the Santa Ana Water Board, which provides oversight of the implementation of the Monitoring Plan and QAPP (see Figure 4-1 in the QAPP). The Responsible Agencies include:

- Agricultural/Dairy Representative
- City of Claremont

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- City of Pomona
- Orange County Public Works
- Riverside County Flood Control and Water Conservation District
- San Bernardino County Flood Control District
- Others, as needed¹

Within each Responsible Agency, five key positions have been identified to fulfill the requirements of the Monitoring Plan: Project Manager, Project Quality Assurance (QA) Officer, Monitoring Manager, Data Manager and Sampling Personnel. While the Project Director and Responsible Agencies are ultimately responsible for collection of water quality data and preparation of annual reports to fulfill the requirements of the SAR Bacteria Monitoring Program, the Monitoring Plan and QAPP provide for the use of contractors to fulfill some or all of these responsibilities. Accordingly, SAWPA retained CDM Smith and its partner firm CWE, to fulfill some of the specific roles and responsibilities as described in the Monitoring Plan and QAPP.

Table 1 identifies who is responsible for completion of specific Monitoring Plan elements in the 2016-2017 fiscal year (FY 2016-2017) and following. These responsibilities are more fully described as follows:

- Water quality sample collection will be conducted by different teams based on site location (Table 1 and **Figure 1**):
 - Orange County Public Works (OCPW) staff will collect samples from monitoring sites located in Orange County.
 - CDM Smith/CWE will collect samples from all sites located in Riverside and San Bernardino Counties.
- The Monitoring Managers for OCPW and CDM Smith (as identified in the QAPP) are responsible for ensuring that monitoring activities are conducted as required by the QAPP and coordination with the following contract laboratories:
 - OCPW will submit water samples to Orange County Public Health Laboratories (OCPHL) for analysis of *E. coli* and Enterococcus. Total Suspended Solids (TSS) are submitted to Enthalpy Analytical (formerly Associated Laboratories) or Weck Laboratories for analysis. OCPW is responsible for managing the OCPHL contract and payment of OCPHL invoices.

¹ Two monitoring sites in Orange County are surrounded by private or state lands. The agency that will be responsible for sampling these sites is still being determined.

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- CDM Smith/CWE will submit water samples to Babcock Laboratories (Babcock) for analysis of *E.coli* and TSS. CDM Smith is responsible for managing the Babcock contract and payment of Babcock invoices.
- The Laboratory Managers of OCPHL, Weck, Enthalpy Analytical, and Babcock are responsible for ensuring that Laboratory Personnel implement the requirements of the QAPP.
- CDM Smith is responsible for the data management and reporting requirements for the SAR Bacteria Monitoring Program. To support this effort, OCPW will provide field documentation and laboratory results to CDM Smith in a timely manner.

Figure 1 provides an illustration of the work flow process for OCPW and CDM Smith/CWE from sample collection through preparation of the annual report.

Table 1. Responsibilities by County

Work Plan Activity	Orange County	Riverside County	San Bernardino County
Sample Collection <ul style="list-style-type: none"> ■ Supplies ■ Schedule ■ Staffing 	Orange County Public Works	CDM Smith/CWE	CDM Smith/CWE
Laboratory Coordination <ul style="list-style-type: none"> ■ Sample drop off and analyses ■ Reporting ■ Invoicing and payment 	Orange County Public Works	CDM Smith/CWE	CDM Smith/CWE
Data Management <ul style="list-style-type: none"> ■ Maintain and upload database 	CDM Smith	CDM Smith	CDM Smith
Reporting <ul style="list-style-type: none"> ■ Quarterly Reports ■ Annual Report 	CDM Smith	CDM Smith	CDM Smith

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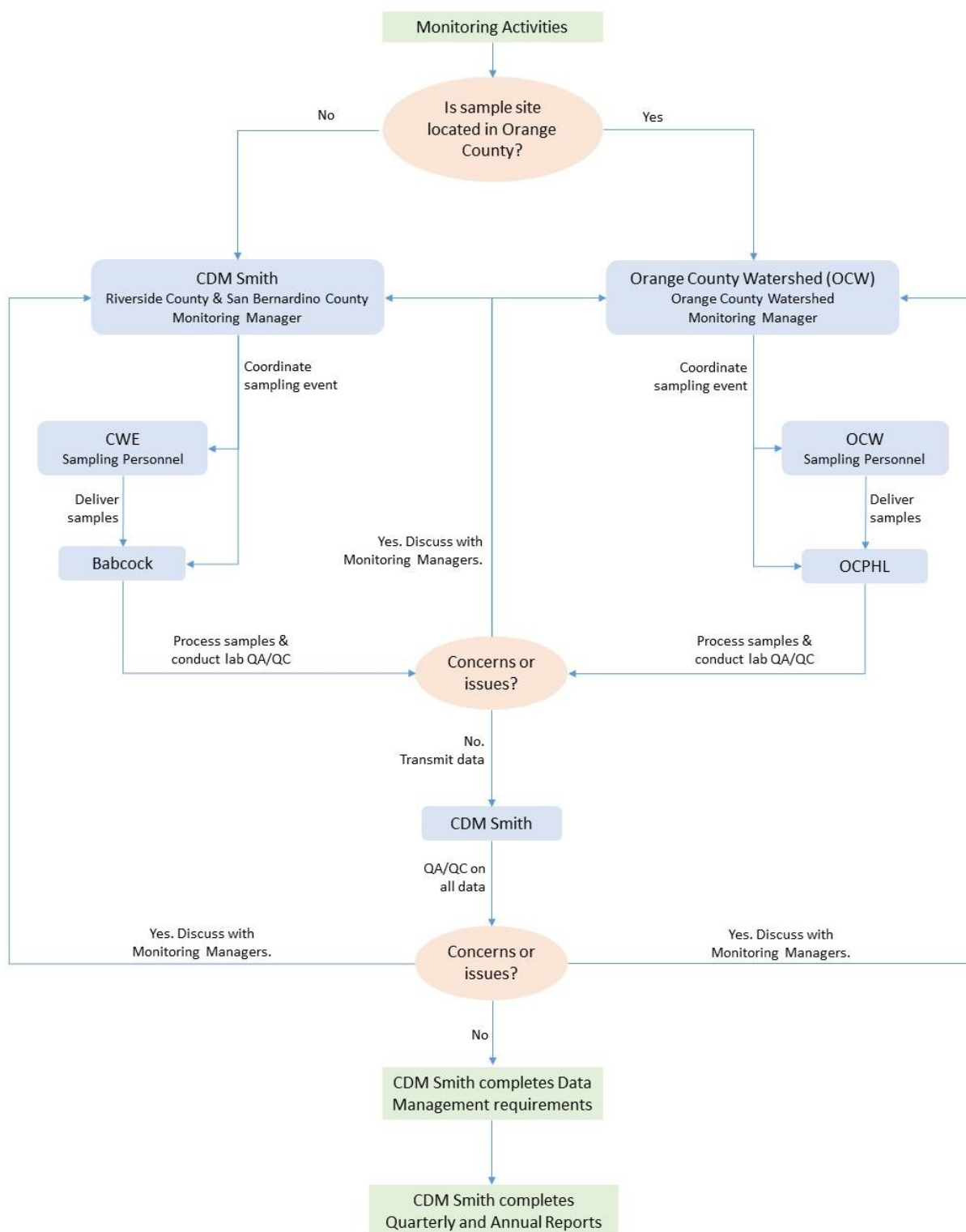


Figure 1. SAR Bacteria Monitoring Program Work Flow Diagram

3.0 Monitoring Sites & Schedule

3.1 Monitoring Sites

Monitoring sites for the SAR Bacteria Monitoring Program, discussed in more detail in Section 3 of the Monitoring Plan and Sections 6 and 10 of the QAPP, are classified into four groups based on the priority of the waterbodies (**Table 2**). With the exception of Priority 2 waterbodies, which are also sampled during one wet weather event each year (see Section 3.2 below), these sites are monitored only under dry weather conditions, which is defined as no measurable rainfall within a 72 hour period prior to sampling. Priority sites are described as follows in the Monitoring Plan:

- **Priority 1:** The first priority is to establish a monitoring program that can determine whether bacteria levels are "safe" at those locations where and when people are most likely to engage in water contact recreation. These waters are all Tier A waters per the 2012 BPA.
- **Priority 2:** The second priority is to focus monitoring resources on waterbodies that have been identified as "impaired" due to excessive bacterial indicator concentrations and a TMDL has already been adopted. Monitoring efforts to evaluate progress toward attainment with the water quality standard in these impaired waters fall with priority two. This will ensure that the monitoring program is closely coordinated with TMDL-related sampling efforts.
- **Priority 3:** The third priority is 303(d)-listed or impaired waterbodies where a TMDL has not yet been developed. For these Priority 3 sites the monitoring program includes periodic sample collection on an annual basis.
- **Priority 4:** The fourth priority is to collect the bacteria indicator data needed to implement the antidegradation targets that have been established for waterbodies designated as REC2 only (i.e., the REC1 beneficial use has been de-designated through an approved Use Attainability Analysis). Data collection from these Priority 4 waterbodies provides the Santa Ana Water Board with the ability to assess the status and trend of bacterial indicator water quality as part of the normal Triennial Review process.

3.2 Dry Weather Monitoring Schedule

The dry weather sample frequency varies by priority and is described as follows:

- **Priority 1:** Priority 1 sites will be sampled during dry weather for a 20-week period during the warmest part of the year between May 1 and September 30. Priority 1 sample sites will also be sampled during one 5-week period from the end of October through most of November each year during the cooler season.
- **Priority 2:** Priority 2 sites are sampled at the same frequency and schedule as Priority 1 sites. This includes a 20-week period during the warmer season and a 5-week period during the cooler season.

Table 2. Monitoring Sites

Priority	Site ID	Site Description	Latitude	Longitude	Responsibility
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1	P1-1	Canyon Lake at Holiday Harbor	33.6808	-117.2724	CDM Smith/CWE
1	P1-2	Lake Elsinore	33.3937	-117.3345	CDM Smith/CWE
1	P1-3	Lake Perris	33.8614	-117.1908	CDM Smith/CWE
1	P1-4	Big Bear Lake at Swim Beach	34.2482	-116.9034	CDM Smith/CWE
1	P1-5	Mill Creek Reach 2	34.0891	-116.9247	CDM Smith/CWE
1	P1-6	Lytle Creek (Middle Fork) ¹	34.2480	-117.5110	CDM Smith/CWE
1,2	WW-S1	Santa Ana River Reach 3 at MWD Crossing	33.9681	-117.4479	CDM Smith/CWE
1,2	WW-S4	Santa Ana River Reach 3 at Pedley Avenue	33.9552	-117.5327	CDM Smith/CWE
2	WW-M6	Mill-Cucamonga Creek below Wetlands	33.9268	-117.6250	CDM Smith/CWE
2	WW-C7	Chino Creek at Central Avenue	33.9737	-117.6889	CDM Smith/CWE
2	WW-C3	Prado Park Lake	33.9400	-117.6473	CDM Smith/CWE
3	P3-OC1	Bolsa Chica Channel upstream of Westminster Blvd/Bolsa Chica Rd	33.7596	-118.0430	OCPW
3	P3-OC2	Borrego Creek upstream of Barranca Parkway	33.6546	-117.7321	OCPW
3	P3-OC3	Buck Gully Creek Little Corona Beach at Poppy Avenue/Ocean Blvd	33.5900	-117.8684	OCPW
3	P3-OC5	Los Trancos Creek at Crystal Cove State Park	33.5760	-117.8406	TBD ²
3	P3-OC6	Morning Canyon Creek at Morning Canyon Beach	33.5876	-117.8658	TBD ²
3	P3-OC7	Peters Canyon Wash downstream of Barranca Parkway	33.6908	-117.8240	OCPW
3	P3-OC8	San Diego Creek downstream of Campus Drive (Reach 1)	33.6553	-117.8454	OCPW
3	P3-OC9	San Diego Creek at Harvard Avenue (Reach 2)	33.6880	-117.8187	OCPW
3	P3-OC10	Santa Ana River Reach 2 downstream of Imperial Highway	33.8574	-117.7916	OCPW
3	P3-OC11	Serrano Creek upstream of Barranca/Alton Parkway	33.6483	-117.7248	OCPW
3	P3-RC1	Goldenstar Creek at Ridge Canyon Drive	33.8964	-117.3586	CDM Smith/CWE
3	P3-RC2	Lake Fulmor at the Lakeside Boardwalk	33.8052	-116.7798	CDM Smith/CWE
3	P3-SBC1	Santa Ana River Reach 4 above S. Riverside Avenue Bridge	34.0248	-117.3628	CDM Smith/CWE
4	P4-RC1	Temescal Creek at Main Street	33.8895	-117.5636	CDM Smith/CWE
4	P4-OC1	Santa Ana Delhi Channel Upstream of Irvine Avenue	33.6602	-117.8810	OCPW
4	P4-OC2	Santa Ana Delhi Channel in Tidal Prism	33.6529	-117.8837	OCPW
4	P4-OC3	Greenville-Banning Channel in Tidal Prism	33.6594	-117.9479	OCPW
4	P4-SBC1	Cucamonga Creek at Hellman Avenue	33.9493	-117.6104	CDM Smith/CWE
¹ An alternative location for Lytle Creek was approved by the Regional Board staff during the April 26, 2016 Task Force meeting; site number will remain P1-6.					
² The responsibility for sampling this site is still to be determined.					

- **Priority 3:** Priority 3 sites will be sampled five times during dry weather each year. The thirteen sites are grouped into five groups primarily based on location and each group for efficiency purposes. Each group of sites will be sampled for 5 consecutive weeks at different periods of the year. The overall sample schedule for these sites overlaps with the Priority 1 & 2 sample site schedule to maximize efficiency with the collection of samples.
- **Priority 4:** Priority 4 sites will be sampled once per year during the dry season between June 21 and September 21. If the result exceeds the antidegradation target threshold value for the site, additional samples will be collected once per month for the three following months. If any of the follow-up samples exceeds the antidegradation target, then sampling will continue on a monthly basis until source(s) of the increased bacterial indicator concentration is identified and mitigated and bacterial indicator levels return to below the antidegradation target in three of four samples collected over three consecutive months.

This Project Work Plan, including the budget, *only* covers the collection, analysis and reporting of the one sample collected from each Priority 4 site each year. The budget does not include any necessary follow-up sampling if an antidegradation target is exceeded. If the antidegradation target is exceeded, the following actions are required:

- If the site is in Orange County, OCPW is responsible for implementing the follow-up sample requirements, including sample collection, laboratory analysis, data management, and submitting results to CDM Smith for reporting.
- If the site is in Riverside County or San Bernardino County, CDM Smith/CWE is responsible for working with SAWPA on development of a follow-up sampling schedule and securing the budget to fulfill the follow-up sampling requirements, including sample collection, laboratory analysis, data management, and reporting.

Table 3 provides the dry weather monitoring periods through 2020; **Table 4** provides the rotational schedule for Priority 3 sites.

3.2 Wet Weather Monitoring Schedule

Priority 2 sites are also sampled during wet weather to comply with specific monitoring requirements established by the MSAR TMDL. This requirement includes sampling one wet weather event during each wet season (November 1 through March 31). Samples will be collected on the day of the storm as well as 48, 72, and 96 hours after collection of the first sample. All Priority 2 sites are located in Riverside or San Bernardino Counties and CDM Smith/CWE is responsible for completing this monitoring requirement each year. If sampling occurs on weekends or holidays, CWE charges labor at an overtime rate to appropriately compensate staff. The Project Budget has taken this into account.

Table 3. Sample schedule for Priority 1 and 2 waters during dry weather conditions
(See the Monitoring Plan for referenced Tables 3.1 and 3.3)

Year	Sample Season	First Week of Sampling	Last Week of Sampling	Priority 1 Waters	Priority 2 Waters
2017	Warm Season	May 7	September 17	All Table 3.1 Waters	All Table 3.3 Waters
	Cool Season	October 29	November 26	All Table 3.1 Waters	All Table 3.3 Waters
2018	Warm Season	May 6	September 16	All Table 3.1 Waters	All Table 3.3 Waters
	Cool Season	October 28	November 25	All Table 3.1 Waters	All Table 3.3 Waters
2019	Warm Season	May 5	September 15	All Table 3.1 Waters	All Table 3.3 Waters
	Cool Season	October 27	November 24	All Table 3.1 Waters	All Table 3.3 Waters
2020	Warm Season	May 10	September 20	All Table 3.1 Waters	All Table 3.3 Waters
	Cool Season	October 25	November 22	All Table 3.1 Waters	All Table 3.3 Waters

Table 4. Sample schedule for Priority 3 waters during dry weather conditions

Year	First Week of Sampling	Last Week of Sampling	Priority 3 Waters
2017	May 7	June 4	Group 2: Peters Canyon Wash, San Diego Creek Reach 1, San Diego Creek Reach 2, Borrego Creek, Serrano Creek
	June 11	July 9	Group 3: Los Trancos Creek, Morning Canyon Creek, Buck Gully Creek
	July 16	August 13	Group 4: Santa Ana Reach 4
	August 20	September 17	Group 5: Goldenstar Creek, Lake Fulmor
	October 29	November 26	Group 1: Bolsa Chica Channel, , Santa Ana River Reach 2
2018	May 6	June 3	Group 3: Los Trancos Creek, Morning Canyon Creek, Buck Gully Creek
	June 10	July 8	Group 4: Santa Ana Reach 4
	July 15	August 12	Group 5: Goldenstar Creek, Lake Fulmor
	August 19	September 16	Group 1: Bolsa Chica Channel, , Santa Ana River Reach 2
	October 28	November 25	Group 2: Peters Canyon Wash, San Diego Creek Reach 1, San Diego Creek Reach 2, Borrego Creek, Serrano Creek
2019	May 5	June 2	Group 4: Santa Ana Reach 4
	June 9	July 7	Group 5: Goldenstar Creek, Lake Fulmor

Table 4. Sample schedule for Priority 3 waters during dry weather conditions

Year	First Week of Sampling	Last Week of Sampling	Priority 3 Waters
	July 14	August 11	Group 1: Bolsa Chica Channel, , Santa Ana River Reach 2
	August 18	September 15	Group 2: Peters Canyon Wash, San Diego Creek Reach 1, San Diego Creek Reach 2, Borrego Creek, Serrano Creek
	October 27	November 24	Group 3: Los Trancos Creek, Morning Canyon Creek, Buck Gully Creek
2020	May 10	June 7	Group 5: Goldenstar Creek, Lake Fulmor
	June 14	July 12	Group 1: Bolsa Chica Channel, , Santa Ana River Reach 2
	July 19	August 16	Group 2: Peters Canyon Wash, San Diego Creek Reach 1, San Diego Creek Reach 2, Borrego Creek, Serrano Creek
	August 23	September 20	Group 3: Los Trancos Creek, Morning Canyon Creek, Buck Gully Creek
	October 25	November 22	Group 4: Santa Ana Reach 4

4.0 Laboratory Selection

Since bacteria samples have a limited holding time of 6 hours, it is optimal and more efficient to use multiple laboratories based on their proximity to monitoring sites. As such, OCPHL and Babcock were selected by Responsible Agencies to analyze samples collected from Orange County and the Inland Empire (Riverside and San Bernardino Counties), respectively. Analytical methods and associated costs for analyzing *E.coli* and TSS are shown in **Table 5**. To maintain consistency within the watershed and allow for direct comparisons where available, both Babcock and OCPHL will use SM 9223B to analyze *E.coli* samples. OCPHL will use EPA Method 1600 to analyze Enterococcus samples.

Table 5. Cost and Methodology for *E.coli* and TSS Analyses

Laboratory	<i>E.coli</i> Method	<i>E.coli</i> Cost per Sample	TSS Method	TSS Cost per Sample
Babcock Laboratories	SM9223B (Colilert)	\$20 (\$20)	SM2540D	\$15
Orange County Public Health Laboratory	SM9223B (Colilert)	\$27.55 (\$27.55)	n/a	
	EPA Method 1600	\$40.17		
Enthalpy Analytical	n/a		SM 2540D	\$10
Weck Laboratories			SM 2540D	\$10

Note: EPA Methods 1600 includes three dilutions per sample; pricing for Colilert methods includes one dilution only and each additional dilution will result in added cost listed in parenthesis.

5.0 Data Management

The Data Manager (CDM Smith) will implement the following data management activities as required by the SAR Bacteria Monitoring Program Monitoring Plan and QAPP:

- Data and project documentation generated as part of monitoring activities will be provided to CDM Smith to inventory and maintain. Documentation will include sample collection records (field logs and photographs), analytical records (laboratory results and Chain-of-Custody forms), and reports (laboratory results and QA/QC reports).
 - By the 10th of each calendar month, CWE and OCPW will provide photographs, field logs, and copies of the COCs to CDM Smith generated by all sampling events that occurred within the previous calendar month.
 - Babcock Laboratories will provide laboratory results to CDM Smith following each sampling event. Laboratory QA/QC reports will be provided to CDM Smith within one month of the conclusion of each sampling season (January 15th for dry weather and April 15th for wet weather).
 - By the 10th of each calendar month, OCPW will provide CDM Smith with laboratory results generated by all sampling events that occurred within the previous calendar month. OCPW will also provide CDM Smith with OCPHL laboratory QA/QC reports within one month of the conclusion of each sampling season (January 15th for dry weather and April 15th for wet weather).
- CDM Smith will review the data and project documentation to ensure the expected data set is complete and the data and samples are collected as specified by the Monitoring Plan and QAPP. The review will be conducted quarterly as part of the quarterly report preparation as well as annually as part of the annual report preparation.
 - If the review indicates any concerns (e.g., incomplete dataset), CDM Smith will discuss concerns and corrective actions with CWE, Babcock Laboratories, and/or the OCPW

Monitoring Manager. The OCPW Monitoring Manager is responsible for discussing any concerns related to OCPHL or OWC with sampling personnel.

- CDM Smith will enter all data into a Project Database that uses an acceptable format. The format of this project database will consider requirements for upload to the California Environmental Data Exchange Network (CEDEN). CDM Smith will implement appropriate data entry QA/QC checks as required by the QAPP. Any data anomalies identified during this QA/QC check will be investigated and resolved to the maximum extent practicable. Where such issues occur, these will be reported in the quarterly and annual reports.
- QA/QC checked data will be uploaded to the CEDEN database on a monthly basis.
- Data in the Project Database will be extracted to support preparation of the quarterly reports, Annual Report, and other requests from SAWPA or stakeholders.
- CDM Smith will submit to SAWPA on an annual basis the data and field documentation generated by the monitoring program; this information will be provided in an electronic format. This submittal will occur at the same time the Final Annual Report is submitted to SAWPA.

6.0 Reporting Requirements

Annual reporting requirements for the SAR Bacteria Monitoring Program are described in Section 7 of the Monitoring Plan and Section 9 of the QAPP. In addition, quarterly reports are required for submittal to the Project Director. CDM Smith will be responsible for both quarterly and annual reporting for all three counties through implementation of the activities described below.

6.1 Quarterly Reports

- CDM Smith will prepare quarterly reports for SAWPA and stakeholders for delivery to SAWPA by the 15th of the month following the end of the previous quarter. These reports will include, at a minimum, the following information:
 - A summary of monitoring activities that have occurred during the previous quarter;
 - Documentation of any issues (e.g., data or laboratory QA/QC issues) that arose during the execution of the monitoring program and how these issues were resolved;
 - A tabular data summary that documents available *E.coli*, Enterococcus, and TSS laboratory results and field measurements for each sampled site for the quarter;
 - A summary of upcoming sampling activity; and
 - Recommendations, if any, for modifications to the monitoring program based on knowledge gained.
- OCPW will be responsible for providing all project documentation to CDM Smith monthly. Documentation includes photographs, field logs, COCs, and laboratory data. OCPW will also

be responsible for communicating to CDM Smith any monitoring-related concerns (e.g., protocol, QA/QC, laboratory) as well as steps taken to resolve any concerns.

- CWE will be responsible for providing CDM Smith with photographs, field logs, and COCs at the end of each month.
- Babcock will be responsible for providing CDM Smith with laboratory data following each sampling event.

6.2 Annual Report

CDM Smith will prepare a Draft and a Final Annual Report for each year of the contract to reflect findings from sampling conducted during the previous sample year. A sample year is the period from May 1 through April 30 and includes the following sample activities: (a) collection of dry weather samples from Priority 1, 2, 3, and 4 sites from May through September; (b) collection of dry weather samples from Priority 1, 2 and 3 sites in late October through November; and (c) collection of samples from one wet weather event in the MSAR watershed between November 1 and March 31. Note that for the first annual report, the period covered by the annual report will be for the period through April 30, 2017.

To support preparation of the Annual Report, project documentation will be provided to CDM Smith as follows:

- By January 15th of each reporting year, CWE, Babcock, and OCPW will provide all forms, data sheets, or electronic files associated with non-wet weather event sampling will be provided to CDM Smith. For the first annual report, this information will be provided by January 15, 2017.
- Within 15 days after completion of wet weather event sampling, CWE will provide all forms, data sheets, or electronic files associated with the sampling event to CDM Smith.
- Any QA/QC-related information not yet provided to CDM Smith during the previous fiscal year when sampling was occurring will be provided to CDM Smith by Babcock and OCPW by January 15th of each reporting year for non-wet weather sampling and April 15th of each reporting year for the wet-weather sampling event.

The Draft Annual Report will build on the relevant information already developed for the quarterly reports. At a minimum, the Draft Annual Report will include the following information:

- Compliance with applicable water quality objectives for REC1;
- Compliance with applicable antidegradation targets for waters classified as REC2 only;
- Progress towards achieving attainment of MSAR Bacteria TMDL numeric targets for E. coli; and
- Impairment status of waterbodies listed as impaired in the watershed but a TMDL has not been adopted.

As part of the effort to evaluate the above, water quality analyses will include descriptive statistics such as geometric mean and percentile calculations. In addition where appropriate, water quality results may be compared to historical data collected through this plan or previous monitoring efforts to assess temporal trends at monitoring sites.

By April 30 of each year, CDM Smith will submit the Draft Annual Report to SAWPA for distribution to stakeholders and the Santa Ana Water Board for review and comment. CDM Smith will prepare a Final Annual Report based on comments received on the Draft Annual Report. The Final Annual Report will be submitted electronically to SAWPA by June 30 each year. The Final Annual Report will include a comment/response matrix that summarizes the comments received on the draft report and how the comments were addressed. SAWPA will make the Final Annual Report available to the public on either the Santa Ana Water Board or SAWPA's website.

7.0 Deliverables

CDM Smith will provide the following deliverables:

- Quarterly Reports (April 15, July 15, October 15, and January 15 of each year)
- Draft Annual Report by April 30 of each year, with the first Draft Annual Report under this program being provided as a draft by April 30, 2017.
- Final Annual Report by June 30 of each year, with the first Final Annual Report under this program being submitted as final by June 30, 2017.
- Updated CEDEN Database file or spreadsheet by January 15th of each year for dry weather samples and by April 15th of each year for wet weather samples.
- Uploaded data file to CEDEN by within 30 days of submittal of the Final Annual Report
- Updated Project Work Plan annually for up to 3 years

8.0 Annual Program Budget

The annual program budget is presented in the following tables:

- **Table 6** – Explanation regarding how costs were apportioned by County;
- **Table 7** – Cost breakdown by task for each County;
- **Table 8** – Cost breakdown by task for each contractor; and
- **Table 9** – Summary of task-specific cost for each County.

Where common costs needed to be divided between two or three counties, the total budget was allocated based on the relative number of samples collected during one year. For example if the total budget for a hypothetical task was \$10,000 and 30% of the samples were collected in one county, then that county would be responsible for 30% of that task budget. Table 6 summarizes the cost apportionment by task.

Table 6. Basis for Apportioning Costs to Riverside (RC), San Bernardino County (SBC), and Orange County (OC)

Task	Cost Apportionment
1	RC, SBC, OC – Based on relative percent of samples among counties.
2.1 & 2.2	RC, SBC only – Based on relative percent of samples between counties. OCPW is responsible for coordination with OCPHL.
2.3	RC, SBC, OC – Based on relative percent of samples among counties. Assumed CDM Smith would do final QA/QC the OCPHL data provided by OCPW to ensure in compliance with QAPP.
3.1 & 3.4	RC, SBC, OC – Based on relative percent of samples among counties. Assumed CDM Smith would have labor costs for coordination with OCPW Monitoring Manager; CDM Smith preparing quarterly reports for all 3 counties.
3.2	RC, SBC only – Based on relative percent of samples between counties. OCPW responsible for sample collection and analysis in OC.
3.3	RC & SBC – Based on relative percent of samples between counties; no wet weather monitoring occurs in OC.
4 & 5	RC, SBC, OC – based on relative percent of samples among counties.

Tables 7, 8 and 9 provide overall program costs and breakdown by County:

- The proposed budget of \$133,212 for Riverside County includes: (1) CDM Smith Task Force meeting attendance and preparation (Task 1); (2) contracting, invoicing, and coordinating with Babcock Laboratory (Task 2); (3) data review for completeness and QA/QC (Task 2); (4) coordination and implementation of all monitoring activities for sites located within Riverside County, including coordinating with the field team, sample collection by the field team, and ensuring monitoring activities are conducted in accordance with the Monitoring Plan and QAPP (Task 3); and (5) completing all reporting and data management requirements (Tasks 4 & 5).
- The proposed budget of \$154,808 for San Bernardino County includes: (1) CDM Smith Task Force meeting attendance and preparation (Task 1); (2) contracting, invoicing, and coordinating with Babcock Laboratory (Task 2); (3) data review for completeness and QA/QC (Task 2); (4) coordination and implementation of all monitoring activities for sites located within San Bernardino County, including coordinating with the field team, sample collection by the field team, and ensuring monitoring activities are conducted in accordance with the Monitoring Plan and QAPP (Task 3); and (5) completing all reporting and data management requirements (Tasks 4 & 5).
- The proposed budget of \$19,396 for Orange County includes a subset of previously listed responsibilities. This includes (1) CDM Smith Task Force meeting attendance and preparation (Task 1); (2) data review for completeness and QA/QC (Task 2); (3) coordination

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with the OCPW Monitoring Manager to ensure their portion of the Monitoring Program is implemented (Task 3), and (4) completing all reporting and data management requirements (Task 4 & 5). Contracting, invoicing, and coordination with OCPHL as well as implementation of the Monitoring Program (coordination with field team, sample collection, and sample analyses) is the responsibility of the OCPW Monitoring Manager and is not included in the annual program budget.

Table 7. SAR Bacteria Monitoring Program Task-Specific Estimated Cost Breakdown by County for FY 2016-2017

Task	Riverside County		San Bernardino County		Orange County		Totals
	Labor	ODCs	Labor	ODCs	Labor	ODCs	
Task 1: Stakeholder Coordination¹	\$1,831	\$694	\$2,106	\$798	\$813	\$308	\$6,550
Task 1.4 Quarterly Stakeholder Meetings	\$1,831	\$694	\$2,106	\$798	\$813	\$308	\$6,550
Task 2: Contract with Qualified Laboratory¹	\$7,121	\$12,600	\$8,189	\$14,490	\$1,270	\$ -	\$43,670
Task 2.1 Laboratory Contracts/Agreements	\$1,321	\$ -	\$1,519	\$ -	\$ -	\$ -	\$2,840
Task 2.2 Laboratory Coordination	\$2,937	\$ -	\$3,378	\$ -	\$ -	\$ -	\$6,315
Task 2.3 Laboratory Analysis	\$2,863	\$12,600	\$3,292	\$14,490	\$1,270	\$ -	\$34,515
Task 3: Implement Monitoring Program²	\$75,334	\$8,222	\$88,051	\$9,652	\$4,841	\$ -	\$186,100
Task 3.1 Sample Team Administration	\$5,600	\$ -	\$6,318	\$ -	\$2,442	\$ -	\$14,360
Task 3.2 Dry Weather Monitoring ³	\$58,484	\$7,843	\$68,656	\$9,208	\$ -	\$ -	\$144,191
Task 3.3 Wet Weather Monitoring	\$5,845	\$379	\$6,861	\$444	\$ -	\$ -	\$13,529
Task 3.4 Quarterly Reports	\$5,405	\$ -	\$6,216	\$ -	\$2,399	\$ -	\$14,020
Task 4: Annual Reporting	\$13,710	\$ -	\$15,767	\$ -	\$6,084	\$ -	\$35,560
Task 4.1 Draft Annual Report	\$9,615	\$ -	\$11,058	\$ -	\$4,267	\$ -	\$24,940
Task 4.2 Final Annual Report	\$3,855	\$ -	\$4,434	\$ -	\$1,711	\$ -	\$10,000
Task 4.3 Data Requests	\$240	\$ -	\$275	\$ -	\$106	\$ -	\$620
Task 5: Data Management	\$13,700	\$ -	\$15,755	\$ -	\$6,080	\$ -	\$35,535
Task 5.1 Database Development	\$3,152	\$ -	\$3,625	\$ -	\$1,399	\$ -	\$8,175
Task 5.2 Data Entry; QA/QC	\$5,160	\$ -	\$5,935	\$ -	\$2,290	\$ -	\$13,385
Task 5.3 Monthly Uploads to CEDEN	\$4,478	\$ -	\$5,150	\$ -	\$1,987	\$ -	\$11,615
Task 5.4 Other Data Requests	\$910	\$ -	\$1,046	\$ -	\$404	\$ -	\$2,360
Total - 2016	\$111,696	\$21,516	\$129,868	\$24,940	\$19,088	\$308	\$307,415
¹ Task 1 ODC costs for attendance by Dr. Meyerhoff at quarterly stakeholder meetings; Task 2 ODC costs are for analysis of <i>E. coli</i> or Enterococcus, which assumes 3 dilutions, and TSS samples.							
² Task 3 ODCs are as follows: (a) mileage at IRS rate of 0.575/mile; (b) YSI cost at \$96/sample day; (c) waterproof digital camera at \$10/sample day; (d) decontamination kit at \$10/sample day; (e) grab pole/bucket at \$5/sample day; and (f) consumables (gloves, distilled water, ice, etc., at \$15/sample day). If flow measurements require additional equipment, additional costs may be incurred.							
³ The responsible party for the two sites in Orange County located on private or state land is part of an ongoing discussion and will be finalized at a later time. Task 3 dry weather monitoring costs in this budget does not include these two sites but pending the outcome of the discussions, additional costs will be incurred by the Responsible Agency (TBD).							

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Table 8. SAR Bacteria Monitoring Program Task-Specific Estimated Cost Breakdown by Contractor for FY 2016-2017

Task	CDM Smith		CWE		Totals
	Labor	ODCs	Labor	ODCs	
Task 1: Stakeholder Coordination¹	\$4,750	\$1,800	\$ -	\$ -	\$6,550
Task 1.4 Quarterly Stakeholder Meetings	\$4,750	\$1,800	\$ -	\$ -	\$6,550
Task 2: Contract with Qualified Laboratory¹	\$16,580	\$27,090	\$ -	\$ -	\$43,670
Task 2.1 Laboratory Contracts/Agreements	\$2,840	\$ -	\$ -	\$ -	\$2,840
Task 2.2 Laboratory Coordination	\$6,315	\$ -	\$ -	\$ -	\$6,315
Task 2.3 Laboratory Analysis	\$7,425	\$27,090	\$ -	\$ -	\$34,515
Task 3: Implement Monitoring Program²	\$30,110	\$ -	\$138,116	\$17,874	\$186,100
Task 3.1 Sample Team Administration	\$14,360	\$ -	\$ -	\$ -	\$14,360
Task 3.2 Dry Weather Monitoring ³	\$ -	\$ -	\$127,140	\$17,051	\$144,191
Task 3.3 Wet Weather Monitoring	\$1,730	\$ -	\$10,976	\$823	\$13,529
Task 3.4 Quarterly Reports	\$14,020	\$ -	\$ -	\$ -	\$14,020
Task 4: Annual Reporting	\$35,560	\$ -	\$ -	\$ -	\$35,560
Task 4.1 Draft Annual Report	\$24,940	\$ -	\$ -	\$ -	\$24,940
Task 4.2 Final Annual Report	\$10,000	\$ -	\$ -	\$ -	\$10,000
Task 4.3 Data Requests	\$620	\$ -	\$ -	\$ -	\$620
Task 5: Data Management	\$35,535	\$ -	\$ -	\$ -	\$35,535
Task 5.1 Database Development	\$8,175	\$ -	\$ -	\$ -	\$8,175
Task 5.2 Data Entry; QA/QC	\$13,385	\$ -	\$ -	\$ -	\$13,385
Task 5.3 Monthly Uploads to CEDEN	\$11,615	\$ -	\$ -	\$ -	\$11,615
Task 5.4 Other Data Requests	\$2,360	\$ -	\$ -	\$ -	\$2,360
Total - 2016	\$122,535	\$28,890	\$138,116	\$17,874	\$307,415
¹ Task 1 ODC costs for attendance by Dr. Meyerhoff at quarterly stakeholder meetings; Task 2 ODC costs are for analysis of <i>E. coli</i> or Enterococcus, which assumes 3 dilutions, and TSS samples.					
² Task 3 ODCs are as follows: (a) mileage at current IRS rate of 0.54/mile; (b) YSI cost at \$96/sample day; (c) waterproof digital camera at \$10/sample day; (d) decontamination kit at \$10/sample day; (e) grab pole/bucket at \$5/sample day; and (f) consumables (gloves, distilled water, ice, etc., at \$15/sample day). If flow measurements require additional equipment, additional costs may be incurred.					
³ The responsible party for the two sites in Orange County located on private or state land is part of an ongoing discussion and will be finalized at a later time. Task 3 dry weather monitoring costs in this budget does not include these two sites but pending the outcome of the discussions, additional costs will be incurred by the identified Responsible Agency (TBD).					

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Table 9. Summary of Estimated SAR Bacteria Monitoring Program Costs for Each County for FY 2016-2017

Task	Riverside County		San Bernardino County		Orange County		Totals
	Labor	ODCs	Labor	ODCs	Labor	ODCs	
Task 1: Stakeholder Coordination	\$1,831	\$694	\$2,106	\$798	\$813	\$308	\$6,550
Task 2: Contract with Qualified Laboratory	\$7,121	\$12,600	\$8,189	\$14,490	\$1,270	\$ -	\$43,670
Task 3: Implement Monitoring Program	\$75,334	\$8,222	\$88,051	\$9,652	\$4,841	\$ -	\$186,100
Task 4: Annual Reporting	\$13,710	\$ -	\$15,767	\$ -	\$6,084	\$ -	\$35,560
Task 5: Data Management	\$13,700	\$ -	\$15,755	\$ -	\$6,080	\$ -	\$35,535
Totals	\$111,696	\$21,516	\$129,868	\$24,940	\$19,088	\$308	\$307,415
Grand Total ^{1,2}	\$133,212		\$154,808		\$19,396		
¹ With the exception of Tasks 2.1, 2.2, and 3.3, which only applies to Riverside and San Bernardino Counties, per county costs are based on percentage of total samples collected within each County each year. Riverside County = 39%; San Bernardino County = 44% and Orange County = 17%. These percentages were used as multipliers for each task to assign an estimated cost by task for each county. Task 3.2 and ODCs for Task 2.3 (laboratory analysis costs) for Orange County are not included in the annual program budget.							
² Budget assumes that all field work will be conducted during weekdays and that weekend hours will be considered overtime, resulting in overtime labor costs.							