APPENDIX C

CCCWP Conceptual Work Plan for PCBs Source Area Assessment

Contra Costa Clean Water Program

Contra Costa Source Area Investigation for PCBs Control

Work Plan

September 16, 2020

Submitted to

Contra Costa Clean Water Program
255 Glacier Drive
Martinez, California 94553

Submitted by

ADH Environmental
3065 Porter Street, Suite 101
Soquel, California 95073

and

Wood Environment & Infrastructure Solutions, Inc.
180 Grand Avenue, Suite 1100
Oakland, California 94612

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Acronyms and Abbreviations

ADH	ADH Environmental
BART	Bay Area Rapid Transit District
BASMAA	Bay Area Stormwater Management Agencies Association
CCCWP	Contra Costa Clean Water Program
DQO	data quality objective
EPA	United States Environmental Protection Agency
MRP	Municipal Regional NPDES Stormwater Permit
MS4	municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
PCB	polychlorinated biphenyl
POC	pollutants of concern
PSD	particle size distribution
QAPP	quality assurance project plan
QA/QC	quality assurance / quality control
RMC	BASMAA Regional Monitoring Coalition
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SOP	standard operating procedure
SSC	suspended sediment concentration
TMDL	total maximum daily load

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1. INTRODUCTION AND BACKGROUND

The Contra Costa Clean Water Program (CCCWP) together with its Bay Area Stormwater Management Agencies Association (BASMAA) colleagues, and in discussions with the San Francisco Bay Regional Water Quality Control Board (SFRWQCB), has developed a monitoring approach for investigating potential PCBs high interest areas during the upcoming five-year term (2021-2025) of the Municipal Regional Stormwater NPDES Permit (MRP) 3.0. This Work Plan addresses CCCWP's commitment to continue the screening of old industrial areas where opportunities may exist for polychlorinated biphenyls (PCBs) control through property referrals to SFRWQCB, or through enhanced operations and maintenance activities conducted by private land holders and/or Permittees.

1.1 Monitoring Goals

CCCWP Permittees prioritize monitoring pollutants of concern with the goal of identifying reasonable and foreseeable means of achieving load reductions of pollutants required by total maximum daily loads (TMDLs). TMDLs are watershed plans to attain water quality goals developed and established by SFRWQCB. The two most prominent TMDLs in driving stormwater monitoring, source control, and treatment projects are the Mercury TMDL and the PCBs TMDL. In the interest of protecting the beneficial uses of surface waters for people and wildlife dependent on San Francisco Bay for food, the overall monitoring goal is intended to reduce concentrations of mercury and PCBs in fish within the Bay.

Mercury and PCBs tend to bind to sediments. The principal means of transport from watersheds is via sediments washed into the Municipal Separate Storm Sewer System (MS4); therefore, an important focus of monitoring is identifying the most significant sources of contaminated sediments to the MS4. The highest pollutants of concern (POC) monitoring priorities for Permittees are answering these two basic TMDL implementation questions: where are the most significant sources of pollutants of concern, and what can be done to control them?

1.2 Environmental Setting

Much of Contra Costa County lies within the San Francisco Bay margin which has a rich history of industrial activity from a time when either little was known about the potential ecological harm from PCBs and mercury, or regulation and controls were not amply effective. Today we know that these pollutants are distributed in a patchy nature throughout old industrial lands, not only along Bay margins but in other old industrial land-use pockets throughout the County.

From some of these former and current-use industrial lands, the legacy pollutants of PCBs and mercury are migrating offsite (from private lands) through varies means to the MS4 (to public lands), and subsequently to the Bay. The implementation goal of this Work Plan is to identify those segments of public lands where legacy pollutants are found in elevated concentration and to further identify the source for abatement and control.

1.3 Regulatory Setting

The SFRWQCB has indicated to BASMAA member agencies that they seek reportable metrics for PCB control progress. These metrics include a specific number of acres of remaining source areas investigated per year, and a completion date for the investigation of all remaining source areas.

In response to SFRWQCB concerns over having specific metrics for PCB control progress, CCCWP is committed to providing annual targets for the screening of remaining potential source areas. This Work Plan identifies those targets within the framework of the upcoming MRP and follow-on permits beyond the term of MRP 3.0.

2. CONCEPTUAL MODEL AND MONITORING APPROACH

Since 2014, CCCWP and Permittee have conducted source area assessments to delineate high interest parcels and areas for consideration of property referrals and focused implementation planning for PCBs and mercury load reductions. Past monitoring efforts were focused in areas that were identified through various means as having high likelihood for PCBs control. To date, there have been five source properties that were self-abated, three properties that were referred to the SFRWQCB for enforcement action, and two properties that are likely to be referred to SFRWQCB in the near future.

The following subsections describe the remaining source areas to be investigated and corresponding monitoring approach and schedule to complete the task.

2.1 Source Areas

A GIS assessment was conducted by CCCWP’s C.11/C.12 contractor, Geosyntec Consultants, to identify remaining old industrial properties throughout the county that may not have been thoroughly investigated in the past, and that may have the potential to contribute PCBs to the public right of way and the MS4. In generating the property database, careful consideration was given to the historic land use of each property and to results of previous monitoring efforts. In total, 723 individual properties encompassing 4,539 acres of land were identified for investigation. Table 1 identifies the key statistics of the properties to be investigated. Figures 1 and 2 depict the location of most of these properties as they tend to fall close to Bay margins in the western and northern portions of the County where former and present day industry lies.

Table 1. Remaining Source Areas Categories

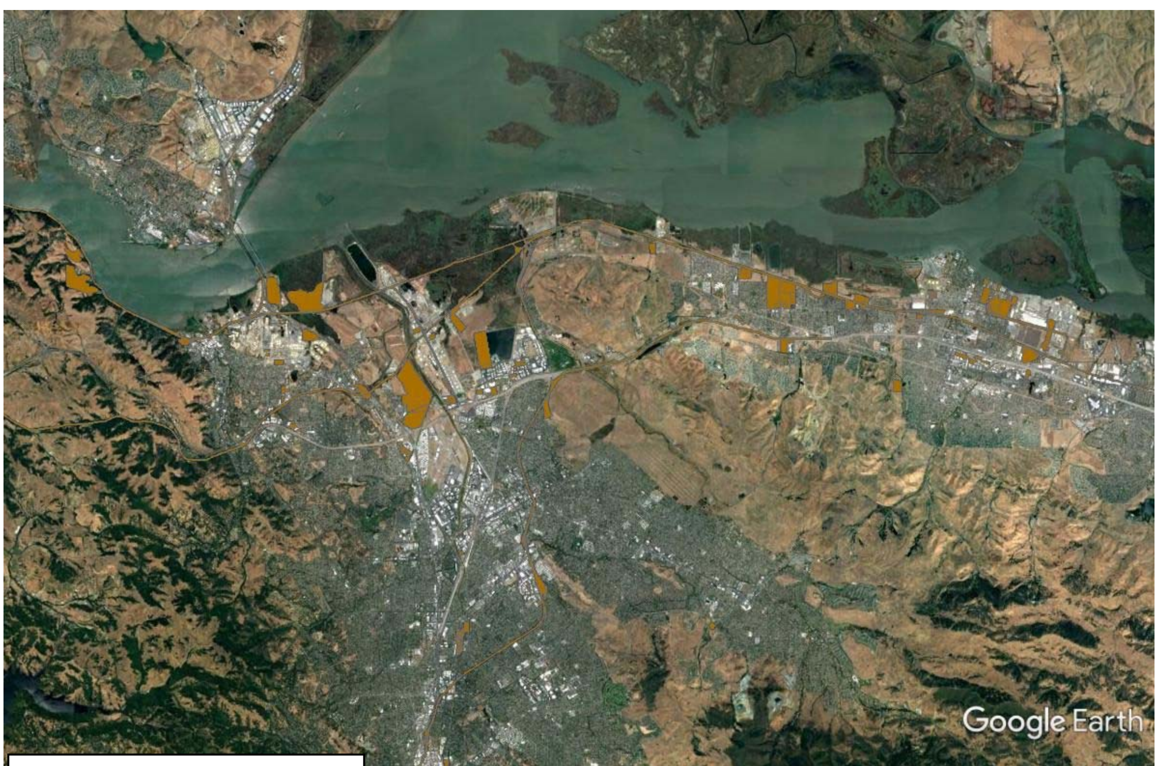
Likelihood that PCBs are Present[1]	Number of Properties[1]	Acreage[1]
High	305	2,005
Medium-High	212	510
Medium	48	709
Medium-Low	126	625
Not Categorized	32	690
Total:	*723*	*4,539*

1 Source: Geosyntec Consultants, 2020

Figure 1. Remaining Source Areas (Orange Polygons) – West County

Source: Geosyntec Consultants, 2020

Figure 2. Remaining Source Areas (Orange Polygons) – North County



Source: Geosyntec Consultants, 2020

2.2 Approach – Initial Screening

The GIS source areas assessment provided CCCWP the specific information needed to develop a monitoring approach to investigate the remaining old industrial lands. To maintain consistency with the current level of effort expended during the term of MRP 2.0, CCCWP intends to screen remaining high interest areas for potential source properties, and conduct some focused follow-up sampling, at the rate of 80 samples per permit term. Therefore, during the upcoming term of MRP 3.0, 80 samples will be assigned to source areas investigation. A further goal under MRP 3.0 is to assess at least 25 percent of the remaining source areas acreage. That is, 0.25 x 4,539 acres equals 1,135 acres to be targeted for analysis in the next five years.

Sampling will first focus on properties that have the highest likelihood of contributing PCBs to the MS4 (properties categorized as "High" in Table 1). After the high likelihood properties are screened, the focus will fall on medium-high likelihood properties and so on until all 723 have been assessed. In many cases, a single sample will serve to screen several properties. As such, there is not a one to one correspondence between the number of samples analyzed and the number of properties screened. To estimate the overall number of samples necessary to screen all 723 properties, an desktop reconnaissance effort was conducted to identify sampling locations that maximizes the number of properties (and acreage) per sample. Table 2 provides the key findings of the desktop reconnaissance effort.

Table 2. Desktop Reconnaissance Key Findings

Number of Remaining High Interest Areas [1]	Acreage of Remaining High Interest Areas1	Number of Areas on Non-Jurisdictional Lands[2,3]	Number of Samples Estimated to Conduct Initial Screening[2]
723	4,539	125	200
Distribution of 200 Initial Screening Samples by Category[2]			
High Likelihood	Medium-High Likelihood	Medium Likelihood	Medium-Low Likelihood
67	69	40	24
Distribution of 200 initial Screening Samples by Type[2]			
Street Dirt / Sediment	MS4 Drop Inlet Sediment	Sediment Sample on Property[4]	Stormwater Grab
170	14	11	5

1 Source: Geosyntec Consultants, 2020

2 Estimated number was extrapolated from a representative desktop analysis of 60% of all remaining properties

3 Discharges directly to the Bay without entering the MS4, on private railroad or BART land, or do not offer feasible sampling from the public right of way; these properties are excluded from the initial screening

4 Sediment sample to be collected on property rather than in public right of way adjacent to property; this is usually done on public agency land where encroachment permission is easily granted

2.3 Approach – Follow-Up Sampling

Following initial screening, it will become necessary to conduct some follow-up sampling and analysis to refine the identification of source areas. For example, if a sample result is elevated that characterized multiple properties, then additional sampling will be necessary to narrow in on the source. In another example, if initial screening results are inconsistent with past monitoring data, then additional sampling may be needed to confirm either elevated concentrations or low concentrations. In many instances, a useful technique for follow-up sampling is to conduct stormwater collection to either confirm or disprove results of previous sediment sampling results. Stormwater sampling is typically not used in the initial screening phase because it is substantially more expensive both in terms of collection level of effort and laboratory analytical costs, but it remains the best method to confirm that pollutants are (or are not) being conveyed through storm drain infrastructure to receiving waters.

The anticipated number of follow-up samples is somewhat difficult to predict and largely depends on the level of proof needed to either: 1) recommend referral to SFRWQCB, or 2) clear of property that may have been known to release PCBs in the past. It is entirely possible that there will be inconclusive cases with confounding results. These uncertainties for follow-up sampling underscore the need for a flexible monitoring approach moving forward, allowing for temporary cessation of initial screening efforts to focus on follow-up monitoring in an area of interest. Conversely, follow-up sampling in a target area may have to be stopped to refocus on another area of interest even when results are inconclusive.

2.4 Schedule and Expected Outcome

Assuming 200 initial screening samples, up to an additional 50 samples for follow-up analysis, and a collection rate of 80 samples per permit term, it may take approximately three permit cycles (15 years) to complete the source areas investigation. Based on the recent history of monitoring suspected/known high-opportunity properties and the number of referrals that resulted from that monitoring (three referrals with two more likely), it is conservatively assumed that one or two additional referrals may result from the investigation of all remaining source areas.

3. FIELD AND LABORATORY METHODS

Field sampling personnel will collect sediment and water samples in the field using methods that minimize contamination, losses, and changes to the chemical form of the analytes of interest. The samples will be collected in the field into pre-cleaned sample containers of a material appropriate to the analysis to be conducted. Pre-cleaned sampling equipment is used for each site, whenever possible and/or when necessary. Appropriate sampling technique and measuring equipment may vary depending on the location, sample type, sampling objective, and weather.

BASMAA standard operating procedures (SOPs) associated with sampling and sample handling which are to be followed are included in Table 3.

Table 3. List of BASMAA RMC SOPs

Standard Operating Procedure	SOP No. (BASMAA 2014)
Manual Collection of Water Samples for Chemical Analysis	RMC FS-2
Collection of Sediment Samples for Chemical Analysis	RMC FS-6
Field Equipment Cleaning Procedures	RMC FS-7
Sample Container, Handling, and Chain of Custody Procedures	RMC FS-9
Completion and Processing of Field Datasheets	RMC FS-10

3.1 Sediment Sampling

Ideally and where a sufficient volume of sediment allows, samples are collected into a composite container, where they are thoroughly homogenized in the field, and then aliquoted into separate jars for each chemical analysis to be conducted. Table x identifies each sediment analytical test name, method number, reporting limit and sample holding time.

The sediment will be scooped from the sample location with the trowel or other pre-cleaned sediment sampling implement and placed into the compositing bucket, or directly into the sample container if no compositing will take place. In cases where sediment samples are taken from street surfaces or other impervious areas, a small nylon or natural fiber pre-cleaned brush may be used in conjunction with the trowel, consistent with methods used during the Proposition 13-funded project conducted by SFEI (McKee and Yee, 2010) and the EPA grant funded study Clean Watersheds for a Clean Bay Task 3

When applicable, when all of the sediment samples from a given site have been collected in the compositing bucket, the sediment will be composited in the field. The composite sample will then be scooped with the trowel into laboratory-provided glass containers. Sample containers will be filled to the top, taking care to prevent sediment from remaining in the lid threads prior to being closed to prevent potential contaminant migration to or from the sample. All samples will then be sealed, labeled, and placed in a chilled cooler pending delivery under COC to the laboratory.

Table 4. Sediment Screening Analytical Tests, Methods, Reporting Limits, and Holding Times

Sediment Analytical Test	Method	Target Reporting Limit	Holding Time
Total PCBs (RMP 40 congeners)[1]	EPA 8082A	0.5 µg/kg	1 year
Total Mercury	EPA 7471B	5 µg/kg	1 year
Total Organic Carbon	ASTM D4129-05M	0.05%	28 days
Particle Size Distribution[2]	ASTM D422M	0.01%	28 days

1 San Francisco Bay RMP 40 PCB congeners include PCB-8, 18, 28, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, 105, 110, 118, 128, 132, 138, 141, 149, 151, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203.

2 Particle size distribution by the Wentworth scale; percent fines (slit and clay) are less than 62.5 microns.

3.2 Stormwater Sampling

Stormwater sample collection techniques and health and safety considerations will adhere to all relevant protocols specified in the RMC's SOP FS-2, *Manual Collection of Water Samples for Chemical Analysis, Bacteriological Analysis, and Toxicity Testing* (BASMAA, 2014). Table x identifies each stormwater analytical test name, method number, reporting limit and sample holding time.

As feasible, monitoring staff will also adhere to RMC guidance in selection of storm events to monitor:

- Track storms that are likely to produce runoff
- Minimum 0.5" Quantity of Precipitation Forecast (QPF) is good rule of thumb
- When appropriate, observe 72 hour antecedent dry period; however for legacy pollutant sampling locations the 72-hour antecedent dry period need not be observed.
- Collect sample on rising limb of hydrograph, near peak flow
- Coordinate sample collection when possible to sample multiple sites during same event
- Coordinate events with labs in advance.

Table 5. Stormwater Analytical Tests, Methods, Reporting Limits, and Holding Times

Sediment Analytical Test	Method	Target Reporting Limit	Holding Time
Total PCBs (RMP 40 congeners)[1]	EPA 1668C	0.1 µg/kg	1 year
Total Mercury	EPA 1631E	0.5 ng/L	90 days
Suspended Sediment Concentration	ASTM D 3977-97	1.5 mg/L	7 days
Total Organic Carbon	EPA 9060	0.50 mg/L	28 days

1 San Francisco Bay RMP 40 PCB congeners include PCB-8, 18, 28, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, 105, 110, 118, 128, 132, 138, 141, 149, 151, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203.

2 Particle size distribution by the Wentworth scale; percent fines (slit and clay) are less than 62.5 microns.

3.3 Field Equipment and Cleaning Procedures

A list of recommended sampling equipment is presented in Table x. Prior to sampling, all sediment collection implements and mixing trays will be thoroughly cleaned according the following procedure:

- Wash in a solution of Alconox®, Liquinox®, or similar phosphate-free detergent and deionized water
- Rinse three times with deionized water
- Wash with a dilute (2%) solution of hydrochloric acid
- Rinse three times with deionized water
- Wash with reagent grade methanol
- Rinse three times with deionized water
- All equipment is then allowed to dry in a clean environment
- The cleaned equipment is then stored in clean polyethylene bags until used in the field

Table 6. Field Sampling Equipment

Description of Equipment	Material (if applicable)
Sampling scoops / trowels / implements	Stainless steel or Kynar® coated
Compositing bucket / tray	Stainless steel or Kynar® coated
Broom, various sizes (for street dirt collection)	Natural fiber or nylon
Sample containers (8 oz.)	Amber glass, certified clean
Methanol, Reagent grade (Teflon™ squeeze bottle with refill)	
Hydrochloric acid, 2%, Reagent grade (Teflon™ squeeze bottle with refill)	
Liquinox detergent (diluted in Teflon™ squeeze bottle with refill)	
Deionized water	
Plastic scrub brushes	
Container for storage of sampling derived waste, dry	
Container for storage of sampling derived waste, wet	
Wet ice	
Coolers, as required	
Aluminum foil (heavy duty recommended)	
Protective packaging materials	Bubble / foam bags
Splash-proof eye protection	
Personal protective equipment for sampling personnel, including traffic control, as required	
Gloves for sample collection, reagent handling	Nitrile, powder-free
Gloves for “clean hands/dirty hands” mercury sampling	Vinyl, provided by laboratory
Field datasheets	
Chain of custody forms	
Shipping materials (as required)	
Global positioning system	

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4. QUALITY ASSURANCE / QUALITY CONTROL

The data quality objective process is implemented through a quality assurance/quality control (QA/QC) program. The elements of the QA/QC program including required levels of precision and accuracy, and tolerable levels of error are presented in detail in the CCCWP QAPP (CCCWP, 2020).

4.1 Field QA/QC and Duplicate Samples

Field personnel will strictly adhere to the project QA guidelines (CCCWP, 2020) to ensure the collection of representative, uncontaminated samples. Sampling methods are designed to be consistent with those employed for the CW4CB and other previous BASMAA investigations, as will be reasonably practicable in order to facilitate comparability with prior results. The most important aspects of field QA/QC associated with sample collection are:

- Field personnel will be thoroughly trained in the proper use of sample collection equipment and will be able to distinguish acceptable versus unacceptable samples in accordance with pre-established criteria presented in this Work Plan and relevant SOPs.
- Field personnel will be thoroughly trained to recognize and avoid potential sources of sample contamination (e.g., dirty hands, vehicle exhaust, contaminated equipment, ice used for cooling).
- Sampling implements that come in direct contact with the sample will be made of non-contaminating materials (e.g., glass, stainless steel, inert chemical coatings) and will be thoroughly cleaned between sampling stations.
- Sample containers will be pre-cleaned and of the type recommended by the analytical laboratory.

It is anticipated that there will be some degree of naturally occurring heterogeneity associated with both sediment and stormwater sample matrices, and therefore variability within analytical results. Field duplicate samples may assist with interpretation of analytical results by providing a measure of this variability.

Field duplicate samples will be collected with a frequency that is approximately five percent of sample locations or sample count. Generally, field duplicate sample collection will be spatially and temporally distributed among sampling sites to best represent variability of field conditions.

Stormwater sample duplicates will be filled sequentially, immediately following collection of their respective parent sample. Sediment sample duplicates will be homogenized with a mixing implement in sample-dedicated compositing buckets or trays where sample volume allows. Homogenized material will then be transferred to the appropriate wide-mouth glass jars for both the regular (parent) and duplicate samples. All jars designated for a particular analysis (e.g., PCBs) will be filled sequentially before jars designated for another analysis are filled (e.g., grain size). Duplicate samples will be preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate sample number and station number will be assigned to each field duplicate, and it will be submitted blind to the laboratory.

4.2 Laboratory QA/QC

The end products of laboratory analysis are data reports that should include a number of QA/QC results along with the environmental results. QA/QC sample results reported by the lab must include internal laboratory QA/QC results (method blanks, matrix spikes, laboratory duplicates, and laboratory control samples). These laboratory QA/QC results help assess analytical accuracy, precision and the potential for contamination. There are often differences among laboratories in terms of style and format of reporting. The data reviewer will verify that the laboratory data package as received includes the following items:

- A narrative which outlines any problems, anomalies, conclusions, and corrective actions
- Sample identification numbers
- Sample extraction and analysis dates/times
- Reporting limits and detection limits
- Results of method blanks
- Results of matrix spike and matrix spike duplicate analyses, including calculation of percent recovery and relative percent differences
- Results of laboratory control sample analyses, and calculation of percent recovery
- Results of standard reference material analyses, and calculation of percent recovery
- Surrogate spike analyses results for organic constituents and calculation of percent recovery
- A summary of acceptable QA/QC criteria used by the laboratory

4.3 Analytical Data Verification and Validation

Verification

Chain of custody records will be compared with field logbooks and laboratory data reports to verify the accuracy of all sample identification and to ensure that all samples submitted for analysis have a value reported for each parameter requested. The laboratory reports will be reviewed to identify results that are outside the range of normally observed values. Any type of suspect result or apparent typographical error will be verified with the laboratory. Besides apparent out-of-range values, the indicators of potential laboratory reporting problems include the following:

- Significant lack of agreement between analytical results reported for laboratory duplicates or field duplicates
- Unusual numbers of detected values reported for blank sample analyses
- Inconsistency in sample identification/labeling

If the laboratory confirms a problem with the reported concentration, the corrected or recalculated result will be issued in an amended report, or if necessary, the sample might be re-analyzed. If laboratory results are changed or other corrections are made by the laboratory, a revised laboratory report will be requested to update the project records.

Other steps for the data verification process include the following:

- Ensuring the proper preparation and/or preservation method was applied to all samples
- Ensuring that the correct analytical method was applied to the samples
- Verifying that target reporting limits were achieved
- Assessing that method holding times were met after sample delivery to the laboratory

Validation

The data quality evaluation process (data validation) is structured to provide systematic checks to ensure that the reported data accurately represent the concentrations of constituents to the maximum extent practicable. Data validation can often identify sources of contamination in the sampling and/or analytical processes, as well as detect deficiencies in the laboratory analyses or errors in data reporting. Data validation allows monitoring data to be used in the proper context with the appropriate level of confidence. QA/QC parameters that are reviewed in the validation process fall into the following categories:

- Reporting and method limits
- Holding times
- Contamination check results (method blanks)
- Precision analysis results (laboratory, field, and matrix spike duplicates)
- Accuracy analysis results (matrix spikes, surrogate spikes, laboratory control samples, and external reference standards)

Each of these QA/QC parameters will be compared to data quality acceptability criteria, also known as the project's data quality objectives (DQOs). The key steps that will be adhered to in the analysis of each of these QA/QC parameters are as follows:

- Examine the complete set of the QA/QC results for the parameter being analyzed
- Compare the laboratory QA/QC results to accepted criteria (DQOs)
- Compile any out-of-range values and report them to the laboratory for verification and potential reissue of the results for the parameter

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5. DATA MANAGEMENT AND REPORTING

Record keeping of field measurements data will employ standard record-keeping and tracking practices. All field measurements will be entered in datasheets at the time of collection. Field measurement data that were entered into datasheets will be quality control checked for entry errors. These data as well as all laboratory data deliverables will be maintained on a secure central server which is backed up daily. Additional data management procedures will follow the CCCWP QAPP where specified.

On an annual water-year basis, after field sampling is concluded and all issues related to project data have been finalized, a report documenting methods and results will be prepared. The annual reports may include discussions of sampling results, summary tables, graphical representation of sampling sites and analytical concentrations, statistical analysis and interpretation, recommendations for future monitoring, and an assessment of data quality.

Annual reports will conform to MRP requirements of completeness and content. To track progress toward achieving the monitoring goals set forth in this Work Plan, the annual reports will show how sampling was applied to the prioritized list of remaining source areas and will document percent completion. On a permit-cycle basis, updates on the overall completion time frame will be made.

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6. REFERENCES

CCCWP, 2020. Quality Assurance Project Plan, Pollutants of Concern Monitoring; Pesticides and Toxicity Monitoring MRP 2 Provisions C.8.f, C.8.g. Prepared by ADH Environmental and Applied Marine Sciences. February 14, 2020.

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Yee, D., and McKee, L. J., 2010. *Task 3. 5: Concentrations of PCBs and Hg in soils, sediments and water in the urbanized Bay Area: Implications for best management.* A technical report of the Watershed Program. SFEI Contribution 608. San Francisco Estuary Institute, Oakland, CA. March 31, 2010.

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7. APPENDIX A – EXAMPLE FIELD DATASHEETS FOR SEDIMENT STORMWATER QUALITY SAMPLING

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CCCWP POCs Field Data Sheet - SEDIMENT Collection		Contractor:	Pg of Pgs
StationID:	*Date (mm/dd/yyyy): / /		
General Location:	ArrivalTime: DepartureTime:		
ProjectCode:	Personnel:		

Location: Bank Midchannel StormDrain PumpStation Curb&Gutte	*GPS/DGPS	**Lat (dd.ddddd)**	**Long (ddd.ddddd)**	OCCUPATION METHOD: Walk-in Bridge R/V ________ Other
GPS Device:	**Target:**			STARTING BANK (facing downstream): LB / RB / NA
Datum: NAD83 / Accuracy (ft / m):	**Actual:**			DISTANCE FROM BANK (m): STREAM WIDTH (m): WATER DEPTH (m):

Habitat Observations (CollectionMethod = Habitat_generic)		WADEABILITY: Y / N / Unk	Wind Speed (mph):	HYDROMODIFICATION: None, Bridge, Pipes, ConcreteChannel, GradeControl, Culvert, AerialZipline, Other
SITE ODOR:	None, Sulfides, Sewage, Petroleum, Smoke, Other_______			LOCATION (to sample): US / DS / WI / NA
SKY CODE:	Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy	WIND DIRECTION (from): N W E S		
OTHERPRESENCE:	Vascular, Nonvascular, OilySheen, Foam, Trash, Other____		**PHOTOS** (RB & LB assigned when facing downstream; RENAME to StationCode_yyyy_mm_dd_uniquecode):	1: (RB / LB / BB / US / DS / ##)
DOMINANTSUBSTRATE:	Bedrock, Concrete, Cobble, Gravel, Sand, Mud, Unk, Other________________			
SEDODOR:	None, Sulfides, Sewage, Petroleum, Mixed, Other______	PRECIPITATION:	None, Fog, Drizzle, Rain, Snow	2: (RB / LB / BB / US / DS / ##)
SEDCOLOR:	Colorless, Green, Yellow , Brown	PRECIPITATION (last 24 hrs):	Unknown, <1", >1", None	
SEDCOMPOSITION:	Silt/Clay, FineSand, CoarseSand, Gravel, Cobble, Mixed, HardPanClay	EVIDENCE OF FIRES:	No, <1 years, <5 years	3: (RB / LB / BB / US / DS / ##)
OBSERVED FLOW:	NA, Dry Waterbody Bed, No Obs Flow , Isolated Pool, Trickle (<0.1cfs), 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs, 50-200cfs, >200c			

Samples Taken (# of containers filled) - Method=Sed_Grab		**Field Dup YES / NO:** (SampleType = Grab / Integrated; LABEL_ID = FieldQA; create collection record upon data entry
SAMPLE TYPE: Grab / Composite	Equip. Used: Scoop (SS / PC / PE), Core (SS / PC / PE), Grab (Van Veen / Eckman / Petite Ponar)	Depth Collected (cm): ____________

Circle all that apply	PCBs	Mercury	Grain Size	TOC	Metals[1]	PAHs	Pesticides[2]	Toxicity[3]
Sample ID								

1. Metals = arsenic, cadmium, chromium, copper, lead, nickel, zinc
2. Pesticides = pyrethroids (bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lamda-cyhalothrin, permethrin), carbaryl, fipronil and degredates.
3. Toxicity = *P. promelas, C. dubia, S. capricornutum, H. azteca, C. dilutus*

COMMENTS:

CCCWP POCs Field Data Sheet - WATER collection

CCCWP POCs Field Data Sheet - WATER collection		Contractor:	Pg of Pgs
StationID:	Date (mm/dd/yyyy): / /		
General Location:	ArrivalTime:	DepartureTime:	
ProjectCode:	Personnel:		

Location: Bank Midchannel StormDrain PumpStation Curb&Gutter	GPS/DGPS	**Latitude**	**Longitude**	OCCUPATION METHOD: Walk-in Bridge R/V _________ Other
GPS Device:	**Target:**			STARTING BANK (facing downstream): LB / RB / NA
Datum: NAD83 / Accuracy (ft / m):	**Actual:**			Point of Sample (if Integrated, then -88 in dbase)

Habitat Observations (CollectionMethod = Habitat_generic)		WADEABILITY: Y / N / Unk	Wind Speed (mph):	DISTANCE FROM BANK (m): / STREAM WIDTH (m): / WATER DEPTH (m):
SITE ODOR:	None,Sulfides,Sewage,Petroleum,Smoke,Other_______			
SKY CODE:	Clear, Partly Cloudy, Overcast, Fog, Smoky, Hazy	WIND DIRECTION (from):	N W E S	HYDROMODIFICATION: None, Bridge, Pipes, ConcreteChannel, GradeControl, Culvert, AerialZipline, Other / LOCATION (to sample): US / DS / WI / NA
OTHER PRESENCE:	Vascular,Nonvascular,OilySheen,Foam,Trash,Other______			**PHOTOS** (RB & LB assigned when facing downstream; RENAME to StationCode_yyyy_mm_dd_uniquecode): 1: (RB / LB / BB / US / DS / ##)
DOMINANT SUBSTRATE:	Bedrock, Concrete, Cobble, Gravel, Sand, Mud, Unk, Other___________________			
WATERCLARITY:	Clear (see bottom), Cloudy (>4" vis), Murky (<4" vis)	PRECIPITATION:	None, Fog, Drizzle, Rain, Snow	2: (RB / LB / BB / US / DS / ##)
WATERODOR:	None, Sulfides, Sewage, Petroleum, Mixed, Other_____________	PRECIPITATION (last 24 hrs):	Unknown, <1", >1", None	
WATERCOLOR:	Colorless, Green, Yellow , Brown, Gray	EVIDENCE OF FIRES:	No, <1 year, <5 years	3: (RB / LB / BB / US / DS / ##)
OVERLAND RUNOFF (Last 24 hrs):	none, light, moderate / heavy, unknown			
OBSERVED FLOW:	NA, Dry Waterbody Bed, No Obs Flow, Isolated Pool, Trickle (<0.1cfs), 0.1-1cfs, 1-5cfs, 5-20cfs, 20-50cfs, 50-200cfs, >200cfs			

Field Measurements (SampleType = FieldMeasure; Method = Field) *Record replicate Free and Total Chlorine measurements for any results > 0.08 mg/L*

	DepthCollected (m)	Water Temp (°C)	pH	O_2 (mg/L)	Specific Conductivity (uS/cm)	Salinity (ppt)	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Chlorine Kit Exp. Date
SUBSURF/MID/ BOTTOM											
Instrument:											
Calib. Date:											

Samples Taken (# of containers filled) - Method=Water_Grab | **Field Dup** YES / NO: (SampleType = Grab / Integrated; LABEL_ID = FieldQA; create collection record upon data entry

SAMPLE TYPE: Grab / Integrated | COLLECTION DEVICE: | Indiv bottle (by hand, by pole, by bucket); Teflon tubing; Kemmer; Pole & Beaker; Other _________________

Circle all that apply	SSC	PCBs	TOC	Mercury	Methymercury	Total Copper	Dissolved Copper	Hardness	Nutrients[1]	Pesticides[2]	Toxicity[3]
Sample ID											

1. Nutrients = ammonia, nitrate, nitrite, TKN, orthophosphate, and total phosphorus. Field filter for ammonia, nitrate, nitrite, and orthophosphate.

2. Pesticides = pyrethroids (bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lamda-cyhalothrin, permethrin), imidacloprid, indoxacarb, fipronil and degredates.

3. Toxicity = *P. promelas, C. dubia, S. capricornutum, H. azteca, C. dilutus*

COMMENTS: