Attachment B

Sediment Monitoring and Reporting Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

MONITORING AND REPORTING PROGRAM
FOR THE

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

STREAM MAINTENANCE PROGRAM

NAPA COUNTY

ORDER NO. R2-2019-00XX

A. GENERAL

1. This Monitoring and Reporting Program (MRP) is issued in accordance with Water Board Order No. R2-2019-00XX (Order) and pursuant to Water Code sections 13263 and 13267(b).
2. The MRP is necessary to: 1) document compliance with waste discharge requirements and prohibitions established by the Water Board, 2) facilitate self-policing by the Napa County Flood Control & Water Conservation District (Discharger) in the prevention and abatement of pollution arising from waste discharge, 3) evaluate the effectiveness of the Stream Maintenance Program (SMP), including assessment of best management practices (BMPs) and mitigation measures, and 4) assist the Discharger in complying with State requirements and policies. The evidence supporting this MRP is in the public file for this matter.
3. The MRP includes monitoring requirements for maintenance and restoration activities including the following monitoring elements: receiving water monitoring for the types of pollutants and conditions listed under the Standard Observations section; surface water monitoring during active water diversions; sediment monitoring from sediment removal projects; erosion and sediment control monitoring for bank stabilization projects; monitoring of revegetation projects and biotechnical bank stabilization projects to determine if plant establishment success criteria have been met; and monitoring BMPs to assess their effectiveness.
4. For monitoring, the Discharger shall follow requirements contained in this MRP and any additional requirements listed in the Sediment Sampling and Analysis Guidelines in the Discharger's Stream Maintenance Manual (Manual)).

B. SAMPLING AND ANALYTICAL METHODS

1. Sample collection, storage, and analyses shall be performed according to the most recent version of U.S. EPA Standard Methods for the Analysis of Water and Wastewater.
2. Water and sediment analyses shall be performed by a laboratory certified for these analyses by the State of California.
3. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. A **grab sample** is a discrete sample collected at any time.
2. A **composite sample** is a discrete sample comprised of two or more grab samples collected at any time from a defined project area.
3. **Receiving waters** refers to any water body that actually or potentially receives surface or groundwater, which passes over, through, or under

dredged sediment during placement, dewatering, settling/consolidation, and excavation/removal activities.

4. **Receiving Waters Standard Observations** refer to:
   a. Evidence of floating and suspended materials as recorded by visual observations.
   b. Discoloration and turbidity: description of color, source, and size of affected area.
   c. Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
5. **Site Standard Observations** refer to visual inspection of:
   a. For sediment removal projects, the overall condition of the sediment containment structure(s) and area and any BMPs to contain the excavated sediment.
   b. The location of placed material, distance to waters of the State, and whether any discharge of dredged sediments outside of the containment structures has occurred.
   c. The condition of the excavated material transport equipment along the entire length of the transport path from the sediment removal area to the point of discharge into the containment area.
   d. For bank stabilization projects, the overall condition of the bank stabilization structure (e.g., rock riprap, crib wall, wrapped soil lifts) and the areas of the bed and bank of the channel adjacent to the bank stabilization structure. Overall condition includes, but is not limited to, the presence or absence of vegetation, the stability of the structure, or the presence of slumping, rills, or other evidence of erosion on the channel bank.

D. MONITORING REQUIREMENTS

1. **Observations and Monitoring Schedule -** The schedule of observations and monitoring is provided in Table 1, below:

Table 1 - Observations and Monitoring Schedule for Sediment Removal or Disposal Projects

Observation/Monitoring Frequency	**Type**	**Location**	**Reporting Frequency**
Twice daily (once in AM and once in PM) during operations	Receiving water standard observations	Receiving water within the project area	Annually
	Site standard observations	Along project area	Annually

2. **Standard Observations -** The following Standard Observations of the receiving water shall be recorded on every day of operation on the field reporting form:

   a. Floating and suspended materials of waste origin (to include oil, grease, algae, and other macroscopic particulate matter): presence or absence, source, and size of affected area.

   b. Discoloration and turbidity: description of color, source, and size of affected area.

   c. Odor: presence or absence, characterization, source, distance of travel, and wind direction.

   d. Hydrographic conditions, including: time and height of corrected low and high tides and depth of water columns and sampling depths.

   e. Weather conditions, including: air temperatures, wind direction and velocity, and precipitation.

3. **Active Water Diversion Monitoring -** For all activities involving an active diversion of a stream:

   a. The Discharger shall establish surface water monitoring stations, one representative of typical undisturbed conditions directly upstream of the active work area and the point of diversion, and one representative of surface water affected by the diversion that is directly downstream of the water diversion outlet.

   b. Baseline measurements shall be taken before installation of diversion structures at the established surface water monitoring stations identified above in 3.a.

   c. If for whatever reason work within that reach is interrupted for over one day, new baseline measurements shall be taken.

   d. Water diversion activity monitoring shall be in accordance with Table 2, below:

Table 2 – Water Diversion Sampling and Analysis

Parameter	**Units**	**Sample Type**	**Minimum Analysis Frequency**
Dissolved Oxygen	mg/L	Grab	Once Daily at each monitoring station
pH	pH units		
Temperature	°F		
Turbidity	NTU		

e. The daily sampling set shall be taken during work hours but not within the first hour after maintenance activities have started each day.

f. Samples shall be taken with accurately calibrated field measurement instrument(s) and the results shall be saved and logged.

g. A Quality Assurance/Quality Control (QA/QC) plan equivalent to requirements of the State's Surface Water Ambient Monitoring Program shall be followed.

h. The Discharger shall observe surface water conditions upstream and downstream of the active project area to visually detect impacts of the water diversion.

i. Observations shall be conducted during sampling events at sampling locations for presence of bottom deposits, color, film, or coating (from oil, grease, wax, etc.), floating material (including solids, liquids, foams, and scum), and odor. See the Standard Observations section for the complete list of observations that will be tracked. If any visual events occur, additional samples as detailed in Table 2 shall be taken, with results being saved, logged, and reported.

j. The Discharger shall have equipment and supplies onsite (or readily available nearby) that could be quickly deployed to provide additional filtration if turbidity is observed. These supplies may include: bladders for settling, filter bags and pumps, silt filter dams, or a silt barrier as appropriate depending on site conditions.

k. Surface water observations detecting exceedances of Discharge Specifications and Receiving Water Limitations are subject to "Reporting" requirements in Section F of this document.

l. During the installation and removal of diversion structures, the Discharger shall monitor surface monitoring stations as described in 3.a, above, and in accordance with Table 3, below:

Table 3 – Diversion Structure Monitoring

Parameter	**Units**	**Sample Type**	**Minimum Analysis Frequency**
Turbidity	NTU	Grab	Twice Daily

4. **Sediment Monitoring**

a. Sampling Frequency and Locations

i. For sediment removal projects and bank stabilization projects at creeks that have not been approved for reduced sampling frequency, one sample will be collected and analyzed for every 500 cubic yards of sediment removed. Several grab samples may be composited into one sample to represent the bulk of sediment to be removed from the creek.

ii. For long channel reaches that are not particularly wide or deep with sediment, the Discharger will collect grab sediment samples for every 1000 feet of project length rather than per 500 cubic yards of sediment removal. The Discharger shall use whichever approach results in more samples to better characterize the variability along the entire length of the project site.

iii. For project sites that require more than one sample, grab sampling locations will be selected to represent overall reach conditions. Sampling sites will also specifically target conditions downstream of culvert crossings, culvert outfalls, and key stream confluences.

iv. In all cases, sampling locations shall be within the project area where there is the highest potential for detecting the maximum number of contaminants at the highest concentrations, and the sampling locations shall be the most representative of site conditions.

v. Upon approval by the Executive Officer, sampling frequencies may be reduced at locations where the review of readily available, existing information, including all results of previously collected physical and chemical testing, have continually demonstrated attainment of screening guidelines. The Discharger may propose reduced sampling frequency for sites within a minimum of two years of data. Testing results must meet screening criteria for "Wetland Surface Material" established in the May 2000 *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* or be commensurate with natural/anthropogenic background concentrations. For sites with reduced sampling frequency, Water Board staff may still require sediment sampling and analysis when there is a suspected contamination source.

b. Sediment Sampling Methodology

This guidance applies to discrete (single) samples and composite samples:

i. All samples shall be collected in accordance with U.S. EPA Guidelines and sampling methodologies.

ii. The methods of analyses and detection limits must be appropriate for the expected concentrations, water quality standards, and screening levels depending on the final disposition of the sediment. For example, if the material is proposed for beneficial reuse at an aquatic site, then appropriate sampling methodology should be used to determine if the material meets screening criteria for wetland surface material. Specific methods of analyses must be identified. If methods other than U.S. EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and approved by the Executive Officer.

iii. Sediment sampling methodology is described in the Manual's Sediment Sampling and Analysis Guidelines.

iv. For each sediment removal project, the Discharger shall characterize the sediment and summarize all sediment sampling analyses, prior to proposed sediment removal activities.

v. Every sediment sample location shall be sampled for the full list of parameters/analytes listed in Table 4 as appropriate, depending on the final disposition of the sediment. Sampling parameters/analytes listed in Table 4 may be modified after a history of sampling is obtained. This may result in not requiring monitoring for some of these contaminants under certain situations or at certain locations, or adding more parameters/analytes if deemed necessary by the Executive Officer.

5. **Post-Project Monitoring**

a. Bank Stabilization Erosion and Sediment Control Monitoring

i. For the first year following completion of a bank stabilization project, the Discharger shall inspect surface waters daily following larger storm events to determine if the project and the installed BMPs are adequately functioning to stabilize soil and prevent excessive erosion.

ii. Photos shall be taken to document all site inspections.

iii. After the first year of monitoring, the project site shall be monitored annually for a minimum of five years monitoring post-construction.

iv. The Discharger shall observe surface water upstream and downstream of each bank stabilization site for bottom deposits, color, turbidity, and floating material. Monitoring shall include a visual observation of conditions 200 feet upstream and downstream of the site, conditions of the bank stabilization repair, and conditions of any vegetation planting that was performed.

v. If any site fails such that erosion or degradation is apparent or the appearance of surface water is degraded, the Water Board shall be immediately notified. The Discharger shall undertake an evaluation that identifies the causes of excessive erosion/sedimentation and develop corrective actions to ensure channel stability. The Discharger shall implement all corrective actions identified in the evaluation upon receiving written acceptance by the Executive Officer.

b. Revegetation Monitoring including Bank Revegetation

i. The Discharger shall monitor all revegetated sites annually for five years after planting, and for at least two years after supplemental watering is discontinued, to determine if supplemental watering, weed control, rodent control, protection from vandalism or herbivory, or other actions are required to encourage plant establishment.

ii. The Discharger shall implement all vegetation management requirements until the success criteria are attained.

c. Geomorphic Shaping Activities

i. The Discharger shall monitor all projects that require "geomorphic shaping activities" to determine the sustainability of the grading. These project sites shall be monitored for a minimum of five years and all monitoring results shall be submitted to the Water Board.

ii. For geomorphic shaping projects, post-project monitoring shall include evaluating the following channel conditions: channel bank stability, bed scour, thalweg location, and any indications of excessive erosion, instability, or deposition in the channel. If signs of excessive erosion or deposition are observed and/or if the project reach is not geomorphically stable at the end of the five-year monitoring period, the Discharger shall prepare an analysis of the cause of instability implement corrective actions upon receiving written acceptance by the Executive Officer.

d. *Maintenance Activities in Alluvial Fans*

The Discharger shall monitor all maintenance projects located in or influenced by alluvial fan environments to determine if adaptive management of these areas will inform future management plans. These project sites shall be monitored for a minimum of five years and all monitoring results shall be submitted to the Water Board.

6. **Best Management Practices Monitoring**

a. The Discharger shall inspect temporary and permanent structural BMPs at active sites on an on-going basis and at least once each morning and once each afternoon that an activity is being implemented to determine if maintenance, repair, or replacement of BMPs is necessary.

b. The Discharger shall maintain, repair, or replace BMPs as appropriate to prevent sediment discharge and reduce erosion.

c. The Discharger shall document BMPs installations and inspections and enter all data in the BMPs inspection log.

d. The Discharger shall document BMPs effectiveness, maintenance and repair, and corrective actions taken, and enter all data in the BMPs inspection log.

e. The BMPs inspection log shall be kept onsite while the site is active and shall be available to Water Board staff upon request.

f. At a minimum, BMPs at active project sites shall be inspected and maintained within two business days (48 hours) prior to each qualifying rain event and within two business days (48 hours) after each qualifying rain event. For this requirement, a qualifying rain event is one producing precipitation of ½ inch or more of discharge.

E. QUALITY ASSURANCE AND QUALITY CONTROL

A QA/QC plan is an important component of a monitoring program involving extensive field sampling and laboratory analyses. The two objectives of the QA/QC plan are: 1) to provide a means of ongoing control and evaluation of the sampling and analysis procedures; and 2) to quantify data precision and accuracy for use in data interpretation. The QA/QC plan will be followed in all phases of the monitoring program including sampling, data validation, and reporting. QA/QC requirements are noted below.

a. The Discharger shall use a sampling contractor or internal staff to perform field measurements with appropriate field instruments and sampling equipment; the persons performing field measurements will be responsible for managing all field sampling and analysis.

b. All equipment used for field sampling shall be tested and calibrated before leaving the office and verified upon arrival at the site to ensure the instruments are in proper working condition.

F. REPORTING

1. General Reporting Requirements

a. The Discharger shall comply with reporting dates and requirements within the SMP Manual and the Order.

b. All results of monitoring performed in compliance with this Order shall be made available to Water Board staff upon request.

c. The Discharger shall submit a transmittal letter with all required monitoring reports to demonstrate compliance with the Order.

2. Records to Be Maintained

Written reports shall be maintained by the Discharger or its laboratory and shall be retained for a minimum of five years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Water Board. Such records shall show the following for each sample:

a. Identity of sample and sample station number.

b. Date and time of sampling and the name of the person performing the sampling.

c. Date and time that analyses are started and completed and name of the personnel performing the analyses.

d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used.

e. Calculation and evaluation of results.

f. Results of analyses, reporting limits for each analytical batch, and detection limits for each analysis.

3. **Reports to Be Filed With the Water Board**

Written monitoring reports shall be filed with the Water Board annually. The reporting requirements are noted below.

a. A letter transmitting the essential points in each report should accompany the Annual Post-maintenance Report. Such a letter shall include:

i. A discussion of any violations of the requirements of the Order found during the last report period, and actions taken or planned for correcting the violations. If the Discharger had previously submitted a detailed time schedule for correcting violations, a reference to the correspondence transmitting such schedule will be satisfactory.

ii. If no violations have occurred in the last report period, this shall be stated in the letter of transmittal.

iii. Monitoring reports and the letter transmitting the monitoring reports shall be signed by the duly authorized representative of the Discharger that is responsible for implementing projects authorized by this Order.

iv. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

b. The Annual Post-Maintenance Report shall contain the following:

i. A summary of all maintenance activities implemented under the SMP authorized by this Order.

ii. Tabular and graphical summaries of the monitoring data obtained during the previous year.

iii. A summary and certification of completion of all Standard Observations for each project site.

iv. A description of the compliance record and any corrective actions taken or planned that may be needed to bring the Discharger into full compliance with this Order.

v. The Discharger shall submit an Annual Post-maintenance Report to the Water Board by January 31 of each year, covering the previous calendar year activities.

vi. For each sediment removal project:

1. Characterization of the sediment.

2. A summary of all sediment sampling analyses.

vii. For each sediment disposal event:

1. The quantity and locations of excavated material placed at the site and the source of the excavated material.

2. An estimate of the total volume of dried excavated material that was reused or disposed of off-site during the past year along with a description of the reuse or disposal location(s) where this material was sent.

3. A map or aerial photograph showing the sediment disposal location.

c. Laboratory statements of results of analyses specified in the MRP must be included in each sediment removal and sediment disposal report. The laboratory reporting requirements are as follows.

i. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Water Board.

ii. Laboratory QA/QC information must be included in the monitoring report.

iii. The laboratory QA/QC information should include: the method; equipment and analytical detection limits; the reporting limits for each analytical batch, the recovery rates of method spikes and matrix spikes; an explanation for any recovery rate that is less than the recovery acceptance limits specified in the U.S. EPA method procedures or the laboratory's acceptance limits (if they are more stringent than those in the U.S. EPA method procedures); the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

4. **Contingency Reporting**

A report to the Executive Officer and Water Board case manager shall be made by telephone of any accidental discharge of whatever origin immediately after it is discovered. A written report shall be filed with the Water Board within five days thereafter. This report shall contain the following information:

i. A map showing the location(s) of discharge(s);

ii. Approximate quantity of discharged material;

iii. Nature of effects, i.e., all pertinent observations and analyses; and

iv. Corrective measures under way or proposed.

5. **Violation Reporting**

a. Upon discovery of a violation of any Water Quality Standard or Water Quality Objective in the Basin Plan, the Discharger shall identify the source of the exceedance, implement corrective action, and resample or make additional observations to determine whether or not the exceedance was corrected.

b. A report to the Executive Officer and the Water Board case manager shall be made by telephone of any accidental discharge of whatever origin immediately after it is discovered. A written report shall be filed with the Water Board within five days thereafter.

c. The Discharger shall stop all work at the site for violations lasting longer than two hours. The Discharger shall update Water Board staff of site conditions and obtain verbal permission to resume work.

d. The Discharger shall notify Water Board staff in writing within five calendar days of all violations. Written reports shall include time and date of incident, duration, estimate of discharge or bypass volume, and documentation of sampling results/observations determining compliance status. The report shall also include detailed discussion of reasons for noncompliance, and specific steps that were or will be taken to correct the failure and prevent it from reoccurring.

G. MODIFICATION

Any part of this Monitoring and Reporting Program may be revised with the written approval of the Executive Officer.

Table 4
Discrete Sediment Sampling and Analysis

U.S. EPA Test Method[1]	Analyte	Reporting Limit for Soil[2] (mg/kg)	Analyte (cont.)	Reporting Limit for Soil (mg/kg)
	Conventional Parameters			
	Grain size (%)	0.1		
9060	Total organic carbon (TOC) (%)	0.1		
	Total solids (%)	0.1		
6020	**Total Metals**			
	Arsenic	0.05	Mercury (total)	0.01
	Cadmium (total)	0.05	Nickel (total)	0.1
	Chromium (total)	0.1	Selenium (total)	0.1
	Copper (total)	0.1	Silver (total)	0.1
	Lead (total)	0.1	Zinc (total)	1.0
8081 or 8082A	**Organochlorine Pesticides/PCBs**			
	Aldrin	0.02	Total DDT	NA
	α-HCH (hexachlorocyclohexane)	0.02	Dieldrin	0.02
	β-HCH	0.02	Endosulfan I	0.02
	γ-HCH (Lindane)	0.02	Endosulfan II	0.02
	δ-HCH	0.02	Endosulfan sulfate	0.02
	Chlordane (tech)	0.02	Endrin	0.02
	2,4'-DDD	0.02	Endrin aldehyde	0.02
	4,4'-DDD	0.02	Heptachlor	0.02
	2,4'-DDE	0.02	Heptachlor epoxide	0.02
	4,4'-DDE	0.02	Toxaphene	0.02
	2,4'-DDT	0.02	PCBs (sum)	
	4,4'-DDT	0.02		
8270	**Poly Aromatic Hydrocarbons (PAHs)**			
	2-Methylnaphthalene	0.005	Chrysene	0.001
	Acenaphthene	0.001	Dibenz(a,h)anthracene	0.001
	Acenaphthylene	0.001	Fluoranthene	0.001
	Anthracene	0.001	Fluorene	0.001
	Benz(a)anthracene	0.001	Indeno(1,2,3-cd)pyrene	0.001
	Benzo(a)pyrene	0.001	Naphthalene	0.001
	Benzo(b)fluoranthene	0.001	Phenanthrene	0.001

[1] The most recent version of U.S. EPA's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," also known as SW-846, shall be used.
[2] All laboratory analytical reports shall include the detection and reporting limits, any flags, and a QA/QC report. Electronic (PDF) submittals are preferred.

U.S. EPA Test Method[1]	**Analyte**	**Reporting Limit for Soil**[2] (mg/kg)	**Analyte (cont.)**	**Reporting Limit for Soil** (mg/kg)
	Benzo(k)fluoranthene	0.001	Pyrene	0.001
	High molecular weight PAHs (sum)	NA	Low molecular weight PAHs (sum)	NA
	PAHs (total)	NA		

The Discharger shall maintain records of field sampling in a log containing at least the following information:

- Date and time
- Site location
- Sample collector
- Sampling methods
- Sampling location
- Sampling depth
- Number of sampling containers
- Specific site conditions
- Analysis requested
- Other information describing the sampling event

Field sampling logs shall be made available to Water Board staff upon request.