

APPENDIX 4

Water Quality Monitoring Program Plan

As required by SWRCB Order No. WQ 2013-0058-EXEC, this plan shall be implemented by the BCPUD immediately upon discovery of any Category 1 SSO of 50,000 gallons or more in order to assess the impacts from the SSO to surface waters. Water quality testing must be completed within 48 hours of the BCPUD becoming aware of the SSO. **Note that due to the specific characteristics of the BCPUD sewer collection system it is highly unlikely that a Category 1 SSO of 50,000 gallons or more would ever occur. Given the historic flows into the BCPUD sewer system, the source of an SSO will be identified, and containment and repair procedures will be implemented well before 50,000 gallons or more of untreated or partially treated wastewater could be spilled.**

SWRCB Water Quality Monitoring Requirements

SWRCB Order No. WQ 2013-0058-EXEC requires that all enrollees develop and implement an SSO Water Quality Monitoring Program to assess impacts from SSOs to surface waters in which 50,000 gallons or more are spilled to surface waters. The SSO Water Quality Monitoring Program, shall, at a minimum:

1. Contain protocols for water quality monitoring.
2. Account for spill travel time in the surface water and scenarios where monitoring may not be possible (e.g. safety, access restrictions, etc.).
3. Require water quality analyses for ammonia and bacterial indicators to be performed by an accredited or certified laboratory.
4. Require monitoring instruments and devices used to implement the SSO Water Quality Monitoring Program to be properly maintained and calibrated, including any records to document maintenance and calibration, as necessary, to ensure their continued accuracy.
5. Within 48 hours of the enrollee becoming aware of the SSO, require water quality sampling for, at a minimum, the following constituents:
 - i. Ammonia
 - ii. Appropriate Bacterial indicator(s) per the applicable Basin Plan water quality objective or Regional Board direction which may include total and fecal coliform, enterococcus, and e-coli.

Additionally, for Category 1 SSOs of 50,000 gallons or more, an SSO Technical Report is required and must be submitted within 45 calendar days from the SSO end date. The SSO Technical Report requirements are described in Element 5, Overflow Emergency Response Plan, of the SSMP.

SAFETY

All BCPUD staff shall be aware of safety issues and are not required to work in unsafe conditions in order to comply with this Water Quality Monitoring Plan. Scenarios where monitoring may not be possible may include, but are not limited to, heavy rain/storm events where access points have been compromised, flooding around low level areas, or fast-moving water. BCPUD staff shall employ the buddy system as required to maximize employee safety as appropriate when sample collection is required.

ESTIMATION OF SPILL TRAVEL TIME

The follow methods are recommended to estimate spill travel time and direction:

- Method-1; use a velocity probe if available to determine the rate of flow in the surface water or
- Method-2; take visual ft/sec measurement from above, based on floating debris, to estimate the number of feet the debris has traveled in seconds. (Note: If the first measurement is uncertain, this time estimate may be performed three to five times, and the values averaged to determine the estimate travel time. The velocity in the upper portion of the water body can then be calculated by dividing the measured distance by the average time.)

Either method will provide a means to estimate the distance traveled and identify where the SSO may be headed within the waterway.

WATER QUALITY SAMPLING PROCEDURES

• In the event an SSO reaches a surface water or (flowing) drainage channel tributary, BCPUD staff shall take samples for spills less than 50,000 gallons as soon as (and as directed by Marin County EHS Department, as provided in Element 5 of this SSMP) and within 48 hours for spills greater than 50,000 gallons. The purpose of water quality sampling is to determine the nature and extent of the impact of the SSO.

- When sampling an SSO, a minimum of three separate sample sets shall be obtained as soon as possible, as conditions allow. Water quality sampling should not be given precedence over stopping the spill or protecting public health. One sample shall be taken 500-feet upstream of the discharge location. The second sample shall be taken at the discharge location. A third sample shall be taken 1000-feet downstream of the discharge location.

- Sample for Total and Fecal Coliform, eColi, Enterococcus, and Ammonia as a minimum. Conduct additional sampling for pH if practical.

- Additional follow-up samples are recommended to confirm the extent that the impact reverts back to baseline levels. Follow-up samples may be used to determine if posting of warning signs should be discontinued (if signs were posted).

- Collaboration with the Marin County EHS Department should continue until such time as that department determines that sampling may be stopped.

- Staff shall take into account Spill Travel Time. If the SSO is occurring, the “source” sample location is the point where the SSO is entering the waterway. If the SSO has stopped, staff shall calculate the approximate downstream distance from the original SSO location by dividing the time since the SSO occurred by the estimated velocity. This is the approximate downstream distance from the SSO discharge point to the “source” sampling location.

WATER QUALITY SAMPLING EQUIPMENT

The following list describes equipment that should be stocked and readily available for each water quality sampling event.

- Personnel protective equipment including latex/nitrile gloves and eye protection
- 3 – 100 mL sterile plastic containers for coliform analysis.
- 3 – 500 mL Poly containers preserved with H₂SO₄ for Ammonia analysis.
- 3 – sterile funnels
- 1 – Sample Collection Container
- Cooler with ice packs
- Chain of Custody forms

Staff shall ensure that there are adequate quantities of sample containers-kits if there are more than three sample locations.

WATER QUALITY SAMPLING PROCEDURE

1. Put on all required protective equipment including latex/nitrile gloves and eye protection.
2. Use the 100 mL sterile container for coliform and 500mL poly container for ammonia. Ammonia sample requires preservation with H₂SO₄.
3. Collect three sets of samples for each incident:
 - a. 500 feet upstream
 - b. At the SSO discharge location
 - c. 1000 feet downstream
4. Collect all grab samples approximately 3' - 6" below the surface (or if shallower, as close as possible to this depth) to avoid sampling debris or scum from the surface.
5. Collect the sample in a safe manner in the middle of the flow, against the direction of water flow.
6. Rinse the sample collection container.
7. Collect sample in sample collection container and photo-document the locations.
8. Transfer sample from sample collection container to individual sample bottle(s).
9. Leave approximately one inch of head space in individual sample bottles. Do not overfill.
10. Once the lid is opened for the individual sample bottle, do not touch the inside surface of the bottle or lid.
11. For the sample bottles that contain a preservative, take care to keep the preservation material in the container.
12. Immediately place all sample bottles on ice.
13. Complete Chain of Custody form and take samples to contracted accredited or certified environmental laboratory as directed by Marin County EHS Department.

WATER QUALITY ANALYSIS - PROTOCOLS

Laboratory: All samples will be sent to an accredited or certified laboratory. The laboratory methods will be performed according to the laboratory's Standard Operating Procedures (SOPs).

Maintenance and Calibration of Monitoring Instruments and Devices: All laboratory monitoring instruments and devices used for water quality analyses are maintained and calibrated according to the SOPs to ensure their continued accuracy, including field measuring devices (such as a velocity probe, if used). The BCPUD's sampling equipment is checked by staff annual to verify the contents and staff replace chemical preservatives in the sample bottles at that time.

REPORTING REQUIREMENTS

The General Manager is responsible for submitted water quality monitoring information with the certified Category 1 SSO report in the ciwqs Online SSO Database within 15 calendar days of the SSO end date.

The General Manager also is responsible for submitting information related to the Technical Report (required per Element 5, Overflow Emergency Response Plan in the SSMP) in the ciwqs Online SSO Database, which must be done within 45 calendar days of the SSO end date. The SSO Technical Report must include the following water quality monitoring information:

- Description of all water quality sampling activities conducted;
- Analytical results and evaluation of the results; and
- Detailed location map showing all water quality sampling points.