

SAMPLING AND ANALYSIS BULLETIN

In 1999, the State Water Resources Control Board (SWRCB) issued the *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity* (CAS000002), hereafter referred to as the *General Permit*. In April 2001, the SWRCB modified the Monitoring Program and Reporting Requirements of the *General Permit* to include new sampling and analytical requirements for construction projects. The new monitoring requirements do not apply to discharges from tribal lands or from the Lake Tahoe Hydrologic Unit. The new requirements are intended to determine if Best Management Practices (BMPs) implemented on the construction site are effective for preventing sediment/silt and other construction-related pollutants from impacting water quality objectives.

The new sampling and analysis requirements are set forth in the *Modifications to Water Quality Order 99-08-DWQ, SWRCB, NPDES General Permit for Storm Water Discharges Associated with Construction Activity*, hereafter referred to as the *Modifications*, which were adopted by the SWRCB on April 26, 2001. A copy of the *Modifications* can be accessed on the SWRCB web site at http://www.swrcb.ca.gov/stormwtr/docs/adopted_modifications%20.doc. The *Modifications* do not apply to projects in tribal lands or to projects in the Lake Tahoe Hydrologic Unit.

The *Modifications* delineate two categories of pollutants. These categories of pollutants are (1) sediment/siltation/turbidity and (2) non-visible pollutants. These two categories are subject to different sampling and analysis requirements as described in this directive.

1. **Category 1: Sediment/Siltation/Turbidity** – The Environmental Protection Agency (EPA) lists certain water bodies as being impaired for sediment/siltation or turbidity, referred to as 303(d) water bodies. The *Modifications* require specific sampling and analysis for construction projects that directly discharge to 303(d) water bodies listed as impaired due to high levels of Sedimentation/Siltation or Turbidity. Water bodies that are listed as impaired due to sedimentation/siltation or turbidity in California can be accessed at the SWRCB web site at: <http://www.swrcb.ca.gov/stormwtr/construction.html> in the *General Permit*.

Where a project discharges directly into a 303(d) water body listed for sediment or turbidity, the SWPPP must include a sampling and analysis plan (SAP) that will determine whether water quality objectives are impacted by direct storm water discharges from the project. Discharges that flow to tributaries of 303(d) waters, which are not themselves listed, or which flow to a Municipal Separate Storm Sewer System, are not subject to these requirements.

Category 2: Non-Visible Pollutants – Where a project has the potential to discharge storm water that may be contaminated with pollutants that cannot be detected visually, the SWPPP must include a SAP that will be implemented to monitor the runoff for non-visible pollutants that are known or should be known to be on site. This requirement applies to discharges from the construction site **to any water body, storm drain, or land**. Pollutants that should be considered for inclusion in the SAP are those identified in Sections A.5.b. and A.5.c of the *General Permit*.

All construction sites will be required to prepare a SAP for non-visible pollutants unless the contractor, with the RE's approval, can document that **all** of the following conditions apply to the project:

- The project does not store or transport potential non-visible pollutants.
- The project does not have the potential to spill or spread non-visible pollutants.
- The project stores potential non-visible pollutants on the construction site at all times under watertight conditions. Watertight conditions include storage in a watertight container, under a watertight roof, or within a building; or protected by temporary cover and containment that prevents storm water contact and runoff from the storage area.
- The project does not have uncovered stockpiles of materials.
- The project does not use soil amendments with the potential to elevate pH levels (such as lime or gypsum) or contribute toxic pollutants to storm water.
- The project will not conduct the following activities: sawcutting of concrete or asphalt; washing of exposed aggregate concrete; concrete operations washout; building washing; equipment maintenance, fueling, or washing; minor street washing associated with street delineation; and/or sealing and paving operations during rain events.
- The existing project site does not have any features that, as a result of known past usage, may contribute pollutants to storm water, (e.g., toxic materials that are known to have been treated, stored, disposed, spilled, or leaked onto the construction site).

Non-visible pollutants are those that cannot be seen in the discharge. Such pollutants may result where storm water contacts pollutants that are or should be known to occur on the site (e.g., contaminated soils, spills, soil amendments, uncovered material stockpiles, or other sources of materials and chemicals). For example, if storm water en route to the storm drainage inlet were to contact spills of construction materials or wastes, or an unprotected stockpile of cement bags, the storm water could be contaminated with non-visible pollutants and would be subject to the sampling and analysis requirements of the *Modifications*.

Under the new requirements, the SWPPP must include an appropriate SAP to be implemented if the **potential** for such contamination is known. Where appropriate BMPs are not implemented prior to a rain event, or any failure of a BMP occurs, which could result in the discharge of non-visible pollutants to surface waters, or the site is known to be contaminated, the requirements to conduct sampling and analysis shall apply. Appropriate BMPs identified in the *Caltrans Storm Water Handbooks* include Non-Storm Water Management BMPs and Waste Management and Materials Pollution Control BMPs. If spilled materials or wastes are completely removed (including contaminated soils) and are properly stored or disposed of prior to a rain event in accordance with BMPs, no sampling and analysis of storm water would be required because there is no potential for storm water contamination. Similarly, if a stockpile of cement bags is stored in a watertight condition, no sampling and analysis would be required.

CHECKLIST OF SWPPP REQUIREMENTS FOR SAPS

- 1. Does the construction site storm water runoff discharge directly to a 303(d) water body listed as being impaired due to Sedimentation/Siltation or Turbidity?** Note: Discharges that flow directly into

tributaries of 303(d) water bodies, which are not themselves 303(d) listed, and discharges to Municipal Separate Storm Sewer Systems, including Caltrans storm drainage system, are not subject to the new requirements.

IF **NO**, THE REQUIREMENTS FOR SEDIMENT/TURBIDITY MONITORING DO NOT APPLY. CONTINUE WITH QUESTION #2 ON THE CHECKLIST.

IF **YES**:

A. The SWPPP must comply with Sections A.1.e, A.5.b.(7), and B.7 of the *Modifications* as follows:

1. Add Section 600.4– SAP for Sediment

a. The SAP shall comply with the requirements in the sample contractor's water quality SAPs that are available on the Caltrans internet site at: <http://www.dot.ca.gov/hq/construc/stormwater.html>.

An additional guidance document titled *Construction Storm Water Quality Sampling Document* is available from the Storm Water Quality Task Force at <http://www.stormwatertaskforce.org/swqtf/products.htm>. This guidance document is not a Caltrans document and is provided for informational purposes only. The information in this document should not be considered a requirement to the SAP.

b. Name the 303(d) listed receiving water and the reason for impairment (Sedimentation/Siltation or Turbidity).

c. Identify the potential for storm water discharges containing sediment to discharge directly to the 303(d) listed receiving water.

d. Identify the specific locations of direct discharge from and run-on to the construction site into the 303(d) water body.

e. Identify sampling locations for monitoring the discharge and run-on and include the rationale for selecting these locations: (1) a location upstream of the discharge that represents prevailing condition of the water body, (2) a location immediately downstream from the last point of discharge, and (3) locations where run-on enters the Caltrans right-of-way. Identify sampling schedule: (1) Samples shall be collected from safe collection points during the first two hours of discharge from rain events during daylight hours which result in a direct discharge to the 303(d) water body; and (2) a maximum of four sampling events will be required per month.

f. State that personnel trained in water quality sampling procedures shall collect samples.

g. If the water body has been listed because of impairment due to Sedimentation/Siltation, samples must be analyzed for:

- Settleable Solids (ml/l) using EPA Test Method 2540(f) and Total Suspended Solids (TSS) (mg/l) using EPA Test Method 2540 (d) **or**
- Suspended Sediment Concentration using ASTM D3977-97.

i. If the water body has been listed because of impairment due to Turbidity, analyze for Turbidity (NTU) using EPA Test Method 2130(b).

j. For samples that will be analyzed by a laboratory, specify that sampling, preservation and analysis shall be in accordance with 40 CFR Part 136.

k. For samples that will be analyzed in the field by the contractor, specify that collection, analysis, and equipment calibration will be in accordance with manufacturer's specifications.

l. A copy of all water quality sample analytical results and Quality Assurance/Quality Control (QA/QC) data shall be submitted to the resident engineer within five days of sampling (for field analyses) or 30 days (for laboratory analyses). The results shall be provided in a hard copy and electronic format consistent with the data reporting requirements in the Caltrans *Guidance Manual: Stormwater Monitoring Protocols* (July 2000).

- m. An evaluation of the water quality sample analytical results shall be submitted with the analytical results and the QA/QC data.
- n. State that all field and laboratory results will be maintained on the project site with the SWPPP documents.

2. Attachment B – Water Pollution Control Drawings

- a. Show the locations of direct discharge from and run-on to the construction site into the water body.
 - b. Show the sampling locations for monitoring the discharge including: (1) a location upstream of the discharge that represents prevailing conditions of the water body, (2) a location immediately downstream from the last point of discharge, and (3) locations where run-on enters the Caltrans right-of-way.
3. Attachment H or I – Inspection Checklist
- a. Revise the Storm Water Quality Construction Inspection Checklist in the SWPPP to document that samples for sedimentation/siltation or turbidity were taken during rain events as required by the SAP. See Attachment A for a sample Storm Water Quality Construction Inspection check list.

For category 1: Sediment/Siltation/Turbidity, the contractor shall be compensated for the work of all required sampling and analysis.

2. ALL SWPPP PROJECTS will be required to prepare a SAP for non-visible pollutants, unless the contractor, with the RE’s approval, can document that the answer to each of the following questions is NO:

- Yes No Does the project store or transport potential pollutants other than sediment?
- Yes No Does the project have the potential to spill or spread pollutants other than sediment?
- Yes No Are there construction materials or wastes that are stored on the construction site that are not in watertight condition. Watertight conditions include storage in a watertight container, under a watertight roof, or within a building; or protected by temporary cover and containment that prevents storm water contact and runoff from the storage area.
- Yes No Do construction activities include application of soil amendments with the potential to elevate pH (such as lime or gypsum) or contribute toxic pollutants to storm water?
- Yes No Does the project conduct the following activities: Sawcutting of concrete or asphalt? Washing of exposed aggregate concrete? Concrete operations washout? Building washing? Equipment maintenance/fueling/washing? Minor street washing associated with street delineation? Sealing and paving activities during rain events?
- Yes No Does the existing project site have any features that, as a result of known past usage, may contribute pollutants to storm water? Is there known contamination on the site?

If YES to any of the above questions:

1. Add Section 600.5– SAP for Non-Visible Pollutants

- a. The SAP shall comply with the requirements in the the sample contractor’s water quality SAPs that are available on the Caltrans internet site at: <http://www.dot.ca.gov/hq/construc/stormwater.html>.

An additional guidance document titled *Construction Storm Water Quality Sampling Document* is available from the Storm Water Quality Task Force at <http://www.stormwatertaskforce.org/swqtf/products.htm>. This guidance document is not a Caltrans document and is provided for informational purposes only. The information in this document should not be considered a requirement to the SAP.

- b. Identify the potential pollutants on the construction site (Section 500.3.1 & 500.3.3) that would not be visibly detectable in storm water runoff. Identify storage locations. Reference the locations shown on the Water Pollution Control Drawings in Attachment B of the SWPPP as applicable.
- c. State that a sufficiently large sample of storm water that has not come in contact with disturbed soil or the potential pollutants will be collected as a baseline sample for comparison with samples being analyzed for pollutants.
- d. State that collection of discharge samples will be triggered upon observation of any breach, malfunction, leakage, or spill which could result in the discharge of pollutants to surface waters or a storm sewer system before, during or after rain events that occur during daylight hours and generate runoff and/or by any other knowledge that would indicate that non-visible pollutants may be present in the storm water. Other knowledge would include that the project does not store construction materials or wastes in watertight conditions, and the project does not use soil amendments with the potential to elevate pH levels) or contribute toxic pollutants to storm water, such as lime or gypsum.
- e. State that samples shall be collected during the first two hours of discharge at all discharge locations, which drain the area of the observed breach, malfunction, leakage, or spill, or suspected contamination. Include the rationale used to select each sample location.
- f. State that personnel trained in water quality sampling procedures shall collect samples.
- g. State that samples shall be analyzed for indicator parameters including, but not limited to: pH, specific conductance, dissolved oxygen, conductivity, salinity, and total dissolved solids (TDS). The SAP shall state a rationale for each analytical procedure used, and for indicator analytical procedures, the specific pollutant(s) shall be identified.
- h. State that samples will be analyzed for the suspected pollutant in the field or through laboratory analysis and compared with the baseline sample collected and stored on site.
 - For samples that will be analyzed by a laboratory, specify that sampling, preservation and analysis shall be in accordance with 40 CFR Part 136.
 - For samples that will be analyzed in the field by the contractor, state that sampling, collection, analysis, and equipment calibration will be in accordance with manufacturer's specifications.
- i. A copy of all water quality sample analytical results and QA/QC data shall be submitted to the resident engineer within five days of sampling (for field analyses) or 30 days (for laboratory analyses). The results shall be provided in a hard copy and electronic format consistent with the data reporting requirements in the Caltrans *Guidance Manual: Stormwater Monitoring Protocols* (July 2000).
- j. An evaluation of the water quality sample analytical results shall be submitted with the analytical results and the QA/QC data.
- k. State that all field and laboratory results will be maintained on the project site with the SWPPP documents.

2. Attachment B – Water Pollution Control Drawings

Show the sampling locations for monitoring the discharge.

3. Attachment H or I – Inspection Checklist

Revise the Storm Water Quality Construction Inspection Checklist in the SWPPP to state if water quality sampling is necessary based on the requirements in the *Modifications* such as: breach, malfunction, leakage, or spill observed which could result in the discharge of non-visible pollutants. See Attachment A for a sample Storm Water Quality Construction Inspection check list.

For category 2: Non-Visible Pollutants, the contractor shall only be compensated for the work of sampling and analysis that is required as a result of known pollutants or contaminants on the site because of past usage

and/or the application of soil amendments. **The contractor will not be compensated for sampling and analysis work because of the contractor's failure to properly implement, inspect, maintain, and repair BMPs in the approved SWPPP, or for failing to store construction materials or wastes in watertight conditions.**

ATTACHMENT A

Sample Storm Water Quality Construction Inspection Checklist

GENERAL INFORMATION				
Project Name				
Caltrans Contract N ^o				
Contractor				
Inspector's Name				
Inspector's Title				
Signature				
Date of Inspection				
Inspection Type (Check Applicable)	<input type="checkbox"/> Prior to forecast rain	<input type="checkbox"/> After a rain event		
	<input type="checkbox"/> 24-hr intervals during extended rain	<input type="checkbox"/> Other _____		
Season (Check Applicable)	<input type="checkbox"/> Rainy		<input type="checkbox"/> Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	

GENERAL INFORMATION			
Time elapsed since last storm (Circle Applicable Units)	Min.	Hr.	Days
Approximate Rainfall Amount (mm)			

PROJECT AREA SUMMARY AND DISTURBED SOIL AREA (DSA) SIZE LIMITS FROM SPECIAL PROVISIONS			
Total Project Area	_____ Hectares	_____ Acres	
Rainy Season DSA Limit	_____ Hectares	_____ Acres	
Field Estimate of Active DSAs	_____ Hectares	_____ Acres	

OTHER REQUIREMENTS				
Requirement	Yes	No	N/A	Corrective Action
Preservation of Existing Vegetation				
Is temporary fencing provided to preserve vegetation in areas where no construction activity is planned?				
Location:				
Temporary Soil Stabilization				
Does the applied temporary soil stabilization provide 100% coverage for the required areas?				
Are any non-vegetated areas that may require temporary soil stabilization?				
Is the area where temporary soil stabilization required free from visible erosion?				
Location:				
Temporary Linear Sediment Barriers				
Are temporary linear sediment barriers properly installed in accordance with the details, functional and maintained?				
Are temporary linear sediment barriers free of accumulated litter?				
Is the built-up sediment less than 1/3 the height of the barrier?				
Are cross barriers installed where necessary and properly spaced?				
Location:				

OTHER REQUIREMENTS				
Requirement	Yes	No	N/A	Corrective Action
Location:				
Storm Drain Inlet Protection				
Are storm drain inlets internal to the project properly protected with either Type 1, 2 or 3 inlet protection?				
Are storm drain inlet protection devices in working order and being properly maintained?				
Location:				
Desilting Basins				
Are basins maintained to provide the required retention/detention?				
Are basin controls (inlets, outlets, diversions, weirs, spillways, and racks) in working order?				
Location:				
Stockpiles				
Are all locations of temporary stockpiles, including soil, hazardous waste, and construction materials in approved areas?				
Are stockpiles protected from run-on, run-off from adjacent areas and from winds?				
Are stockpiles located at least 15 m from concentrated flows, downstream drainage courses and storm drain inlets?				
Are required covers and/or perimeter controls in place?				
Location:				
Concentrated Flows				
Are concentrated flow paths free of visible erosion?				
Location:				
Location:				
Location:				

OTHER REQUIREMENTS				
Requirement	Yes	No	N/A	Corrective Action
Location:				
Tracking Control				
Are points of ingress/egress to public/private roads inspected and swept and vacuumed daily?				
Are all paved areas free of visible sediment tracking or other particulate matter?				
Location:				
Wind Erosion Control				
Is dust control implemented in conformance with Section 10 of the Standard Specifications?				
Location:				
Dewatering Operations				
Is dewatering handled in conformance with the dewatering permit issued by the RWQCB?				
Is required treatment provided for dewatering effluent?				
Location:				
Vehicle & Equipment Fueling, Cleaning, and Maintenance				
Are vehicle and equipment fueling, cleaning and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious material?				
Are vehicle and equipment fueling, cleaning and maintenance activities performed on an impermeable surface in dedicated areas?				
If no, are drip pans used?				
Are dedicated fueling, cleaning, and maintenance areas located at least 15 m away from downstream drainage facilities and water courses and protected from run-on and runoff?				
Is wash water contained for infiltration/ evaporation and disposed of outside the highway right of way?				
Is on-site cleaning limited to washing with water (no soap, soaps substitutes, solvents, or steam)?				
On each day of use, are vehicles and equipment inspected for leaks and if necessary, repaired?				
Location:				
Location:				

OTHER REQUIREMENTS				
Requirement	Yes	No	N/A	Corrective Action
Location:				
Location:				
Waste Management & Materials Pollution Control				
Are material storage areas and washout areas protected from run-on and runoff, and located at least 15 m from concentrated flows and downstream drainage facilities?				
Are all material handling and storage areas clean; organized; free of spills, leaks, or any other deleterious material; and stocked with appropriate clean-up supplies?				
Are liquid materials, hazardous materials, and hazardous wastes stored in temporary containment facilities?				
Are bagged and boxed materials stored on pallets?				
Are hazardous materials and wastes stored in appropriate, labeled containers?				
Are proper storage, clean-up, and spill-reporting procedures for hazardous materials and wastes posted in open, conspicuous and accessible locations adjacent to storage areas?				
Are temporary containment facilities free of spills and rainwater?				
Are temporary containment facilities and bagged/boxed materials covered?				
Are temporary concrete washout facilities designated and being used?				
Are temporary concrete washout facilities functional for receiving and containing concrete waste and are concrete residues prevented from entering the drainage system?				
Do temporary concrete washout facilities provide sufficient volume and freeboard for planned concrete operations?				
Are concrete wastes, including residues from cutting and grinding, contained and disposed of off-site or in concrete washout facilities?				
Are spills from mobile equipment fueling and maintenance properly contained and cleaned up?				
Is the site free of litter?				
Are trash receptacles provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods?				
Is litter from work areas within the construction limits of the project site collected and placed in watertight dumpsters?				
Are waste management receptacles free of leaks?				
Are the contents of waste management receptacles properly protected from contact with storm water or from being dislodged by winds?				
Are waste management receptacles filled at or beyond capacity?				
Location:				
Temporary Water Body Crossing or Encroachment				

OTHER REQUIREMENTS				
Requirement	Yes	No	N/A	Corrective Action
Are temporary water body crossings and encroachments constructed as shown on the plans or as approved by the engineer?				
Does the project conform to the requirements of the 404 permit and/or 1601 agreement?				
Location:				
Illicit Connection/Illegal Discharge Detection and Reporting				
Is there any evidence of illicit discharges or illegal dumping on the project site?				
If yes, has the Engineer been notified?				
Location:				
Discharge Points				
Are discharge points and discharge flows free from noticeable pollutants?				
Are discharge points free of any significant erosion or sediment transport?				
Location:				
WPCP/SWPPP Update				
Does the WPCP/SWPPP, Project Schedule/Water Pollution Control Schedule and WPCDs adequately reflect the current site conditions and contractor operations?				
Are all BMPs shown on the WPCDs installed in the proper location(s) and according to the details for the plan?				
Location:				
General				
Are there any other potential water pollution control concerns at the site?				
Location:				
Location:				
Location:				

OTHER REQUIREMENTS				
Requirement	Yes	No	N/A	Corrective Action
Location:				
Storm Water Monitoring				
Does storm water discharge directly to an impaired water body for Sedimentation/Siltation or Turbidity as listed in the General Construction Activity Permit?				
If yes, were samples for sedimentation/siltation or turbidity taken pursuant to the sampling and analysis plan, if required, during the rain event?				
Were there any BMPs not properly implemented or breaches, malfunctions, leakages or spills observed which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water?				
If yes, were samples for non-visually detectable pollutants taken pursuant to the sampling and analysis plan during the rain event?				
Were soil amendments (e.g. gypsum) used on the project?				
If yes, were samples for non-visually detectable pollutants taken pursuant to the sampling and analysis plan during the rain event?				
Did storm water contact stored materials or wastes and run off of the construction site? (Materials not in watertight containers, etc.)				
If yes, were samples for non-visually detectable pollutants taken pursuant to the sampling and analysis plan during the rain event?				