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**BMP
Retrofit
Pilot Program**

**OPERATION
MAINTENANCE
AND
MONITORING PLAN
DISTRICT 7**

**BMP Stormwater Monitoring
Field Guidance Notebooks**

CTSW-RT-99-052

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California Department of Transportation

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NOTE: This list is linked to the applicable Field Guidance Notebook for the individual BMP. Click on the title of the BMP to go directly to the Field Guidance Notebook for that BMP.

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- Biofiltration Swales/Strips
- Oil/Water Separators
- Multi-Chambered Treatment Trains
- Continuous Deflective Separators
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BMP Type	BMP Location	WQ Site ID
Biofiltration Swale	SR-91/I-605 Separation	73222b
Biofiltration Swale	West 91 behind Cerritos MS	73223
Biofiltration Swale	I-5/I-605 Separation	73224
Biofiltration Swale	I-605/Del Amo	73225
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Continuous Deflective Separator™	I-210 East of Orcas Ave	73102
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Drain Inlet Insert – StreamGuard™	Las Flores MS	73217a
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Media Filter, Sand, Austin	Termination Park & Ride	74204
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Multi-chambered Treatment Train	Via Verde Park & Ride	74206
Multi-chambered Treatment Train	Lakewood Park & Ride	74208
Oil/Water Separator	Alameda MS	74201

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE, AND
MONITORING PLAN
VOLUME II

BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
EXTENDED DETENTION BASINS



DISTRICT 7, LOS ANGELES

September 1999



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1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel appropriate field evaluation and documentation for the District 7 extended detention basins (EDBs) belonging to the Caltrans Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-A of this guidance document for supporting information on detention basin technology and characteristics.

1.1 Data to be Collected

The following data will be collected to assess the performance and maintenance aspects of an extended detention basin:

- Water quality and quantity data of runoff into and discharge from the detention basin from flow-composite samples and grab (as soon as possible after the start of runoff) samples for at least 10 storm events during two wet seasons, weather permitting.
- Rainfall data recorded as a function of time, from rainfall events during the study period.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring and abatement data.
- Records of vector control measures taken.
- Vegetation management records.
- Continuous water basin level data

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to be Performed

Field activities that will be performed at the extended detention basin facilities include:

- Monitoring Equipment Installations
- Monitoring Equipment Maintenance
- Monitoring Observations
- Facility Maintenance Inspections
- Facility Maintenance
- Vector and Nuisance Animal Control Inspections
- Vegetation Control
- Stormwater Monitoring and Observation

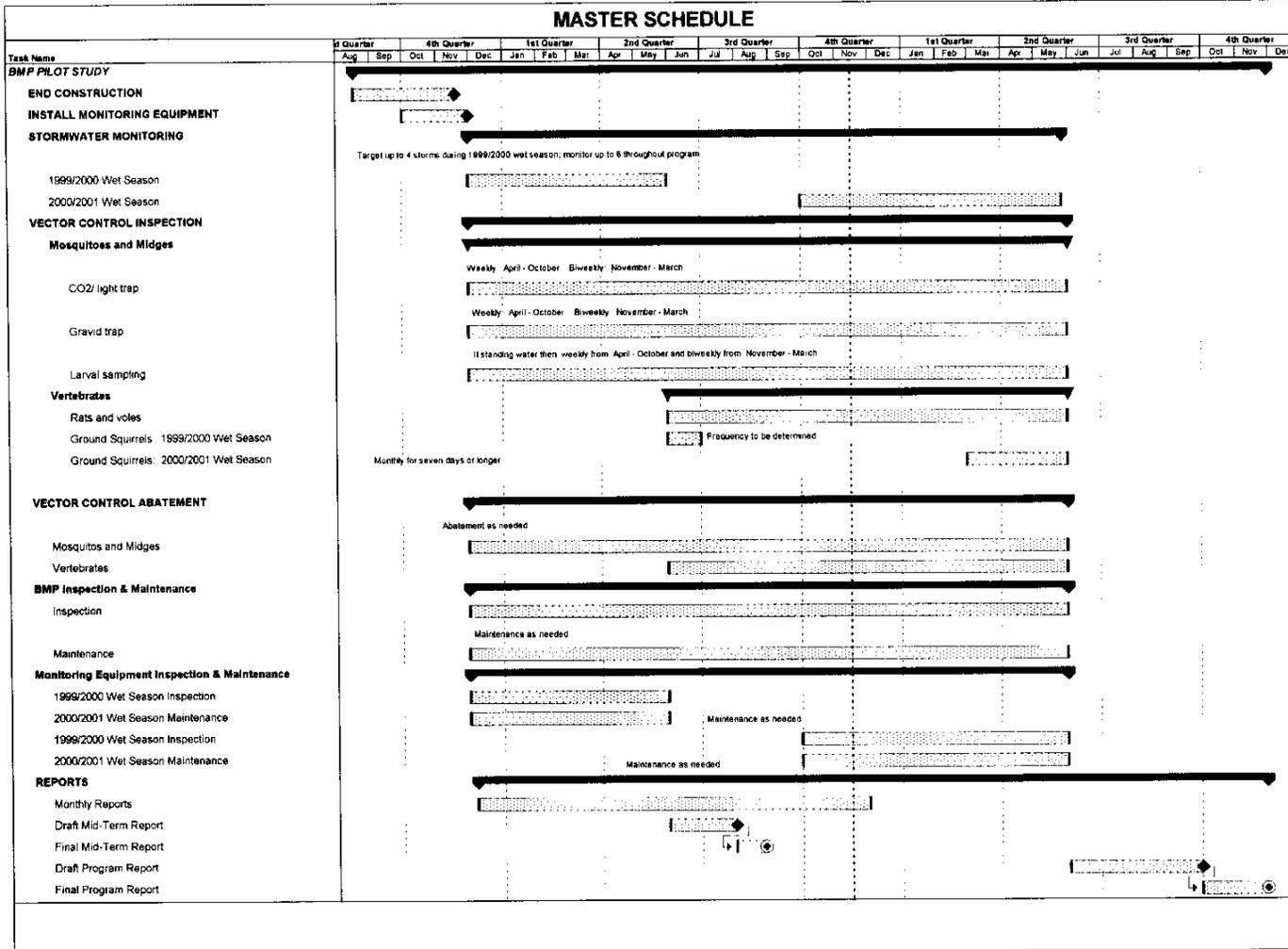


Vector management may also be necessary at extended detention basin facilities, but may be contingent on facility housekeeping and other environmental influences. Refer to Appendix IV volume II if vector management is necessary.

1.3 Master Schedule

The schedule on the following page shows the time-line for each phase of the extended detention basin OMM program.

MASTER SCHEDULE



2.0 SITE INFORMATION

Access requirements for each site are summarized in Table 2.1, in the encroachment permit found in Tab 9, and in the Site Location Maps in Tab 1. ***Encroachment permits must be on hand*** for each site visit, and notification ***requirements found in these permits must be followed***.

Always check in with the appropriate Caltrans personnel before conducting any site fieldwork.

Table 2.1
Caltrans District 7 Extended Detention Basins Site Summary

Site No.	Site Name	Site Location	Access and Parking
074101	I-5/I-605 (south)	City of Downey	Park along the I-5 southbound shoulder underneath the first overpass of the intersection.
074102	I-605 (south) /SR91(east)	City of Cerritos	Park along the I-605 southbound shoulder.

2.1 Extended Detention Basins (EDB)

Refer to the accompanying Appendix for a general description of EDBs. The sections below provide site-specific information for each EDB site in District 7.

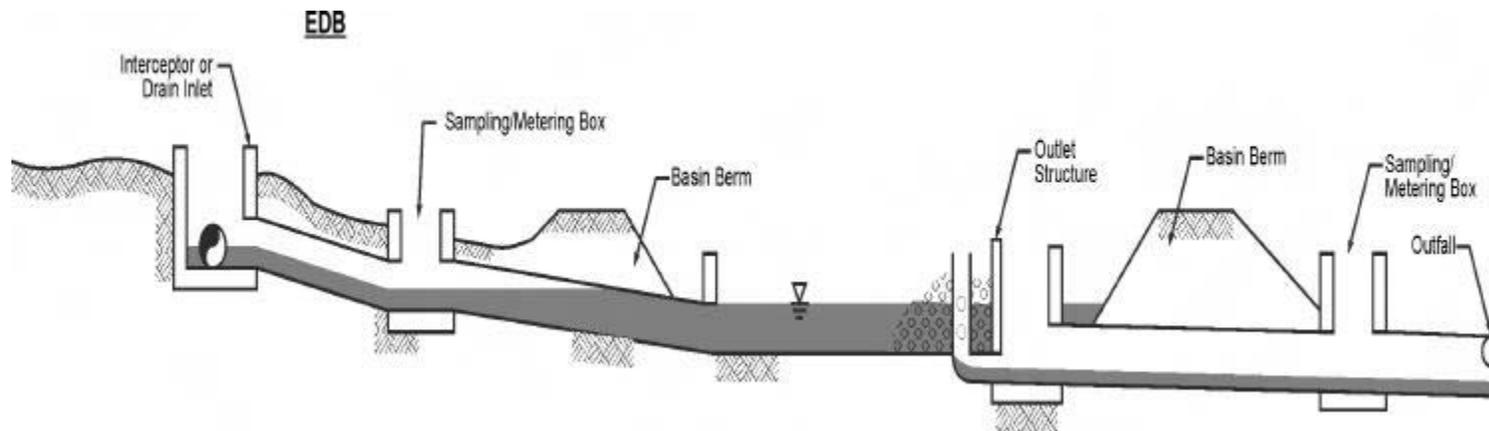
Refer to Tab 9 for a summary of the hydraulic characteristics for these BMPs. Refer to Tab 1 for BMP facility plans. A typical schematic of an EDB is included in Figure 2.1.

2.1.1 Site 74101: I-605/SR-91 Interchange Extended Detention Basin

Flow to the I-605/SR-91 EDB is carried by two existing 300-mm corrugated-steel pipe (CSP) downdrains. A manhole is constructed at each of these drains to intercept and direct the drainage flows to two new 300-mm CSP drains. The new drains intersect at a common manhole, which is connected to a 600-mm RCP pipe that conveys the flow to the basin. An in-line sample box is provided to allow collection of a sample for water quality analysis and access to a flow meter. A flap gate connected at the end of the inlet RCP piping provides a minimum amount of head upstream and create the depth of flow needed to measure the incoming flow. Rock slope protection is provided at the end of the inlet piping to reduce the velocity and spread the flow where it enters the basin.

The inflow sampling point is located upstream of the outfall to the basin. The effluent sampling point is located downstream of the outlet box. Access to the discharge conveyance is through a manhole located near the southwest corner of the basin on the back edge of the service road. Refer to Tab 1 for Site Location Maps and BMP Facility Plans.

Figure 2.1
Typical Schematic of an Extended Detention Basin



2.1.2 Site 74102: I-5/I-605 Extended Detention Basin

An existing area at the intersection of I-5 and I-605 has been modified into an EDB. Runoff from catchments on I-5 is conveyed to the EDB. Flow to this site is carried by an existing 1.5 meter by 0.6-meter reinforced concrete box (RCB) culvert located under the I-5 freeway. A concrete inlet structure is constructed where the RCB enters the site to redirect up to 1-year, 24-hour storm flows from the RCB to the basin. An emergency weir overflow is provided at the inlet structure. From the inlet structure the flow is conveyed to the basin through a 600-mm reinforced concrete pipe (RCP). An in-line sample box is provided to allow collection of a sample for water quality analysis and access to a flow meter. A flap gate connected at the end of the inlet RCP piping provides a minimum amount of head upstream and create the depth of flow needed to measure the incoming flow. Rock slope protection is provided at the end of the inlet piping to prevent reduce the velocity and spread the flow where it enters the basin.

The inflow sampling point is located upstream of the outfall to the basin. The effluent sampling point is located downstream of the outlet box. Access to the discharge conveyance is through a manhole located near the southwest corner of the basin on the back edge of the service road (see Site map in Tab 1).

Refer to Tab 1 for Site Location Maps and BMP Facility Plans.

2.2 Emergency Hospital Routes

See the “**Emergency Procedures**” **Tab 2** for maps and descriptions showing the direct routes to the nearest hospitals and for emergency and site-related telephone contacts.

2.3 Site Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at detention basins, field crews will consist of a minimum of 2 people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Activities at detention basins bring up traffic concerns including access and parking on shoulders or at pullouts (if necessary). During access and routine visits to the facilities, the following precautions will be taken:

- Minimize the time spent on the shoulder of the highway (exit shoulder immediately).
- Enter the facility access road or pullout (if available), open access gate, and park inside the facility.

- Affiliated personnel must wear an orange safety vest, hard hat, and appropriate shoes.
- Rotating amber lights must be operated on work vehicles if shoulder work is performed.
- Use cones and shoulder closed signs at facilities where shoulder parking is required.

According to Chapter 8 (Protection of Workers) of the *Caltrans Maintenance Manual*, working for more than 10 minutes on the shoulder involves a shoulder closure procedure. This shoulder closure procedure will conform to the safety precautions below and the site-specific instruction provided in the Encroachment Permits (Exhibit 9.3 of Tab 9).

- Prior to beginning any work on or adjacent to a major roadway, the local highway patrol traffic control department shall be notified. See the Emergency Contacts List in Tab 2 for a listing of the local highway patrol phone numbers.
- Whenever possible, plan the timing of the work for non-peak traffic congestion periods if long-term parking on the shoulder is required.
- Use enough cones and barricades to sufficiently divert traffic safely around the work area (adhere to specific shoulder closure requirements detailed in the Encroachment Permits).
- Any open manhole or ditch must be barricaded.
- Remember that visibility is the key to minimizing the dangers of working in traffic.
- Upon completion of the work, the area must be cleaned up of materials and left in a clean and orderly state.

2.3.2 General Safety

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the extended detention basin facilities, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Lightning.
- Fast moving water.
- Unstable earth.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Transients.
- Muggers and other criminals.
- Power tools and heavy equipment.
- High places.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.

Other important field precautions include:

- Stay away from the edges of a fast moving body of water. These edges are usually slippery and unstable during rainy conditions.
- If sampling is required at the edge of a fast moving body of water, use a lifeline and a personal flotation device. Use grabbing devices when possible.
- Never work alone at night and avoid working alone during the day.
- Avoid leaving materials, tools and equipment lying around where someone can trip over them.
- Maximize lighting, especially at night.
- Keep a phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear a hard hat and an orange vest.
- Do not use power tools and heavy equipment unless trained in the proper use and care of the specific power tools.
- Always wear eye protection when working with tools or chemicals.
- Wear rain gear
- Never leave open holes unattended or not barricaded.
- Do not sample during lightning
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 on the following page as a guide to find appropriate forms and information required for field visits. This table covers aspects of the field OMM program including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is by obtaining and going through each item on the table pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks for facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
for Extended Detention Basins

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Maps	NA	Prior to site visits
	BMP Layout Diagrams	NA	Prior to site visits
	Sampling Point Diagrams	NA	Prior to site visits and sampling
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist	Form C	Filled out for each inspection visit
	Monitoring Equipment Inspection Checklist	Form D	Filled out for each equipment inspection
5	BMP Site Maintenance Activity Checklist	Form E	Filled out for each maintenance inspection
	Monitoring Equipment Maintenance Activity Checklist	Form F	Filled out for each maintenance inspection of sampling equipment
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling
	Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling
6	Empirical Observations Field Data Log Sheet for Storm Events	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and basin.
	Field Data Log Sheet	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet for Influent/Control Sampling Point	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet for Effluent Sampling Point	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses List	Ex. 7.1	Reference for each sampling event and lab analysis request submittal
8	Vector Control Checklists	Forms O1 and O2	Fill out for each site visit related to vector monitoring.
9	Runoff Coefficient Listing	Ex. 9.1	Reference: for calculations
	“Volume-to-Sample” Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.

NA=Not Applicable

4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

Each EDB will be inspected on a regular basis according to the following minimum rates:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Forms C and D (Tab 4).*

1. Prior to arrival, contact the appropriate Caltrans District 7 personnel identified in the Encroachment Permit (Exhibit 9.3 in Tab 9).
2. Completely walk around the BMP while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism),
 - Vegetation management (grass, shrubs, trees),
 - Erosion and slope stability,
 - BMP performance (fouling, blockage, damage),
 - Equipment repair/maintenance (BMP components, autosampler),
 - Sediment accumulation (within BMP, at influent confluence),
 - Storage of accumulated sediment or other wastes, and
 - Vector control.
4. Complete Form C (see Tab 4) during inspections.
5. Log field activities and their corresponding time accurately.
6. If immediate corrective or preventive maintenance is needed, call the appropriate contacts listed in the Project Contacts List in Tab 2.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.
- Vector Control.
- Vandalism.
- Standing Water.

The frequency of individual maintenance activities at the EDB facilities will be conducted according to the schedule listed in Appendix V, the Maintenance Indicator Document..

Maintenance activities performed will be documented using the Forms E and F in Tab 5. See Section 2.0 of Appendix I-A for complete details on maintenance activities.

4.3 Vegetation Management

Maintenance and control of vegetation is essential to the optimal operation and performance of a BMP. The condition of the native vegetation will be inspected on a monthly basis at a minimum to ensure that

- vegetation is kept relatively short,
- slope vegetation is protected and kept healthy, and
- undesirable plant species do not take root.

Shorter vegetation on the EDBs optimize the treatment capacity, the residence time of runoff, and will aid in vector control. Maintaining healthy and continuous vegetation on the slopes will minimize erosion. Preventing undesirable plant species from taking root will prevent plants with large root systems from damaging the embankments. Use the inspection and maintenance checklists (Forms C through F) whenever inspections and maintenance activities for vegetation management are performed. See Sections 2.0 and 4.0 of Appendix I-A for specific details on controlling vegetation.

4.4 Disposal of Trash and Debris

Trash and debris from EDBs is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the BMP will be responsible for removal and disposal of the trash and debris. This disposal will comply with applicable local, county, state, and federal waste control programs. Table 2.1 in Appendix I-A shows some few possible disposal services for waste material.

4.5 Deposited Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs is critical. Stockpiling is only allowed at the facility under the following conditions:

- Sandbag berms are created (8-inch minimum) and are placed around the stockpile area.
- At least 0.5-mil plastic is used to contain any dewatered liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored.

Once sediment stockpile storage has reached disposal quantity, chemical characterization must be conducted to satisfy land disposal requirements (LDRs). Document any evidence of oil and



grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

For sediment stockpiles, the minimum number of discrete samples initially required must comply with Form G, Tab 5. Random samples will be selected from locations on a three-dimensional grid. If the presence of materials such as boulders, debris, etc. hinder the application of this process, the sample will be collected as close as possible to the randomly selected point without altering the essence of the random selection process.

Stockpile sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the stockpile or drum.
3. Collect the sample using a soil probe or equivalent. Ensure that the sample is collected at the correct depth and location that was randomly selected.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for volatile TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.6 Vector and Nuisance Animal Control

Vector control and management will be performed in accordance with Appendix IV by subcontracted Vector Control Districts.



5.0 STORM MONITORING

Careful preparation and planning is critically important. Representative samples must be obtained for each storm event. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that onsite rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours preferred).
2. Meeting deployment criteria defined in Exhibit 3.1

Check appropriate sources for local weather conditions before deploying field staff. Use the Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for a decision tree on when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-A details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, detection limits, and holding times for samples from EDBs sites. Appendix III contains the BMP Retrofit Pilot Program Quality Assurance and Quality Control Plan.

A separate logbook is used for each EDB facility. Pertinent checklists, log forms, and information necessary to conduct a successful monitoring program and to be contained in the site-specific field logbooks are listed in Table 3.1 in Section 3.0. The pertinent checklists and log forms are located in Tabs 1 through 9. Table 3.1 also lists analytical and office forms, contains corresponding form and table numbers, identifies the location in this document, and explains when each form is to be filled out.

Sampling equipment shall be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting stormwater sampling at BMP sites:

- Pre-Storm preparation,
- Storm event sampling (grab samples and composite sample collection of both influent and effluent), and
- Post-Storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1 in Tab 3) for when to mobilize.
2. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).



3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.
4. Decontaminate and assemble decontaminated sample containers, teflon[®] hose, and other sampling equipment according to the following procedures:

Cleaning Procedures for Sample Bottles

Bottles will be:

- a. Rinsed three times with warm tap water.
- b. Scrubbed with a clean plastic brush.
- c. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
- d. Rinsed three times with tap water.
- e. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
- f. Rinsed three times with hexane while rotating the bottle, and then air-dried.
- g. Rinsed six times with Milli-Q water.
- h. Soaked in 2N nitric acid for a minimum of 24-hours.
- i. Rinsed six times with Milli-Q water.

Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

- a. Teflon[®] hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
 - b. Rinsed three times with warm tap water.
 - c. Rinsed three times with Milli-Q or equivalent water.
 - d. Rinsed three times with 2N nitric acid.
 - e. Soaked at least 24-hours in 2N nitric acid.
 - f. Rinsed three times with Milli-Q water.
5. Inspect monitoring equipment for proper operation (use Form D, Tab 4). At each sampling location do the following:
 - a. Check battery voltages and electrical connections.
 - b. Inspect the pump tubing and replace if necessary.
 - c. Inspect desiccant cartridges in flow meter.
 - d. Inspect intake tubing condition and connections. Make sure intakes, flow structures, and sensors are clear of debris (this is only possible if all confined space requirements are met).
 - e. Make sure the correct user-entered program parameters are entered (use Forms I, J1, J2 and K in Tab 6).
 - f. Set system status flags.



- g. Make sure the automatic sampler is set up properly by verifying that the correct bottle size, number of bottles, hose diameter, hose material, hose length, head height, aliquot volume, number of samples to fill the bottle, and number of pulses to sample has been entered correctly.
 - h. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger.
6. Ice composite bottles.
 7. From the office or field set "Volume-to-Sample" numbers (Exhibit 9.2 in Tab 9) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K, Tab 6).
 8. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected twice per year.

5.1.2 Storm Event and Sample Collection

1. Once onsite, fill out the Empirical Observations Field Data Log and a Field Data Log Sheets (Forms H1 and I in Tab 6) to document storm characteristics.
2. Locate influent/control autosampler and inspect for proper operation.
3. Locate effluent autosampler and inspect for proper operation.
4. Change composite bottles and re-initiate equipment as needed.
5. Take grab samples as needed (two will be taken per monitoring season at the influent and effluent locations of the EDB).

5.1.3 Post-Storm Sample Analyses

After a storm event has ended as determined by Storm Control, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

1. Reset the storm monitoring program to prepare for another storm event.
2. Replace the sample bottle in the autosampler and the reset the sampler.
3. Physically inspect the station to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if all confined space requirements are met).
4. Retrieve data via modem from the remote monitoring computer.
5. Check all battery voltages; replace batteries that are low.

5.1.1.1 Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

5.1.1.2 Chain of Custody Forms

When all of the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody forms (Form M,



Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.2 Empirical Observations

Complete and succinct empirical observations are required during all site visits (rain/runoff and BMP characteristics). Observations shall be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). Particularly note the following:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory).
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Treatment medium condition.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Refer to Form H in Tab 6 for recording empirical observation information.



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TAB 9: TECHNICAL SUPPORT INFORMATION

Exhibit 9.1: Runoff Coefficients

Exhibit 9.2: Volume-to-Sample Tables

Exhibit 9.3: Encroachment Permits

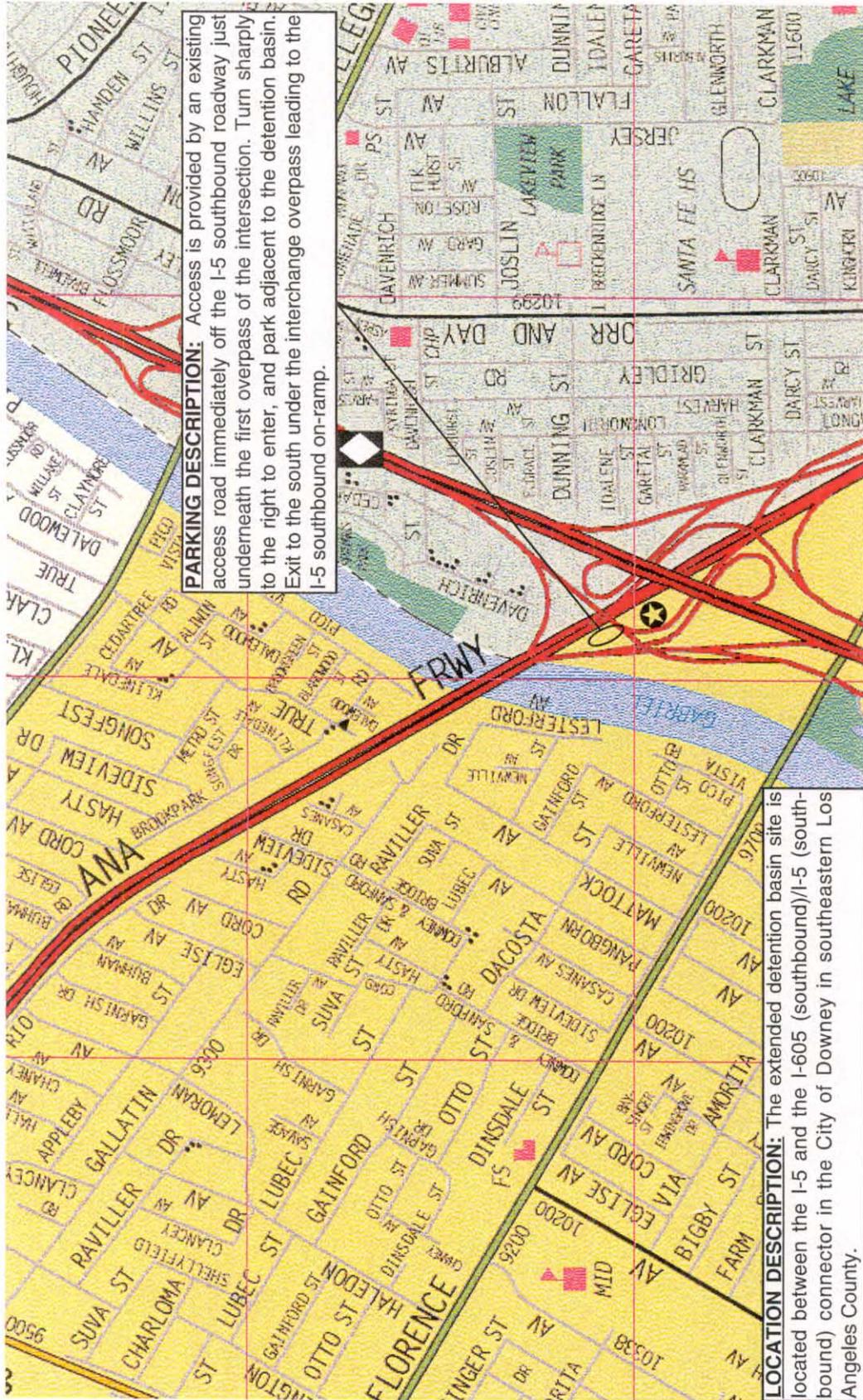


TAB 1

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans
BMP Maintenance Perimeter Maps**



PARKING DESCRIPTION: Access is provided by an existing access road immediately off the I-5 southbound roadway just underneath the first overpass of the intersection. Turn sharply to the right to enter, and park adjacent to the detention basin. Exit to the south under the interchange overpass leading to the I-5 southbound on-ramp.

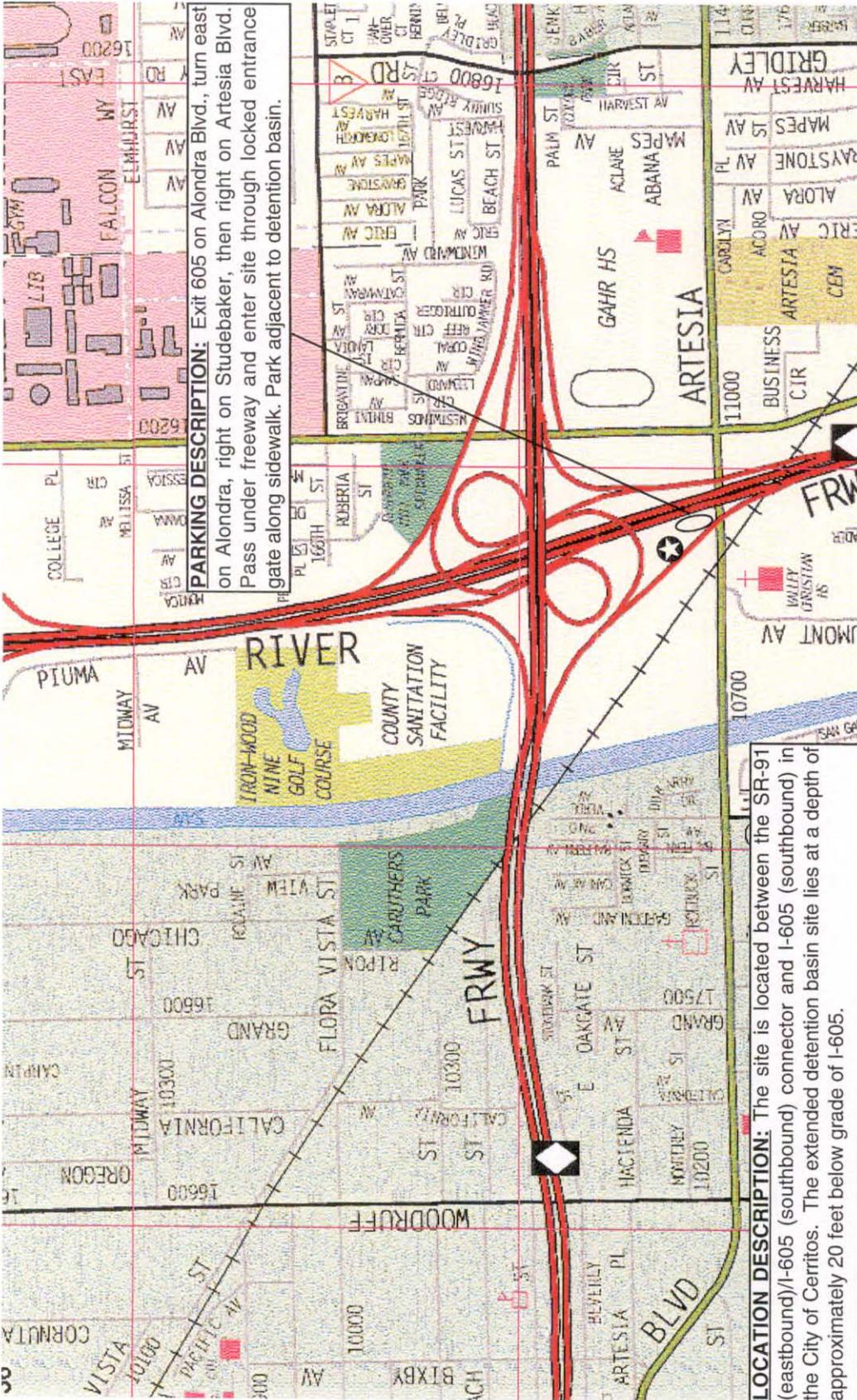
LOCATION DESCRIPTION: The extended detention basin site is located between the I-5 and the I-605 (southbound)/I-5 (southbound) connector in the City of Downey in southeastern Los Angeles County.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-5/I-605 (south)
BMP Pilot Study Site #074101
Site Location Map

 BMP Pilot Site

 Not to Scale



PARKING DESCRIPTION: Exit 605 on Alondra Blvd., turn east on Alondra, right on Studebaker, then right on Artesia Blvd. Pass under freeway and enter site through locked entrance gate along sidewalk. Park adjacent to detention basin.

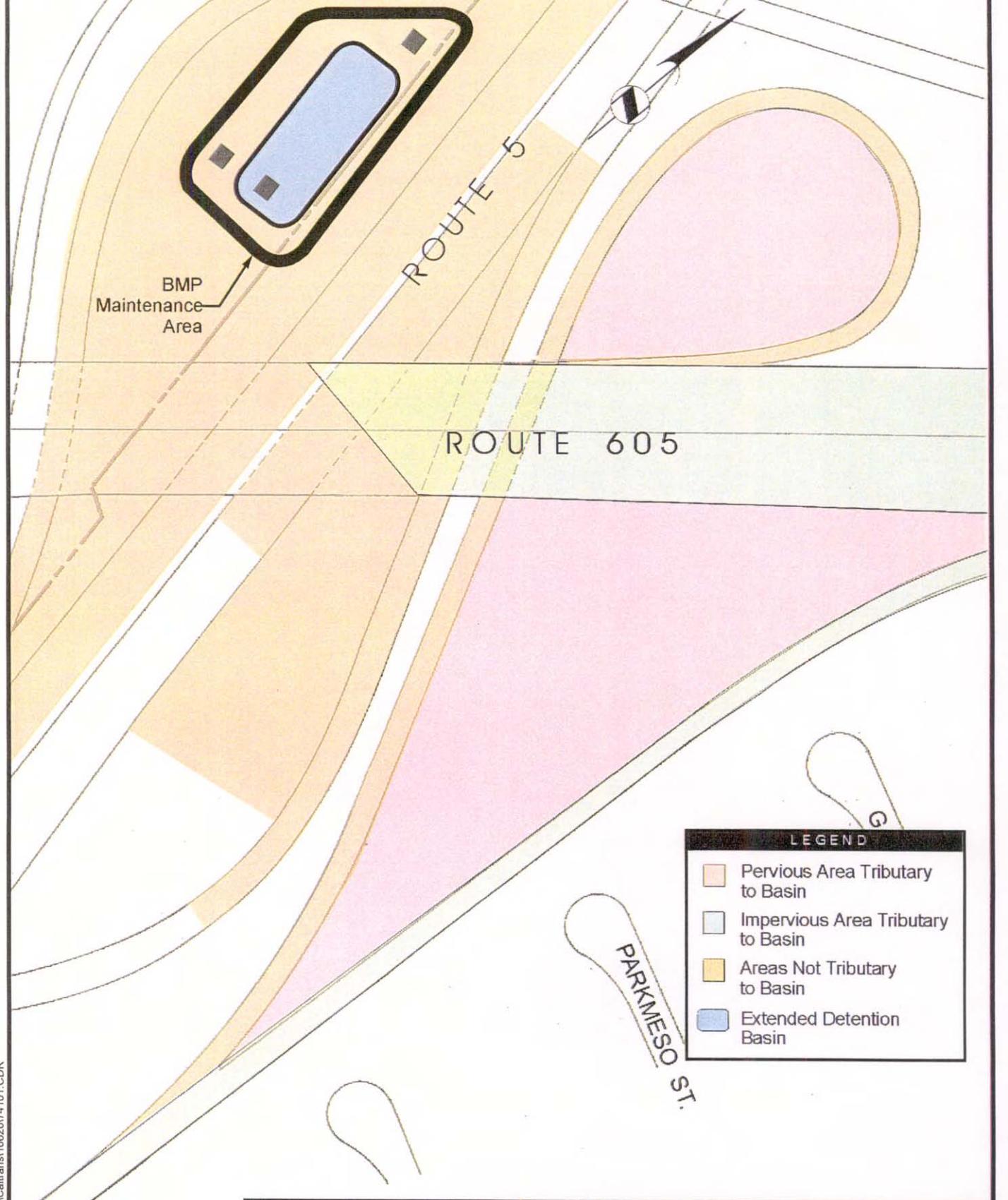
LOCATION DESCRIPTION: The site is located between the SR-91 (eastbound)/I-605 (southbound) connector and I-605 (southbound) in the City of Cerritos. The extended detention basin site lies at a depth of approximately 20 feet below grade of I-605.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-605 (south)/SR-91 Interchange
BMP Pilot Study Site #074102
Site Location Map

 BMP Pilot Site

 Not to Scale



BMP
Maintenance
Area

ROUTE 5

ROUTE 605

PARKMESO ST.

LEGEND

- Pervious Area Tributary to Basin
- Impervious Area Tributary to Basin
- Areas Not Tributary to Basin
- Extended Detention Basin

**BROWN AND
CALDWELL**

Site 74101 I5/605 Intersection
Extended Detention Basin
Tributary Drainage Areas

For digital use only as contained in 10020194 to 10020195



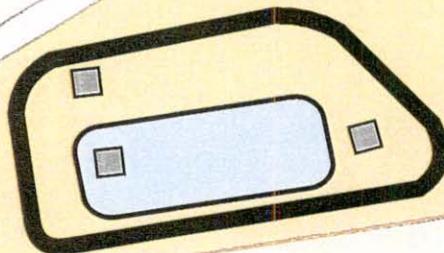
LEGEND

-  Impervious Area Tributary to Basin
-  Areas Not Tributary to Basin
-  Extended Detention Basin

BMP Maintenance Area

ARTESIA ST.

ROUTE 605



BROWN AND
CALDWELL

Site 74102 I605/SR91 Intersection
Extended Detention Basin
Tributary Drainage Areas



TAB 2

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**

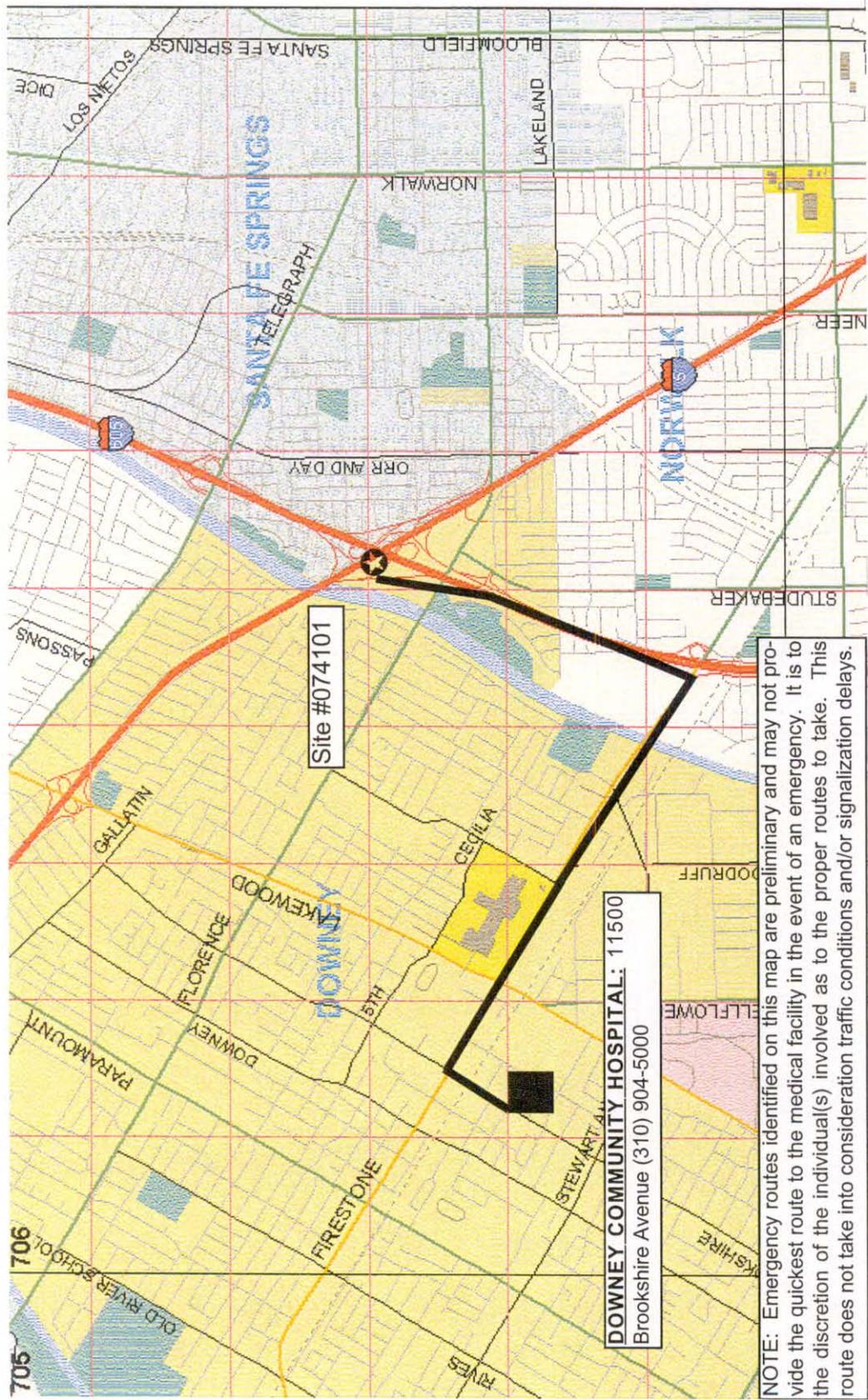
Document all information related to any accident or incident that resulted in injury or damage and report it to Mark Williams at Brown and Caldwell at (619) 528-9090.

Emergency Contacts
Site 074101: I-5/I-605 Extended Detention Basin

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 861-0771	In case of emergency
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Downey Community Hospital	(310) 904-5000	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector	<i>will be provided when encroachment permit is obtained</i>	Notify for any accident or injury
Regional Manager (Roy Pool)	(562) 692-0823	Notify for any accident or injury
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contact Numbers
Site 074102: I-605/SR-91 Extended Detention Basin

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 866-9061	In case of emergency
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Pioneer Community Hospital	(310) 865-6291	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector	<i>will be provided when encroachment permit is obtained</i>	Notify for any accident or injury
Regional Manager (Roy Pool)	(562) 692-0823	Notify for any accident or injury
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury



Site #074101

DOWNEY COMMUNITY HOSPITAL: 11500
 Brookshire Avenue (310) 904-5000

NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

 **BMP Pilot Site**

 **Not to Scale**

 **Potential Emergency Route**

SOURCE: Thomas Bros., Los Angeles County, 1997
 CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-5/I-605
Hospital Route Map

Project Contacts

Name	Organization	Phone	Fax Mobile	Email
Robert Wu	Caltrans Program Manager Dist 7	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Mark Williams	Brown and Caldwell	(619) 528-9090-w	(619) 528-9199-f	mwilliams@brwncald.com
Ed Othmer	Law/Crandall	(619) 278-3600	(619) 278-5300-f	eohtmer@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678	peter_vanriper@dot.ca.gov
Bill Whittenberg	RBF	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Patti Matta	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Patty@dmaipo.attmail.com
Mark Weiner	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Mweiner@dmalabs.com
Chet Reynolds	FLW/R.C. Hoffman Co.	(949) 643-0831	(949) 643-0832	--
John Misiti	American Sigma	(800) 635-4567	(716) 798-5599	Misitiz@aol.com
Anthony Tavano	American Sigma	(716) 798-5580	(716) 798-5599	
Internet	National Weather Service	(805) 988-6610	--	http://nimbo.wrh.noaa.gov/
Internet	Accuweather	--	--	http://www.weather.com
Internet	Los Angeles Doppler Radar	--	--	http://www.weather.com weather/radar/single- site/CA_Los_Angeles.html
Internet	Intellicast	--	--	http://www.Intellicast.com
Internet	Weather Underground	--	--	http://www.wunderground.com
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Dean Messer	Mosquitoes and Midge Vector Abatement Specialist	530 753-6400	(909) 787-3086	dean@lawdavis.com

Name	Organization	Phone	Fax Mobile	Email
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(909) 365-0117	geoscr1@ix.netcom.com
Suzanne Klueh	Greater Los Angeles County Vector Control District	(562) 944-9656	(562) 944-7976	--
P. Sue Zuhlke	San Gabriel Valley Mosquito and Vector Control District	(626) 814-9466	(626) 337-5686	Psuez@earthlink.net
Deborah Neiter	Robert Bein, William Frost	(949) 472-3505	(949) 586-6531	dneiter@rbf.com



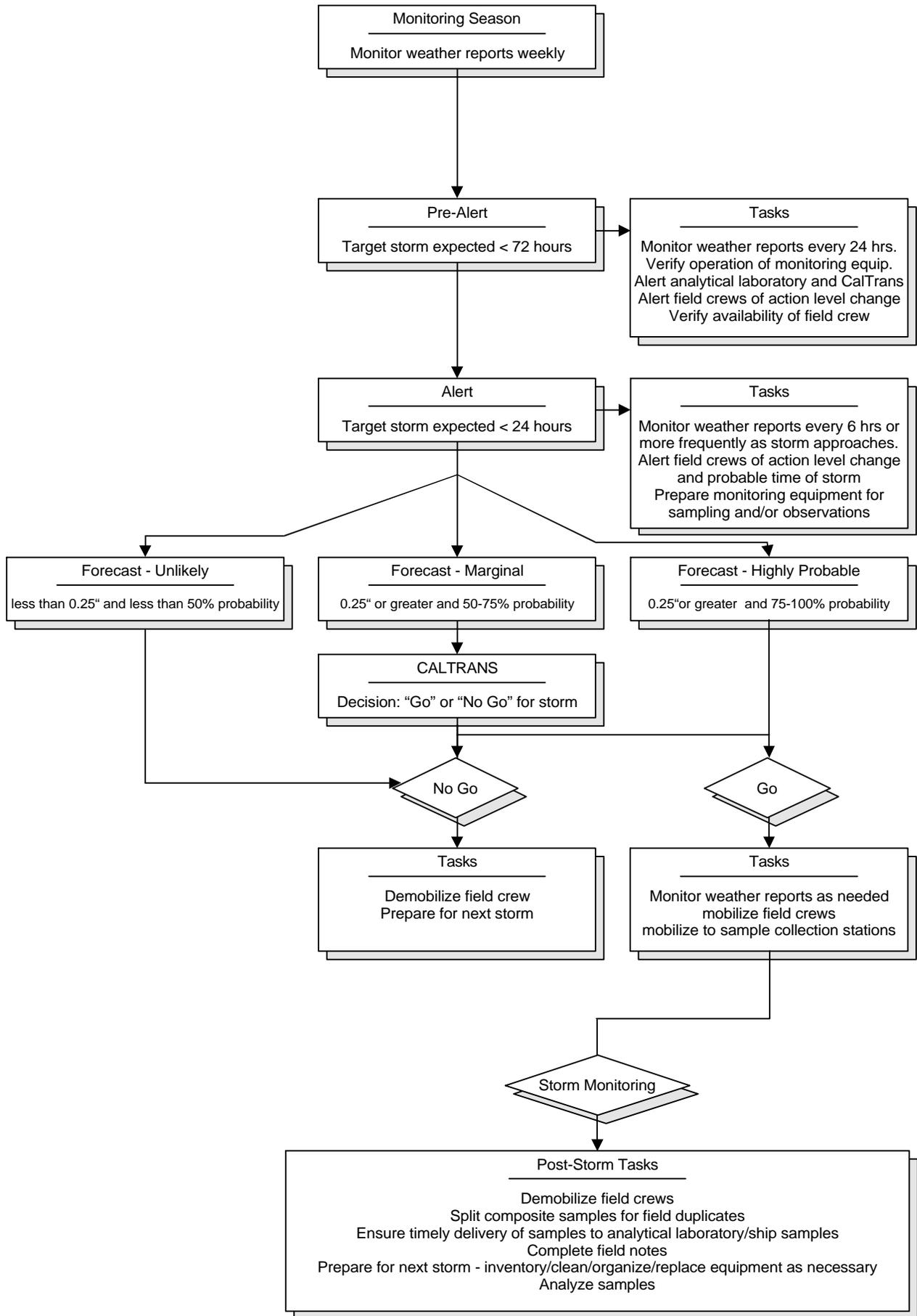
TAB 3

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring



FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Phone card	Volume to sample matrix
	Vendor's autosampler manual

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Maps for all required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm kit	Log books
pH meter	Paper towels
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
pH grab bottles	Spare sample labels
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	20 liter bottles in 10 gallon containment buckets
Grab sample bottles (see below)	Coolers and ice (at least one extra)
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Lab telephone number
for each QA/QC analysis	Backup lab contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

Form C: BMP Site Inspection Checklist
Form D: Monitoring Equipment Inspection Checklist

FORM C			
Caltrans BMP Retrofit Pilot Program			
BMP Site Inspection Checklist for Extended Detention Basins			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
SEDIMENT/EROSION CONTROL:			Maintenance Req'd?
Sediment depth (is average sediment depth in excess of 18 inches, 10% of basin volume or is there an alluvial type deposit impeding EDB hydraulics at the inlet):			? yes ? no
Sediment type and location:			
Standing water or other drainage problems?		? yes ? no	? yes ? no
Comments:			
If yes, what is the depth of water?			
What is the extent of the water?			
Where is the location of the water?			
Evidence of erosion, rilling, or undercutting?		? yes ? no	? yes ? no
Seeps?		? yes ? no	? yes ? no
Embankment slumping or cracking?		? yes ? no	? yes ? no
Comments:			
VEGETATION:			Maintenance Req'd?
Height of vegetation (<i>if length >18 inches mark yes</i>):			? yes ? no
Does vegetation cover all of the detention basin's floor and/or slopes?		? yes ? no	? yes ? no
Is vegetation management required?			
Is native vegetation, weeds, leaves, or other organic debris present in the basin?			? yes ? no
If yes, what type:			
Does native vegetation, weeds, leaves, or other organic debris interfere with the operation of the detention basin by (a) overgrowing the detention basin vegetation, (b) interfering with the hydraulic resident time of the detention basin, or (c) saturation of the bottom with dead or dying vegetation or (d) in another way?		? yes ? no	? yes ? no
If so, explain:			
Evidence of flattening of vegetation??		? yes ? no	? yes ? no
If so, which species?			
Condition of landscaping?			? yes ? no
? Inhibited Growth		? Excessive Growth	? Normal Growth
Comments:			

FORM C				
Caltrans BMP Retrofit Pilot Program				
BMP Site Inspection Checklist for Extended Detention Basins (Continued)				
STRUCTURAL:				Maintenance Req'd?
Are flumes, flume-to-basin transitions, basin -to-flume transitions, and energy dissipaters clear of sediment?		? yes	? no	? yes ? no
Risers and Conveyances: Blockage or sediment in risers? :		? yes	? no	? yes ? no
If yes, extent and location: _____				
Is corrosion present?		? yes	? no	? not applicable
If yes, extent and location: _____				? yes ? no
Evidence of concrete scour, spalling, or cracking of structural parts?		? yes	? no	? yes ? no
Fences:	? OK	? not OK	? not applicable	? yes ? no
Locks:	? OK	? not OK	? not applicable	? yes ? no
Other general maintenance concerns/comments:				
ANIMAL CONCERNS:				Maintenance Req'd?
Is there evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)?		? yes	? no	? yes ? no
Comments:				
AESTHETIC CONCERNS:				
Debris (non-trash)?	? yes	? no	Type, amount and location:	
Trash?	? yes	? no	Type, amount and location:	
Graffiti?	? yes	? no	Description and location:	
Other general aesthetic concerns:				
WATER MANAGEMENT:				
? <i>Dewatering (describe):</i>				
Start time:	End time:	Total time:	More	
work required? ? yes ? no				
Equipment used				
NON-STORMWATER CONCERNS:				
Non-storm water discharge to BMP		? yes	? no	
BMP wet from obvious non-stormwater discharge (no rain)		? yes	? no	
If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678				
From:		Contact Number:		

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Extended Detention Basins (Continued)

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

Comments:

OVERALL;

Other concerns affecting operation:

Condition of facility: ? acceptable ? not acceptable

Comments:

Dates for maintenance to be completed by:

 (Team Leader's Signature)

FORM D			
Caltrans BMP Retrofit Pilot Program			
Monitoring Equipment Inspection Checklist for Extended Detention Basins			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:	Influent	Effluent	(circle one)
SAMPLING AND FLOW MEASUREMENT EQUIPMENT:			Maintenance Required?
Is the monitoring station enclosure locked? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Is the monitoring station enclosure structurally sound? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Is the system status of the automatic sampler online? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Is the automatic sampler properly programmed and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Does the peristaltic pump tubing need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Does the intake tubing and/or connections need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Do the desiccant cartridges in the flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Is internal modem online? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			
Is the flow meter properly installed (specify type of meter)? <input type="checkbox"/> yes <input type="checkbox"/> no			<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:			

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Extended Detention Basins
 (continued)

SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.):	Maintenance Required?
Is the flow meter tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the acoustic level meter properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the AV meter sensors properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the AV meter sensors free of obstructions? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is strainer clean and free of obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no

INFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

EFFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

Comments:

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Extended Detention Basins
(continued)

Dates for maintenance to be completed by:

(Team Leader's Signature)



TAB 5

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

- Form E: BMP Site Maintenance Activity Checklist**
- Form F: Monitoring Equipment Maintenance Activity Checklist**
- Form G: Sediment Sampling Checklist**
- Exhibit 5.1: Title 22 Characterization Requirements**

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Extended Detention Basins

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		

Fill out appropriate sections only

SEDIMENT/EROSION CONTROL:

Sediment removal or sediment management

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

Clean flumes, and/or cracks in stormwater conveyance system

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

Erosion repair (including vegetative stabilization)

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

Embankment/slope repair(s)

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

Other (describe):

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

VEGETATION:

Detention basin grass mowing/trimming and removal of cuttings

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

Detention basin vegetation trimming and tree pruning

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

Replant EDB vegetation

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Extended Detention Basins
 (continued)

Weed control
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

STRUCTURAL:

Structural repairs (describe):
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

ANIMAL CONCERNS:

Burrow control
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Other (describe):
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

AESTHETIC CONCERNS:

Debris and trash removal
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Graffiti removal
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Painting
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Other (describe):
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

_____ (Team Leader's Signature)	General Comments:
------------------------------------	-------------------

FORM F			
Caltrans BMP Retrofit Pilot Program			
Monitoring Equipment Maintenance Activity Checklist			
for Extended Detention Basins			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
<i>Fill out appropriate sections only</i>			
<input type="checkbox"/> <i>Clean flumes, orifices, and other components</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Diagnostic test of automatic sampler</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replacement of peristaltic pump tubing</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replacement of flow meter tubing, pump tubing, or intake tubing</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replacement of strainer</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replacement of 12-volt marine battery</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Removal of kinks or obstructions from flow meter</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replacement of desiccant cartridges in the flow meter and/or sampler</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			

FORM F
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Maintenance Activity Checklist
for Extended Detention Basins (continued)

Repair and maintenance of AV meter
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Repair and maintenance of look-down level meter
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Other maintenance/calibration of automatic sampling equipment (describe):
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Other maintenance of flow measurement equipment (describe):
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

Other (describe):
 Start time: End time: Total time: More work required? yes no
 Equipment used:
 Comments:

_____ (Team Leader's Signature)	General Comments:
------------------------------------	-------------------

FORM G
Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist

GENERAL INFORMATION:

Date:	Time In:	Team Leader's Initials:	Time Out:
Location:			

SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:

Depth of sediment:

Color:	<input type="checkbox"/> black	<input type="checkbox"/> brown	<input type="checkbox"/> green	<input type="checkbox"/> tan	<input type="checkbox"/> other
Consistency:	<input type="checkbox"/>	<input type="checkbox"/> sandy	<input type="checkbox"/> silty	<input type="checkbox"/> granular	<input type="checkbox"/> other
Odors:	<input type="checkbox"/> petroleum	<input type="checkbox"/> solvents	<input type="checkbox"/> organic (rotten eggs)	<input type="checkbox"/> sewage	
	<input type="checkbox"/> none	<input type="checkbox"/> other			

Depth of sediment:

SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST

Powder Free Nitrile Gloves	
Soil Probe or equivalent for sample collection	
8-ounce glass jar labeled Total Petroleum Hydrocarbons (TPH)	
Plastic bags, seal bags	
Chilled cooler	
Chain-of-Custody form	
Log book for record keeping	

STOCKPILE/DRUMMED SEDIMENT:

Maintenance Required?

Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.	<input type="checkbox"/> yes	<input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.	<input type="checkbox"/> yes	<input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.	<input type="checkbox"/> yes	<input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.	<input type="checkbox"/> yes	<input type="checkbox"/> no

SEDIMENT COLLECTION:

<10 cubic yards: <i>Minimum of 2 samples, one randomly from each half of the soil mass</i>	
10-20 cubic yards: <i>Minimum of 3 samples, one randomly from each third of the soil mass</i>	
20-100 cubic yards: <i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>	
100-500 cubic yards: <i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>	
Over 500 cubic yards: <i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>	<i>Contact Dept. of Environmental Health for Guidance</i>

FORM G	
Caltrans BMP Retrofit Pilot Program	
Stockpile/Sediment Sampling Checklist	
SEDIMENT SAMPLE COLLECTION	
Observation sheet completed	
Personal and equipment decon completed	
Number of aliquots taken from composite _____	
Sample IDs:	
1. _____ Analysis requested: _____	
2. _____ Analysis requested: _____	
3. _____ Analysis requested: _____	
4. _____ Analysis requested: _____	
5. _____ Analysis requested: _____	
6. _____ Analysis requested: _____	
Photos taken:	
Chain of Custody form attached	
Record information in logbook for record keeping	
Comments:	

Exhibit 5.1
Sediment Matrix (Disposal)
Analytical Parameters, Methodologies, Detection Limits, Holding Times,
Container Volumes and Types, and Preservation

Parameter	Method	Units	Detection Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.
- (5) “Test Methods for Evaluating Solid Waste, Physical /Chemical Methods.” SW-846, Update III.(SW-846)



TAB 6

CALTRANS BMP STORM WATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for
Storm Events**

Form I: Field Data Log Sheet

Form J1: User-Entered Program Parameters (Influent/Control)

Form J2: User-Entered Program Parameters (Effluent)

Form K: Station Phone Log

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Extended Detention Basins

INFLUENT WATER QUALITY APPEARANCE:

(Check all that apply and describe under comments)

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Over entire basin: _____

In one spot: _____

In multiple spots: _____

In outflow/effluent channel: _____

Solids resuspension evident (*check all that apply*):

- In inflow/influent channel Near inlet Near outlet In outflow/effluent channel
 Other (describe): _____

Solids deposition and resuspension comments:

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Extended Detention Basins

EROSION:

For the following locations, record erosion locations, area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Near inlet: _____

Basin bed: _____

Basin side slopes: _____

Near outlet: _____

In outflow/effluent channel: _____

Comments: _____

VEGETATION CONDITION:

Basin bed vegetation cover:

- Complete Few small bare spots Few large bare spots Many small bare spots
 Many large bare spots Large areas bare All or nearly bare

Basin side slopes vegetation cover:

- Complete Few small bare spots Few large bare spots Many small bare spots
 Many large bare spots Large areas bare All or nearly bare

Basin bed vegetation type:

- All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses
 All wetland plants

Extent of woody shrubs or trees: _____

Basin side slopes vegetation type:

- All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses
 All wetland plants

Extent of woody shrubs or trees: _____

Vegetation condition comments:

OUTLET CONDITIONS:

Describe any obstructions or restrictions interfering with outflow/effluent:

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Extended Detention Basins

EFFLUENT WATER QUALITY APPEARANCE:

Check all that apply and describe under comments

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

VECTORS:

Presence of vectors:

- Yes No

If yes, what type:

- Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

- Inlet structure damage Outlet structure damage Vandalism

Comments:

MONITORING EQUIPMENT CONDITIONS:

Equipment functional:

- Yes No N/A

Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: _____

Time: _____

Comments:

Date: _____

Time: _____

Comments:

Date: _____

Time: _____

Comments:

FORM I
Caltrans BMP Retrofit Pilot Program
Extended Detention Basin Field Data Log Sheet

GENERAL INFORMATION		Julian Day (*5AA): _____
Date: _____	Time in (PST,*5): _____	Team Leader's Initials: _____
Location: _____	Crew: _____	
5.2.1.1.1 <i>Influent or Effluent (circle one)</i>	Storm Event Visit or Maintenance Visit (circle one)	
SYSTEM STATUS FLAGS (*6AD; 1=high, 0=low)		PROGRAM SIGNATURE (*B)
Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Arrive: _____	
Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Depart: _____	
DATA LOGGER INFORMATION (*6)		
<i>All Site Visits:</i>	<i>Samp. Batt Volt</i> 22:	<i>Manual Rain Gauge:</i>
Basin Staff Gauge:	Cell Batt Volt 82:	Total Rain (in.) 25:
Flow Sensor Stage:	Flow Meter Batt Volt 28:	Total Storm Vol. 72:
Stage (ft) 02:	<u>Storm Site Visits:</u>	Strm Vol Smpld 75:
Velocity (ft/s) 03:	Volume (kcf) 05:	Max Stage Day 51:
Flow (cfs) 04:	Storm Sum (kcf) 06:	Max Stage Time 52:
Station ID 21:	Percent Capture 08:	Max Stage (ft) 53:
	Volume2Sample 14:	Date Last Sample 105:
	Sample Count 17:	Time Last Sample 106:
AUTOSAMPLER INFORMATION		
<i>Storm only</i>		Bottle # in: _____
Number of Samples Total: _____	Bottle # out: _____	
Number of Samples Remaining: _____	Bottle Volume: _____	
	Volume2SAMPL: _____	
GRAB SAMPLE COLLECTION	CALIBRATIONS and CHECKS	
Time: _____	Stage: _____	<input type="checkbox"/>
TPH (Diesel/Oil) _____	Sample Volume: _____	<input type="checkbox"/>
TPH (Gasoline) _____	Rain Gauge: _____	<input type="checkbox"/>
Bacteria _____	Other: _____	
Other: _____		
SAMPLING EQUIPMENT AND REPAIR NEEDS:		
ACTION TAKEN:		
Team Leader's Signature _____		

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
03 Volume to sample (kcf)					
04 Level Meter Stage Offset (feet)					
05 Level Meter Multiplier (feet/mv)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. Failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
30					
31					
34 Flume Parameter 1					
35 Flume Parameter 2					
36 Cellular phone battery state control parameter					
37 Duration when cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions



TAB 7

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Chain-of-Custody Form
Exhibit 7.1: Chemical Analyses List**

Exhibit 7.1
Water Matrices
Analytical Parameters, Methodologies, Detection Limits, Holding Times,
Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/ Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/ Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics									
Total Petroleum Hydrocarbons – Diesel/Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons – Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Bacteria									
Fecal Coliform	Grab	2	MPN/100 mL	Multiple-tube	SM 9221E	6 hours ⁶	50 mL	1-100 mL plastic	4°C

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification
6. Attempts will be made to maintain the 6-hour holding time for bacteria samples to the extent possible. When not possible, a maximum holding time of 24 hours will be followed in accordance with “Standard Methods for the Examination of Water and Wastewater”, 18th Edition.



TAB 8

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related Maintenance Activity
Checklist for Affected BMP Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform monitoring.



TAB 9

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

- Exhibit 9.1: Runoff Coefficients**
- Exhibit 9.2: Volume-to-Sample Tables**
- Exhibit 9.3: Encroachment Permits**

Exhibit 9.1
Runoff Coefficient Matrix Table for Extended Detention Basins
Caltrans District 7

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
074102	I-605/SR91	0.8	1.00
074101	I-5/I-605 (south)	6.8	0.54

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
I-5/I-605 (EDB)

Number of Sample Aliquots Acreage Runoff Coefficient 72 6.8 0.54			
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)
0.1	0.0185	2.6	0.4813
0.2	0.0370	2.7	0.4999
0.3	0.0555	2.8	0.5184
0.4	0.0741	2.9	0.5369
0.5	0.0926	3.0	0.5554
0.6	0.1111	3.1	0.5739
0.7	0.1296	3.2	0.5924
0.8	0.1481	3.3	0.6109
0.9	0.1666	3.4	0.6294
1.0	0.1851	3.5	0.6480
1.1	0.2036	3.6	0.6665
1.2	0.2222	3.7	0.6850
1.3	0.2407	3.8	0.7035
1.4	0.2592	3.9	0.7220
1.5	0.2777	4.0	0.7405
1.6	0.2962	4.1	0.7590
1.7	0.3147	4.2	0.7775
1.8	0.3332	4.3	0.7961
1.9	0.3517	4.4	0.8146
2.0	0.3703	4.5	0.8331
2.1	0.3888	4.6	0.8516
2.2	0.4073	4.7	0.8701
2.3	0.4258	4.8	0.8886
2.4	0.4443	4.9	0.9071
2.5	0.4628	5.0	0.9257

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
I-605/SR 91 (EDB)

Number of Sample Aliquots 72		Acreage 0.8	Runoff Coefficient 1	
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)	
0.1	0.0040	2.6	0.1049	
0.2	0.0081	2.7	0.1089	
0.3	0.0121	2.8	0.1129	
0.4	0.0161	2.9	0.1170	
0.5	0.0202	3.0	0.1210	
0.6	0.0242	3.1	0.1250	
0.7	0.0282	3.2	0.1291	
0.8	0.0323	3.3	0.1331	
0.9	0.0363	3.4	0.1371	
1.0	0.0403	3.5	0.1412	
1.1	0.0444	3.6	0.1452	
1.2	0.0484	3.7	0.1492	
1.3	0.0524	3.8	0.1533	
1.4	0.0565	3.9	0.1573	
1.5	0.0605	4.0	0.1613	
1.6	0.0645	4.1	0.1654	
1.7	0.0686	4.2	0.1694	
1.8	0.0726	4.3	0.1734	
1.9	0.0766	4.4	0.1775	
2.0	0.0807	4.5	0.1815	
2.1	0.0847	4.6	0.1855	
2.2	0.0887	4.7	0.1896	
2.3	0.0928	4.8	0.1936	
2.4	0.0968	4.9	0.1976	
2.5	0.1008	5.0	0.2017	

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE,
AND MONITORING PLAN
VOLUME II

BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
INFILTRATION BASINS



DISTRICT 7, LOS ANGELES

September 1999



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1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel the appropriate field evaluation and documentation for the District 7 Infiltration Basin (IB) belonging to the Caltrans BMP Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-B of this guidance document for supporting information on IB technology and characteristics. If needed, further background information is supplied in Volume I of the Operations, Maintenance & Monitoring Plan (OMM), which provides program-specific requirements and procedures.

1.1 Data to Be Collected

The following data will be collected to assess the performance and maintenance aspects of an IB:

- Continuous basin level data, recorded as a function of time, from rainfall events during the study period.
- Rainfall data, recorded as a function of time, from rainfall events during the study period.
- Determine the quantity of runoff treated by the BMP.
- Documentation of inspection and maintenance records.
- Determine basin level fluctuations and degree and rate of infiltration.
- Empirical observations of stormwater runoff and BMP performance, etc.
- Determine and document the level of effort required to maintain the BMP at optimal effectiveness (i.e., treatment of stormwater runoff for storm events producing up to the 1-year, 24-hour peak flow).
- Vegetation management records.
- Determine and document the level of effort required to control vectors of human disease and nuisance insects, rodents, and vegetation at the BMP.
- Determine effects, if any, on the groundwater.
- Determine the concentration of pollutants removed through deposition.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.



1.2 Field Activities to Be Performed

Field activities that will be performed at the IB facilities include:

- Empirical Observation of Infiltration Basin Operation.
- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Facility Inspections.
- Facility Maintenance.
- Vector and Nuisance Animal Control Inspections.
- Vegetation Control.
- Stormwater Monitoring.
- Soil and Sediment Sampling.

Also, vector management may occur at the IB facility, but may be contingent on facility housekeeping and other environmental influence. Please see Appendix IV of Volume II for further details.

1.3 Master Schedule

The schedule on the following pages shows the time-line for each phase of the IB OMM program.



2.0 SITE INFORMATION

Access requirements for the site are summarized in Table 2.1, in the Encroachment Permit found in Tab 9, and in the Site Location Map in Tab 1. ***Encroachment Permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed.***

Check in with appropriate Caltrans personnel before conducting field work.

**Table 2.1
 Caltrans District 7 Infiltration Basin Site Summary**

Site No.	Site Name	Site Location	Access and Parking
073101	I-605/SR-91 Interchange (Infiltration Basin)	East of the intersection between Westbound SR-91 and the SR-91/I-605 Connector, in the City of Cerritos.	Access to the Infiltration Basin is from the SR91/I-605 Connector. Vehicles will be parked on the Basin Access Road (see BMP Facility Plan in Tab 1.)

2.1 Infiltration Basins

Refer to the accompanying appendix for a general description of an IB. The section below provides site-specific information for the IB site in District 7.

2.1.1 I-605/SR-91 Interchange IB

The BMP Retrofit Pilot Project incorporating an IB is located in the center of a cloverleaf ramp connecting Northbound I-605 to Westbound SR-91. The pilot area is an excavation depression that captures mostly highway and maintenance yard runoff, which will be allowed to infiltrate into the soil.

The BMP is an off-line IB. Drainage areas tributary to the cloverleaf interior include the mainline freeway, the cloverleaf connector ramp and a Caltrans maintenance station. Of the four storm drains inlets, flows from two of them are diverted to the IB. Runoff from the I-605 Northbound and from the overside drain from Westbound SR-91 do not discharge to the basin.

Flows from the maintenance yard and cloverleaf ramp discharge separately into the basin. The runoff from the maintenance yard is diverted to the IB through a 600-mm plastic pipe at a 1% slope. The inlet structure is modified to allow excessive runoff to overflow to a 2.0-meter concrete swale that connects to the existing outlet. The cloverleaf connector runoff flows into an inlet and 300-mm plastic pipe having a slope of 2% to the IB. Each inlet is provided with an energy dissipator to provide pretreatment and



uniform flow by spreading/distributing the runoff over the basin floor. The basin floor is flat and the embankment is sloped 1:3.

Vegetation is established on the basin floor and side slopes to improve infiltration, trap constituents, and to stabilize the IB embankments. The surrounding area affected by construction has been supplemented with hydroseed mix to reduce erosion potential.

The basin has been designed to collect the 1-year, 24-hour storm runoff volume, and store larger storm events. This is accomplished by using the available freeboard of 0.6 meters and by the design of the maintenance yard's two-way directional flow with an overflow orifice to control the volume detained in the basin. As the storm intensity declines, the basin depth decreases to the overflow elevation of the pipe of 19.7 meters, leaving a surface water depth in the basin of 0.22 meters. The overflow level is set to detain the 1-year, 24-hour storm event of 1-inch runoff volume in the IB. The basin bottom is at elevation 19.48 meters and the maintenance yard outlet drain invert is at elevation 19.72 meters. This design ensures flows in excess of 1-year, 24-hour storm will not affect the basin's capability to capture, detain and treat the initial runoff.

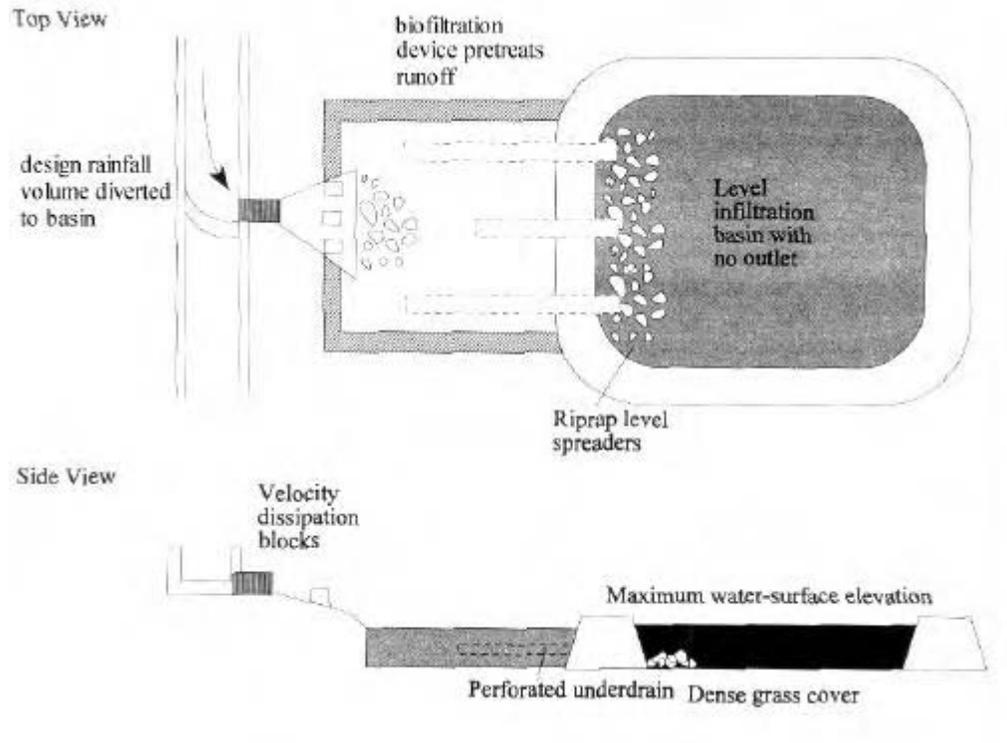
All other stormwater runoff that enters the cloverleaf is directed by earthen or concrete swales to the outlet and does not enter the IB.

Concrete pads are located at each corner to provide elevation control benchmarks. A bubbler tube is anchored to a concrete pad near the center of the basin. A lysimeter measures vadose zone water quality and is located in the basin near the access road.

See the Site Location Map and BMP Facility Plan in Tab 1.

Figures 2.2 through 2.4 illustrate monitoring details of the IB.

Figure 2.1 Overview of an Infiltration Basin



2.2 Emergency Hospital Routes

See the “**Emergency Procedures Support**”, **Tab 2**, for a map and description showing the route to the nearest hospital and for emergency and site-related telephone contacts.

2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at an IB, field crews will consist of a minimum of two people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Activities at an IB brings up traffic concerns including access and parking at pullouts. During access and routine visits to the facilities, the following precautions will be taken:

- Minimize the time spent on the shoulder of the highway.
- Park on the facility access road.
- Affiliated personnel shall wear a reflective orange safety vest, a hard hat, and appropriate shoes.
- Rotating amber lights shall be mounted and operational on work vehicles.



While it is not anticipated that personnel will work on a highway shoulder for the I-605/SR-91 Interchange IB, the following information is provided if such work becomes necessary.

According to Chapter 8 (Protection of Workers) of the *Caltrans Maintenance Manual* (see Appendix D-2 of Volume I), working for more than 10 minutes on the shoulder involves a shoulder closure procedure. This shoulder closure procedure will conform to the safety precautions below and the site-specific instruction provided in the Encroachment Permits (Exhibit 9.1 of Tab 9).

- Prior to beginning any work on or adjacent to a major roadway, the local highway patrol traffic control department shall be notified. See the Emergency Contacts List in Tab 2 for a listing of the local highway patrol phone numbers.
- Whenever possible, plan the timing of the work for non-peak traffic congestion periods if long-term parking on the shoulder is required.
- Use enough cones and barricades to sufficiently divert traffic safely around the work area (adhere to specific shoulder closure requirements detailed in the Encroachment Permits).
- Any open manhole or ditch must be barricaded.
- Remember that visibility is the key to minimizing the dangers of working in traffic.
- Upon completion of the work, the area must be cleaned up of materials and left in a clean and orderly state.

2.3.2 General Safety

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the IB facilities, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Lightning.
- Fast moving water.
- Unstable earth.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Muggers and other criminals.
- Transients
- Power tools and heavy equipment.
- Ledges.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.



- Electrical hazards posed by equipment malfunctions.

Other important field precautions include:

- Stay away from the edges of a fast moving body of water. These edges are usually slippery and unstable during rainy conditions.
- If sampling is required at the edge of a fast moving body of water, use a lifeline and a personal flotation device. Use grabbing devices when possible.
- Never work alone at night and avoid working alone during the day.
- Avoid leaving materials, tools and equipment lying around where someone can trip over them.
- Maximize lighting at all times, especially at night.
- Keep a phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear a hard hat and orange safety vest.
- Do not use power tools and heavy equipment unless trained in the proper use and care of the specific power tools.
- Always wear eye protection when working with tools or chemicals
- Wear rain gear.
- Never leave open holes unattended or unbarricaded.
- Do not sample during lightning.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 on the following page as a guide to find appropriate forms and information required for field visits. This table covers appropriate aspects of the field OMM program including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is by obtaining and going through each item on the table pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks for facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
for Infiltration Basins

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Location Map	NA	Prior to site visits.
	BMP Facility Plan	NA	Prior to site visits.
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist for Infiltration Basins	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist for Infiltration Basins	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist for Infiltration Basins	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist for Infiltration Basins	Form F	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	CCR Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events for Infiltration Basins	Form H1	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and BMP.
	Sediment and Soil Sampling Field Data Log Sheet (for BMP Performance Evaluation)	Form H2	During annual collection of sediment and soil samples.
	Field Data Log Sheet for Infiltration Basins	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameters	Form J	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses Lists	Ex. 7.1	References for each sampling event and laboratory analysis request submittal.
8	Vector Control and Monitoring Forms	Forms O1-O2	Fill out for each site visit related to vector monitoring.
9	Encroachment Permits	Ex. 9.1	Explains access and safety requirements. Must always accompany field crews.



4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

Each IB will be inspected on a regular basis according to the following minimum rates:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Forms C and D (Tab 4).*

1. Prior to arrival, contact appropriate Caltrans District 7 personnel identified in the Encroachment Permit (Exhibit 9.1 in Tab 9).
2. Completely walk around the BMP while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism),
 - Vegetation management (grass, shrubs, trees),
 - Erosion and slope stability,
 - BMP performance (fouling, blockage, damage),
 - Equipment repair/maintenance (BMP components, autosampler),
 - Sediment accumulation (within BMP, at influent confluence),
 - Storage of accumulated sediment or other wastes, and
 - Vector control.
4. Complete Form C (see Tab 4) during inspections.
5. Log field activities and their corresponding time accurately.
6. If immediate corrective or preventive maintenance is needed, call the appropriate contacts listed in the Project Contacts List in Tab 2.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.



- Standing or Stagnating Water.
- Vector Control.
- Vandalism.

The frequency of individual maintenance activities at the IB facilities will be conducted according to the schedule listed in the maintenance indicator document, included as Appendix V of Volume II.

Maintenance activities performed will be documented using Forms E and F in Tab 5. See Section 2 of Appendix I-B for full details on maintenance activities.

4.3 Vegetation Management

Maintenance and control of vegetation is essential to the optimal operation and performance of an IB. The IB will be seeded with an erosion control mix.

The condition of the erosion control mix will be inspected on a monthly basis at a minimum. These inspections will ensure:

- that the IB vegetation is kept at an average height of 12 in;
- that the vegetation protecting the slopes is kept healthy and continuous; and
- undesirable plant species do not take root.

4.3.1 Maintenance Requirements for Vegetation Control

Mowing, trimming, and pruning are the preferred means for controlling vegetation at an IB. Controlling standing water will also be essential to controlling vegetation. Burning will not be allowed.

When equipment is used to remove vegetation, care will be taken to prevent ruts, holes, and an uneven IB floor. Such depressions can cause standing water that will create problems of vector control.

Maintenance activities will be conducted in a fashion that minimizes soil compaction.

Maintenance activities that will be conducted on landscaped vegetation include:

- Weeding.
- Pruning.
- Replacement of dead or dying plants.

Vegetation removed from an IB will be promptly hauled off and disposed of properly. Cut vegetation will not be stockpiled onsite, especially in the IB.



4.3.2 Checklists for Vegetation Control

During the routine vegetation inspections of an IB, the BMP Site Inspection Checklist and Monitoring Equipment Inspection Checklists (Forms C and D in Tab 4) will be completely filled out and signed by the inspector. These checklists incorporate the necessary vegetation inspection requirements. A BMP Site Maintenance Activity Checklist and Monitoring Equipment Maintenance Checklist (Forms E and F in Tab 5) will be filled out for the maintenance activities performed.

4.4 Disposal of Trash and Debris

Trash and debris from an IB is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the BMP will be responsible for removal and disposal of the trash and debris. This disposal will comply with applicable local, county, state, and federal waste control programs. Table 2.1 in the accompanying Appendix for the IB shows a few possible disposal services for waste material.

4.5 Deposited Sediment Management and Characterization Sampling

This section refers to sediment that needs to be sampled and characterized for disposal purposes. Refer to Section 5.4 for sampling of soil and sediment for BMP performance evaluation. *Handling and appropriate disposal of sediment residues from BMPs is critical.* Stockpiling is only allowed at the facility under the following conditions:

- Sandbag berms are created (8-inch minimum) and are placed around the stockpile area.
- At least 0.5-mil plastic is used to contain any dewatered liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored at all times.

Once sediment stockpile storage has reached disposal quantity, chemical characterization must be conducted to satisfy land disposal requirements (LDRs). Document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

For sediment stockpiles, the minimum number of discrete samples initially required must comply with Form G, Tab 5. Random samples will be selected from locations on a three-dimensional grid. If the presence of materials such as boulders, debris, etc. hinder the application of this process, the sample will be collected as close as possible to the randomly selected point without altering the essence of the random selection process.



Stockpile sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the stockpile or drum.
3. Collect the sample using a soil probe or equivalent. Ensure that the sample is collected at the correct depth and location that was randomly selected.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.6 Vector and Nuisance Animal Control

Vector Control Districts have been subcontracted to work in accordance with Appendix IV.



5.0 STORM MONITORING

Careful preparation and planning is critically important. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that local rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours preferred).
2. Meeting deployment criteria defined in Exhibit 3.1.

Check appropriate sources for local weather conditions before deploying field staff. Use the Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for a decision tree on when and how to mobilize field personnel and equipment.

5.1 Decontamination Procedures

Prior to basin water level measurements, vadose zone monitoring and soil/sediment sample collections, assemble necessary decontaminated sample containers other sampling equipment according to the following procedures:

5.1.1 *Cleaning Procedures for Sample Bottles*

Bottles will be:

1. Rinsed three times with warm tap water.
2. Scrubbed with a clean plastic brush.
3. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
4. Rinsed three times with tap water.
5. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
6. Rinsed three times with hexane while rotating the bottle, and then air-dried.
7. Rinsed six times with Milli-Q water.
8. Soaked in 2N nitric acid for a minimum of 24-hours.
9. Rinsed six times with Milli-Q water.

5.1.2 *Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment that May be Used at an Infiltration Basin*

Teflon[®] hose and other sampling equipment will be:



1. Teflon® hose will be rinsed three times with a 2% Micro® solution or equivalent. Other sampling equipment will be washed with a 2% Micro® solution and a clean plastic brush.
2. Rinsed three times with warm tap water.
3. Rinsed three times with Milli-Q or equivalent water.
4. Rinsed three times with 2N nitric acid.
5. Soaked at least 24-hours in 2N nitric acid.
6. Rinsed three times with Milli-Q water.

5.2 Basin Water Level Measurements

The depth of water inside the basin is measured using a bubbler meter. Basin water level depth will be continually logged with a data logger/controller. A staff gauge inside the basin will be used to calibrate the bubbler. Basin water level changes will be used to estimate the percolation rate.

Pertinent checklists, log forms, and information necessary to conduct a successful monitoring program and to be contained in the site-specific field logbooks are listed in Table 3.1 in Section 3.0. The pertinent checklists and log forms are located in Tabs 1 through 9. Table 3.1 also contains corresponding form and table numbers, identifies the location in this document, and explains when each form is to be filled out.

5.3 Vadose Zone Monitoring

The vadose zone will be monitored by measuring dissolved metals (copper, lead, and zinc) concentrations. To collect pore liquids from the vadose zone, a pressure-vacuum lysimeter will be used. Sample collection will follow the procedures listed below:

1. Once onsite, fill out Empirical Observation Field Data Log and a Field Data Log Sheet (Forms H1 and I, Tab 6) to document storm characteristics.
2. Locate lysimeter and inspect for proper operation.
3. Collect pore samples (using the lysimeter) as follows:
 - a. Place the lysimeter in the sample extraction mode by closing the sample collection stopcock.
 - b. Connect a 12-volt electric vacuum pump to the vacuum/pressure port. Slowly regulate the vacuum to 10 psi [508 mm of Hg] by adjusting the pressure vacuum stopcock on the lysimeter head assembly and then seal the system.
 - c. Once the vacuum is generated, pore liquid will be drawn from the soil pores and into the lysimeter. When the vacuum drops to 5 psi [254 mm of Hg] or less, attempt sample recovery.
 - d. Fit a clean, rigid, polyethylene sample container (400 mL minimum volume) with a two-port bung to the sample collection tube, making a sealed system.



The tube from the lysimeter will protrude into the sample container approximately one-half inch [13 mm]. The tube to the vacuum/pressure pump will be flush with the bung.

- e. Ensure that the vacuum/pressure tube and sample collection tube stopcocks are in the open position.
- f. Evacuate the sample from the lysimeter by applying a vacuum of approximately 10 psi [508 mm of Hg].
- g. A minimum volume of 100 mL (300 mL is recommended) is required for the analysis of dissolved copper, lead, and zinc. Transfer the sample to an unpreserved polyethylene bottle provided by the laboratory. If the required volume was not obtained, repeat Steps a. through f.
- h. When the minimum volume of sample has been obtained, properly pack and transport the sample in accordance with the procedures described in Section 5.10 of Appendix I-B. Ensure that a note has been recorded on the Chain-of-Custody Form (see example in Form M, Tab 7) requiring the laboratory to filter the sample upon receipt.

5.4 Soil and Sediment Sampling for BMP Performance Evaluation

Core soil and surface sediment samples will be collected from within the IB and will be used in part to evaluate the BMP's performance. A baseline set of nine core soil samples will be collected from within the IB following completion of its construction. Annual sampling of core soil and surface sediment will be performed at the same locations following the end of the 1999/2000 and 2000/2001 wet seasons. Samples will be analyzed for constituents listed in Exhibit 7.1b. In addition, surface sediment accumulation rate within the IB and surface sediment grain size distribution will be determined by making measurements at the end of each wet season.

Nine cores will be collected from locations on an equilateral basin grid (superimposed over the basin) to quantify annual sediment accumulation and quality data. If the presence of materials such as boulders, debris, etc. hinders the application of this process or if there is a lack of sediment, the cores will be collected as close as possible to the selected point. Each of the nine cores will be collected using a hand-held, stainless steel soil probe, or equivalent. The cores will be driven 1 m [3.28 ft] below the sediment surface and recovered. Using the log shown in Form H2, soil borings will be logged for depth of penetration and recovery, location, and geotechnical characteristics. Each core will then be subdivided into three sections as follows:

1. Section 1 is from the sediment surface to the surface of the native soils.
2. Section 2 is from 0.3 m [0.98 ft] to 0.5 m [1.64 ft] below the surface of the native soils
3. Section 3 is from 0.6 m [1.97 ft] to 0.8 m [2.62 ft] below the surface of the native soils.



Use the following steps in collecting sediment and soil samples:

1. Don personal protective equipment.
2. Locate the sample locations within the IB.
3. Using a transit, determine the sediment surface elevation from a referenced benchmark on the IB embankment.
4. Collect the core samples at the nine locations using a soil probe or equivalent. Ensure that the sample is collected to a depth of 1 m [3.28 ft] below the original IB floor elevation and in the correct location. Record the sediment depth at each location. Discard soil below the bottom sample interval (i.e., soil below 1 m [3.28 ft] from the IB floor).
5. Record sample characteristics, and subdivide each core into three sections as described above.
6. Deposit each selection of each core into stainless steel mixing bowls.
7. Homogenize the sample in each bowl.
8. Fill four 8-ounce glass jars and close the containers with the caps. One jar will be labeled and analyzed for Total Recoverable Petroleum Hydrocarbons (TRPH); one jar will be labeled and analyzed for metals; the remaining two jars will be combined in the laboratory and analyzed for grain size.
9. Wipe the outside of each sample container with a clean paper towel.
10. Record initials, date, and time on the pre-labeled sample bottle.
11. Place the sample containers in individual zip-top plastic bags and seal the bags.
12. Immediately pack the samples into a chilled cooler.
13. Record the required information on the Chain-of-Custody Form (see example in Form M in Tab 7).
14. Document the sampling event, recording information in the designated field logbook.

5.5 Empirical Observations

Complete and succinct empirical observations, for both rain/runoff and the BMP, are required during each site visit related to wet season monitoring. These observations will be taken throughout the facility as they apply to the BMP (particularly at the influent locations of the IB at the I-605/SR-91 Interchange. The following empirical observations will be recorded on Form H1 in Tab 6.

Observations will be succinct but also complete. For an IB performance evaluation, the following observations will be taken at the influent location, within the IB, and within the basin:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water).
- Inlet conditions (problems affecting performance).



- Water quality appearance (visual, olfactory).
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Erosion.
- Vegetation condition.
- Infiltration surface condition (signs of potential clogging).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Form H1 in Tab 6 will be used to record empirical observations.



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TAB 8: VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

Form O2: Vertebrate Vector Control-Related Maintenance Activity
Checklist for Affected BMP Facilities by Type

TAB 9: TECHNICAL SUPPORT INFORMATION

Exhibit 9.1: Encroachment Permits

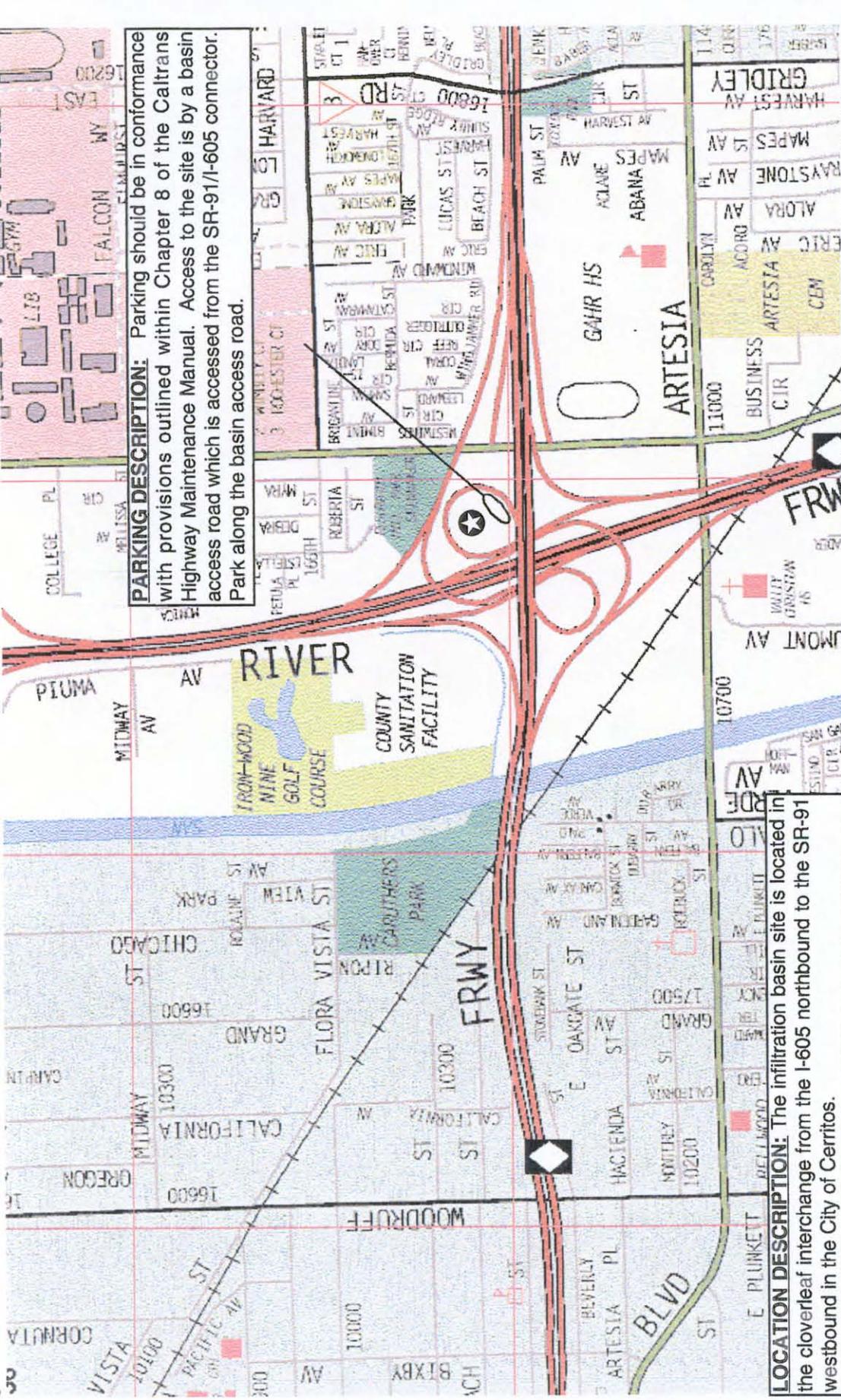


TAB 1

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Map
BMP Facility Plan**



PARKING DESCRIPTION: Parking should be in conformance with provisions outlined within Chapter 8 of the Caltrans Highway Maintenance Manual. Access to the site is by a basin access road which is accessed from the SR-91/I-605 connector. Park along the basin access road.

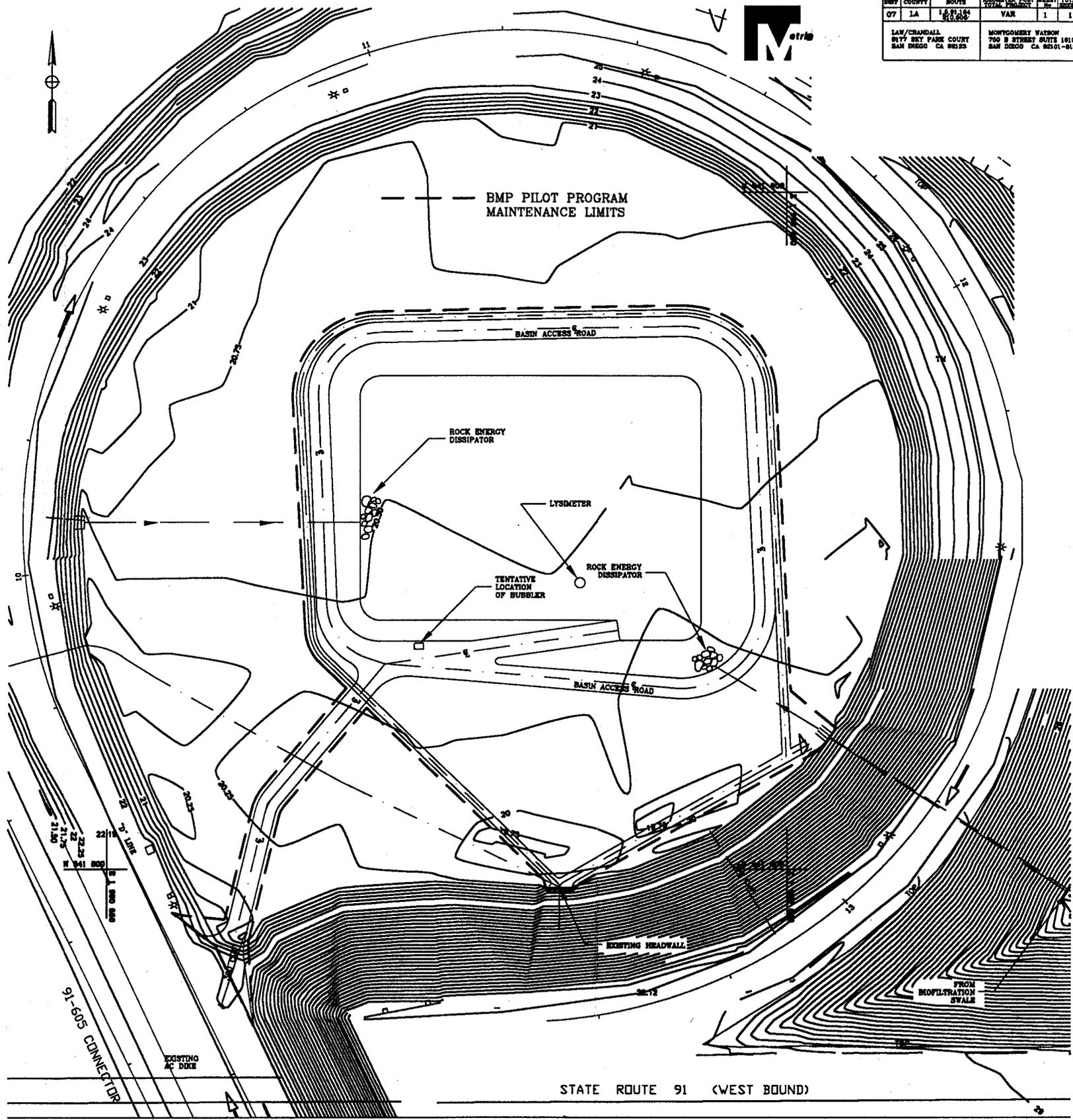
LOCATION DESCRIPTION: The infiltration basin site is located in the cloverleaf interchange from the I-605 northbound to the SR-91 westbound in the City of Cerritos.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-605/SR-91 Interchange
BMP Pilot Study Site #073101
Site Location Map

-  BMP Pilot Site
-  Not to Scale

DIST	COUNTY	ROUTE	LENGTH	POST MILES	TOT
07	LA	1-5	1.16	1	1
			TOTAL FUNDING	NO.	NO.
			VAR	1	1
LAW/CRANDALL 9177 SKY PARK COURT SAN DIEGO CA 92123			MONTGOMERY WATSON 790 B STREET SUITE 101 SAN DIEGO CA 92101-01		



STATE ROUTE 91 (WEST BOUND)

I-605/SR-91 INTERCHANGE
INFILTRATION BASIN
SCALE 1:200
FIGURE 1.2A

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN



TAB 2

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

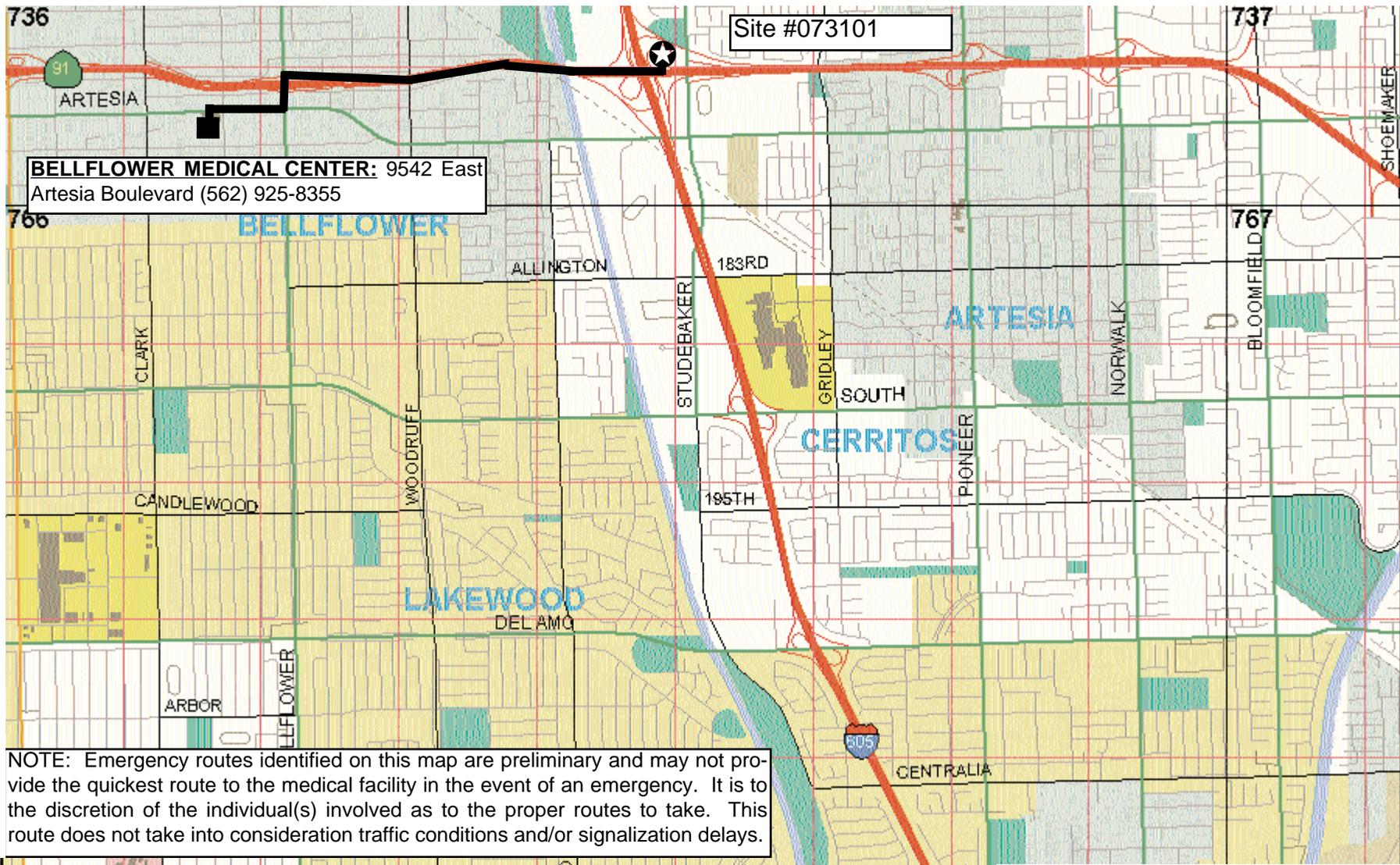
EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts List
Hospital Route Map
Project Contacts List**

Document information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Site 073101: I-605/SR-91 Interchange Infiltration Basin

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 866-9061	From landline phone
Fire Emergency Dispatch	(310) 638-6121	Call immediately in case of fire or hazardous spills
Bellflower Medical Center	(562) 925-8355	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Massoud Nassimi)	(909) 397-4325	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury



SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION

I-605/SR-91 Interchange

(Infiltration Basin)

Hospital Route Map

 BMP Pilot Site

 Not to Scale

 Potential Emergency Route

Project Contacts List

Name	Organization	Phone	Fax Mobile	Email
Bill Whittenberg	RBF and Associates	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Robert Wu	Caltrans District 7 Program Manager	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Ed Othmer	LAWCRANDALL Task Order Manager	(858) 278-3600 Pg (858) 650-2159	(858) 278-5300-f	eothmer@lawco.com
Byron Berger	LAWCRANDALL Field Manager	(714) 776-9544 - Anaheim (858) 278-3600 – San Diego Pg (858) 650-1958	(714) 776 9541 – Anaheim (858) 278-5300- San Diego	bberger@lawco.com
Bill O’Braitis	LAWCRANDALL	(323) 889-5300	(323) 721-6700-f	wobrait@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678-f	Peter_vanriper@dot.ca.gov
Donald Kaiser	American Sigma, Inc.	(716) 798-5580	(716) 798-5599-f	sigma@americasigma.com
Internet	National Weather Service	(805) 988-6610	--	www.nwsla.noaa.gov
Tim Root	WeatherWatch, Chief Meteorologist	(619) 223-8163	(619) 223-4245-f	--
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Debbie Frank	MW Laboratories	(626) 568-6449	--	--
Jon Gildersleeve	Quanterra Laboratory	(916) 373 5600	(916) 371 2857	gilderslej@quanterra.com
Pat Brueckner	Pat-Chem Laboratories	(805) 532 0012	(805) 532 0016	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	(530) 753-6400	--	deanm@lwadavis.com
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(949) 365-0117-f	Geosrcr1@ix.netcom.com
Sal Duarte	United Pumping Service, Inc.	(818) 253 5250	(626) 961-3166-f	salduarte@aol.com



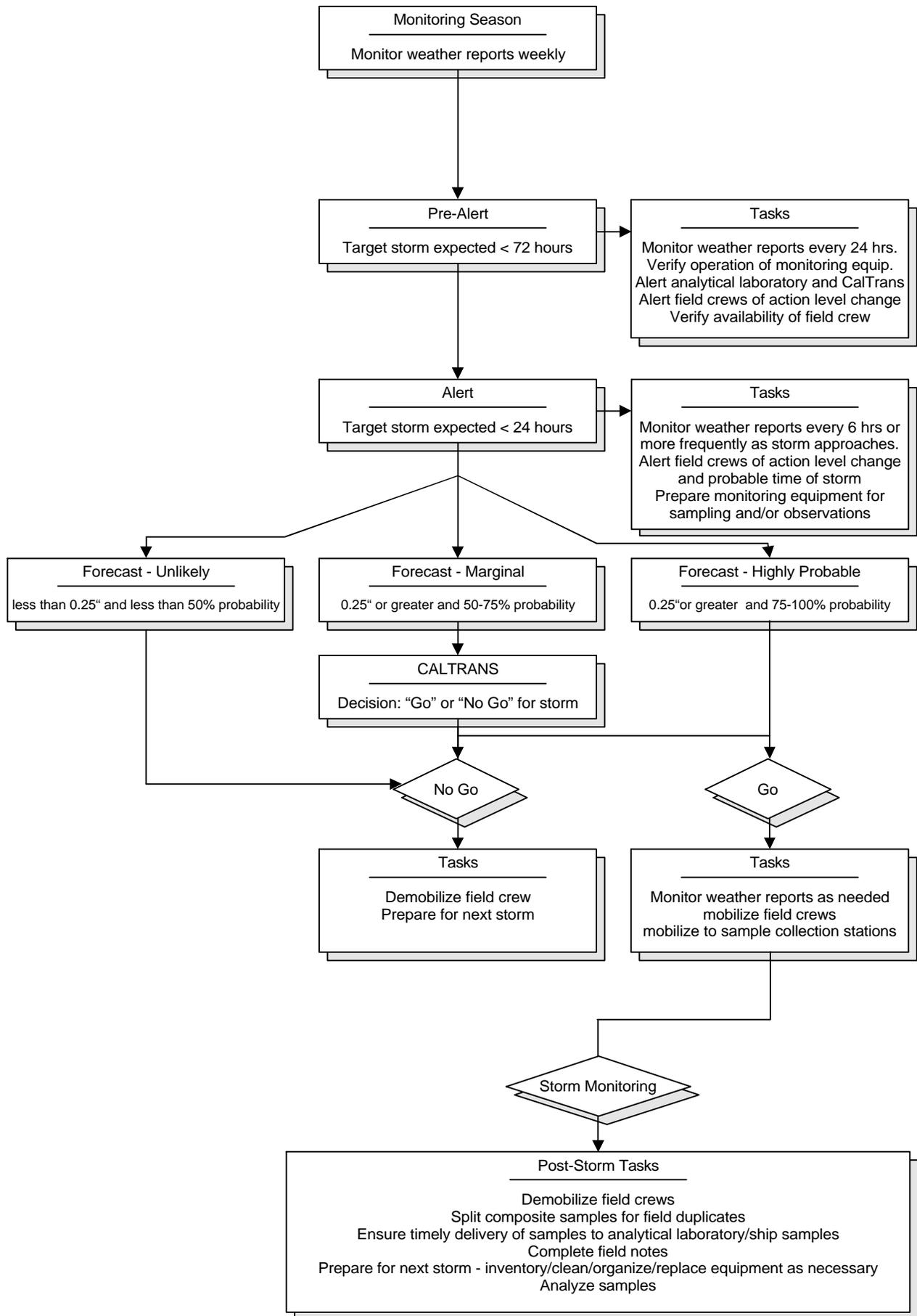
TAB 3

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring



FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Phone card	Vendor's bubbler manual

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Two flashlights
Maps for required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Powder-free nitrile gloves	Rubber bands

Storm Mobilization List

Storm kit	Logbooks
Paper towels	Tape gun with clear tape
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	Personal rain gear
Two-way radio or cellular phone	Trash bags
Any necessary safety gear	Other:

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Laboratory telephone number
for each QA/QC analysis	Backup laboratory contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans BMP Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

- Form C: BMP Site Inspection Checklist for Infiltration Basins**
- Form D: Monitoring Equipment Inspection Checklist for
Infiltration Basins**

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Infiltration Basins

GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
SEDIMENT/EROSION CONTROL:		Maintenance Required?
Sediment depth (<i>if sediment takes up 10% of the basin, is 18 inches deep, clogs the basin, destroys the vegetation, or creates standing water, maintenance is required</i>): Sediment type and location:		<input type="checkbox"/> yes <input type="checkbox"/> no
Standing water or other drainage problems? (<i>If more than 72 hours then maintenance is required.</i>) Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
If yes, what is the depth of water? What is the extent of the water? Where is the location of the water?		
Is contributing drainage area unstable?		<input type="checkbox"/> yes <input type="checkbox"/> no
Evidence of erosion?		<input type="checkbox"/> yes <input type="checkbox"/> no
Seeps?		<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:		
VEGETATION:		Maintenance Required?
Height of IB vegetation (<i>if height is more than approximately 12 inches mark yes</i>):		<input type="checkbox"/> yes <input type="checkbox"/> no
Does vegetation cover at least 70% of the IB's floor and/or slopes?		<input type="checkbox"/> yes <input type="checkbox"/> no
Is native vegetation, weeds, leaves, or other organic debris present in the IB? <input type="checkbox"/> yes <input type="checkbox"/> no		<input type="checkbox"/> yes <input type="checkbox"/> no
If yes, what type: Does native vegetation, weeds, leaves, or other organic debris interfere with the operation of the IB by (a) overgrowing the IB vegetation, (b) interfering with the percolation rate, or (c) saturation of the bottom with dead or dying vegetation or (d) in another way? <input type="checkbox"/> yes <input type="checkbox"/> no		<input type="checkbox"/> yes <input type="checkbox"/> no
If so, explain: Evidence of flattening of vegetation? If so, which species?		<input type="checkbox"/> yes <input type="checkbox"/> no

FORM C	
Caltrans BMP Retrofit Pilot Program	
BMP Site Inspection Checklist for Infiltration Basins (continued)	
Condition of landscaping? <input type="checkbox"/> Inhibited Growth <input type="checkbox"/> Excessive Growth <input type="checkbox"/> Normal Growth Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
STRUCTURAL:	Maintenance Required?
Are access roads and ramps in good condition? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable	<input type="checkbox"/> yes <input type="checkbox"/> no
Is corrosion present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable If yes, extent and location:	<input type="checkbox"/> yes <input type="checkbox"/> no
Evidence of concrete scour, spalling, or cracking of structural parts? <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Embankment or slopes slumping or cracking or is there rip rap failure? <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Fences: <input type="checkbox"/> OK <input type="checkbox"/> not OK <input type="checkbox"/> not applicable	<input type="checkbox"/> yes <input type="checkbox"/> no
Locks: <input type="checkbox"/> OK <input type="checkbox"/> not OK <input type="checkbox"/> not applicable	<input type="checkbox"/> yes <input type="checkbox"/> no
Other general maintenance concerns/comments:	
ANIMAL CONCERNS:	Maintenance Required?
Is there evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)? <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	
AESTHETIC CONCERNS:	Maintenance Required?
Debris (non-trash)? <input type="checkbox"/> yes <input type="checkbox"/> no Type, amount and location:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash? <input type="checkbox"/> yes <input type="checkbox"/> no Type, amount and location:	<input type="checkbox"/> yes <input type="checkbox"/> no
Graffiti or vandalism? <input type="checkbox"/> yes <input type="checkbox"/> no Description and location:	<input type="checkbox"/> yes <input type="checkbox"/> no
Theft? <input type="checkbox"/> yes <input type="checkbox"/> no Description and location:	<input type="checkbox"/> yes <input type="checkbox"/> no
Vehicle accident? <input type="checkbox"/> yes <input type="checkbox"/> no Description and location:	<input type="checkbox"/> yes <input type="checkbox"/> no
Other general aesthetic concerns:	
NON-STORMWATER CONCERNS:	
Non-storm water discharge to BMP <input type="checkbox"/> yes <input type="checkbox"/> no	
BMP wet from obvious non-stormwater discharge (no rain) <input type="checkbox"/> yes <input type="checkbox"/> no	
If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678	
From: _____	Contact Number: _____

FORM C

**Caltrans BMP Retrofit Pilot Program
 BMP Site Inspection Checklist for Infiltration Basins (continued)**

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

OVERALL:

Other concerns affecting operation:

Condition of facility: acceptable not acceptable
 Comments:

Dates for maintenance to be completed by:

 (Team Leader's Signature)

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM D		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Infiltration Basins		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
WATER LEVEL MEASUREMENT EQUIPMENT:	Maintenance Required?	
Is the monitoring station enclosure locked? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Is the monitoring station enclosure structurally sound? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Is the system status of the water level meter (bubbler) online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Is the water level meter (bubbler) properly programmed and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Do the desiccant cartridges in water level meter (bubbler) need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Is internal modem online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Is the bubbler tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	
Is the water level meter (bubbler) properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Infiltration Basins
(continued)

LYSIMETER EQUIPMENT:	Maintenance Required?
Is the metal cap locked? <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	
Is there any sign of corrosion on the casing? <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	
Evidence of spalling or cracking of the concrete seal? <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

INFLUENT/OVERFLOW LOCATION:	Maintenance Required?
Sediment in inlet? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

Dates for maintenance to be completed by:

(Team Leader's Signature)



TAB 5

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

**Form E: BMP Site Maintenance Activity Checklist for Infiltration
Basins**

**Form F: Monitoring Equipment Maintenance Activity Checklist for
Infiltration Basins**

Form G: Stockpile/Sediment Sampling Checklist

Exhibit 5.1: CCR Title 22 Characterization Requirements

FORM E			
Caltrans BMP Retrofit Pilot Program			
BMP Site Maintenance Activity Checklist for Infiltration Basins			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
SEDIMENT/EROSION CONTROL:			
<input type="checkbox"/> <i>Sediment removal from the IB or sediment management*</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Clean orifices and/or cracks in stormwater conveyance system</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Erosion repair (including vegetative stabilization)</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Embankment/slope repair(s) or stabilization of contributing drainage area</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
VEGETATION:			
<input type="checkbox"/> <i>IB vegetation mowing/trimming and removal of cuttings</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replant IB vegetation</i>			
Start time:	End time:	Total time:	More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			

***Maintenance activities will be conducted in a fashion that minimizes soil compaction.**

FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Infiltration Basins (continued)		
VEGETATION (cont.):		
<input type="checkbox"/> Weed control Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
<input type="checkbox"/> Leaf collection and removal of dead/rotting vegetation Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
<input type="checkbox"/> Other (describe): Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
STRUCTURAL:		
<input type="checkbox"/> Structural repairs (describe): Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
ANIMAL CONCERNS:		
<input type="checkbox"/> Burrow control Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
<input type="checkbox"/> Other (describe): Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
AESTHETIC CONCERNS:		
<input type="checkbox"/> Debris and trash removal Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:
<input type="checkbox"/> Graffiti removal or replacement of vandalized or stolen property Start time: _____ End time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:		Total time:

FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Infiltration Basins (continued)			
<input type="checkbox"/>	Painting	Start time: _____ End time: _____ Total time: _____ work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	More
<input type="checkbox"/>	Other (describe):	Start time: _____ End time: _____ Total time: _____ work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	More
_____ (Team Leader's Signature)		General Comments:	

FORM F		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Maintenance Activity Checklist for Infiltration Basins		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
LYSIMETER:		
<input type="checkbox"/> Repair/replacement of metal cap or lock		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Repair of casing		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Repair of concrete seal		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Other (describe):		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
WATER LEVEL METER:		
<input type="checkbox"/> Diagnostic test of bubbler		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Replacement of bubbler tubing		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Replacement of 12-volt marine battery		
Start time:	End time:	Total time: More
work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		

FORM F Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Infiltration Basins (continued)			
<input type="checkbox"/>	<i>Removal of kinks or obstructions from bubbler tubing</i>	Total time:	More
Start time: _____ End time: _____			
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/>	<i>Replacement of desiccant cartridge in flow meter</i>	Total time:	More
Start time: _____ End time: _____			
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/>	<i>Other maintenance/calibration of bubbler equipment (describe):</i>	Total time:	More
Start time: _____ End time: _____			
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/>	<i>Other (describe):</i>	Total time:	More
Start time: _____ End time: _____			
work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
_____ (Team Leader's Signature)	General Comments:		

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM G	
Caltrans BMP Retrofit Pilot Program Stockpile/Sediment Sampling Checklist	
GENERAL INFORMATION:	
Date:	Time In: Team Leader's Initials: Time Out:
Location:	
SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:	
Depth of sediment:	
Color:	<input type="checkbox"/> black <input type="checkbox"/> brown <input type="checkbox"/> green <input type="checkbox"/> tan <input type="checkbox"/> other
Consistency:	<input type="checkbox"/> sandy <input type="checkbox"/> silty <input type="checkbox"/> granular <input type="checkbox"/> other
Odors:	<input type="checkbox"/> petroleum <input type="checkbox"/> solvents <input type="checkbox"/> organic (rotten eggs) <input type="checkbox"/> sewage <input type="checkbox"/> none <input type="checkbox"/> other
Depth of sediment:	
SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST	
Powder Free Nitrile Gloves	
Soil Probe or equivalent for sample collection	
Labeled 8-ounce glass jars	
Plastic bags, seal bags	
Chilled cooler	
Chain-of-Custody form	
Log book for record keeping	
STOCKPILE/DRUMMED SEDIMENT:	Maintenance Required?
Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.	<input type="checkbox"/> yes <input type="checkbox"/> no
SEDIMENT COLLECTION:	
<10 cubic yards: <i>Minimum of 2 samples, one randomly from each half of the soil mass</i>	
10-20 cubic yards: <i>Minimum of 3 samples, one randomly from each third of the soil mass</i>	
20-100 cubic yards: <i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>	
100-500 cubic yards: <i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>	
Over 500 cubic yards: <i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>	<i>Contact Dept. of Environmental Health for Guidance</i>

<i>FORM G</i>	
Caltrans BMP Retrofit Pilot Program Stockpile/Sediment Sampling Checklist	
SEDIMENT SAMPLE COLLECTION	
Observation sheet completed	
Personal and equipment decon completed	
Number of aliquots taken for composite _____	
Sample IDs:	
1. _____ Analysis requested: _____	
2. _____ Analysis requested: _____	
3. _____ Analysis requested: _____	
4. _____ Analysis requested: _____	
5. _____ Analysis requested: _____	
6. _____ Analysis requested: _____	
Photos taken:	
Chain of Custody Form attached	
Record information in logbook for record keeping	
Comments:	Team Leader's Signature

Exhibit 5.1: CCR Title 22 Characterization Requirements

**Sediment Matrix (Disposal)
Analytical Parameters, Methodologies, Reporting Limits, Holding Times,
Container Volumes and Types, and Preservation**

Parameter	Method	Units	Reporting Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.
- (5) “Test Methods for Evaluating Solid Waste, Physical /Chemical Methods”. SW-846, Update III.(SW-846)

TAB 6

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H1: Empirical Observations Field Data Log Sheet for Storm
Events for Infiltration Basins**

**Form H2: Sediment and Soil Sampling Field Data Log Sheet (for
BMP Performance Evaluation)**

Form I: Field Data Log Sheet for Infiltration Basins

Form J: User-Entered Program Parameters

Form K: Station Phone Log

FORM H1
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Infiltration Basins

GENERAL INFORMATION:

Date:	Time:
Team leader:	Stormwater Consultant:
Other personnel:	Location of facility:

METEOROLOGICAL CHARACTERISTICS:

Time since end of previous storm event visit: > 72 hours 48-72 hours 24-48 hours < 24 hours

Present rainfall: None Mist Drizzle Sprinkle Light, Steady
 Moderate Heavy

Time present rain event started: _____

Wind speed: 0-5 mph (light) 5-10 mph (moderate) 10-15 mph (brisk) >15 mph (strong)

Cloud cover: ____%

Distribution of Rainfall: Uniform Localized cells Scattered showers

Meteorological characteristics comments:

HYDROLOGIC AND HYDRAULIC CHARACTERISTICS:

Flow conditions (*check all that apply*):

Runoff entering facility
 Facility discharging
 Flow bypassing facility

Standing water conditions (*record measurements as appropriate and check all that apply*):

Water standing over entire basin. Depth: _____

Water standing in one isolated pool: Describe Location: _____
 Depth: _____

Water standing in multiple pools: Describe Locations: _____

 Depths: _____

If during a storm event:
 Record maximum depth of pooled water. Depth: _____
 Time to drain from the first entrance of runoff? _____
 Time to drain from the maximum depth? _____

Comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H1

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Infiltration Basins (continued)**

INLET CONDITIONS:

Describe any erosion or resuspension of settled solids being caused by the flow in the influent channel and/or the basin: _____

Describe any obstructions or restrictions interfering with inflow/influent: _____

WATER QUALITY APPEARANCE:

Check all that apply and describe under comments.

Odor:

? Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide
None

Floating materials:

Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

Sheen Heavy floating concentration Emulsion Deposit None

Color:

Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments: _____

SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Over entire basin: _____

In one spot: _____

In multiple spots: _____

In outflow/effluent channel: _____

FORM H1
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Infiltration Basins (continued)

SOLIDS DEPOSITION AND RESUSPENSION (cont.):

Solids resuspension evident (*check all that apply*):

In inflow/influent channel Near inlet Near overflow In outflow/effluent channel

Other (describe): _____

Solids deposition and resuspension comments:

EROSION:

For the following locations, record erosion locations, area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Near inlet: _____

Basin bed: _____

Basin side slopes: _____

Near overflow structure: _____

In outflow/effluent channel: _____

Comments:

VEGETATION CONDITION:

Basin bed vegetation cover:

Complete Few small bare spots Few large bare spots Many small bare spots

Many large bare spots Large areas bare All or nearly bare

Basin side slopes vegetation cover:

Complete Few small bare spots Few large bare spots Many small bare spots

Many large bare spots Large areas bare All or nearly bare

Basin bed vegetation type:

All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses

All wetland plants

Extent of woody shrubs or trees: _____

FORM H1
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Infiltration Basins (continued)

VEGETATION CONDITION (cont.):

Basin side slopes vegetation type:

- All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses
 All wetland plants

Extent of woody shrubs or trees: _____

Vegetation condition comments:

INFILTRATION SURFACE CONDITION:

Record any evidence of soil compaction (*check all that apply*):

- Foot traffic Bicycle traffic Light motorized vehicle traffic Heavy motorized vehicle traffic

Describe any surface crust that is evident (location, area covered, characteristics):

Describe any other evidence that clogging is occurring or that the infiltration rate is otherwise being reduced based on hydrological and hydraulic, solids deposition, erosion, and vegetation observations:

OVERFLOW CONDITIONS:

Describe any obstructions or restrictions interfering with outflow/effluent:

VECTORS:

Presence of vectors: Yes No

If yes, what type: Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

- Inlet structure damage Vandalism

Comments:

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet for Infiltration Basins

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:		
Station Identifier:		
Storm Event Visit, Vadose Zone Sampling, or Maintenance Visit (circle one)		
<i>Use Facility Inspection Logs and Empirical Observation Field Data Sheets to record observations. These logs <u>must</u> be filled out during station visits.</i>		

BASIN LEVEL AND RAINFALL EQUIPMENT DATA LOGGER INFORMATION
SYSTEM STATUS FLAGS (*6-AD; 1=high, 0=low) PROGRAM SIGNATURE (*6-100)

Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____ Arr:
 Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____ Dep:

DATA LOGGER INFORMATION (*6)

Stage (ft) _____	Station ID _____	Total Rain (in) _____
Staff Gauge _____	Battery Voltage _____	
Basin Level (ft) _____	Level Meter Batt. _____	
15 min. Change in Basin Level _____	Cell Equip. Batt _____	
Previous 1-Hour Basin _____		
Max. Stage (ft) _____		

WATER LEVEL EQUIPMENT REPAIR NEEDS:

ACTION TAKEN:

Storage Module Data Dump: Start ____ End ____

 (Team Leader's Signature)

FORM J
User-Entered Program Parameters*

Facility Type: **Infiltration Basin**

Station Name:

Date:					
Time:					
01 Station ID					
02 Stage Offset (feet)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions



TAB 7

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Example Chain-of-Custody Form
Exhibit 7.1: Chemical Analyses Lists**

FORM M: Example Chain-of-Custody Form

Laboratory: _____ Lab # _____ Date Received _____	From: _____
---	-------------

Project: _____ P.O.#: _____	Project #: _____ Required Completion Date: _____
--------------------------------	---

Sample ID #	Site ID #	Lab ID #	Matrix/Analysis	Containers	Pres.	Sample Date/Time	Condition Upon Receipt

Data Reports WILL include the following: Sample/Site ID, Analytical Method, Reporting Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.

Special Instructions/Comments:

Relinquished By: _____	Date/Time _____	Transporter _____	Received By: _____	Date/Time _____
Relinquished By: _____	Date/Time _____	Transporter _____	Received By: _____	Date/Time _____
Relinquished By: _____	Date/Time _____	Transporter _____	Received By: _____	Date/Time _____

Exhibit 7.1a: Chemical Analyses for Vadose Zone Pore Liquid

Groundwater Matrix (Vadose Zone)

Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Preferred Volume and Container Type ⁽¹⁾	Preservation
<i>Dissolved Metals</i> ⁽²⁾								
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	1-100 mL plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	1-100 mL plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	1-100 mL plastic	4°C and HNO ₃ to pH<2 and filter

1. Analytes with the same preservative can be combined into a single container, if the same laboratory is performing the analyses.
2. Dissolved metals will be filtered in the laboratory prior to acidification.

Exhibit 7.1b: Chemical Analyses List for Soil/Sediment Samples

**Soil and Sediment Matrix for BMP Performance Evaluation
Analytical Parameters, Methodologies, Reporting Limits, Holding Times,
Container Volumes and Types, and Preservation**

Parameter	Method	Units	Reporting Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	418.1 (IR)/1664HEM	mg/kg	10	28 days	4°C	8-oz glass jar
Total Metals: - Copper - Lead - Zinc	6020	mg/kg	2.5 0.3 2.0	180 days	4°C	8-oz glass jar
Grain Size Distribution: (Method of Tests for Sieve Analysis of Fine and Course Aggregates)	Caltrans Test 202	---	---	---	---	2 8-oz glass jars (500 ± 25 grams)

1. Each sample will be collected in four 8-oz glass jars



TAB 8

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related Maintenance
Activity Checklist for Affected BMP Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform vector monitoring.



TAB 9

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

Exhibit 9.1: Encroachment Permits

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE, AND
MONITORING PLAN
VOLUME II

BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
SAND FILTERS



DISTRICT 7, LOS ANGELES

September 1999



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-----	------------------------------------



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APPENDIX I-C: SAND FILTERS

APPENDIX II: HEALTH AND SAFETY PLAN

APPENDIX III: QUALITY ASSURANCE/QUALITY CONTROL PLAN

APPENDIX IV: VECTOR CONTROL PLAN

APPENDIX V: MAINTENANCE INDICATOR DOCUMENT



1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel appropriate field evaluation and documentation for the Caltrans Retrofit Pilot Program District 7 sand filters (SFs). Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-C of this guidance document for supporting information on SF technology and characteristics.

1.1 Data to be Collected

The following data will be collected to assess the performance and maintenance aspects of an SF:

- Water quality and quantity data of runoff into and discharge from the SF from flow-composite and first-flush (as soon as possible after the start of runoff) grab samples for at least eight storm events during two wet seasons.
- Rainfall data recorded as a function of time, from rainfall events during the study period.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring and abatement data.
- Records of vector control measures taken.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to be Performed

Field activities that will be performed at the SF facilities include:

- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Monitoring Observations.
- Observation of SF operation.
- Facility Maintenance Inspections.
- Facility Maintenance.
- Vector and Nuisance Animal Control Inspections.
- Stormwater Monitoring.

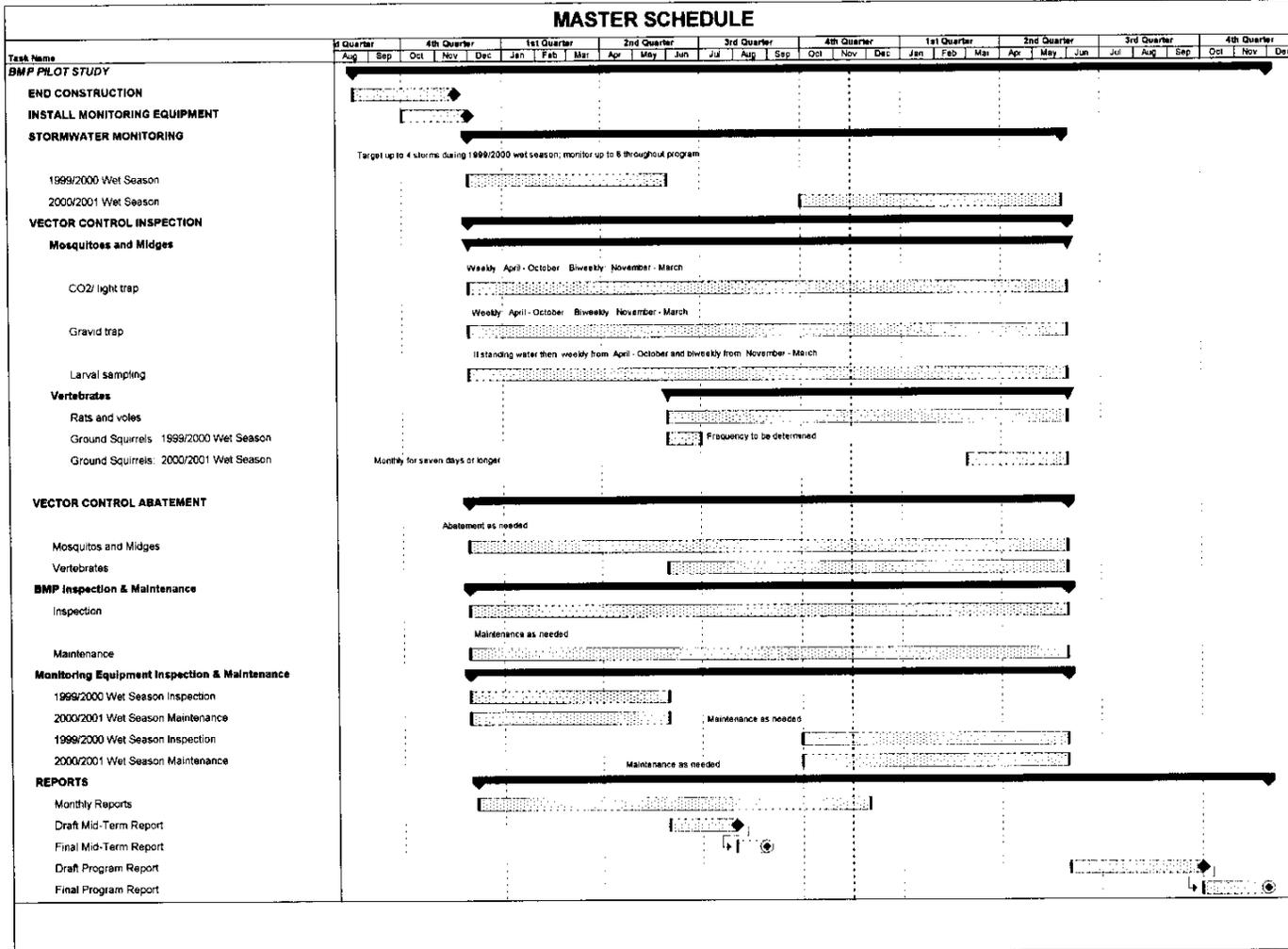


Vector management may also be necessary at SF facilities, but may be contingent on facility housekeeping and other environmental influences. Please see Appendix IV, if vector management is necessary.

1.3 Master Schedule

The schedule on the following page shows the time-line for each phase of the SF OMM program.

MASTER SCHEDULE





2.0 SITE INFORMATION

Access requirements for each site are summarized in Table 2.1, in the encroachment permit found in Tab 9, and in the Site Location Maps in Tab 1. *Encroachment permits must be on hand* for each site visit, and *notification requirements found in these permits must be followed*.

Check in with appropriate Caltrans personnel before conducting any site fieldwork.

Table 2.1
Caltrans District 7 Sand Filters Site Summary

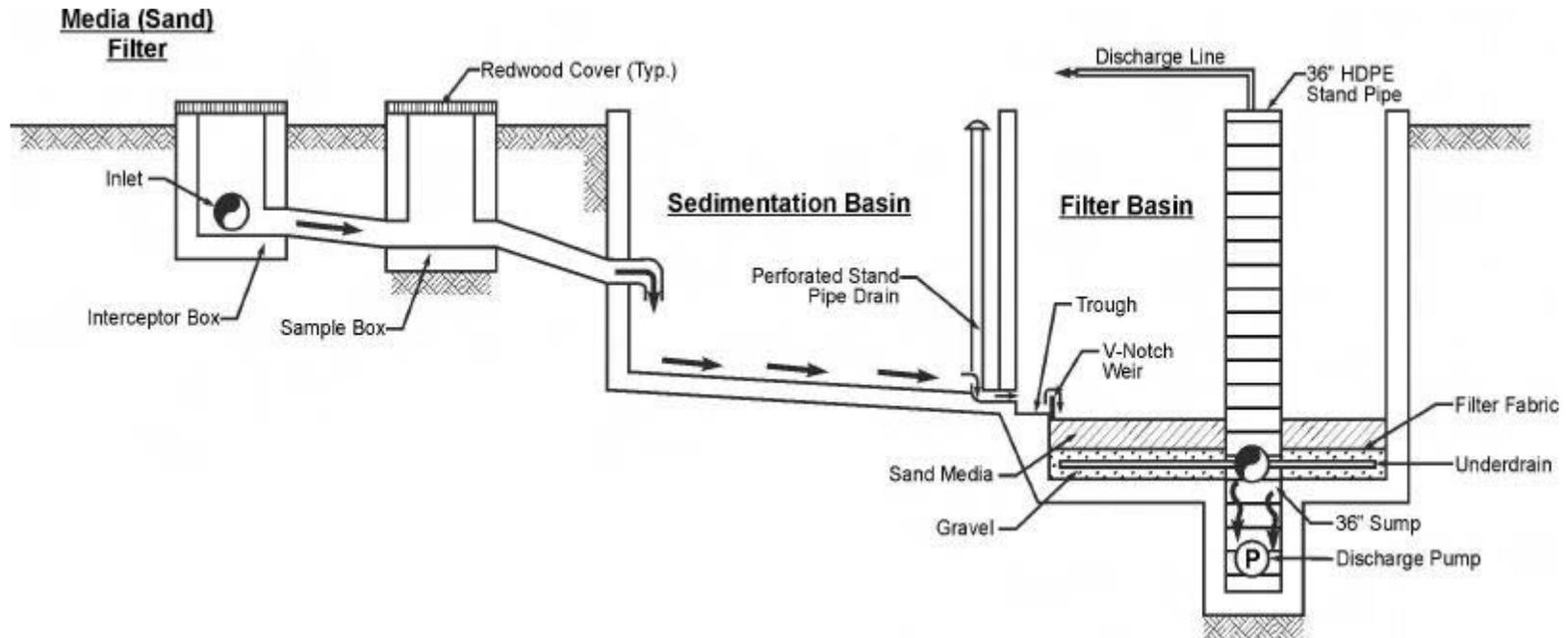
Site No.	Site Name	Site Location	Access and Parking
074103	Paxton Park and Ride	City of Los Angeles	Near the I-210/SR-118 interchange. Park in designated parking stalls.
074202	Eastern Regional Maintenance Yard	1940 S. Workman Mill Road, City of Whittier	Off the 60 freeway. Park in designated parking stalls.
074203	Foothill Maintenance Station	850 Huntington Drive	Off the I-210 freeway/Mountain Avenue off-ramp. Park in designated parking stalls.
074204	Termination Park and Ride	City of Norwalk	Eastern Terminus of I-105 at the I-105/I-605 Interchange. Park in designated parking stalls.

2.1 Sand Filters

Refer to the accompanying Appendix for a general description of the SF. The sections below provide site-specific information for each SF site in District 7.

Refer to Tab 9 for a summary of the hydraulic characteristics for these BMPs. Figure 2.1 shows a schematic of an SF.

Figure 2.1
Schematic of a Sand Filter





3.0 FIELD PREPARATION

Use Table 3.1 to find appropriate forms and information required for aspects of the field OMM program, including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is to review and assemble each item in Table 3.1 pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks: facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
For Sand Filters

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Maps	NA	Prior to site visits.
	BMP Layout Diagrams	NA	Prior to site visits.
	Sampling Point Diagrams	NA	Prior to site visits and sampling.
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist	Form F	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and basin.
	Field Data Log Sheet	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet for Influent/Control Sampling Point	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet for Effluent Sampling Point	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses List	Ex. 7.1	Reference for each sampling event and lab analysis request submittal.
8	Vector Control Checklists	Forms O1-O3	Fill out for each site visit when vectors are observed.
9	Runoff Coefficient Listing	Ex. 9.1	Reference: for calculations.
	"Volume-to-Sample" Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.

NA=Not Applicable

4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

At a minimum, each SF will be inspected:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.5 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Form C (Tab 4).*

1. Contact appropriate Caltrans personnel in accordance with Encroachment Permit requirements (see Tab 9, Exhibit 9.3).
2. Completely walk around the site while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism).
 - Vegetation management (grass, shrubs, trees).
 - Erosion and slope stability.
 - BMP performance (fouling, blockage, damage).
 - Equipment repair/maintenance (BMP components, autosampler).
 - Sediment accumulation (within BMP, at influent confluence).
 - Storage of accumulated sediment or other wastes.
 - Vector control.
4. Log field activities and their corresponding time accurately.
5. Call the appropriate contacts (Project Contacts List, Tab 2) if immediate corrective or preventative maintenance is needed.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.
- General Facility Maintenance.
- Vector Control.
- Vandalism.
- Standing Water.

Frequency of individual maintenance activities at the SF facilities will be conducted in accordance with Appendix V, the Maintenance Indicator Document. Maintenance activities performed will be documented using the Forms E and F in Tab 5. See Section 2.0 of Appendix I-C for full details on maintenance activities.

4.3 Vegetation Management

SF installations will not require the maintenance and control of vegetation. However, if a site accommodates vegetation, use the maintenance checklists (Form C, Tab 4 and Form E, Tab 5) whenever vegetation management is applicable. See Sections 2.0 and 4.0 of Appendix I-C for specific details on controlling vegetation.

4.4 Disposal of Trash and Debris

Trash and debris from the SF is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the sand filters will be responsible for their removal and disposal of waste material by independent contractors. Disposal of trash and debris will be contracted out in accordance with local, county, state, and federal waste control programs. Table 2.2 of Appendix I-C shows a few possible disposal services for waste material.

4.5 Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs is critical. When sediment removal is required, chemical characterization must be conducted to determine appropriate land disposal requirements (LDRs). Such chemical characterization testing will be conducted from stockpiles in such a fashion as to minimize disturbance and exposure potentials.

If sediment stockpiles are created, their management must, at a minimum, include the following:

- Sandbags berms are created (8-inch minimum) surrounding the stockpile area.
- At least 0.5-mil plastic is used to contain any dewater liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored at times.

When sampling sediments, document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

Random samples will be selected from locations on a three-dimensional grid. If the presence of materials such as boulders, debris, etc. hinder this process, the sample will be

collected as close as possible to the randomly selected point without altering the essence of the random selection process. Sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the sediment chamber.
3. Collect the sample using a submersible sediment sampler or equivalent. Ensure that the sample is collected near the center of the sediment layer and at the location that was randomly selected. Great care must be taken not to make contact with the metal casing.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.6 Vector and Nuisance Animal Control

Vector control and **management** will be performed in accordance with Appendix IV by subcontracted Vector Control Districts.

5.0 STORM MONITORING

Careful preparation and planning is critically important. Representative samples *must* be obtained for each storm event. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that onsite rainfall meets the sampling criteria:

1. A minimum of 48 hours of dry weather preceded the storm (72 hours is preferable).
2. Deployment Criteria defined in Exhibit 3.1.

Check appropriate sources for local weather conditions before deploying field staff. Use Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for determining when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-C details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, detection limits, and holding times for stormwater sampling. Appendix III details the quality assurance and quality control requirements of this program.

Checklists, log forms, and information necessary to conduct a successful monitoring program at SF facilities are listed in Table 3.1 (Section 3.0), and shall be completed.

Sampling equipment shall be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting storm water sampling at BMP sites:

- Pre-Storm preparation.
- Storm event sampling (grab and composite sample collection).
- Post-Storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1) for when to mobilize.
2. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).
3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.
4. Assemble decontaminated sample containers for influent and effluent autosamplers.

Cleaning Procedures for Composite Bottles

Bottles will be:

- a. Rinsed three times with warm tap water.
- b. Scrubbed with a clean plastic brush.
- c. Soaked in a 2% detergent (e.g., Contrad®) solution for at least 48-hours.
- d. Rinsed three times with tap water.
- e. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
- f. Rinsed three times with hexane while rotating the bottle, and then air-dried.
- g. Rinsed six times with Milli-Q water.
- h. Soaked in 2N nitric acid for a minimum of 24-hours.
- i. Rinsed six times with Milli-Q water.

Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

- a. Teflon hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
 - b. Rinsed three times with warm tap water.
 - c. Rinsed three times with Milli-Q or equivalent water.
 - d. Rinsed three times with 2N nitric acid.
 - e. Soaked at least 24-hours in 2N nitric acid.
 - f. Rinsed three times with Milli-Q water.
5. Inspect monitoring equipment for proper operation (use Form D, Tab 4). At each sampling location do the following:
- a. Inspect the pump tubing and replace if necessary.
 - b. Inspect intake tubing condition and connections.
 - c. Inspect desiccant cartridges in sampler and flow meter.
 - d. Check electrical connections.
 - e. Check battery voltages.
 - f. Make sure intakes, flow structures, and sensors are clear of debris (this is only possible if confined space requirements are met).
 - g. Make sure the correct user-entered program parameters are entered (use Forms I, J and K in Tab 6)
 - h. Set system status flags.
 - i. Verify automatic sampler set up by confirming that the correct bottle size, hose diameter, hose material, hose length, head height, aliquot volume, number of samples to fill the bottle, and number of pulses to sample has been entered correctly.

- j. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger.
6. Verify that refrigerated samplers are chilling bottles.
7. From the office set "Volume-to-Sample" numbers (Exhibit 9.2) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K, Tab 6).
8. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected twice per year.

5.1.2 Storm Event and Sample Collection

1. Once on site, fill out Empirical Observation Field Data Log and a Field Data Log Sheet (Forms H and I, Tab 6) to document storm characteristics.
2. Locate influent/control autosampler and inspect for proper operation.
3. Locate effluent autosampler and inspect for proper operation.
4. Take grab samples as needed.
5. Change composite bottles and re-initiate equipment as needed.

5.1.3 Post-Storm Sample Analyses

After a storm event has ended, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

1. Reset the storm monitoring program to prepare for another storm event.
2. Replace the sample bottle(s) in the autosampler and the reset the sampler.
3. Physically inspect the station to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if confined space requirements are met).
4. Check battery voltages; replace batteries that are low.
5. Retrieve data via modem from the remote monitoring computer.

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

Chain-of-Custody Forms

When the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody forms (Form M, Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.2 Empirical Observations

Complete and succinct empirical observations are required during site visits (rain/runoff and BMP characteristics). Observations shall be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). Please refer to Volume II, Appendix I-C, Section 5.8 for a complete discussion of empirical observation at SFs. Particularly note the following:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory).
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Treatment medium condition.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Refer to Form H in Tab 6 for recording empirical observation information.



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TAB 1

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans
BMP Maintenance Perimeter Maps**

PARKING DESCRIPTION: Park adjacent to media filter fence in southwest area of maintenance station, so as not to create any traffic obstruction. Prior to conducting work at the maintenance station discuss potential safety concerns with the maintenance station supervisors.

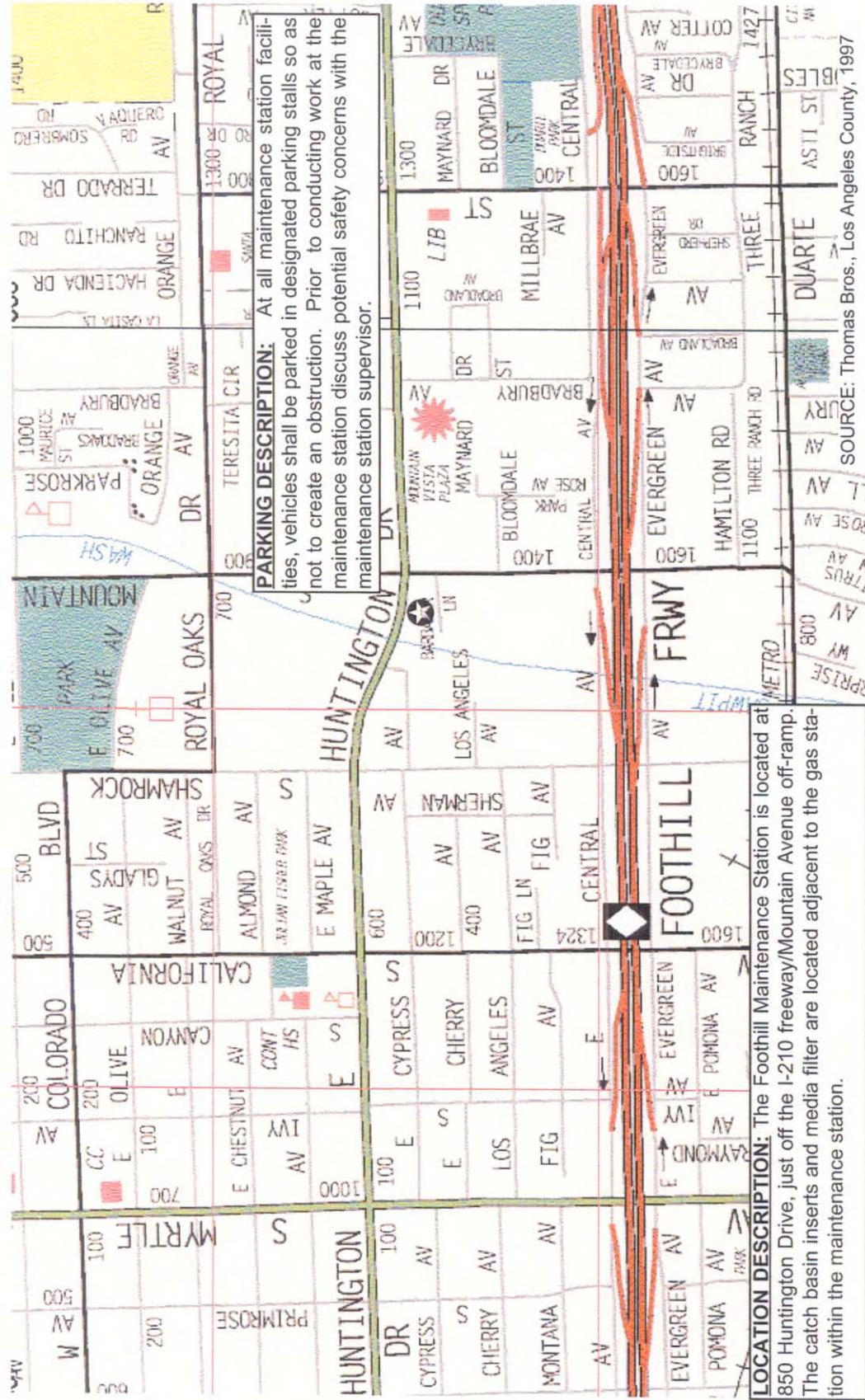
LOCATION DESCRIPTION: A media filter is located in the Eastern Regional Maintenance Station at 1940 South Workman Mill Road, just off the 60 freeway in the City of Whittier. The media filter is located on the southwest portion of the station. From east-bound 60 Freeway, exit Crossroads Parkway, turn left over freeway, then left on Crossroads Pkwy. Drive northwest, turn right on Workman Mill, and turn right in first driveway.

SOURCE: Thomas Bros., Los Angeles, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Eastern Regional Maintenance Station
BMP Pilot Study Site #074202
Site Location Map

 BMP Pilot Site

 Not to Scale

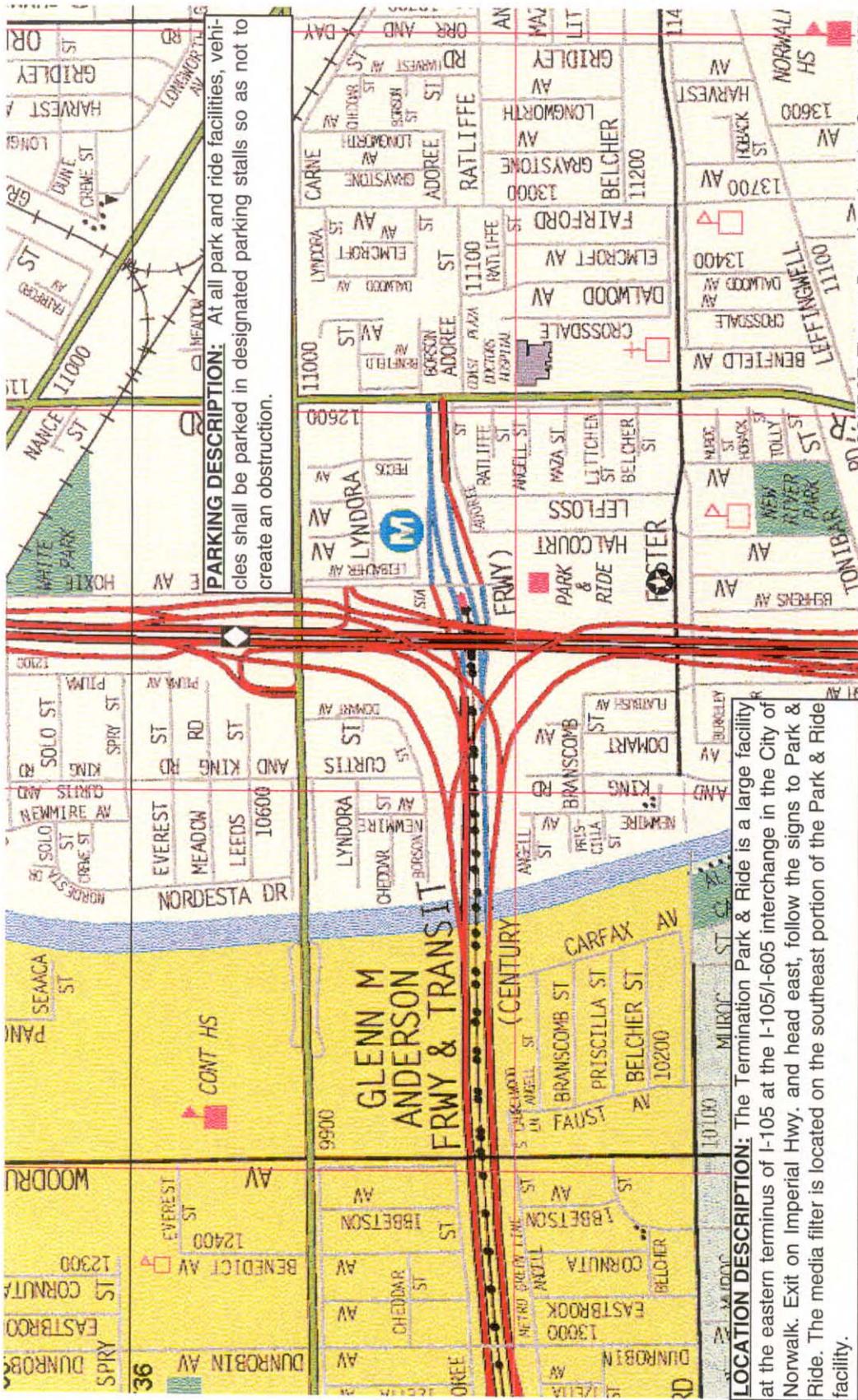


CALIFORNIA DEPARTMENT OF TRANSPORTATION
Foothill Maintenance Station
BMP Pilot Study Site #074203
Site Location Map

BMP Pilot Site

Not to Scale





PARKING DESCRIPTION: At all park and ride facilities, vehicles shall be parked in designated parking stalls so as not to create an obstruction.

LOCATION DESCRIPTION: The Termination Park & Ride is a large facility at the eastern terminus of I-105 at the I-105/I-605 interchange in the City of Norwalk. Exit on Imperial Hwy. and head east, follow the signs to Park & Ride. The media filter is located on the southeast portion of the Park & Ride facility.

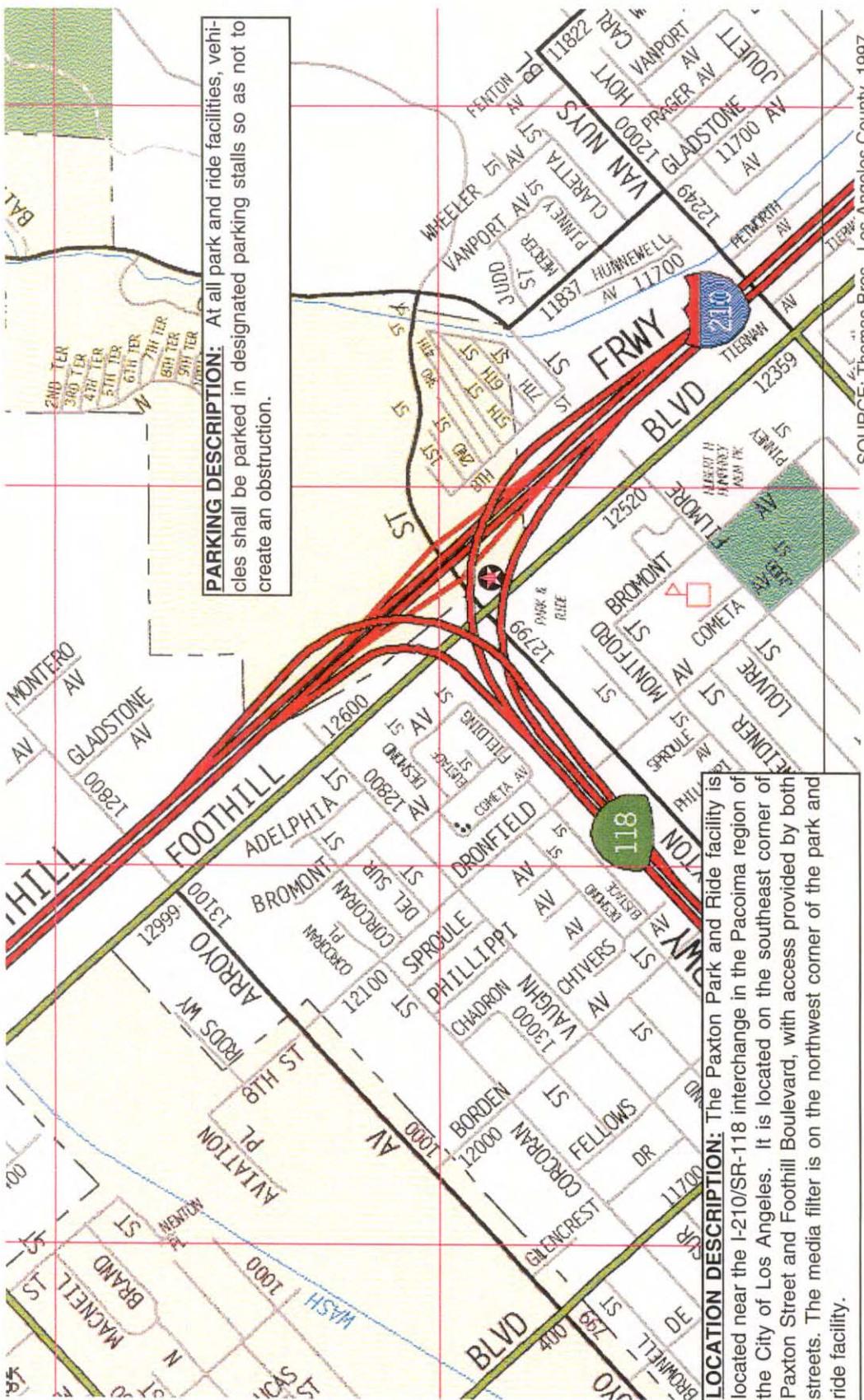
SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Termination Park & Ride BMP Pilot Study Site #074204 Site Location Map

 BMP Pilot Site

 Not to Scale



PARKING DESCRIPTION: At all park and ride facilities, vehicles shall be parked in designated parking stalls so as not to create an obstruction.

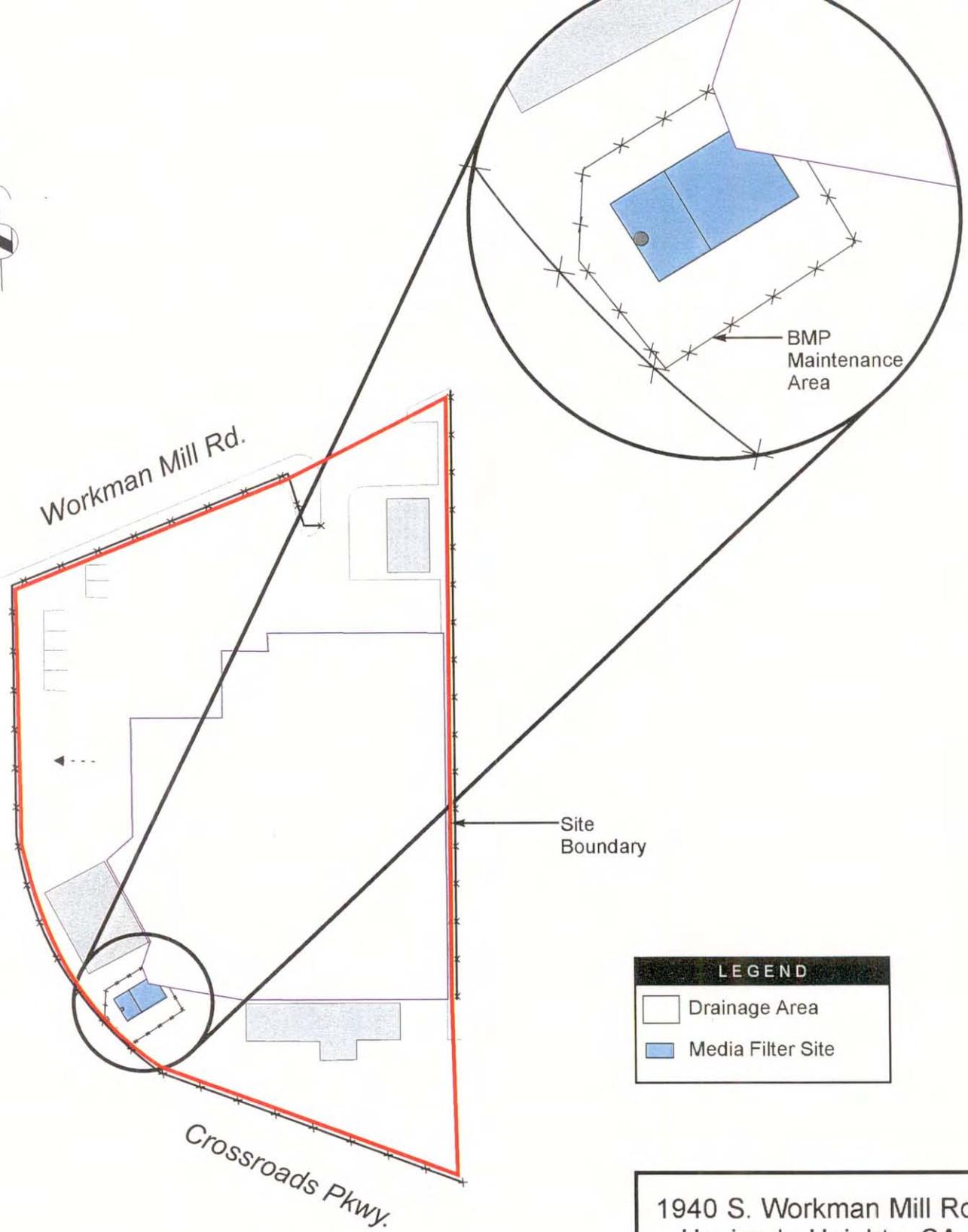
LOCATION DESCRIPTION: The Paxton Park and Ride facility is located near the I-210/SR-118 interchange in the Pacoima region of the City of Los Angeles. It is located on the southeast corner of Paxton Street and Foothill Boulevard, with access provided by both streets. The media filter is on the northwest corner of the park and ride facility.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Paxton Park & Ride
BMP Pilot Study Site #074205
Site Location Map

 BMP Pilot Site

 Not to Scale



LEGEND	
	Drainage Area
	Media Filter Site

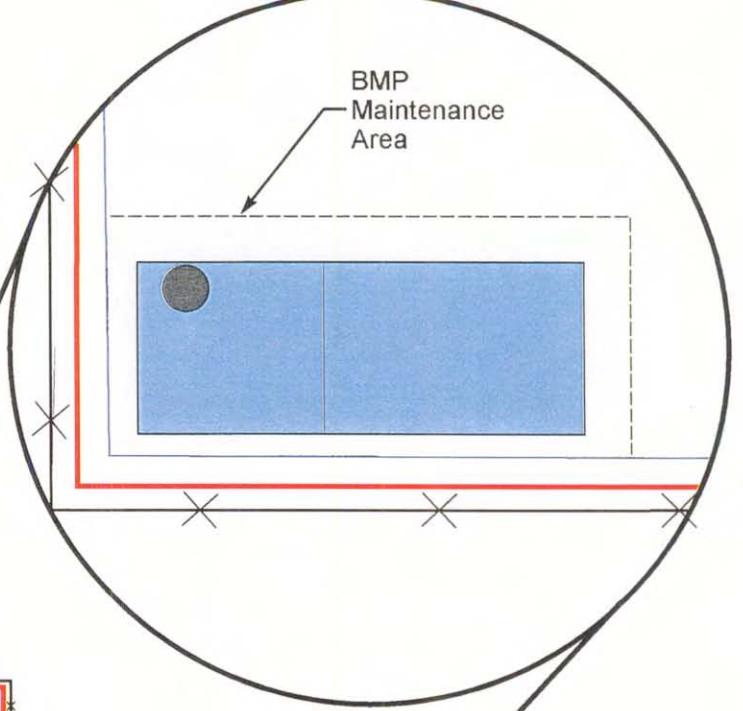
1940 S. Workman Mill Rd.
Hacienda Heights, CA

BROWN AND
CALDWELL

Site 74202 Eastern Regional Maintenance Station
Yard Drainage Area



Huntington Dr.



BMP
Maintenance
Area

Mountain Ave.

Site Boundary

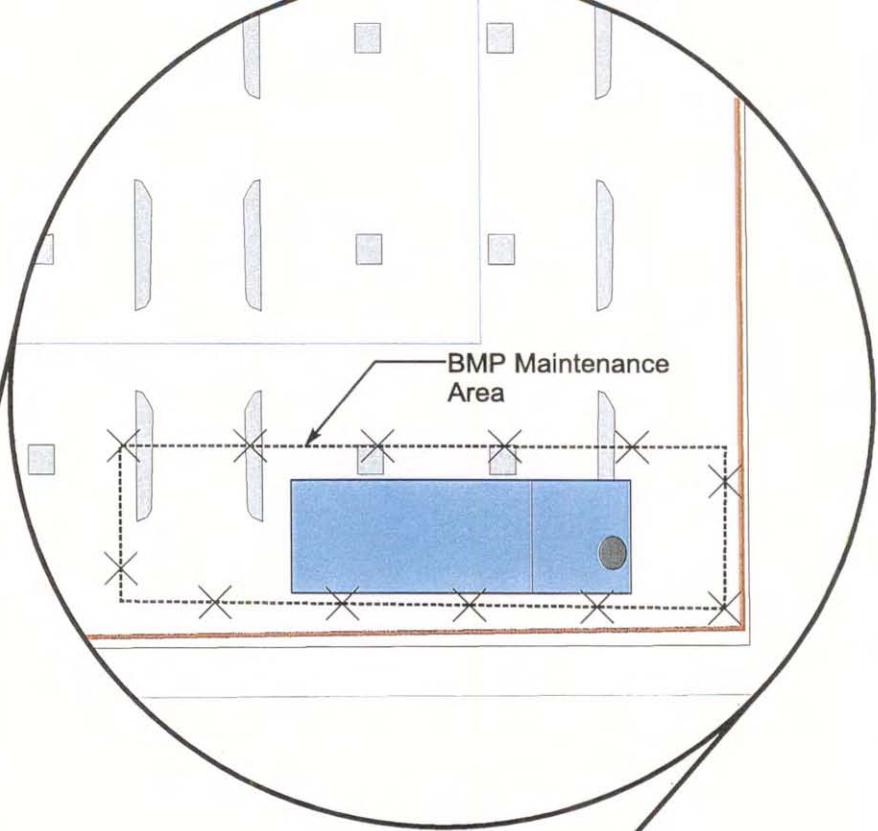
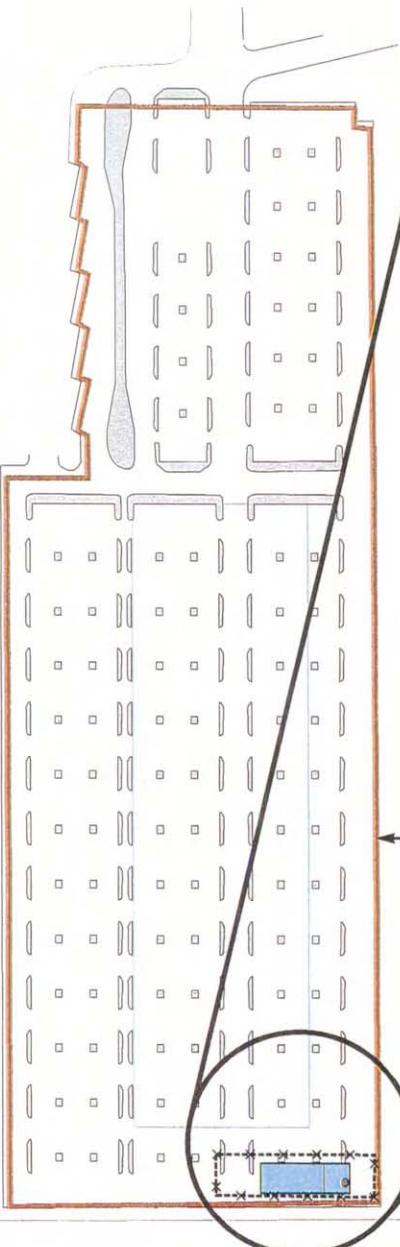
LEGEND

-  Drainage Area
-  Media Filter Site

850 E. Huntington Dr.
Monrovia, CA

**BROWN AND
CALDWELL**

Site 74203 Foothill Maintenance Station
Drainage Area



Site Boundary

LEGEND

- Drainage Area
- Media Filter Site

105/605 Interchange
Norwalk, CA

BROWN AND
CALDWELL

Site 74204 Termination Park & Ride
Drainage Area



TAB 2

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**

**Document information related to any accident or incident that resulted in injury or damage
and report it to Mark Williams at Brown and Caldwell at (619) 528-9090.**

***Emergency Contacts
Site 074203: Foothill Maintenance Station***

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Local Police Department	911	From landline phone
Local Police Emergency Dispatch	(626) 359-1152	In case of emergency
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Santa Teresita	(626) 359-3243	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Pomona Area)	(909) 397-4325	Notify for any accident or injury
Maintenance Supervisor (John Garner)	(626) 357-6218	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

***Emergency Contacts
Site 074202: East Regional Maintenance Station***

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(626) 580-2100	In case of emergency
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Greater El Monte Community Hospital	(626) 579-7777	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Andy Bott)	(626) 301-0742	Notify for any accident or injury
Regional Manager (Roy Pool)	(562) 692-0823	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts
Site 074204: Termination Park and Ride

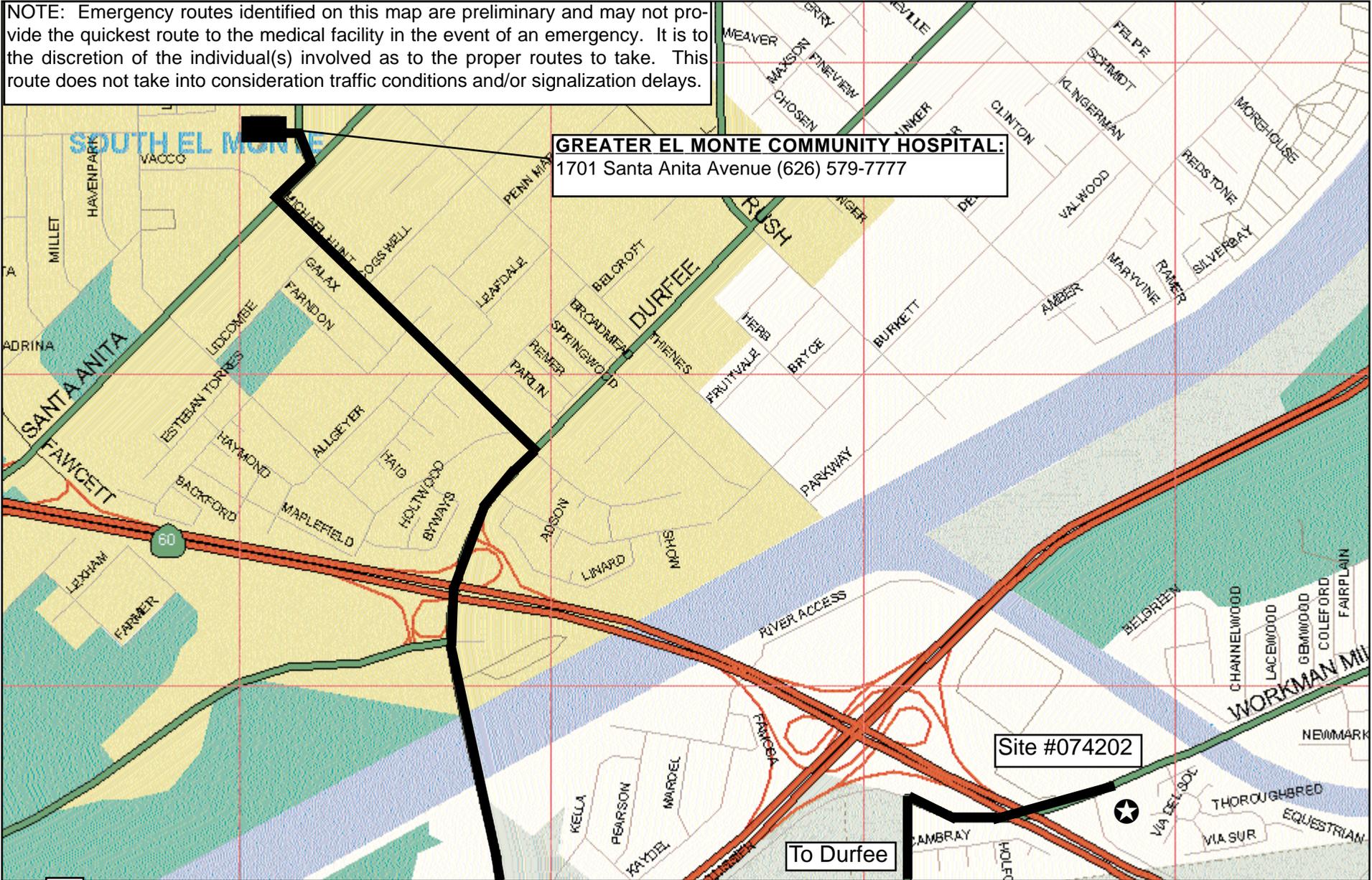
Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch (Sheriff Dept.)	(562) 863-8711	In case of emergency
Call immediately in case of fire or hazardous spills	911	In case emergency
Coast Plaza Doctor's Hospital	(310) 863-3751	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Andy Bott) 24-hour emergency	(626) 301-0742 (213) 897-0383	Notify for any accident or injury
Regional Manager (Roy Pool)	(562) 692-0823	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts
Site 074103: Paxton Park and Ride

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(818) 898-1267	In case emergency
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Pacifica Hospital of the Valley	(818) 767-3310	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Al Salinas) 24-hour emergency	(805) 259-0172 (213) 897-0383	Notify for any accident or injury
Area Supervisor (Chuck Walsh)	(562) 692-0823	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018	Notify for any accident or injury

NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

GREATER EL MONTE COMMUNITY HOSPITAL:
1701 Santa Anita Avenue (626) 579-7777



Site #074202

To Durfee

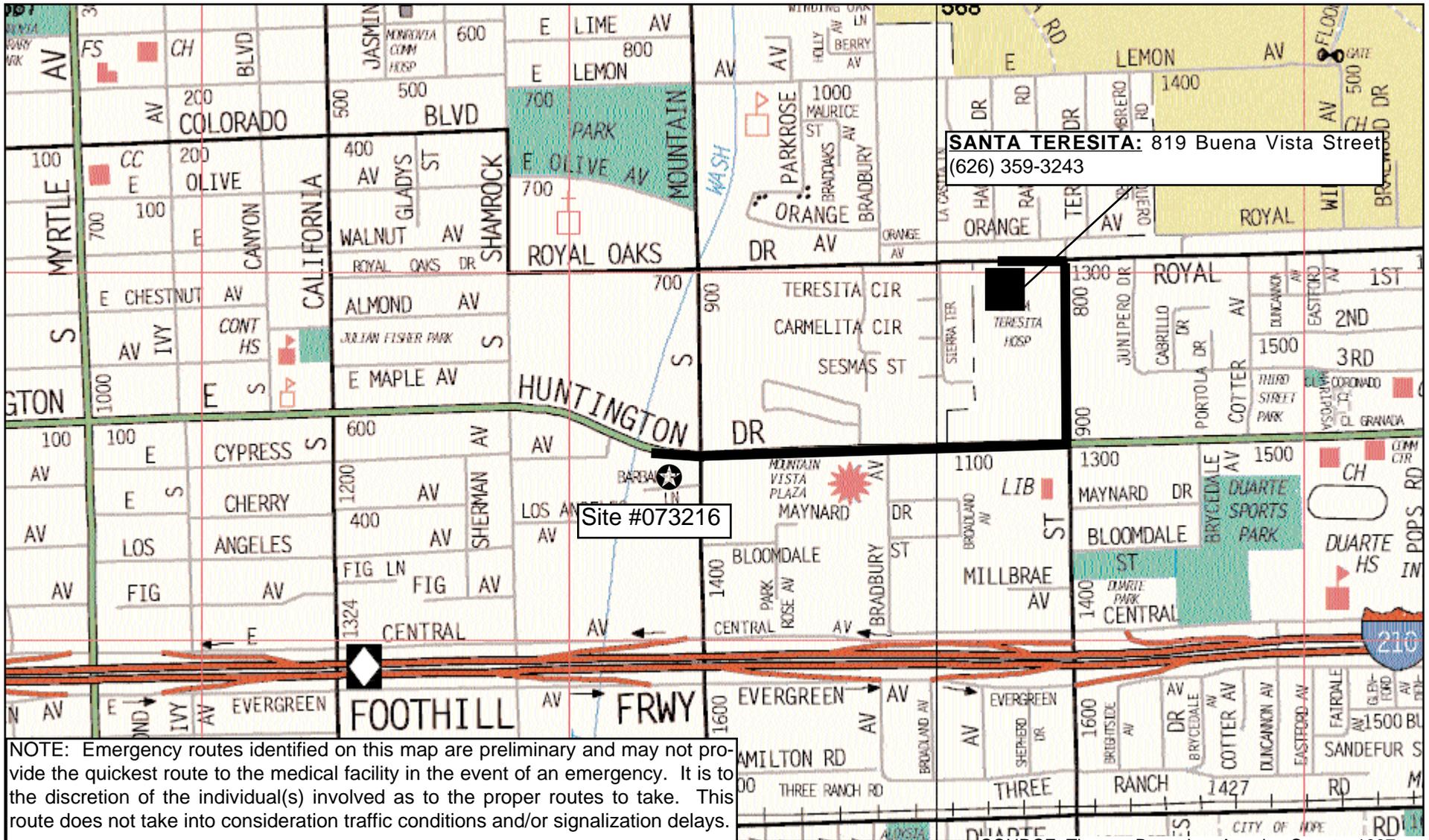
BMP Pilot Site

Not to Scale

Potential Emergency Route

SOURCE: Thomas Bros., Los Angeles County, 1997
CALIFORNIA DEPARTMENT OF TRANSPORTATION

East Regional Maintenance Station Hospital Route Map



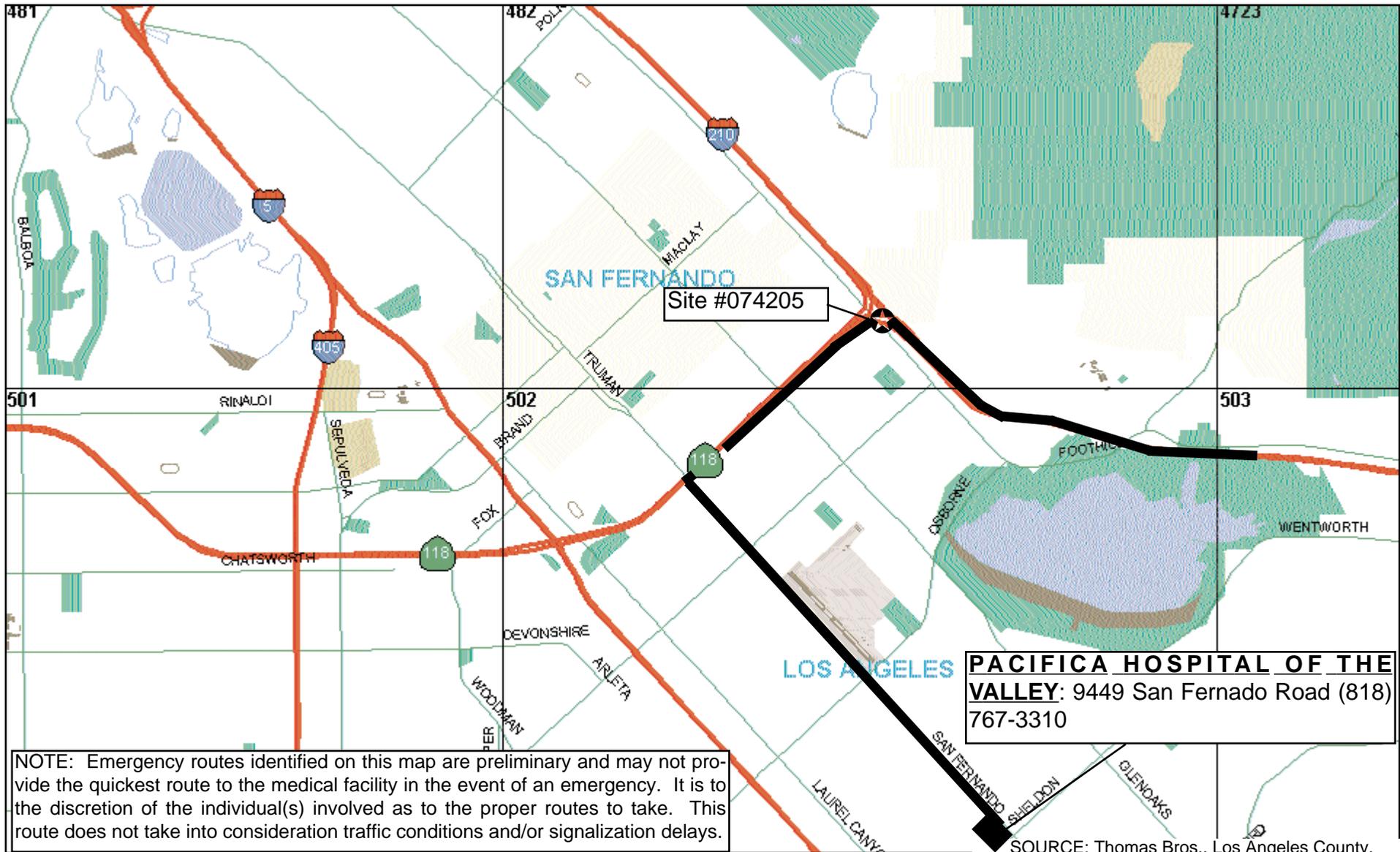
SOURCE: Thomas Bros., Los Angeles County, 1997

 BMP Pilot Site

 Not to Scale


Potential Emergency Route

CALIFORNIA DEPARTMENT OF TRANSPORTATION
**Foothill Maintenance Station
Hospital Route Map**



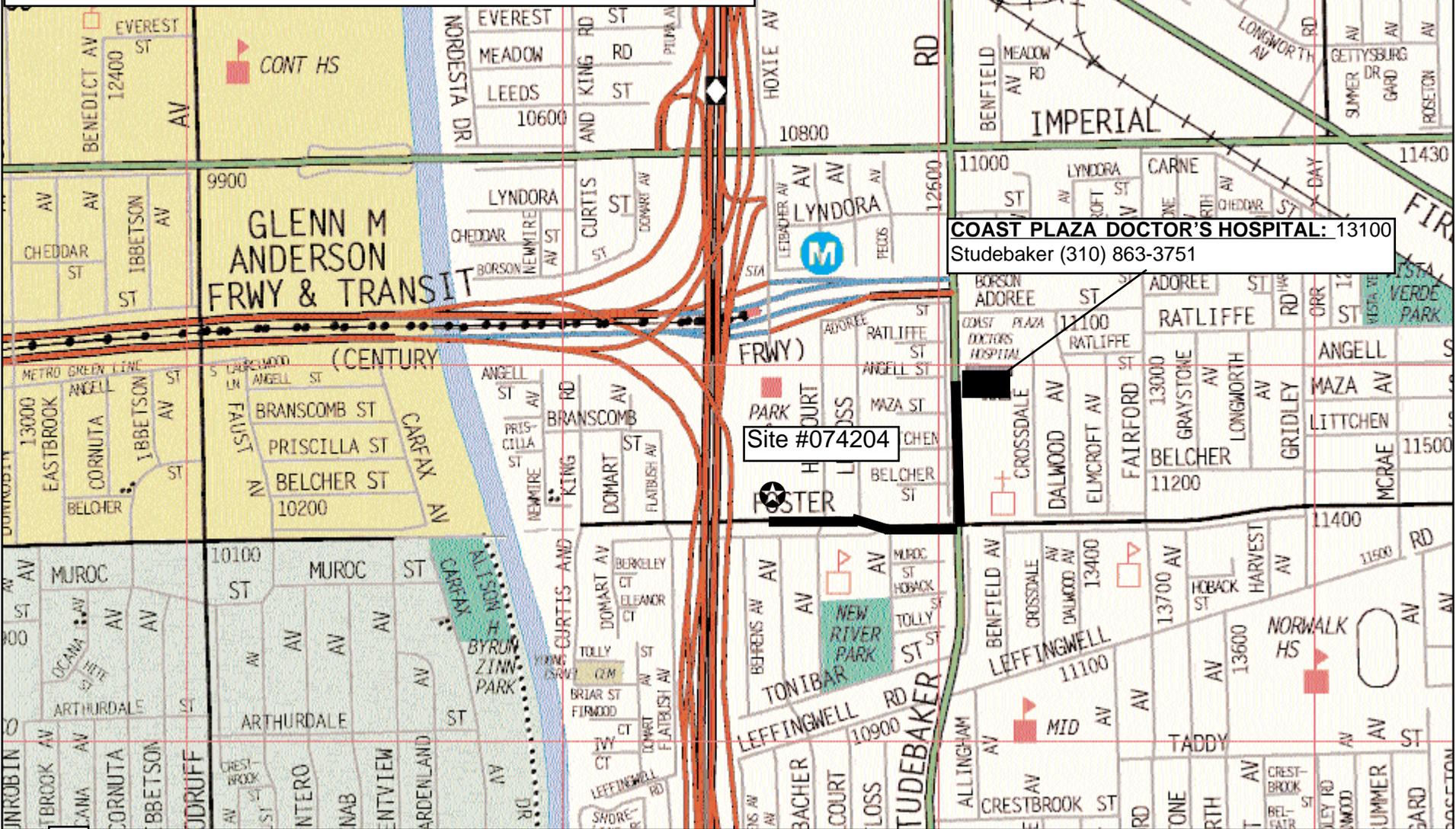
 BMP Pilot Site

 Not to Scale


Potential Emergency Route

CALIFORNIA DEPARTMENT OF TRANSPORTATION
**Paxton Park and Ride
Hospital Route Map**

NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.



COAST PLAZA DOCTOR'S HOSPITAL: 13100
Studebaker (310) 863-3751

Site #074204

 BMP Pilot Site

 Not to Scale

 Potential Emergency Route

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
**Termination Park and Ride
Hospital Route Map**

Project Contacts

Name	Organization	Phone	Fax Mobile	Email
Robert Wu	Caltrans Program Manager Dist 7	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Mark Williams	Brown and Caldwell	(619) 528-9090-w	(619) 528-9199-f	mwilliams@brwncald.com
Ed Othmer	Law/Crandall	(619) 278-3600	(619) 278-5300-f	eothmer@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678	peter_vanriper@dot.ca.gov
Bill Whittenberg	RBF	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Patti Matta	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Patty@dmaipo.attmail.com
Mark Weiner	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Mweiner@dmalabs.com
Chet Reynolds	FLW/R.C. Hoffman Co.	(949) 643-0831	(949) 643-0832	--
John Misiti	American Sigma	(800) 635-4567	(716) 798-5599	Misitiz@aol.com
Anthony Tavano	American Sigma	(716) 798-5580	(716) 798-5599	
Internet	National Weather Service	(805) 988-6610	--	http://nimbo.wrh.noaa.gov/
Internet	Accuweather	--	--	http://www.weather.com
Internet	Los Angeles Doppler Radar	--	--	http://www.weather.com weather/radar/single- site/CA_Los_Angeles.html
Internet	Intellicast	--	--	http://www.Intellicast.com
Internet	Weather Underground	--	--	http://www.wunderground.com
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Dean Messer	Mosquitoes and Midge Vector Abatement Specialist	530 753-6400	--	deanm@lwadavis.com

Name	Organization	Phone	Fax Mobile	Email
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(909) 365-0117	geosrc1@ix.netcom.com
Suzanne Klueh	Greater Los Angeles County Vector Control District	(562) 944-9656	(562) 944-7976	--
P. Sue Zuhlke	San Gabriel Valley Mosquito and Vector Control District	(626) 814-9466	(626) 337-5686	Psuez@earthlink.net



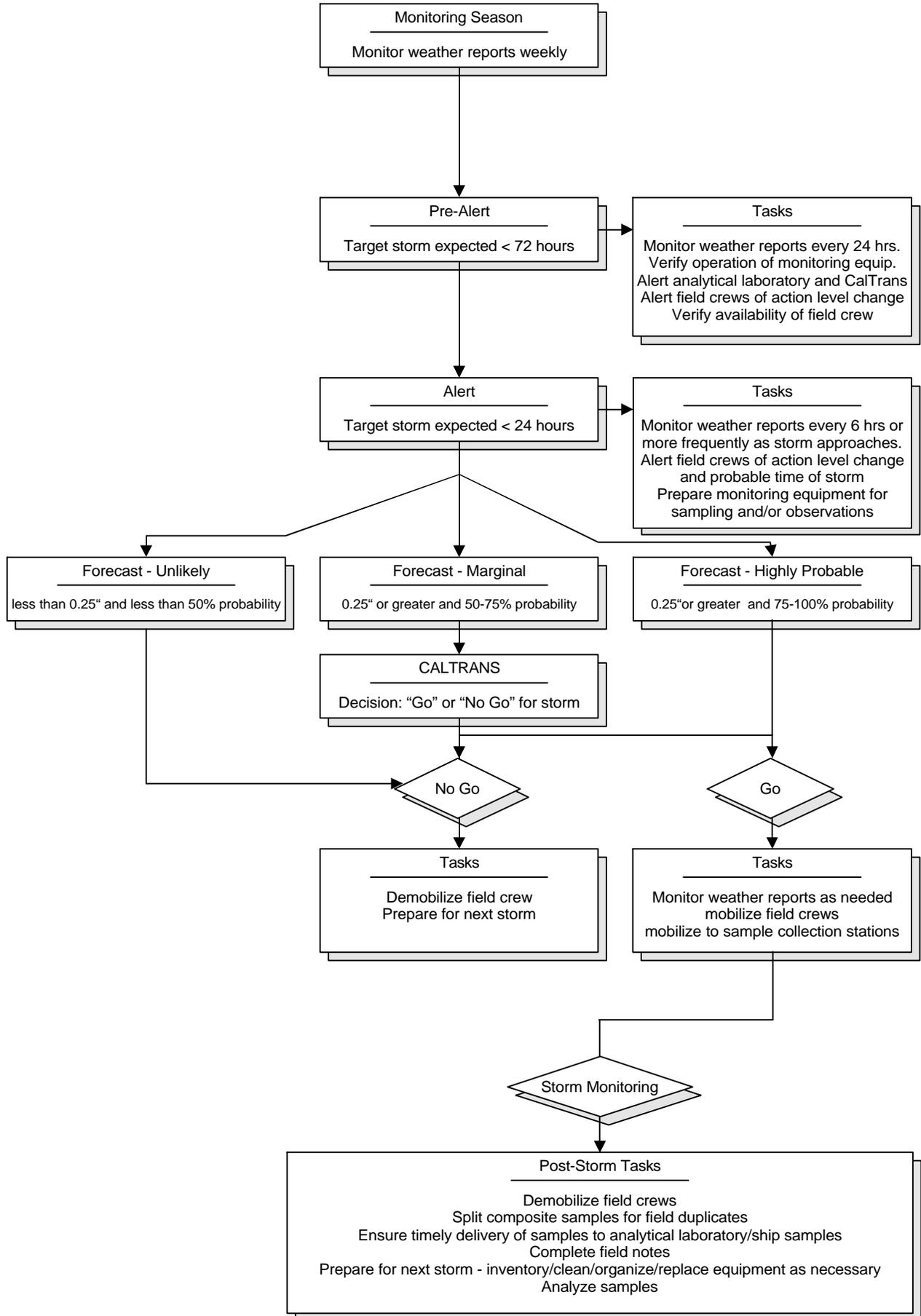
TAB 3

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Mobile phone	Volume to sample matrix
Vendor's autosampler manual	Vendor name and contact

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Rope and throw rope	Gaff
Maps for required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm kit	Log books
pH meter	Paper towels (cloth towels)
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
pH grab bottles	Spare sample labels (waterproof)
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	20 liter bottles in 10 gallon containment buckets
Grab sample bottles (see below)	Coolers and ice (at least one extra)
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Lab telephone number
for each QA/QC analysis	Backup lab contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

**Form C: BMP Site Inspection Checklist
Form D: Monitoring Equipment Inspection Checklist**

FORM C		
Caltrans BMP Retrofit Pilot Program		
BMP Site Inspection Checklist for Sand Filters		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
SEDIMENTATION BASIN:		Maintenance Req'd?
Sediment depth (if sediment >12" maintenance is required): _____ inches		? yes ? no
Removal of accumulated paper, trash and debris every six(6) months or as necessary		? yes ? no
Vegetation growth within the basin(if exceeds 18" maintenance is required): _____ inches		? yes ? no
If drain time of standing water exceeds 48 hours, corrective maintenance is required		? yes ? no
Annual inspection and repair of structure		? yes ? no
Comments:		
FILTER MEDIA:		Maintenance Req'd?
Silt accumulation on Filter (if exceeds ½ inch- maintenance required): _____ inches		? yes ? no
Removal of accumulated paper, trash and debris every six (6) months as necessary		
Vegetation growth within the basin(if exceeds 18" maintenance is required): _____ inches		? yes ? no
Draw down time: _____ hours (If more than 36 hours, replace filter fabric around the media filter)		? yes ? no
Annual inspection and repair of structure		? yes ? no
Comments:		
STRUCTURAL:		Maintenance Req'd?
List any damage to fences:		? yes ? no
List any damage to locks:		? yes ? no
Any damage to inlet channels, outlet chambers, sampling chambers, grating, etc.? If any, please list.		? yes ? no
Annual inspection and repair of structure Other general maintenance concerns:		
PUMPS:		Maintenance Req'd?
Sump overflowing, sump not being drained, problem with pumping operation: ? yes ? no Degree:		? yes ? no
Condition of pumping equip.: ? OK ? not OK		? yes ? no
If not OK, please note the extent of damage:		? yes ? no
Condition of delivery/discharge lines or hoses from the pump:...? OK ? not OK		? yes ? no
Presence of trash or debris in the sump area: ? yes ? no		? yes ? no
If yes, maintain during inspection or at any site of trash or debris.		

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Sand Filters (Continued)

VEGETATION:	Maintenance Req'd?
Evidence of vegetation in filter? ? yes ? no (If yes, maintenance is required)	? yes ? no
Does surrounding vegetation impair component functionality? ? yes ? no (If yes, maintenance is required)	? yes ? no
Comments:	

ANIMAL CONCERNS:	Maintenance Req'd?
Is there evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)? ? yes ? no	? yes ? no
Comments:	

AESTHETIC CONCERNS:

Debris (non-trash)? ? yes ? no	Type, amount and location:
Trash? ? yes ? no	Type, amount and location:
Graffiti? ? yes ? no	Description and location:
Other general aesthetic concerns:	

NON-STORMWATER CONCERNS:

Non-storm water discharge to BMP ? yes ? no
 BMP wet from obvious non-stormwater discharge (no rain) ? yes ? no
 If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678
 From: _____ Contact Number: _____

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction (facing)	Roll	Photograph No.

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Sand Filters (Continued)

OVERALL:

Other concerns affecting operation:

Condition of facility: ? acceptable ? not acceptable

Comments:

Dates for maintenance to be completed by:

(Team Leader's Signature)

FORM D		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Sand Filters		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		
SAMPLING AND FLOW MEASUREMENT EQUIPMENT:		Maintenance Required?
Is the monitoring station enclosure locked? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the automatic sampler online? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the automatic sampler properly programmed and calibrated? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the peristaltic pump tubing need replacement? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the intake tubing and/or connections need replacement? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Do the desiccant cartridges in sampler and flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is internal modem online? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the flow meter properly installed (specify type of meter)? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.):		Maintenance Required?
Is the flow meter tubing free of kinks, free of obstructions, and properly connected to pump? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the bubbler tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are the AV meter sensors properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no

FORM D					
Caltrans BMP Retrofit Pilot Program					
Monitoring Equipment Inspection Checklist for Sand Filters					
Are the AV meter sensors free from obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable					<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:					
Is the acoustic level meter or bubbler properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable					<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:					
Is strainer clean and free of obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no					<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:					
INFLUENT SAMPLING LOCATION:					Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:					<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:					<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:					<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:					
EFFLUENT SAMPLING LOCATION:					Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:					<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:					<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:					<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:					
PHOTOGRAPHS (mandatory if maintenance is required):					
Date	Time	Description	Direction (facing)	Roll	Photograph No.
Dates for maintenance to be completed by:					
<div style="border-top: 1px solid black; margin-top: 10px; width: 80%; margin-left: 0;"> (Team Leader's Signature) </div>					



TAB 5

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

- Form E: BMP Site Maintenance Activity Checklist**
- Form F: Monitoring Equipment Maintenance Activity Checklist**
- Form G: Sediment Sampling Checklist**
- Exhibit 5.1: Title 22 Characterization Requirements**

FORM E			
Caltrans BMP Retrofit Pilot Program			
BMP Site Maintenance Activity Checklist for Sand Filters			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
<i>Fill out Appropriate Sections Only</i>			
SEDIMENT BUILD UP/FOULING:			
<input type="checkbox"/> <i>Sediment removal from Sedimentation Basin</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Approximate volume of sediment removed:			
Comments:			
MECHANICAL:			
<input type="checkbox"/> <i>Sump Pumps</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
Approximate Volume of Oil Waste generated:		Waste Properly Labeled?	
		<input type="checkbox"/> yes <input type="checkbox"/> no	
FILTER MEDIA:			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
VEGETATION:			
<input type="checkbox"/> <i>Weed Control:</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Leaf Collection and removal of dead/rotting vegetation:</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Sand Filters

STRUCTURAL:

Fences, Locks, etc.

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

Inlet/Outlet Channels, Grating, etc.(Describe Maintenance):

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

Other (describe):

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

ANIMAL CONCERNS:

Irradication and control

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

Other (describe):

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

AESTHETIC CONCERNS:

Debris and trash removal

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

Graffiti removal

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

Painting

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

Other (describe):

Start time: _____ End time: _____ Total time: _____ More work required? yes no

Equipment used: _____

Comments: _____

_____ (Team Leader's Signature)	General Comments:
------------------------------------	-------------------

FORM F			
Caltrans BMP Retrofit Pilot Program			
Monitoring Equipment Maintenance Activity Checklist for Sand Filters			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
<i>Fill out appropriate sections only</i>			
<input type="checkbox"/> Clean flumes, orifices, and other components			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Diagnostic test of automatic sampler			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of peristaltic pump tubing			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of flow meter tubing, pump tubing, or intake tubing			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of strainer			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of 12-volt marine battery			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Removal of kinks or obstructions from flow meter			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of desiccant cartridges in sampler and flow meter			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Repair and maintenance of flow meter: <i>Type:</i> _____			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			

FORM F Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Sand Filters (continued)	
<input type="checkbox"/> Other maintenance/calibration of automatic sampling equipment (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: _____ Comments: _____	
<input type="checkbox"/> Other maintenance of flow measurement equipment (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: _____ Comments: _____	
<input type="checkbox"/> Other (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: _____ Comments: _____	
_____ (Team Leader's Signature)	General Comments:

FORM G	
Caltrans BMP Retrofit Pilot Program Stockpile/Sediment Sampling Checklist	
GENERAL INFORMATION:	
Date:	Time In: Team Leader's Initials: Time Out:
Location:	
SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:	
Depth of sediment:	
Color:	<input type="checkbox"/> black <input type="checkbox"/> brown <input type="checkbox"/> green <input type="checkbox"/> tan <input type="checkbox"/> other
Consistency:	<input type="checkbox"/> <input type="checkbox"/> sandy <input type="checkbox"/> silty <input type="checkbox"/> granular <input type="checkbox"/> other
Odors:	<input type="checkbox"/> petroleum <input type="checkbox"/> solvents <input type="checkbox"/> organic (rotten eggs) <input type="checkbox"/> sewage <input type="checkbox"/> none <input type="checkbox"/> other
Depth of sediment:	
SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST	
Powder Free Nitrile Gloves	
Soil Probe or equivalent for sample collection	
8-ounce glass jar labeled Total Petroleum Hydrocarbons (TPH)	
Plastic bags, seal bags	
Chilled cooler	
Chain-of-Custody form	
Log book for record keeping	
STOCKPILE/DRUMMED SEDIMENT:	Maintenance Required?
Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.	<input type="checkbox"/> yes <input type="checkbox"/> no
SEDIMENT COLLECTION:	
<10 cubic yards: <i>Minimum of 2 samples, one randomly from each half of the soil mass</i>	
10-20 cubic yards: <i>Minimum of 3 samples, one randomly from each third of the soil mass</i>	
20-100 cubic yards: <i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>	
100-500 cubic yards: <i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>	
Over 500 cubic yards: <i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>	<i>Contact Dept. of Environmental Health for Guidance</i>

FORM G
Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist

SEDIMENT SAMPLE COLLECTION

Observation sheet completed	
Personal and equipment decon completed	
Number of aliquots taken from composite _____	
Sample IDs: 1. _____ Analysis requested: _____ 2. _____ Analysis requested: _____ 3. _____ Analysis requested: _____ 4. _____ Analysis requested: _____ 5. _____ Analysis requested: _____ 6. _____ Analysis requested: _____	
Photos taken:	
Chain of Custody form attached	
Record information in logbook for record keeping	
Comments: 	

Exhibit 5.1
Title 22 Characterization Requirements, Sediment Matrix
Analytical Parameters, Methodologies, Detection Limits, Holding Times,
Container Volumes and Types, and Preservation

Parameter	Method	Units	Detection Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.
- (5) “Test Methods for Evaluating Solid Waste, Physical /Chemical Methods”. SW-846, Update III.(SW-846)



TAB 6

CALTRANS BMP STORM WATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for
Storm Events**

Form I: Field Data Log Sheet

Form J1: User-Entered Program Parameters (Influent/Control)

Form J2: User-Entered Program Parameters (Effluent)

Form K: Station Phone Log

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Sand Filters

GENERAL INFORMATION:

Date:	Time in:
Team leader:	Stormwater Consultant:
Other personnel:	Location of facility:

METEOROLOGICAL CHARACTERISTICS:

Time since end of previous storm event visit: > 72 hours 48-72 hours 24-48 hours < 24 hours

Present rainfall: None Mist Drizzle Sprinkle Light, Steady
 Moderate Heavy

Time present rain event started: _____

Wind speed: 0-5 mph (light) 5-10 mph (moderate) 10-15 mph (brisk) >15 mph (strong)

Cloud cover: _____%

Distribution of Rainfall: Uniform Localized cells Scattered showers

Meteorological characteristics comments:

HYDROLOGIC AND HYDRAULIC CHARACTERISTICS:

Flow conditions (*check all that apply*):

Runoff entering facility

Flow from pretreatment sedimentation chamber to sand chamber occurring

Flow passing overflow weir to outlet bay (Austin type only)

Flow short circuiting through facility

Facility discharging Time occurred: _____

Flow bypassing facility Time occurred: _____

Standing water conditions (*record measurements as appropriate and check all that apply*):

Standing water in pretreatment sedimentation chamber: Depth: _____

Standing water in sand chamber: Describe Location: _____
 Depth: _____

Standing water in Outlet bay (Austin Type Only): Describe Locations: _____
 Depths: _____

Are there any indications of leakage (e.g., falling water level without flow occurring from a chamber)? If so, what indications and where? _____

If during a Storm Event:

Record maximum depth of pooled water: Depth: _____

Time to drain from the first entrance of runoff? _____

Time to drain from the maximum depth? _____

Comments: _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Sand Filters

INLET CONDITIONS:

Describe flow distribution where flow passes weir or baffle at exit of inlet chamber:

- Flow is uniformly distributed
 Flow is not uniformly distributed, if so describe below:

Describe any obstructions or restrictions interfering with inflow/influent:

INFLUENT WATER QUALITY APPEARANCE:

Check all that apply and describe under comments

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In pretreatment sedimentation chamber: _____

In sand chamber: _____

In outlet bay: _____

Solids resuspension evident (*check all that apply*):

- Pretreatment Sedimentation Chamber Sand Chamber Outlet Bay (Austin Type Only)
 Other (describe): _____

Solids deposition and resuspension comments:

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Sand Filters

TREATMENT MEDIUM CONDITION:
 Describe any indications that the filter medium is clogging or that hydraulic capacity is otherwise being reduced:

OUTLET CONDITIONS:
 Describe any obstructions or restrictions interfering with outflow/effluent:

EFFLUENT WATER QUALITY APPEARANCE:
Check all that apply and describe under comments

Odor:
 Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:
 Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:
 Sheen Heavy floating concentration Emulsion Deposit None

Color:
 Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity
 None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

VECTORS:

Presence of vectors: Yes No

If yes, what type: Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

Inlet structure damage Outlet structure damage Vandalism

Comments:

TREATMENT MEDIUM CONDITION:
 Describe any indications that the filter medium is clogging or that hydraulic capacity is otherwise being reduced:

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Sand Filters

MONITORING EQUIPMENT CONDITIONS:
Equipment functional: Yes No N/A
Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:
Date: _____ Time: _____
Comments:

Date: _____ Time: _____
Comments:

Date: _____ Time: _____
Comments:

ADDITIONAL COMMENTS:

(Team Leader's Signature)

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet

GENERAL INFORMATION		Julian Day (*5AA): _____
Date: _____	Time in (PST,*5): _____	Team Leader's Initials: _____
Location: La Costa / I-5 Northbound	Crew: _____	
<u>Influent or Effluent (circle one)</u>	Storm Event Visit or Maintenance Visit (circle one)	

SYSTEM STATUS FLAGS (*6AD; 1=high, 0=low)	PROGRAM SIGNATURE (*B)
Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Arrive: _____
Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Depart: _____

DATA LOGGER INFORMATION (*6)		
<i>All Site Visits:</i> Basin Staff Gauge: Flow Sensor Stage: Stage (ft) 02: Velocity (ft/s) 03: Flow (cfs) 04: Station ID 21:	Samp. Batt Volt 22: Cell Batt Volt 82: Flow Meter Batt Volt 28: <u>Storm Site Visits:</u> Volume (kcf) 05: Storm Sum (kcf) 06: Percent Capture 08: Volume2Sample 14: Sample Count 17:	Manual Rain Gauge: Total Rain (in.) 25: Total Storm Vol. 72: Strm Vol Smpld 75: Max Stage Day 51: Max Stage Time 52: Max Stage (ft) 53: Date Last Sample 105: Time Last Sample 106:

AUTOSAMPLER INFORMATION	
<i>Storm only</i>	
Number of Samples Total: _____ Number of Samples Remaining: _____	Bottle # out: _____ Bottle Volume: _____ Volume2Sampl: _____
Bottle # in: _____	

GRAB SAMPLE COLLECTION	CALIBRATIONS and CHECKS
Time: _____ TPH (Diesel/Oil) _____ TPH (Gasoline) _____ Bacteria _____ Other: _____	Stage: <input type="checkbox"/> Sample Volume: <input type="checkbox"/> Rain Gauge: <input type="checkbox"/> Other:

SAMPLING EQUIPMENT AND REPAIR NEEDS:

ACTION TAKEN:

Team Leader's Signature _____

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

**Subject to Revisions*

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
03 Volume to sample (kcf)					
04 Level Meter Stage Offset (feet)					
05 Level Meter Multiplier (feet/mv)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. Failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
30					
31					
34 Flume Parameter 1					
35 Flume Parameter 2					
36 Cellular phone battery state control parameter					
37 Duration when cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions



TAB 7

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Chain-of-Custody Form
Exhibit 7.1: Chemical Analyses List**

Exhibit 7.1
Stormwater Matrix
Analytical Parameters, Methodologies, Detection Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics⁶									
Total Petroleum Hydrocarbons – Diesel/Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Bacteria⁶									
Fecal Coliform	Grab	2	MPN/100 mL	Multiple-tube	SM 9221E	6 hours ⁷	50 mL	1-100 mL plastic	4°C

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification.
6. Total Petroleum Hydrocarbon and Fecal Coliform grab samples will be collected for two storms per year.
7. Attempts will be made to maintain the 6-hour holding time for bacteria samples to the extent possible. When not possible, a maximum holding time of 24 hours will be followed in accordance with “Standard Methods for the Examination of Water and Wastewater”, 18th Edition.



TAB 8

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related Maintenance Activity
Checklist for Affected BMP Facilities by Type**

Form O3: Vertebrate Monitoring and Control Trapping Data Sheet

VECTOR CONTROL AND MONITORING FORMS

Vector control and monitoring forms will be provided by the applicable vector control agency.



TAB 9

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

- Exhibit 9.1: Runoff Coefficients**
- Exhibit 9.2: Volume-to-Sample Tables**
- Exhibit 9.3: Encroachment Permits**

Exhibit 9.1

**Runoff Coefficient Matrix Table for Sand Filters
Caltrans District 7**

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
074203	Foothill Maintenance Station	1.75	1
074202	Eastern Regional Maintenance Station	1.45	0.9
074204	Termination Park and Ride	2.79	0.9
074103	Paxton Park and Ride	1.34	0.9

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
Paxton Park and Ride (SF)

Number of Sample Aliquots 72			
Acreage 1.34		Runoff Coefficient 0.9	
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)
0.1	0.0061	2.6	0.1581
0.2	0.0122	2.7	0.1642
0.3	0.0182	2.8	0.1702
0.4	0.0243	2.9	0.1763
0.5	0.0304	3.0	0.1824
0.6	0.0365	3.1	0.1885
0.7	0.0426	3.2	0.1946
0.8	0.0486	3.3	0.2006
0.9	0.0547	3.4	0.2067
1.0	0.0608	3.5	0.2128
1.1	0.0669	3.6	0.2189
1.2	0.0730	3.7	0.2250
1.3	0.0790	3.8	0.2310
1.4	0.0851	3.9	0.2371
1.5	0.0912	4.0	0.2432
1.6	0.0973	4.1	0.2493
1.7	0.1034	4.2	0.2554
1.8	0.1094	4.3	0.2615
1.9	0.1155	4.4	0.2675
2.0	0.1216	4.5	0.2736
2.1	0.1277	4.6	0.2797
2.2	0.1338	4.7	0.2858
2.3	0.1398	4.8	0.2919
2.4	0.1459	4.9	0.2979
2.5	0.1520	5.0	0.3040

Exhibit 9.2**Volume to Sample in (Kilo-cubic feet) for
Eastern Regional Maintenance Station (SF)**

Number of Sample Aliquots 72		Acreage 1.45	Runoff Coefficient 0.9	
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)	
0.1	0.0066	2.6	0.1711	
0.2	0.0132	2.7	0.1776	
0.3	0.0197	2.8	0.1842	
0.4	0.0263	2.9	0.1908	
0.5	0.0329	3.0	0.1974	
0.6	0.0395	3.1	0.2040	
0.7	0.0461	3.2	0.2105	
0.8	0.0526	3.3	0.2171	
0.9	0.0592	3.4	0.2237	
1.0	0.0658	3.5	0.2303	
1.1	0.0724	3.6	0.2369	
1.2	0.0790	3.7	0.2434	
1.3	0.0855	3.8	0.2500	
1.4	0.0921	3.9	0.2566	
1.5	0.0987	4.0	0.2632	
1.6	0.1053	4.1	0.2698	
1.7	0.1118	4.2	0.2763	
1.8	0.1184	4.3	0.2829	
1.9	0.1250	4.4	0.2895	
2.0	0.1316	4.5	0.2961	
2.1	0.1382	4.6	0.3027	
2.2	0.1447	4.7	0.3092	
2.3	0.1513	4.8	0.3158	
2.4	0.1579	4.9	0.3224	
2.5	0.1645	5.0	0.3290	

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
Foothill Maintenance Station (SF)

Number of Sample Aliquots 72		Acreage 1.75	Runoff Coefficient 1	
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)	
0.1	0.0088	2.6	0.2294	
0.2	0.0176	2.7	0.2382	
0.3	0.0265	2.8	0.2470	
0.4	0.0353	2.9	0.2559	
0.5	0.0441	3.0	0.2647	
0.6	0.0529	3.1	0.2735	
0.7	0.0618	3.2	0.2823	
0.8	0.0706	3.3	0.2912	
0.9	0.0794	3.4	0.3000	
1.0	0.0882	3.5	0.3088	
1.1	0.0971	3.6	0.3176	
1.2	0.1059	3.7	0.3264	
1.3	0.1147	3.8	0.3353	
1.4	0.1235	3.9	0.3441	
1.5	0.1323	4.0	0.3529	
1.6	0.1412	4.1	0.3617	
1.7	0.1500	4.2	0.3706	
1.8	0.1588	4.3	0.3794	
1.9	0.1676	4.4	0.3882	
2.0	0.1765	4.5	0.3970	
2.1	0.1853	4.6	0.4059	
2.2	0.1941	4.7	0.4147	
2.3	0.2029	4.8	0.4235	
2.4	0.2118	4.9	0.4323	
2.5	0.2206	5.0	0.4411	

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
Termination Park and Ride (SF)

Number of Sample Aliquots			
72		2.79	
Acreeage		Runoff Coefficient	
2.79		0.9	
Rainfall Amount (inches)	Sample (Kilo-ft³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft³)
0.1	0.0127	2.6	0.3292
0.2	0.0253	2.7	0.3418
0.3	0.0380	2.8	0.3545
0.4	0.0506	2.9	0.3671
0.5	0.0633	3.0	0.3798
0.6	0.0760	3.1	0.3924
0.7	0.0886	3.2	0.4051
0.8	0.1013	3.3	0.4178
0.9	0.1139	3.4	0.4304
1.0	0.1266	3.5	0.4431
1.1	0.1393	3.6	0.4557
1.2	0.1519	3.7	0.4684
1.3	0.1646	3.8	0.4811
1.4	0.1772	3.9	0.4937
1.5	0.1899	4.0	0.5064
1.6	0.2026	4.1	0.5190
1.7	0.2152	4.2	0.5317
1.8	0.2279	4.3	0.5444
1.9	0.2405	4.4	0.5570
2.0	0.2532	4.5	0.5697
2.1	0.2659	4.6	0.5823
2.2	0.2785	4.7	0.5950
2.3	0.2912	4.8	0.6077
2.4	0.3038	4.9	0.6203
2.5	0.3165	5.0	0.6330

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE, AND
MONITORING PLAN
VOLUME II

BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
BIOFILTRATION STRIPS/
INFILTRATION TRENCHES



DISTRICT 7, LOS ANGELES

September 1999



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1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel the appropriate field evaluation and documentation for the District 7 Biofiltration Strip/Infiltration Trench (Strip/IT) belonging to the Caltrans BMP Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-D of this guidance document for supporting information on Strip/IT technology and characteristics.

1.1 Data to be Collected

The following data will be collected to assess the performance and maintenance aspects of a Strip/IT:

- Water quality and quantity data of runoff discharged into the IT from the pretreatment Strip from flow-composite and first-flush (as soon as possible after the start of runoff) grab samples for at least eight storm events during two wet seasons, weather permitting.
- Rainfall data, recorded as a function of time, from rainfall events during the study period.
- Continuous trench water level data and overflow data.
- Vadose zone water quality sampling data.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring and management data.
- Records of vector control measures taken.
- Vegetation management records.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to be Performed

Field activities that will be performed at the Strip/IT facility include:

- Monitoring Equipment Installations
- Monitoring Equipment Maintenance
- Facility Maintenance Inspections
- Facility Maintenance
- Vector and Nuisance Animal Control Inspections



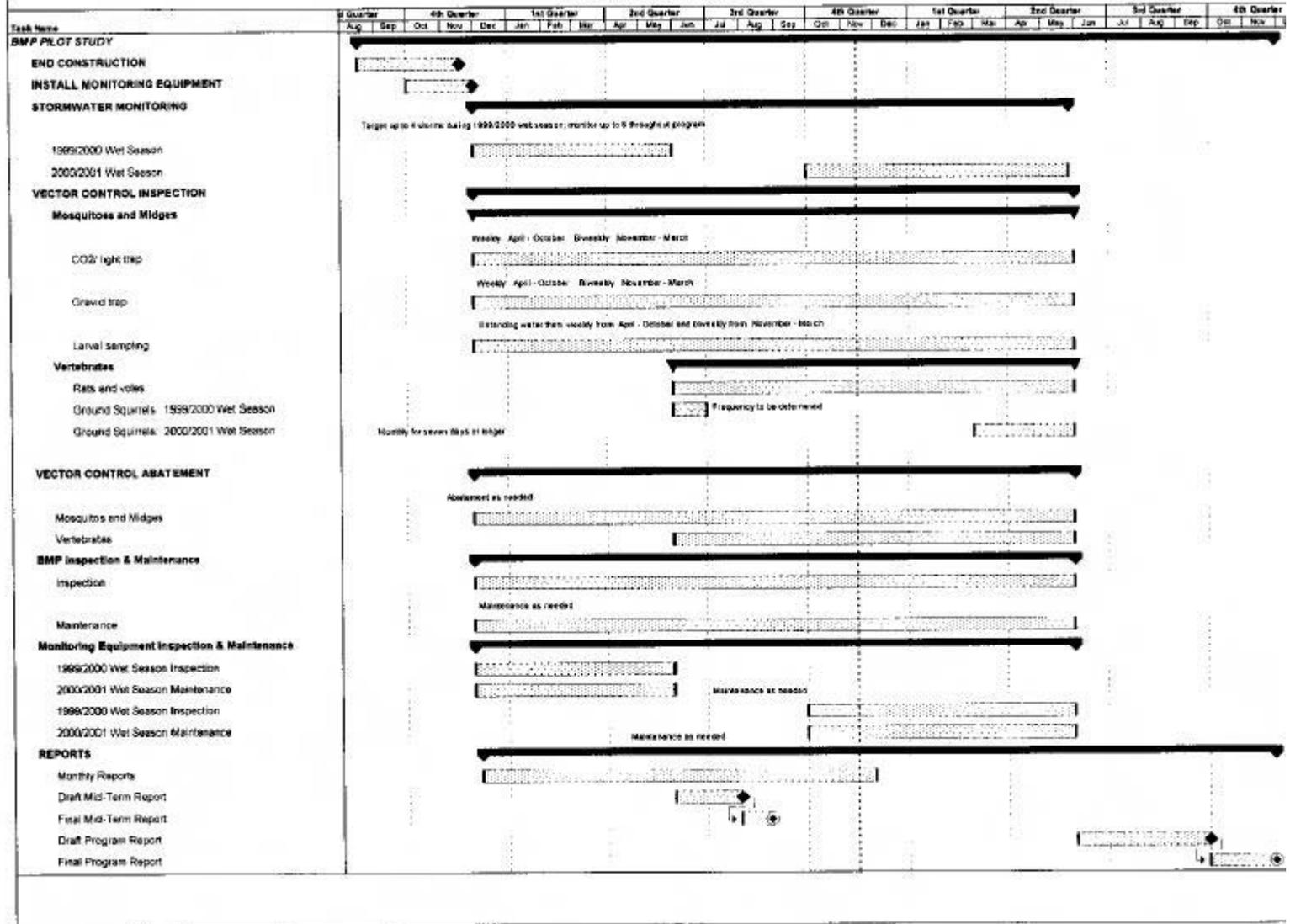
- Vegetation Control
- Stormwater and Vadose Zone Monitoring and Observation
- Empirical Observations of the Strip/IT

Vector management may also be necessary at the Strip/IT facility, but may be contingent on facility housekeeping and other environmental influences.

1.3 Master Schedule

The schedule on the following pages shows the time-line for each phase of the Strip/IT OMM program.

MASTER SCHEDULE



Target up to 4 storms during 1999/2000 wet season, monitor up to 5 freights of program

Weekly April - October Biweekly November - March

Weekly April - October Biweekly November - March

Standing water then weekly from April - October and biweekly from November - March

Frequency to be determined

Monthly for seven days if higher

Abatement as needed

Maintenance as needed

Maintenance as needed

Maintenance as needed



2.0 SITE INFORMATION

Access requirements for the site are summarized in Table 2.1, the Site Location Map is in Tab 1, and the Encroachment Permit is found in Tab 9. ***Encroachment permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed.***

Always check in with the appropriate Caltrans personnel before conducting any site fieldwork.

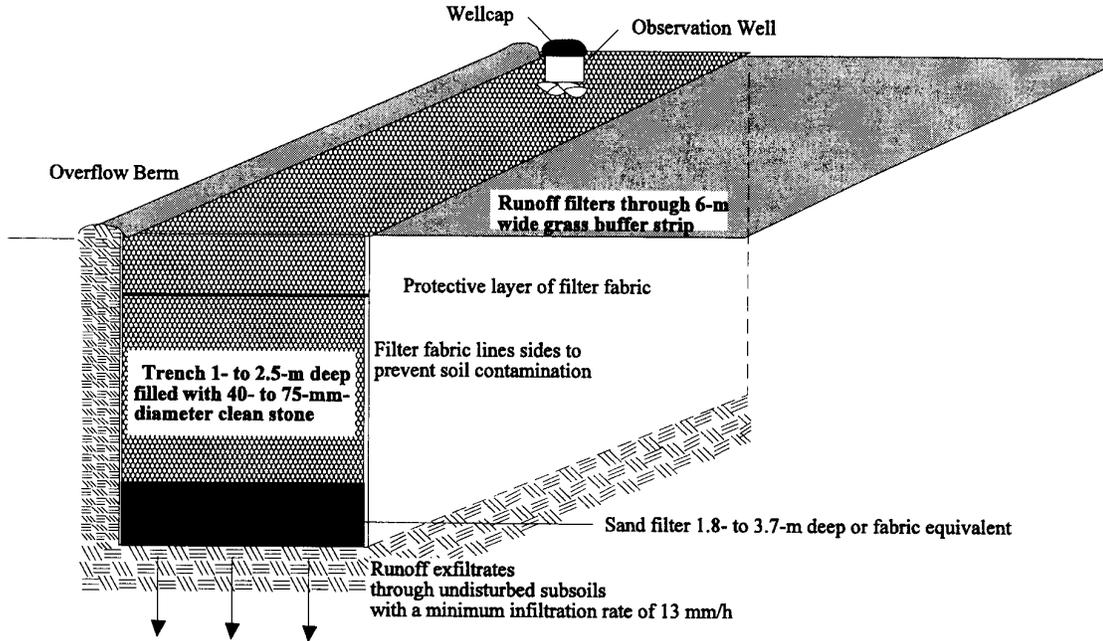
Table 2.1
Caltrans District 7 Biofiltration Strip/Infiltration Trench Site Summary

Site No.	Site Name	Site Location	Access and Parking	Site Location Map Figure	BMP Facility Plan Figure
073211	Altadena Maintenance Station Strip/IT	At the Altadena Maintenance Station located at 2122 North Windsor Avenue just north off the 210 Freeway, North Windsor Avenue off-ramp in the City of Altadena. (I-210 PM 22.49). The Strip/IT is located along the western boundary of the maintenance station.	Access to the maintenance station is through the main gate located on North Windsor Avenue. Vehicles will be parked in designated parking areas and will not impede maintenance station activities.	Tab 1	Tab 1

2.1 Biofiltration Strip/Infiltration Trench (Strip/IT)

Refer to the accompanying Appendix for a general description of a Strip/IT. The section below provides site-specific information for the Strip/IT site in District 7. Figure 2.1 provides a cross-section diagram of the IT.

Figure 2.1 Cross-section of Infiltration Trench



2.1.1 Site 073211: Altadena Maintenance Station

This maintenance station is a site for a Biofiltration Strip and Infiltration Trench. The Strip is part of a stormwater treatment train at the Altadena Maintenance Station and is located upstream of an infiltration trench. The Strip is 8 meters in length by 20 meters wide with a slope of 2%. A concrete spreader ditch distributes runoff across the length of the strip to promote sheet flow through the Strip. An H-flume is placed in the transition structure from the valley gutter to the spreader to measure influent flow characteristics. Flow from the Strip is collected and measured by an inline H-flume before being distributed into the infiltration trench.

The tributary drainage area for the Strip is 6,724 square meters (m²). This runoff begins at the north corner of the maintenance station. A valley gutter is placed upstream of the Strip to direct as much runoff as possible to the BMP site. The 1-year, 24-hour peak flow is 0.033 cubic meters per second (m³/s). The flow velocity through the Strip for the 1-year, 24-hour storm event is 0.07 m/s with a hydraulic residence time of 1.8 minutes.

Runoff enters the trench in the northwest corner, directly behind the H-flume. The fill material in the IT has sufficient voids that allows the influent to first flow into and fill the trench, much like an underground tank. The surrounding soil requires a greater head loss for the water to flow through it and therefore the trench will fill before any “short circuiting” could occur. Once the trench is full, overflow is allowed at the overflow



structure to the existing drain outlet.

The depth of the trench is set to 3 meters [9.8 feet], thereby reducing the width and length to minimize space requirements. A depressed curb is placed around the Strip and IT to prevent runoff from entering the BMPs along the perimeter.

A 1.8-meter high fence has been placed around the entire BMP area, in response to maintenance staff concerns over bumping into or tripping over the BMP at night when the area is not well lit.

Refer to the Site Location Map and BMP Facility Plan in Tab 1.

Water level measurements will be used to evaluate the infiltration rate of an IT using a trench observation well. These data along with observation of the trench during storm events, will be used to estimate the quantity of runoff bypassing the trench through an overflow structure and will be used to determine if the IT is clogged and requires maintenance.

2.2 Emergency Hospital Route

See the “**Emergency Procedure**” **Tab 2** for maps and descriptions showing the direct routes to the nearest hospitals and for emergency and site-related telephone contacts.

2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at the Strip/IT, field crews will consist of a minimum of two people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Activities at the Strip/IT bring up traffic concerns including access and parking at the maintenance station. Care will be taken to be aware of surrounding activities at the maintenance station.

2.3.2 General Safety

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the Strip/IT facility, installing equipment and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Lightning.

- Fast moving water.
- Unstable earth.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Transients.
- Muggers and other criminals.
- Power tools and heavy equipment.
- Ledges.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.

Other important field precautions include:

- Stay away from the edges of a fast moving body of water. These edges are usually slippery and unstable during rainy conditions.
- If sampling is required at the edge of a fast moving body of water, use a lifeline and a personal flotation device. Use grabbing devices when possible.
- Never work alone at night and avoid working alone during the day.
- Avoid leaving materials, tools and equipment lying around where someone can trip over them.
- Maximize lighting at all times, especially at night.
- Keep a phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear a hard hat and orange vest.
- Do not use power tools and heavy equipment unless trained in the proper use and care of the specific power tools.
- Always wear eye protection when hammering with tools or chemicals.
- Wear rain gear.
- Never leave open holes unattended or not barricaded.
- Do not sample during lightning.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 on the following page as a guide to find appropriate forms and information required for field visits. This table covers aspects of the field OMM program including mobilization, observation, and storm event monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is obtaining and going through each item on the table pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks: facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
for a Biofiltration Strip/Infiltration Trench

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Map	NA	Prior to site visits.
	BMP Facility Plan	NA	Prior to site visits.
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Map	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist	Forms CA/CB	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist	Forms DA/DB	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist	Forms EA/EB	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist	Forms FA/FB	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	CCR Title 22 Characterization Requirements	Ex. 5.1	Reference for all sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and basin.
	Field Data Log Sheet	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet for Influent/Control Sampling Point	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet for Effluent Sampling Point	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses Lists	Ex. 7.1	Reference for each sampling event and lab analysis request submittal.
8	Vector Control and Monitoring Forms	Forms O1-O2	Fill out for each site visit related to vector monitoring.
9	Runoff Coefficient Listing	Ex. 9.1	Reference: for calculations.
	"Volume-to-Sample" Table	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permit	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.



4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

The Strip/IT will be inspected on a regular basis according to the following minimum rates:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Inspection visits will be completely documented using the checklists shown in Tab 4 (Forms CA and CB).

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Forms CA and CB (Tab 4).*

1. Make the appropriate contacts with Caltrans District 7 personnel prior to arrival.
2. Completely walk around the BMP while looking for obvious problems, damage, or malfunctions
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism).
 - Vegetation management (grass, shrubs, trees).
 - Erosion and slope stability.
 - BMP performance (fouling, blockage, damage).
 - Equipment repair/maintenance (BMP components, autosampler).
 - Sediment accumulation (within BMP, at influent confluence).
 - Storage of accumulated sediment or other wastes.
 - Vector control.
4. Fill out Forms CA and CB (see Tab 4) during inspections.
5. Log the field activities and their corresponding time accurately.
6. If immediate corrective or preventative maintenance is needed, call the appropriate contacts listed in the Project Contacts List in Tab 2.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For the BMP site, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.
- Vector Control.
- Vandalism.
- Standing or Stagnating Water.

The frequency of individual maintenance activities at the Strip/IT facility will be conducted according to the schedule listed in the maintenance indicator document, included as Appendix V of Volume II.

Maintenance activities performed will be documented using Forms EA, EB, FA, and FB in Tab 5. See Section 2.0 of Appendix I-D for full details on maintenance activities.

4.3 Vegetation Management

Maintenance and control of vegetation is essential to the optimal operation and performance of a Strip. The condition of the native vegetation will be *inspected on a monthly basis* at a minimum to ensure that:

- vegetation is kept at approximately 6 inches,
- vegetation is protected and kept healthy, and
- undesirable plant species do not take root.

Maintaining healthy and continuous vegetation on the slopes will minimize erosion. Preventing undesirable plant species from taking root will prevent plants with large root systems from damaging the embankments. Herbicides will not be used because they could interfere with water quality monitoring. The vegetation seed mix was designed so that it did not require irrigation or fertilizers. But, if vegetation desiccates, the use of irrigation and fertilizers will be discussed with Caltrans and the Plaintiffs. Use the maintenance checklists (Forms CA and CB in Tab 4 and Forms EA and EB in Tab 5) whenever inspections and maintenance activities for vegetation management are performed. See Sections 2.0 and 4.0 of Appendix I-D for specific details on controlling vegetation.

4.4 Disposal of Trash and Debris

Trash and debris from the Strip/IT is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the BMP will be responsible for removal and disposal of the trash and debris. This disposal will comply with applicable local, county, state, and federal waste control programs. Table 2.1 in the accompanying Appendix for the Strip/IT shows a few possible disposal services for waste material.

4.5 Deposited Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs are critical. Stockpiling is only allowed at the facility under the following conditions:

- Sandbag berms are created (8-inch minimum) to surround the stockpile area.
- At least 0.5-mil plastic is used to contain any dewatered liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored at all times.

Once sediment stockpile storage has reached disposal quantity, chemical characterization must be conducted to satisfy land disposal requirements (LDRs). Document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G, Tab 5 for additional details on conducting this sampling.

For sediment stockpiles, the minimum number of discrete samples initially required must comply with Form G, Tab 5. Random samples will be selected from locations on a three-dimensional grid. If the presence of materials such as boulders, debris, etc. hinder the application of this process, the sample will be collected as close as possible to the randomly selected point without altering the essence of the random selection process.

Stockpile sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the stockpile or drum.
3. Collect the sample using a soil probe or equivalent. Ensure that the sample is collected at the correct depth and location that was randomly selected.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.



Unless observations indicate additional testing, the sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.6 Vector and Nuisance Animal Control

Vector Control Districts have been subcontracted to work in accordance with Appendix IV.

5.0 STORM MONITORING

Careful preparation and planning is critically important. High quality samples *must* be obtained for each storm event. Always double-check that appropriate equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that local rainfall meets the sampling criteria:

1. A minimum of 48 hours of dry weather preceded the storm (72 hours is preferred).
2. Meeting deployment criteria defined in Exhibit 3.1.

Check the appropriate sources for local weather conditions before deploying field staff. Use Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for a decision tree on when and how to mobilize field personnel and equipment.

5.1 Decontamination Procedures

Materials used in the collection of stormwater samples will meet criteria to prevent contamination of the sample. These materials will allow for both inorganic and organic trace toxicant analyses from the same sampler and sample bottles. Only Teflon[®] and borosilicate glass are suitable for both trace metal and organic analyses from the same sample bottle. The bottles will be cleaned according to USEPA-approved protocols consistent with approved methodology for analysis of stormwater samples (USEPA, 1983 and subsequent revisions). Sample hoses will be replaced and decontaminated annually, prior to the wet season, using the procedure described below. These bottles and hoses will be evaluated through a blanking process to verify that the sample bottles and sample hoses are decontaminated. Where possible, unused, disposable sampling equipment will be used to eliminate the need for decontamination.

5.1.1 *Cleaning Procedures for Sample Bottles*

Bottles will be:

1. Rinsed three times with warm tap water.
2. Scrubbed with a clean plastic brush.
3. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
4. Rinsed three times with tap water.
5. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
6. Rinsed three times with hexane while rotating the bottle, and then air-dried.
7. Rinsed six times with Milli-Q water.
8. Soaked in 2N nitric acid for a minimum of 24-hours.
9. Rinsed six times with Milli-Q water.

5.1.2 Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

1. Teflon[®] hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
2. Rinsed three times with warm tap water.
3. Rinsed three times with Milli-Q or equivalent water.
4. Rinsed three times with 2N nitric acid.
5. Soaked at least 24-hours in 2N nitric acid.
6. Rinsed three times with Milli-Q water.

5.2 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-D details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, analytical methods, reporting limits, and holding times for the Strip/IT. Appendix III contains the Retrofit Pilot Program Quality Assurance and Quality Control Plan.

Logbooks will be assembled for the Strip/IT. Pertinent checklists, log forms, and information necessary to conduct a successful monitoring program and to be contained in the site-specific field logbooks are listed in Table 3.1 in Section 3.0. This table also lists analytical and office forms, contains corresponding form and table numbers, identifies the location in this document, and explains when each form is to be filled out.

Sampling equipment will be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting stormwater sampling at the BMP site:

- Pre-Storm preparation.
- Storm event sampling (grab and composite sample collection).
- Post-Storm sample analyses.

5.2.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1) for when to mobilize (Tab 3).
2. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).
3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.

4. Assemble decontaminated sample containers for influent/control and effluent autosamplers.
5. Inspect monitoring equipment for proper operation (use Form DA, Tab 4). At each sampling location do the following:
 - a. Check battery voltages.
 - b. Make sure intakes, flow structures, and sensors are clear of debris (this is only possible if all confined space requirements are met).
 - c. Make sure the correct user-entered program parameters are entered (use Forms I, J and K in Tab 6)
 - d. Set system status flags.
 - e. Make sure the automatic sampler is set up properly by verifying that the correct bottle size number of bottles hose material, hose length, head height, aliquot volume number of samples to fill the bottle and number of pulses to sample has been entered correctly.
 - f. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger.
6. Ice composite bottles.
7. Fill out an empirical observation form (Form H, Tab 6) and the station visit log (Form I in Tab 6).
8. From the office set “Volume-to-Sample” numbers (Exhibit 9.2, Tab 9) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K in Tab 6).

5.2.2 Storm Event and Sample Collection

1. Once onsite fill out Empirical Observation Field Data Log and a Field Data Log Sheet (Forms H and I, Tab 6) to document storm characteristics.
2. Locate influent/control autosampler and inspect for proper operation.
3. Change composite bottles and re-initiate equipment as needed.
4. Take grab samples as needed (two will be taken per monitoring season at the influent and effluent locations of the Strip).

5.2.3 Post-Storm Sample Analyses

After a storm event has ended, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

1. Reset the storm monitoring program to prepare for another storm event.
2. Replace the autosampler sample bottle and reset the sampler.
3. Physically inspect the station to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if all confined space requirements are met).

4. Retrieve data via modem from the remote monitoring computer.
5. Check battery voltages; replace batteries that are low.

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

Chain-of-Custody Forms

When the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody Forms (see example in Form M, Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.3 Vadose Zone Monitoring

Samples of pore liquid will be collected by applying a vacuum. The following protocol will be used to collect pore liquid samples using the lysimeter:

1. Place the lysimeter in the sample extraction mode by closing the sample collection stopcock.
2. Connect a 12-volt electric vacuum pump to the vacuum/pressure port. Slowly regulate the vacuum to 10 psi (508 mm of Hg) by adjusting the pressure vacuum stopcock on the lysimeter head assembly and then seal the system.
3. Once the vacuum is generated, pore liquid will be drawn from the soil pores and into the lysimeter. When the vacuum drops to 5 psi (254 mm of Hg) or less, attempt sample recovery.
4. Fit a clean, rigid, polyethylene sample container (400 mL minimum volume) with a two-port bung to the sample collection tube, making a sealed system (refer to Figure 5.2 of Appendix I-D). The tube from the lysimeter will protrude into the sample container approximately one-half inch (13 mm). The tube to the vacuum/pressure pump will be flush with the bung.
5. Ensure that the vacuum/pressure tube and sample collection tube stopcocks are in the open position.
6. Evacuate the sample from the lysimeter by applying a vacuum of approximately 10 psi (508 mm of Hg).
7. A minimum volume of 100 mL (300 mL is recommended) is required for the analysis of dissolved copper, lead, and zinc. Transfer the sample to an unpreserved polyethylene bottle provided by the laboratory. If the required volume was not obtained, repeat Steps 1 through 6.



8. When the minimum volume of sample has been obtained, properly pack and transport the sample in accordance with the procedures described in Section 5.9 of Appendix I-D. Ensure that a note has been recorded on the Chain-of Custody Form requiring the laboratory to filter the sample upon receipt.
9. In accordance with the manufacturer's recommendations, lysimeter equipment decontamination is not necessary.

5.4 Empirical Observations

Complete and succinct empirical observations for both rain/runoff and the BMP, are required during each site visit related to wet season monitoring. These observations will be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). These empirical observations will be recorded on Form H in Tab 6.

The following observations shall be made for each storm event visit and documented using Form H:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water, channelization).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory).
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Erosion.
- Vegetation condition.
- Outlet conditions (problems affecting performance).
- Mosquitoes and vectors.
- Structural condition of facility.
- Monitoring equipment condition.
- Infiltration medium condition (surface and observation well).

Refer to Form H in Tab 6 for recording empirical observation information.



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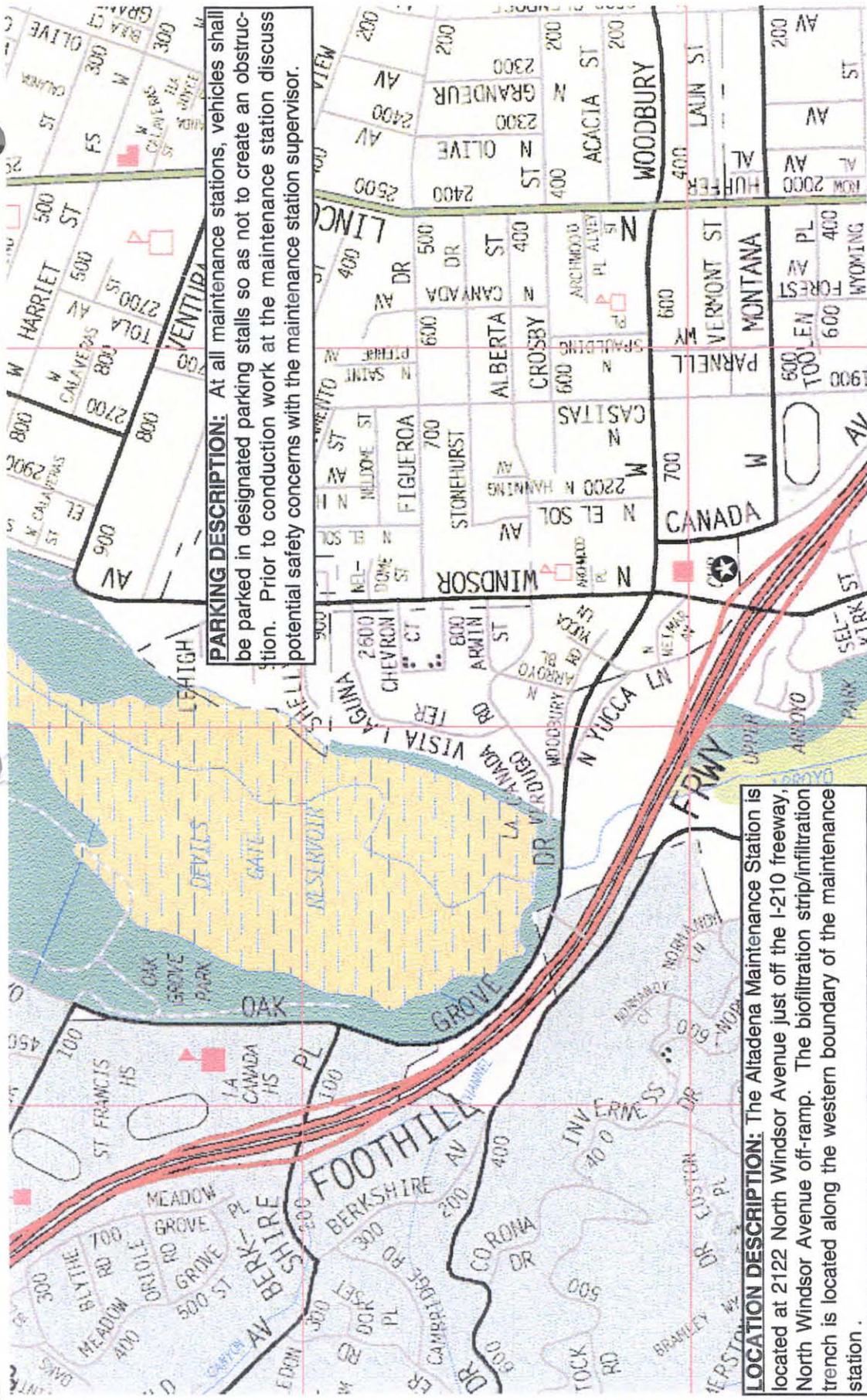


TAB 1

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Map
BMP Facility Plan**



PARKING DESCRIPTION: At all maintenance stations, vehicles shall be parked in designated parking stalls so as not to create an obstruction. Prior to conducting work at the maintenance station discuss potential safety concerns with the maintenance station supervisor.

LOCATION DESCRIPTION: The Altadena Maintenance Station is located at 2122 North Windsor Avenue just off the I-210 freeway, North Windsor Avenue off-ramp. The bioinfiltration strip/infiltration trench is located along the western boundary of the maintenance station.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Altadena Maintenance Station
BMP Pilot Study Site #073211
Site Location Map

 BMP Pilot Site

 Not to Scale



TAB 2

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

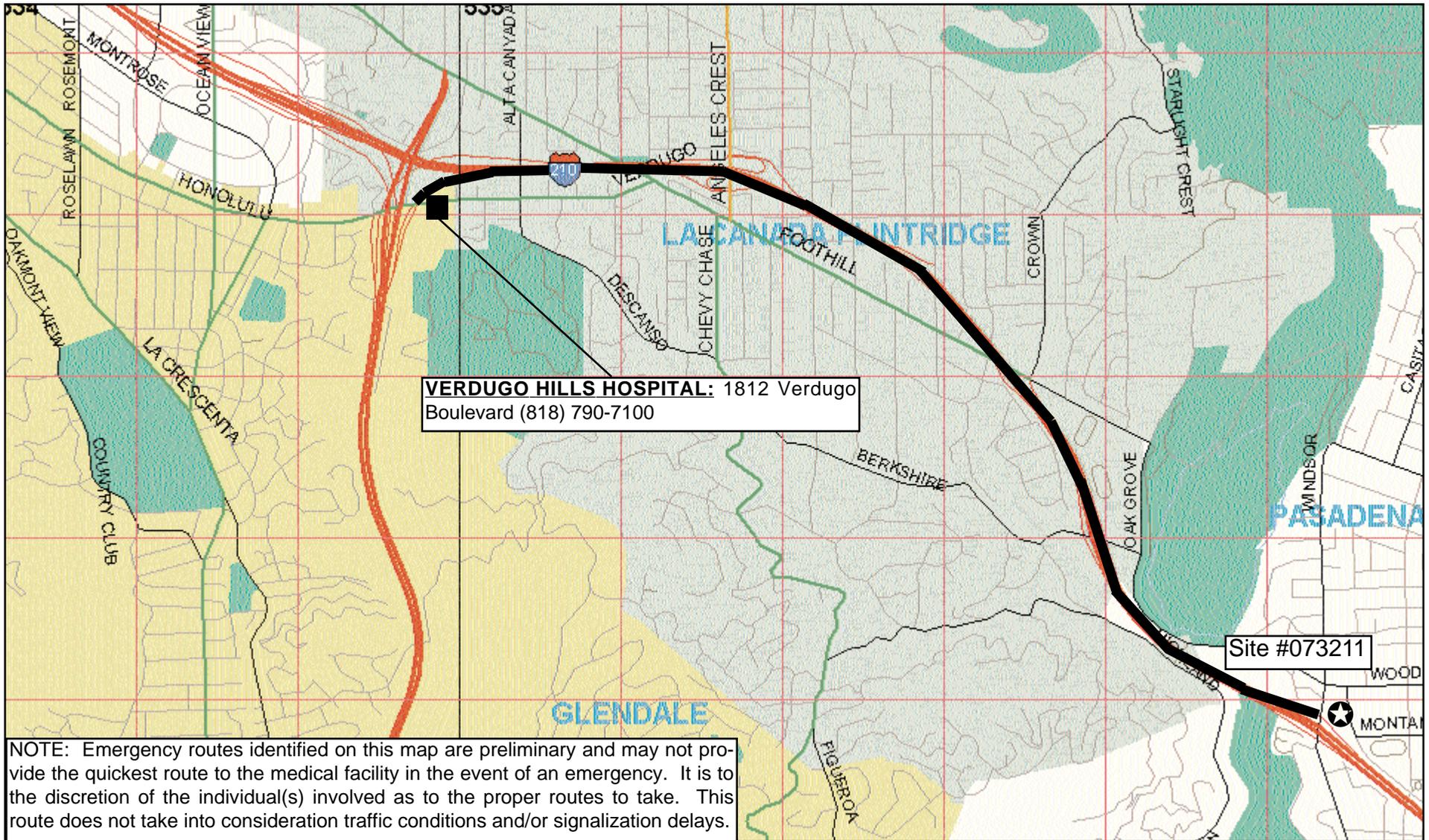
EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts List
Hospital Route Map
Project Contacts List**

Document all information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Site 073211: Altadena Maintenance Station Strip/IT

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	911	From landline phone
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Verdugo Hills Hospital	(818) 790-7100	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Al Salinas)	(805) 259 0172	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury



VERDUGO HILLS HOSPITAL: 1812 Verdugo Boulevard (818) 790-7100

Site #073211

NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Altadena Maintenance Station
Hospital Route Map

 BMP Pilot Site

 Not to Scale


 Potential Emergency Route

Project Contacts List

Name	Organization	Phone	Fax Mobile	Email
Bill Whittenberg	RBF and Associates	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Robert Wu	Caltrans District 7 Program Manager	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Ed Othmer	LAWCRANDALL Task Order Manager	(858) 278-3600 Pg (858) 650-2159	(858) 278-5300-f	eothmer@lawco.com
Byron Berger	LAWCRANDALL Field Manager	(714) 776-9544 - Anaheim (858) 278-3600 – San Diego Pg (858) 650-1958	(714) 776 9541 – Anaheim (858) 278-5300- San Diego	bberger@lawco.com
Bill O’Braitis	LAWCRANDALL	(323) 889-5300	(323) 721-6700-f	wobrait@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678-f	Peter_vanriper@dot.ca.gov
Donald Kaiser	American Sigma, Inc.	(716) 798-5580	(716) 798-5599-f	sigma@americasigma.com
Internet	National Weather Service	(805) 988-6610	--	www.nwsla.noaa.gov
Tim Root	WeatherWatch, Chief Meteorologist	(619) 223-8163	(619) 223-4245-f	--
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Debbie Frank	MW Laboratories	(626) 568-6449	--	--
Jon Gildersleeve	Quanterra Laboratory	(916) 373 5600	(916) 371 2857	gilderslej@quanterra.com
Pat Brueckner	Pat-Chem Laboratories	(805) 532 0012	(805) 532 0016	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	(530) 753-6400		eanm@lawdavis.com
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(949) 365-0117-f	Geosrcr1@ix.netcom.com
Sal Duarte	United Pumping Service, Inc.	(818) 253 5250	(626) 961-3166-f	salduarte@aol.com



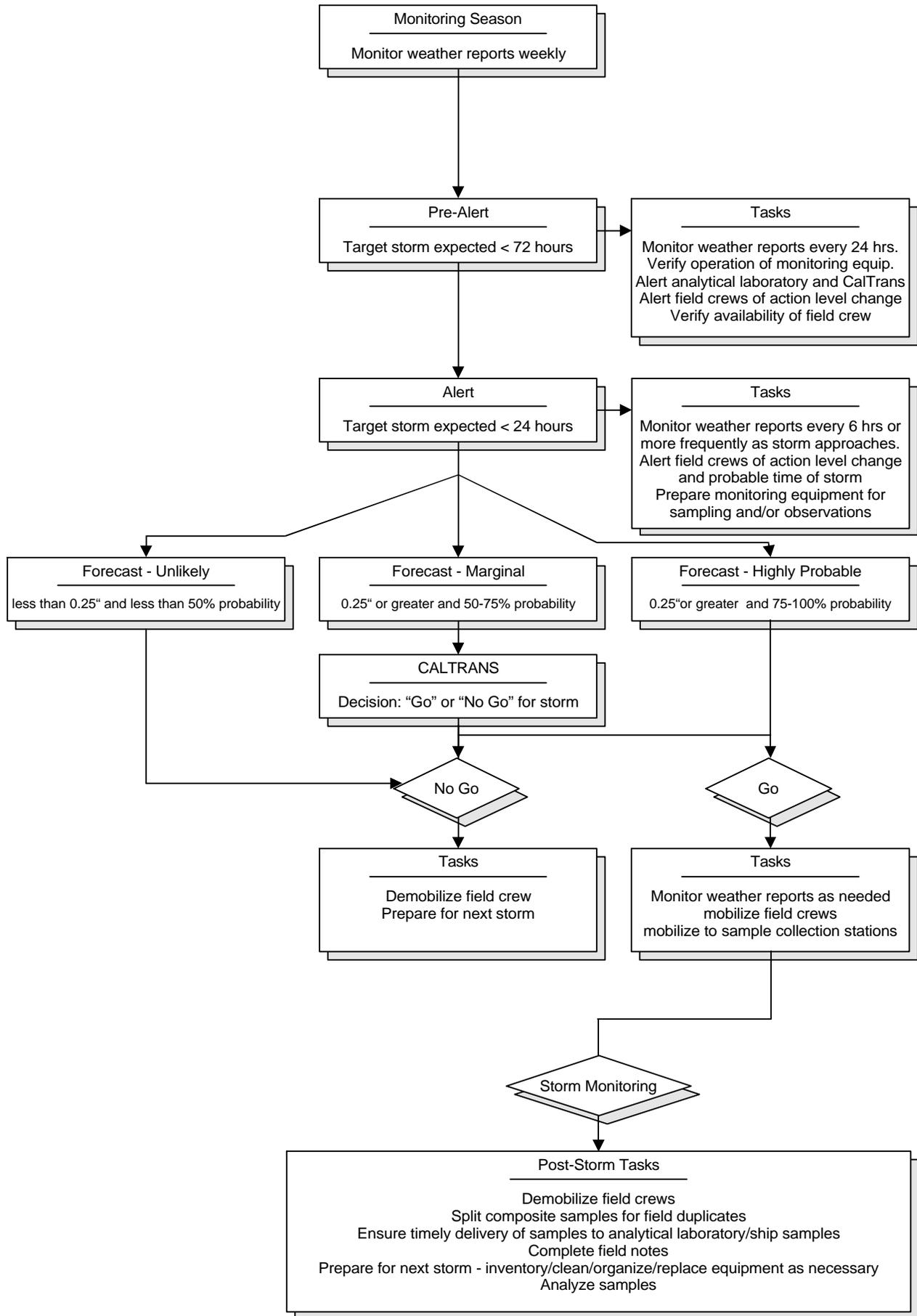
TAB 3

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A

Caltrans BMP Retrofit Pilot Program

Mobilization Checklist for a Strip/IT

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Phone card	Volume to sample matrix
	Vendor's autosampler manual

Storm Kit Equipment List

Electric vacuum pump	Electronic water level meter
Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Maps for all required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm Kit	Log books
Grab sample bottles (see below)	Paper towels
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
Coolers and ice (at least one extra)	Spare sample labels
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	4 1-gallon glass bottles
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Lab telephone number
for each QA/QC analysis	Backup lab contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

Form B: Storm Staffing Plan for a Strip/IT

Caltrans Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio

TAB 4

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

INSPECTION FORMS

Forms CA & CB: BMP Site Inspection Checklists
Forms DA & DB: Monitoring Equipment Inspection Checklists

FORM CA		
Caltrans BMP Retrofit Pilot Program		
BMP Site Inspection Checklist for Biofiltration Strip		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
SEDIMENT/EROSION CONTROL:		Maintenance Req'd?
Sediment depth (<i>if sediment is at or near plant height or could interfere with flow or operation, maintenance is required</i>):		? yes ? no
Sediment type and location:		
Standing water or other drainage problems?		? yes ? no
Comments:		
If yes, what is the depth of water?		
What is the extent of the water?		
Where is the location of the water?		
Evidence of erosion, channeling, or undercutting?		? yes ? no
Seeps?		? yes ? no
Embankment slumping or cracking?		? yes ? no
Comments:		
VEGETATION:		Maintenance Req'd?
Height of Strip vegetation (<i>maintenance required if height exceeds 10 inches</i>):		? yes ? no
Does vegetation cover all of the Strip's floor and/or slopes?		? yes ? no
If no, percentage coverage: (0% - 100%): _____		
Is native vegetation (including woody or wetland vegetation), weeds, leaves, or other organic debris present in the Strip or BMP maintenance area?		? yes ? no
If yes, what type:		? yes ? no
Does native vegetation, weeds, leaves, or other organic debris interfere with the operation of the Strip by (a) overgrowing the Strip vegetation, (b) interfering with the hydraulic resident time of the Strip, or (c) saturation of the bottom with dead or dying vegetation or (d) in another way?		? yes ? no
If so, explain:		

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ OF _____

FORM CA
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Biofiltration Strip (continued)

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

OVERALL:

Other concerns affecting operation:

Condition of facility: ? acceptable ? not acceptable

Comments:

Dates for maintenance to be completed by:

(Team Leader's Signature)

FORM CB		
Caltrans BMP Retrofit Pilot Program		
BMP Site Inspection Checklist for Infiltration Trench		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:		
Date of Last Rainfall:		
TRASH/DEBRIS CONTROL:		Maintenance Req'd?
Trench surface clear of trash/debris?	? yes ? no	? yes ? no
Inlet structure clear of trash/debris?	? yes ? no	? yes ? no
Overflow berm clear of trash/debris?	? yes ? no	? yes ? no
Comments:		
EROSION/INFRASTRUCTURE CONTROL:		Maintenance Req'd?
Evidence of erosion, seepage, slumping or cracking at inlet area, inlet structure, overflow berm, or filter/soil interface? ? yes ? no		? yes ? no
Is contributing drainage area stable? ? yes ? no		? yes ? no
Comments:		
STRUCTURAL:		Maintenance Req'd?
Fence/Gate? ? OK ? not OK ? not applicable		? yes ? no
Lock(s)? ? OK ? not OK ? not applicable		? yes ? no
Other general maintenance concerns/comments:		
ANIMAL CONCERNS:		Maintenance Req'd?
Evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)? ? yes ? no		? yes ? no
Comments:		
INFILTRATION TRENCH:		Maintenance Req'd?
Standing water in the trench? <i>(if it has been more than 72 hours since the last storm event, maintenance is required)</i> ? yes ? no		? yes ? no
If there is standing water,		
what is the water level? _____		
what is the color of the water? _____		
are there any floating materials? _____		
what is the turbidity? ? low ? moderate ? high		
are there any rodents, birds, reptiles, insects? _____		
Comments:		

FORM CB		
Caltrans BMP Retrofit Pilot Program		
<i>BMP Site Inspection Checklist for Infiltration Trench</i>		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:		
Date of Last Rainfall:		
TRASH/DEBRIS CONTROL:		Maintenance Req'd?
Trench surface clear of trash/debris?	? yes ? no	? yes ? no
Inlet structure clear of trash/debris?	? yes ? no	? yes ? no
Overflow berm clear of trash/debris?	? yes ? no	? yes ? no
Comments:		
EROSION/INFRASTRUCTURE CONTROL:		Maintenance Req'd?
Evidence of erosion, seepage, slumping or cracking at inlet area, inlet structure, overflow berm, or filter/soil interface?	? yes ? no	? yes ? no
Is contributing drainage area stable?	? yes ? no	? yes ? no
Comments:		
STRUCTURAL:		Maintenance Req'd?
Fence/Gate?	? OK ? not OK ? not applicable	? yes ? no
Lock(s)?	? OK ? not OK ? not applicable	? yes ? no
Other general maintenance concerns/comments:		
ANIMAL CONCERNS:		Maintenance Req'd?
Evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)?	? yes ? no	? yes ? no
Comments:		
INFILTRATION TRENCH:		Maintenance Req'd?
Standing water in the trench? <i>(if it has been more than 72 hours since the last storm event, maintenance is required)</i>	? yes ? no	? yes ? no
If there is standing water,		
what is the water level? _____		
what is the color of the water? _____		
are there any floating materials? _____		
what is the turbidity? ? low ? moderate ? high		
are there any rodents, birds, reptiles, insects? _____		
Comments:		

FORM CB	
Caltrans BMP Retrofit Pilot Program	
BMP Site Inspection Checklist for Infiltration Trench (continued)	
INFILTRATION TRENCH (cont.):	Maintenance Req'd?
Evidence of sediment in the stone aggregate? <i>(if sediment reaches the top of the trench, the sediment must be removed and the stone aggregate and top filter fabric washed and reinstalled)</i> <div style="text-align: right;">? yes ? no</div> If yes, what is its depth relative to the filter fabric (150 mm [0.50 feet] below the top of the trench? _____ Sediment type: Amount and location of sediment: Comments:	? yes ? no
Evidence of scouring or resuspension near inlet? ? yes ? no Comments:	? yes ? no
Does the stone aggregate appear clean? ? yes ? no If no, describe:	? yes ? no
Does the filter fabric appear to be clogged? ? yes ? no Comments:	? yes ? no
Any rips or tears in the filter fabric? ? yes ? no Comments:	? yes ? no
Any unpleasant odors? ? yes ? no Comments:	? yes ? no
AESTHETIC CONCERNS:	Maintenance Req'd?
Debris (non-trash)? ? yes ? no Type, amount and location:	? yes ? no
Trash? ? yes ? no Type, amount and location:	? yes ? no
Graffiti or vandalism? ? yes ? no Description and location:	? yes ? no
Theft? ? yes ? no Description and location:	? yes ? no
Vehicle accident? ? yes ? no Description and location:	? yes ? no
Other general aesthetic concerns:	

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ OF _____

FORM CB
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Infiltration Trench

NON-STORMWATER CONCERNS:

Non-storm water discharge to BMP ? yes ? no
 BMP wet from obvious non-stormwater discharge (no rain) ? yes ? no
 If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678
 From: _____ Contact Number: _____

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

OVERALL:

Other concerns affecting operation: _____
 Condition of facility: ? acceptable ? not acceptable
 Comments: _____
 Dates for maintenance to be completed by: _____

 (Team Leader's Signature)

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ OF _____

FORM DA		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Biofiltration Strip		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
SAMPLING AND FLOW MEASUREMENT EQUIPMENT:		Maintenance Required?
Is the monitoring station enclosure locked? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the automatic sampler online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the automatic sampler properly programmed and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the peristaltic pump tubing need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the intake tubing and/or connections need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the desiccant cartridge in the flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is internal modem online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the bubbler properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ OF _____

FORM DA
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Biofiltration Strip
(continued)

SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.):		Maintenance Required?			
Is the bubbler tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Is strainer clean and free of obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no			
INFLUENT SAMPLING LOCATION:		Maintenance Required?			
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Comments:					
EFFLUENT SAMPLING LOCATION:		Maintenance Required?			
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no			
Comments:					
PHOTOGRAPHS (mandatory if maintenance is required):					
Date	Time	Description	Direction Facing	Roll	Photograph No.
Dates for maintenance to be completed by:					

(Team Leader's Signature)

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ OF _____

FORM DB					
Caltrans BMP Retrofit Pilot Program					
Monitoring Equipment Inspection Checklist for Infiltration Trench					
GENERAL INFORMATION:					
Date:		Time In:		Time Out:	
Team Leader's Initials:			Stormwater Consultant:		
Location:					
Date of Last Rainfall:					
OBSERVATION WELL AND PRESSURE TRANSDUCER:					Maintenance Required?
Is the pressure transducer secured? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
Is there any sign of corrosion? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
Evidence of erosion, seepage, slumping or cracking of the concrete seal? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the pressure transducer online and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
LYSIMETER EQUIPMENT:					Maintenance Required?
Is the pressure transducer secured? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
Is there any sign of corrosion? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
Evidence of spalling or cracking of the concrete seal? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:					<input type="checkbox"/> yes <input type="checkbox"/> no
PHOTOGRAPHS (mandatory if maintenance is required):					
Date	Time	Description	Direction Facing	Roll	Photograph No.

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ OF _____

FORM DB Caltrans BMP Retrofit Pilot Program Monitoring Equipment Inspection Checklist for Infiltration Trench (continued)
OVERALL:
Other concerns affecting operation:
Condition of facility? <input type="checkbox"/> acceptable <input type="checkbox"/> not acceptable Comments:
Dates for maintenance to be completed by:

(Team Leader's Signature)



TAB 5

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MAINTENANCE FORMS

- Forms EA & EB: BMP Site Maintenance Activity Checklists**
- Forms FA & FB: Monitoring Equipment Maintenance Activity
Checklists**
- Form G: Stockpile/Sediment Sampling Checklist**
- Exhibit 5.1: CCR Title 22 Characterization Requirements**

FORM EA
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Biofiltration Strip

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		

SEDIMENT/EROSION CONTROL:

<input type="checkbox"/> <i>Sediment removal from level spreader and strip</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Clean orifices, and/or cracks in stormwater conveyance system</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Erosion repair (including vegetative stabilization) or stabilization of drainage area</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Embankment/slope repair(s)</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:

VEGETATION:

<input type="checkbox"/> <i>Strip vegetation mowing/trimming and removal of cuttings</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Replant Strip vegetation</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Weed control</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:

FORM EA			
Caltrans BMP Retrofit Pilot Program			
BMP Site Maintenance Activity Checklist for Biofiltration Strip (continued)			
VEGETATION (cont.):			
<input type="checkbox"/> <i>Leaf collection and removal of dead/rotting vegetation</i>			
Start time:	End time:	Total time:	
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:			
Comments:			
STRUCTURAL:			
<input type="checkbox"/> <i>Structural repairs (describe):</i>			
Start time:	End time:	Total time:	
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:			
Comments:			
ANIMAL CONCERNS:			
<input type="checkbox"/> <i>Burrow control</i>			
Start time:	End time:	Total time:	
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:			
Comments:			
AESTHETIC CONCERNS:			
<input type="checkbox"/> <i>Debris and trash removal</i>			
Start time:	End time:	Total time:	
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:			
Comments:			

FORM EA Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Biofiltration Strip (continued)	
AESTHETIC CONCERNS (cont.):	
<input type="checkbox"/> <i>Graffiti removal or replacement of vandalized or stolen parts</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Painting</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FORM EB
BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Infiltration Trench

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Signature:		Stormwater Consultant:
Location:		

EROSION/INFRASTRUCTURE/STRUCTURAL CONTROL:

Erosion/infrastructure repair
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Fence/gate/lock replacement or repair
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

ANIMAL CONCERNS:

Describe:
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

INFILTRATION TRENCH:

Removal of standing water
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Removal of top layer of stone aggregate
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of top layer of stone aggregate and/or filter fabric
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

FORM EB Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Infiltration Trench (continued)			
INFILTRATION TRENCHES (cont.)			
<input type="checkbox"/> <i>Removal of sediment from top layer</i>			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Removal of filter fabric (the layer at 150 mm [0.50 feet])</i>			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Replacement of filter fabric (the layer at 150 mm [0.50 feet])</i>			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
AESTHETIC CONCERNS:			
<input type="checkbox"/> <i>Debris and trash removal</i>			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Graffiti removal or replacement of vandalized or stolen equipment</i>			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			

FORM EB Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Infiltration Trench (continued)	
AESTHETIC CONCERNS (cont.):	
<input type="checkbox"/> Painting Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FORM FA		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Maintenance Activity Checklist for Biofiltration Strip		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		
<input type="checkbox"/> <i>Clean H-flumes, orifices, and/or cracks</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Diagnostic test of automatic sampler</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of peristaltic pump tubing</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of bubbler tubing, pump tubing, or intake tubing</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of strainer</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of 12-volt marine battery</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Removal of kinks or obstructions from bubbler tubing</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of desiccant cartridge in flow meter</i>		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		

FORM FA Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Biofiltration Strip (continued)	
<input type="checkbox"/> <i>Other maintenance of automatic sampling equipment (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other maintenance/calibration of flow measurement equipment (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FORM FB		
BMP Retrofit Pilot Program		
Monitoring Equipment Maintenance Activity Checklist for Infiltration Trench		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Signature:		Stormwater Consultant:
Location:		
LYSIMETER:		
<input type="checkbox"/> Repair/replacement of metal cap or lock		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Repair of casing		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Repair of concrete seal		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Other (describe):		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
OBSERVATION WELL AND PRESSURE TRANSDUCER:		
<input type="checkbox"/> Repair/replacement of metal cap or lock		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Repair of casing		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Repair of concrete seal		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		

FORM FB BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Infiltration Trench (continued)	
OBSERVATION WELL AND PRESSURE TRANSDUCER (cont.):	
<input type="checkbox"/> Calibration and diagnostic test of data logger	
Start time: _____	End time: _____
Total time: _____	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used: _____	
Comments: _____	
<input type="checkbox"/> Other (describe):	
Start time: _____	End time: _____
Total time: _____	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used: _____	
Comments: _____	
_____ (Team Leader's Signature)	General Comments:

FORM G			
Caltrans BMP Retrofit Pilot Program			
Stockpile/Sediment Sampling Checklist			
GENERAL INFORMATION:			
Date:	Time In:	Team Leader's Initials:	Time Out:
Location:			
SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:			
Depth of sediment:			
Color:	<input type="checkbox"/> black	<input type="checkbox"/> brown	<input type="checkbox"/> green <input type="checkbox"/> tan <input type="checkbox"/> other
Consistency:	<input type="checkbox"/> sandy	<input type="checkbox"/> silty	<input type="checkbox"/> granular <input type="checkbox"/> other
Odors:	<input type="checkbox"/> petroleum	<input type="checkbox"/> solvents	<input type="checkbox"/> organic (rotten eggs) <input type="checkbox"/> sewage
	<input type="checkbox"/> none	<input type="checkbox"/> other	
Depth of sediment:			
SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST			
Powder Free Nitrile Gloves			
Soil Probe or equivalent for sample collection			
Labeled 8-ounce glass jars			
Plastic bags, seal bags			
Chilled cooler			
Chain-of-Custody form			
Log book for record keeping			
STOCKPILE/DRUMMED SEDIMENT:			Maintenance Required?
Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.			<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.			<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.			<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.			<input type="checkbox"/> yes <input type="checkbox"/> no
SEDIMENT COLLECTION:			
<10 cubic yards:			
<i>Minimum of 2 samples, one randomly from each half of the soil mass</i>			
10-20 cubic yards:			
<i>Minimum of 3 samples, one randomly from each third of the soil mass</i>			
20-100 cubic yards:			
<i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>			
100-500 cubic yards:			
<i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>			
Over 500 cubic yards:			<i>Contact Dept. of Environmental Health for Guidance</i>
<i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>			

Exhibit 5.1: CCR Title 22 Characterization Requirements

Sediment Matrix (Disposal) Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Parameter	Method	Units	Reporting Limit	Maximum Holding Time	Preservation	Container Size/Type ⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) *California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.*
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.
- (5) “Test Methods for Evaluating Solid Waste, Physical /Chemical Methods”. SW-846, Update III.(SW-846)



TAB 6

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for Storm
Events**

Form I: Field Data Log Sheet

Form J1: User-Entered Program Parameters (Influent/Control)

Form J2: User-Entered Program Parameters (Effluent)

Form K: Station Phone Log

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Strip/Infiltration Trench**

GENERAL INFORMATION:

Date:	Time :
Team leader's initial:	Stormwater consultant:
Other personnel:	Location of facility:
Site ID:	

METEOROLOGICAL CHARACTERISTICS:

Time since end of previous storm event visit: > 72 hours 48-72 hours 24-48 hours < 24 hours

Present rainfall: None Mist Drizzle Sprinkle Light, Steady
 Moderate Heavy

Time present rain event started: _____

Wind speed: 0-5 mph (light) 5-10 mph (moderate) 10-15 mph (brisk) >15 mph (strong)

Cloud cover: ____%

Distribution of Rainfall: Uniform Localized cells Scattered showers

Meteorological characteristics comments:

HYDROLOGIC AND HYDRAULIC CHARACTERISTICS for Biofiltration Strip:

Flow conditions (check all that apply): Runoff entering facility
 Flow distributed uniformly throughout Biofiltration Strip
 Flow not uniformly distributed throughout Biofiltration Strip

If flow is not uniformly distributed throughout the Biofiltration Strip, describe distribution (e.g., where concentrated, where channelized, approximate dimensions and depths of concentrations and/or channel):

Flow conditions continued (check all that apply):
 Water flowing through Biofiltration Strip at a perceptible velocity
 Facility discharging
 Flow bypassing facility
 Flow overtopping facility

Comments:

Standing water conditions (*record measurements as appropriate*):

Water standing over entire Biofiltration Strip. Depth: _____
 Water standing in one isolated pool. Describe Location: _____
Depth: _____
 Water standing in multiple pools: Describe Locations: _____
Depths: _____

Comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Strip/Infiltration Trench (continued)**

HYDROLOGIC AND HYDRAULIC CHARACTERISTICS for Infiltration Trench:

Flow conditions (check all that apply): Runoff entering facility
 Flow bypassing facility
 Effluent from Biofiltration Strip is surfacing in IT instead of infiltrating

If flow is not uniformly distributed throughout the Biofiltration Strip, describe distribution (e.g., where concentrated, where channelized, approximate dimensions and depths of concentrations and/or channel):

Standing water conditions (*record measurements as appropriate*):

Water standing in observation well. Depth: _____
 Water standing over the top of the infiltration medium. Depth: _____

Comments:

INLET CONDITIONS for Biofiltration Strip:

Describe flow distribution where flow enters vegetated treatment zone:

Flow is uniformly distributed across full width of the Biofiltration Strip.
 Flow is not uniformly distributed across full width of the Biofiltration Strip.

Explain:

Describe any erosion being caused by the flow upstream or at the entrance to the Biofiltration Strip:

Describe any obstructions or restrictions interfering with inflow/influent:

INLET CONDITIONS for Infiltration Trench:

Describe any erosion being caused by the flow upstream or at the entrance to the infiltration medium:

Describe any obstructions or restrictions interfering with inflow/influent:

INLET WATER QUALITY APPEARANCE for Biofiltration Strip:

Check all that apply and describe under comments.

Odor:

Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

Sheen Heavy floating concentration Emulsion Deposit None

Color:

Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Strip/Infiltration Trench (continued)**

WATER QUALITY APPEARANCE for Biofiltration Strip (cont.):

Check all that apply and describe under comments.

Water quality appearance comments:

INLET WATER QUALITY APPEARANCE for Infiltration Trench:

Check all that apply and describe under comments.

Odor:

Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

Sheen Heavy floating concentration Emulsion Deposit None

Color:

Colorless Red Orange Yellow Green Blue Violet Brown Black

Gray White Other: _____

Turbidity

None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

SOLIDS DEPOSITION AND RESUSPENSION for Biofiltration Strip:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Over entire Biofiltration Strip: _____

In one spot: _____

In multiple spots: _____

In outflow/effluent channel: _____

Solids resuspension evident (*check all that apply*):

In inflow/influent channel Near inlet Near outlet In outflow/effluent channel

Other (describe): _____

Solids deposition and resuspension comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Strip/Infiltration Trench (continued)**

SOLIDS DEPOSITION AND RESUSPENSION *for Infiltration Trench:*

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

Over entire IT surface: _____

In one surface spot: _____

In multiple spots: _____

In observation well: _____

Filter fabric: _____

Solids resuspension evident (*check all that apply*):

Upstream of IT Where flow enters IT From IT surface

Other (describe): _____

Solids deposition and resuspension comments:

EROSION *for Biofiltration Strip only:*

For the following locations, record erosion locations, area(s) covered, and depth(s), as applicable:

Near flow entrance _____

Biofiltration Strip slope _____

Near flow discharge: _____

In outflow/effluent channel: _____

Erosion comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Strip/Infiltration Trench (continued)**

VEGETATION CONDITION *for Biofiltration Strip only:*

Biofiltration Strip vegetation cover:

- Complete Few small bare spots Few large bare spots Many small bare spots
 Many large bare spots Large areas bare All or nearly bare

Biofiltration Strip vegetation type:

- All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses
 All wetland plants

Extent of woody shrubs or trees: _____

Vegetation condition comments:

INFILTRATION MEDIUM CONDITION *for Infiltration Trench only:*

Describe any indications that the infiltration medium is clogging or that the infiltration rate is otherwise being reduced:

OUTLET CONDITIONS *for Biofiltration Strip:*

Describe any obstructions or restrictions interfering with outflow/effluent:

OVERFLOW CONDITIONS *for Infiltration Trench:*

Is the IT overflowing?

- Yes No

If yes, explain:

VECTORS *for Biofiltration Strip:*

Presence of vectors: Yes No

If yes, what type: Mosquitoes Blackfly Cockroaches Rats

Other _____

Comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM H

**Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Strip/Infiltration Trench (continued)**

STRUCTURAL CONDITION OF *Biofiltration Strip*:

Record the presence of the following (*check all that apply and give location in comments*):

Inlet structure damage Outlet structure damage Vandalism

Comments:

STRUCTURAL CONDITION OF *Infiltration Trench*:

Record the presence of the following (*check all that apply and give location in comments*):

Inlet structure damage Overflow structure damage Vandalism

Comments:

MONITORING EQUIPMENT CONDITIONS for the Site:

Equipment functional: Yes No N/A

Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: _____

Comments:

Date: _____

Comments:

Date: _____

Comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM I		
Caltrans BMP Retrofit Pilot Program		
Field Data Log Sheet for Strip/IT		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:		
BMP Type:		
Storm Event Visit or Maintenance Visit (circle one)		
<i>Use Facility Inspection Logs and Empirical Observation Field Data Sheets to record observations. These logs <u>must</u> be filled out during all station visits.</i>		
STRIP SYSTEM STATUS FLAGS (*6-AD; 1=high, 0=low)		PROGRAM SIGNATURE (*6-100)
Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Arr:	
Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Dep:	
STRIP DATA LOGGER INFORMATION (*6)		
All Site Visits: Stage (ft) 02: Staff Gauge Velocity (ft/s) 03: Q (cfs) 04: Station ID 21:	Storm Site Visits: Volume (kcf) 05: Strm Sum (kcf) 06: Percent Capture 08: Volume2Sample 14: Sample Count 17:	MaxFlow (day) 51: MaxFlow (time) 52: MaxFlow Q 53: Total Rain (in) 66: Total Strm Vol. 72: Strm Vol Smpld 75:
12-volt marine battery (for sampler) voltage:	12-volt marine battery (for cell phone) voltage:	internal sampler voltage:
STRIP AUTOSAMPLER INFORMATION (Storm only)		Bottle # in:
Sample ____ of 72 after 1 pulse	Bottle # out:	Bottle Volume: Volume2Sampl:
STRIP WATER QUALITY (Storm only)		
Time of Manual Grab Samples:		
TPH:		
Bacteria:		
Other Grabs or Measurements _____		
SAMPLING EQUIPMENT AND REPAIR NEEDS:		

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ OF _____

FORM I

**Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet for Strip/IT (continued)**

INFILTRATION TRENCH LEVEL EQUIPMENT DATA LOGGER INFORMATION

SYSTEM STATUS FLAGS (*6-AD; 1=high, 0=low)

PROGRAM SIGNATURE (*6-100)

Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____

Arr:

Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____

Dep:

INFILTRATION TRENCH DATA LOGGER INFORMATION (*6)

Stage (ft) _____

Station ID _____

Total Rain (in) _____

Staff Gauge _____

Battery Voltage _____

Basin Level (ft) _____

Level Meter Batt. _____

15 min. Change in Basin

Cell Equip. Batt _____

Level _____

Previous 1-Hour Basin ____

Max. Stage (ft) _____

INFILTRATION TRENCH WATER LEVEL EQUIPMENT REPAIR NEEDS:

ACTION TAKEN:

Storage Module Data Dump: Start ____ End ____

(Team Leader's Signature)

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:

Time:

01 Station ID				
03 Volume to sample (kcf)				
04 Level Meter Stage Offset (feet)				
05 Level Meter Multiplier (feet/mv)				
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)				
09 Minimum Stage Threshold (feet)				
10 Storm Stage Trigger Level (feet)				
11 Storm End Factor (times storm trigger stage)				
12 No. of Seq. Trans. Failures Before Raising Flag 6				
13 Time (min.) to wait after 1 st set of trans. Failures				
14 No. samples of depth taken for avg. 1 prog. exe.				
15 No. samples of speed taken for avg. 1 prog. exe.				
17 Amount of rain per bucket tip (inches)				
18 Amt. rain samp. before rain data recorded (in.)				
19 Number of samples collected until bottle is full				
20 No. of times Flag 7 goes high before var. reset				
23 Data avg. int. (min.) when storm conditions exist				
24 Data avg. int. (min.) storm conditions don't exist				
30				
31				
34 Flume Parameter 1				
35 Flume Parameter 2				
36 Cellular phone battery state control parameter				
37 Duration when cellular phone battery is on				
38 Period of cellular phone battery state control				
Program Signature (*B)				

*Subject to Revisions



TAB 7

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Example Chain-of-Custody Form
Exhibits 7.1A and 7.1B**

FORM M: Example CHAIN-OF-CUSTODY FORM

Laboratory: <div style="text-align: right; margin-right: 20px;"> Lab # Date Rec'd </div>	From:
---	--------------

Project: P.O.#:	Project #: Required Completion Date:
---------------------------	--

Sample ID #	Site ID #	Lab ID #	Matrix/ Analysis	Containers	Pres.	Sample Date/Time	Condition Upon Receipt

Data Reports **WILL** include the following: Sample/Site ID, Analytical Method, Reporting Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.

Special Instructions/Comments:

Relinquished By: Date/Time	Transporter	Received By: Date/Time
Relinquished By: Date/Time	Transporter	Received By: Date/Time
Relinquished By: Date/Time	Transporter	Received By: Date/Time

**Exhibit 7.1a: Chemical Analyses List for Stormwater
Stormwater Matrix**

Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/ Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/ Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics⁶									
Total Petroleum Hydrocarbons – Diesel/Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Bacteria⁶									
Fecal Coliform	Grab	2	MPN/100 mL	Multiple-tube	SM 9221E	6 hours ⁷	50 mL	1-100 mL plastic	4°C

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification.
6. Total Petroleum Hydrocarbon and Fecal Coliform grab samples will be collected for two storms per year.
7. Attempts will be made to maintain the 6-hour holding time for bacteria samples to the extent possible. When not possible, a maximum holding time of 24 hours will be followed in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th Edition.

Exhibit 7.1b: Chemical Analyses for Vadose Zone Pore Liquid

Groundwater Matrix (Vadose Zone)

Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Preferred Volume and Container Type⁽¹⁾	Preservation
<i>Dissolved Metals⁽²⁾</i>								
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	1 100 mL plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	1 100 mL plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	1 100 mL plastic	4°C and HNO ₃ to pH<2 and filter

1. Analytes with the same preservative can be combined into a single container, if the same laboratory is performing the analyses.
2. Dissolved metals will be filtered in the laboratory prior to acidification



TAB 8

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related
Maintenance Activity Checklist for Affected BMP
Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform monitoring.



TAB 9

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

Exhibit 9.1: Runoff Coefficients for a Strip/IT

Exhibit 9.2: “Volume-to-Sample” Table

Exhibit 9.3: Encroachment Permits

Exhibit 9.1
Runoff Coefficient Matrix Table for Biofiltration Strip/Infiltration Trench

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
073211	Altadena Maintenance Station	1.66	0.95

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073211: Altadena Maintenance Station (Biofiltration Strip)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	1.66	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	16	2.6	413
0.2	32	2.7	429
0.3	48	2.8	445
0.4	64	2.9	461
0.5	80	3.0	477
0.6	95	3.1	493
0.7	111	3.2	509
0.8	127	3.3	525
0.9	143	3.4	541
1.0	159	3.5	557
1.1	175	3.6	572
1.2	191	3.7	588
1.3	207	3.8	604
1.4	223	3.9	620
1.5	239	4.0	636
1.6	254	4.1	652
1.7	270	4.2	668
1.8	286	4.3	684
1.9	302	4.4	700
2.0	318	4.5	716
2.1	334	4.6	731
2.2	350	4.7	747
2.3	366	4.8	763
2.4	382	4.9	779
2.5	398	5.0	795

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE,
AND MONITORING PLAN
VOLUME II

BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
BIOFILTRATION SWALES AND STRIPS



DISTRICT 7, LOS ANGELES

September 1999



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APPENDIX II: HEALTH AND SAFETY PLAN

APPENDIX III: QUALITY ASSURANCE/QUALITY CONTROL PLAN

APPENDIX IV: VECTOR CONTROL PLAN

APPENDIX V: MAINTENANCE INDICATOR DOCUMENT



1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel the appropriate field evaluation and documentation for the District 7 Biofiltration Swales and Strips (Swales/Strips) belonging to the Caltrans BMP Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-E of this guidance document for supporting information on Swale/Strip technology and characteristics. If needed, further background information is supplied in the Volume I of the Operations Maintenance & Monitoring Plan (OMM), which provides program-specific requirements and procedures.

1.1 Data to Be Collected

The following data will be collected to assess the performance and maintenance aspects of a Swale/Strip:

- Water quality and quantity data of runoff into and discharge from the Swale/Strip from flow-composite samples and first-flush (as soon as possible after the start of runoff) grab samples for at least eight storm events, weather permitting.
- Rainfall data, recorded as a function of time, from rainfall events during the study period.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring data.
- Records of vector control measures taken.
- Vegetation management records.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to Be Performed

Field activities that will be performed at the Swale/Strip facilities include:

- Empirical Observation of Biofiltration Swale/Strip Operation.
- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Facility Maintenance Inspections and Facility Maintenance.
- Vector and Nuisance Animal Control Inspections.



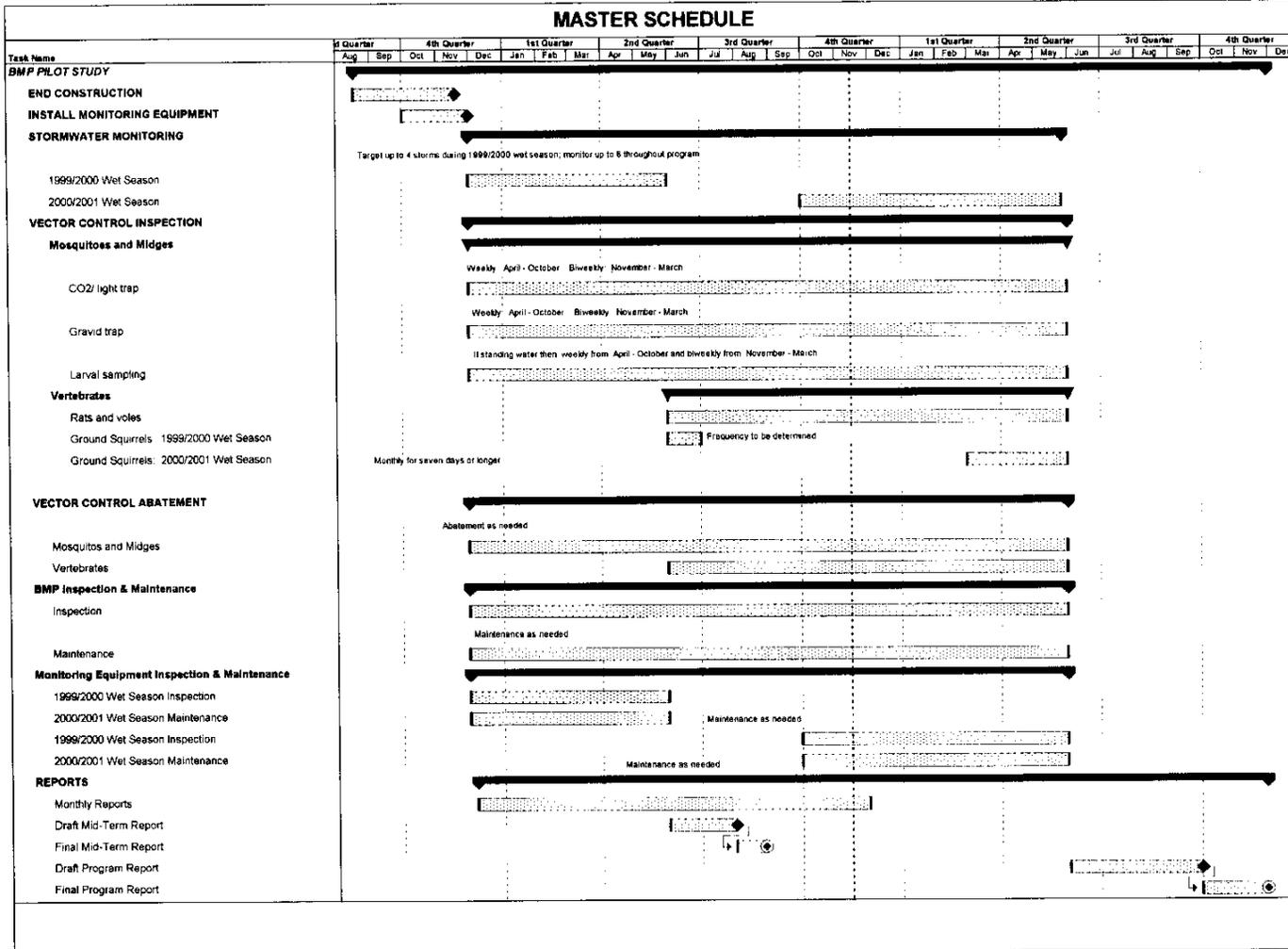
- Vegetation Control.
- Stormwater Monitoring.

Also, vector management may occur at the Swale/Strip facilities, but may be contingent on facility housekeeping and other environmental influences. Please see Appendix IV of Volume II for further details.

1.3 Master Schedule

The schedule on the following page shows the time-line for each phase of the Swale/Strip OMM program.

MASTER SCHEDULE





2.0 SITE INFORMATION

Access requirements for each site are summarized in Table 2.1, in the Encroachment Permit found in Tab 9, and in the Site Location Maps in Tab 1. ***Encroachment Permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed.***

Check in with appropriate Caltrans personnel before conducting field work.

**Table 2.1
 Caltrans District 7 Biofiltration Swales/Strips Site Summary**

Site No.	Site Name	Site Location	Access and Parking
073222a	I-605/SR-91 Interchange (Biofiltration Strip)	East of the I-605 northbound, the SR-91 westbound/I-605 southbound connector, and the I-605 northbound/SR-91 westbound connector in the City of Cerritos (I-605 PM 5.08).	Access to the Biofiltration Strip is from I-605 northbound/SR-91 westbound connector. Vehicles will be parked in the pullout area on the I-605 northbound/SR-91 westbound connector adjacent to the Biofiltration Strip.
073222b	I-605/SR-91 Interchange (Biofiltration Swale)	East of the I-605 northbound, the SR-91 westbound/I-605 southbound connector, and the I-605 northbound/SR-91 westbound connector in the City of Cerritos (I-605 PM 5.08).	Access to the Biofiltration Swale is from I-605 northbound/SR-91 westbound connector. Vehicles will be parked in the pullout area on the I-605 northbound/SR-91 westbound connector adjacent to the Biofiltration Strip.



Table 2.1 (continued)
Biofiltration Swales/Strips Site Summary

Site No.	Site Name	Site Location	Access and Parking
073223	Cerritos Maintenance Station (Biofiltration Swale)	On the southern side of the Cerritos Maintenance Station located at 16849 Studebaker Road in the City of Cerritos (SR-91 PM 17.06). The Biofiltration Swale is located at the foot of the SR-91 westbound slope.	Access to the maintenance station is through the main gate located on Studebaker Road. Inside the maintenance station compound, access to the Biofiltration Swale is through the gate along the southern side of the station. Vehicles will be parked in designated parking areas and will not impede maintenance station activities.
073224	I-5/I-605 (Biofiltration Swale)	At the intersection of the I-5 southbound and the I-5 connector to the I-605 (southbound) in the City of Downey (I-5 PM 6.95).	Access to the Biofiltration Swale is from I-5 southbound. Vehicles will be parked in the pullout area on the I-5 southbound adjacent to the Biofiltration Swale.
073225	I-605/Del Amo Avenue (Biofiltration Swale)	Along the I-605 northbound between Del Amo Boulevard and Carson Street (I-605 PM 1.98)	Access to the Biofiltration Swale is from I-605 northbound. Vehicles will be parked in the pullout area on the I-605 northbound just south of the Biofiltration Swale.

2.1 Biofiltration Swales and Strips

Refer to the accompanying Appendix for a general description of Swales/Strips. The sections below provide site-specific information for each Swale/Strip in District 7.



2.1.1 Sites 073222a (Strip) and 073222b (Swale): I-605/SR-91 Interchange

A Strip and Swale are located in an open area of the I-605/SR-91 Interchange. The Strip treats runoff from the northbound lanes of I-605. The Swale treats runoff from the Westbound SR-91/Southbound I-605 connector road.

The Strip is 8 meters wide and 60 meters long, with a slope of 4%. There are two overside drains located along the I-605 in this area. Flow from the adjacent roadway flows over the 8-meter-wide portion of the Strip. The Strip is designed to treat the runoff that is captured by the southern overside drain only. The runoff from the northern overside drain is not routed to the Strip for two reasons. First, it is used as a control location to monitor untreated stormwater runoff of similar quality and flow rate as that treated by the Strip. This will provide a mechanism for determining the effectiveness of the Strip. Secondly, the runoff would have to be artificially spread across the strip to achieve sheet flow since the drain is located at the northern end of the strip. An H-flume is placed in the transition structure from the northern overside drain to measure untreated flow (control location). Flow from the Strip is collected in a concrete collector ditch and measured by an inline H-flume before being discharged to the ground, where it flows to a concrete culvert.

The tributary drainage area for the Strip is 1,896 m² and the tributary area for the control location is 1,816 m². The 1-year, 24-hour peak flow is 0.004 m³/s. The flow velocity through the Strip for the 1-year, 24-hour storm event is 0.02 m/s with a hydraulic residence time of 6.7 minutes.

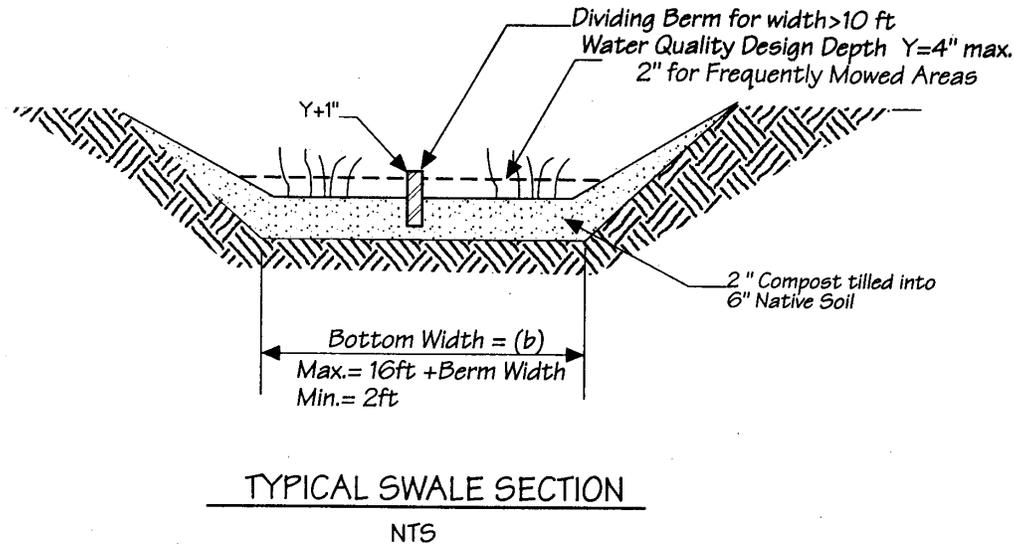
The Swale is 1.5 meter wide and 40 meters in length with a slope of 2.0%. H-flumes are installed in the upstream and downstream transition structures of the Swale and will be utilized to measure flow rates.

Runoff from Westbound SR-91/Southbound I-605 Connector road is diverted to a downdrain and then to an energy dissipater. Flow from the energy dissipater is discharged to a flume-to-swale transition structure, where the runoff is spread evenly over the width of the Swale entrance. As runoff flows through the H-flume at the downstream end of the Swale, it is discharged to the ground, where it flows to a concrete culvert.

The tributary area of the site is 850 m². The peak flow for the 1-year, 24-hour event is 0.002 m³/s. The flow velocity through the Swale for the 1-year, 24-hour storm event is 0.018 m/s with a hydraulic residence time of 38 minutes.

Please see the Site Location Map and BMP Facility Plan in Tab 1.

Figure 2.1 Cross-section of a Biofiltration Swale



2.1.2 Site 073223: Cerritos Maintenance Station (Biofiltration Swale)

A Swale on the south side of the Cerritos Maintenance Station treats runoff from the westbound lanes of the SR-91. The Swale is 1.5 meters wide and 20 meters in length with a slope of 2.1%. H-flumes are installed in the upstream and downstream transition structures of the Swale and will be utilized to measure flow rates.

Runoff from the SR-91 is captured along the shoulder of the roadway by a drain inlet and is discharged at the bottom of an embankment through a corrugated metal pipe. An energy dissipater is located at the upstream end of the Swale where the runoff exits the pipe in the embankment. Discharge from the Swale combines with runoff from: (1) the Cerritos Maintenance Station, and (2) runoff from the embankment located behind the maintenance station (from the Northbound I-605/Westbound SR-91 connector). This combined runoff discharges through a headwall and into the cloverleaf connector, which is the site for an infiltration basin.

The tributary drainage area is 2,318 m². The peak flow for the 1-year, 24-hour event is 0.005 m³/s. The residence time of the Swale is estimated at 4.5 minutes, under the recommended residence time of 9 minutes.

Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.1.3 Site 073224: I-5/I-605 (Biofiltration Swale)

A Swale is located immediately south of the Southbound I-5/Southbound I-605 connector in an open area. The Swale is 1 meter wide and 35 meters in length with a slope of 2.0%.



H-flumes are installed in the upstream and downstream transition structures of the Swale and will be utilized to measure flow rates.

Runoff from I-5 flows along an asphalt-concrete dike, then down an overside drain. Discharge from the overside drain flows through an energy dissipater located at the upstream end of the flume-to-swale transition structure where the runoff is spread evenly over the width of the Swale entrance. As runoff flows through the H-flume at the downstream end of the Swale, it is discharged to the ground, where it flows into a concrete drain located at the low point in the open area.

The tributary area of the site is 2,635 m². The peak flow for the 1-year, 24-hour event is 0.007 m³/s. The flow velocity through the Swale for the 1-year, 24-hour storm event is 0.046 m/s with a hydraulic residence time of 13 minutes.

Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.1.4 Site 073225: I-605/Del Amo Avenue (Biofiltration Swale)

A Swale is located along the shoulder of the Northbound I-605 between Carson Street and Del Amo Boulevard. The Swale is 1 meter wide and 35 meters in length with a slope of 2.0%. H-flumes are installed in the upstream and downstream transition structures of the Swale and will be utilized to measure flow rates.

Runoff from between the Carson Street and Del Amo Boulevard offramps is discharged through a series of down drains (located approximately 1.5 km apart from one another) to a 10-meter wide embankment, which is bounded by a sound wall. A down drain located north of the Centralia Street bridge and approximately 90 meters north of a concrete drain directs flow to a flume-to-swale transition structure, where the runoff is spread evenly over the width of the Swale entrance. As runoff flows through the H-flume at the downstream end of the Swale, it is discharged to the ground, where it flows into a concrete drain. The Swale is placed near the roadway shoulder and away from the sound wall to allow upstream runoff to bypass it.

The tributary area of the site is 2,115 m². The peak flow for the 1-year, 24-hour event is 0.005 m³/s. The flow velocity through the Swale for the 1-year, 24-hour storm event is 0.064 m/s with a hydraulic residence time of 9 minutes.

Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.2 Emergency Hospital Routes

See the “**Emergency Procedures Support**”, **Tab 2**, for maps and descriptions showing routes to the nearest hospitals and for emergency and site-related telephone contacts.



2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at Swales/Strips, field crews will consist of a minimum of two people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Activities at Swales/Strips bring up traffic concerns including access and parking at pullouts. During access and routine visits to the facilities, the following precautions will be taken:

- Minimize the time spent on the shoulder of the highway.
- Park on the facility access road or pullout, as appropriate to the specific site.
- Affiliated personnel shall wear a reflective orange safety vest, a hard hat, and appropriate shoes.
- Rotating amber lights shall be mounted and operational on work vehicles.

According to Chapter 8 (Protection of Workers) of the *Caltrans Maintenance Manual*, working for more than 10 minutes on the shoulder involves a shoulder closure procedure. This shoulder closure procedure will conform to the safety precautions below and the site-specific instruction provided in the Encroachment Permits (Exhibit 9.3 of Tab 9).

- Prior to beginning any work on or adjacent to a major roadway, the local highway patrol traffic control department shall be notified. See the Emergency Contacts List in Tab 2 for a listing of the local highway patrol phone numbers.
- Whenever possible, plan the timing of the work for non-peak traffic congestion periods if long-term parking on the shoulder is required.
- Use enough cones and barricades to sufficiently divert traffic safely around the work area (adhere to specific shoulder closure requirements detailed in the Encroachment Permits).
- Any open manhole or ditch must be barricaded.
- Remember that visibility is the key to minimizing the dangers of working in traffic.
- Upon completion of the work, the area must be cleaned up of materials and left in a clean and orderly state.

2.3.2 General Safety

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the Swale/Strip facilities, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Lightning.
- Fast moving water.
- Unstable earth.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Muggers and other criminals.
- Transients
- Power tools and heavy equipment.
- Ledges.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.

Other important field precautions include:

- Stay away from the edges of a fast moving body of water. These edges are usually slippery and unstable during rainy conditions.
- If sampling is required at the edge of a fast moving body of water, use a lifeline and a personal flotation device. Use grabbing devices when possible.
- Never work alone at night and avoid working alone during the day.
- Avoid leaving materials, tools and equipment lying around where someone can trip over them.
- Maximize lighting at all times, especially at night.
- Keep a phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear a hard hat and orange safety vest.
- Do not use power tools and heavy equipment unless trained in the proper use and care of the specific power tools.
- Always wear eye protection when working with tools or chemicals
- Wear rain gear.
- Never leave open holes unattended or unbarricaded.
- Do not sample during lightning.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 on the following page as a guide to find appropriate forms and information required for field visits. This table covers appropriate aspects of the field OMM program including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is by obtaining and going through each item on the table pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks for facility operations and maintenance, vector control, storm monitoring, and office monitoring.

Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
for Biofiltration Swales/Strips

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Location Maps	NA	Prior to site visits.
	BMP Facility Plans	NA	Prior to site visits.
2	Emergency Contacts Lists	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist for Biofiltration Swales/Strips	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist for Biofiltration Swales/Strips	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist for Biofiltration Swales/Strips	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist for Biofiltration Swales/Strips	Form F	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	CCR Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events for Biofiltration Swales/Strips	Form H1	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and BMP.
	Hydraulic Residence Time Calculation Checklist	Form H2	One time per monitoring season.
	Field Data Log Sheet for Biofiltration Swales/Strips	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet (Influent/Control)	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet (Effluent Sampling)	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses List	Ex. 7.1	Reference for each sampling event and laboratory analysis request submittal.
8	Vector Control and Monitoring Forms	Forms O1-O2	Fill out for each site visit related to vector monitoring.
9	Runoff Coefficients for Biofiltration Swales/Strips	Ex. 9.1	Reference for calculations.
	“Volume-to-Sample” Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.

4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

Each Swale/Strip will be inspected on a regular basis according to the following minimum rates:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Forms C and D (Tab 4).*

1. Prior to arrival, contact the appropriate Caltrans District 7 personnel identified in the Encroachment Permit (Exhibit 9.3 in Tab 9).
2. Completely walk around the BMP while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism),
 - Vegetation management (grass, shrubs, trees),
 - Erosion and slope stability,
 - BMP performance (fouling, blockage, damage),
 - Equipment repair/maintenance (BMP components, autosampler),
 - Sediment accumulation (within BMP, at influent confluence),
 - Storage of accumulated sediment or other wastes, and
 - Vector control.
4. Complete Form C (see Tab 4) during inspections.
5. Log field activities and their corresponding time accurately.
6. If immediate corrective or preventive maintenance is needed, call the appropriate contacts listed in the Project Contacts List in Tab 2.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.

- Standing or Stagnating Water
- Vector Control.
- Vandalism.

The frequency of individual maintenance activities at the Swale/Strip facilities will be conducted according to the schedule listed in the maintenance indicator document, included as Appendix V of Volume II.

Maintenance activities performed will be documented using Forms E and F in Tab 5. See Section 2.0 of Appendix I-E for full details on maintenance activities.

4.3 Vegetation Management

Maintenance and control of vegetation is essential to the optimal operation and performance of a BMP. The condition of the native vegetation will be inspected on a monthly basis at a minimum to ensure that

- vegetation is kept relatively short,
- slope vegetation is protected and kept healthy, and
- undesirable plant species do not take root.

Shorter vegetation on the Swales/Strips optimize the treatment capacity, the residence time of runoff, and will aid in vector control. Maintaining healthy and continuous vegetation on the slopes will minimize erosion. Preventing undesirable plant species from taking root will prevent plants with large root systems from damaging the embankments. Use the inspection and maintenance checklists (Forms C through F) whenever inspections and maintenance activities for vegetation management are performed. See Sections 2.0 and 4.0 of Appendix I-E for specific details on controlling vegetation.

4.4 Disposal of Trash and Debris

Trash and debris from Swales/Strips is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the BMP will be responsible for removal and disposal of the trash and debris. This disposal will comply with applicable local, county, state, and federal waste control programs. Table 2.1 in Appendix I-E for Biofiltration Swales/Strips shows a few possible disposal services for waste material.

4.5 Deposited Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs is critical. Stockpiling is only allowed at the facility under the following conditions:

- Sandbag berms are created (8-inch minimum) and are placed around the stockpile area.
- At least 0.5-mil plastic is used to contain any dewatered liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored at all times.

Once sediment stockpile storage has reached disposal quantity, chemical characterization must be conducted to satisfy land disposal requirements (LDRs). Document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

For sediment stockpiles, the minimum number of discrete samples initially required must comply with Form G, Tab 5. Random samples will be selected from locations on a three-dimensional grid. If the presence of materials such as boulders, debris, etc. hinder the application of this process, the sample will be collected as close as possible to the randomly selected point without altering the essence of the random selection process.

Stockpile sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the stockpile or drum.
3. Collect the sample using a soil probe or equivalent. Ensure that the sample is collected at the correct depth and location that was randomly selected.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).



4.6 Vector and Nuisance Animal Control

Vector Control Districts have been subcontracted to work in accordance with Appendix IV.

5.0 STORM MONITORING

Careful preparation and planning is critically important. Representative samples *must* be obtained for each storm event. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that local rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours preferred).
2. Meeting deployment criteria defined in Exhibit 3.1, Tab 3.

Check appropriate sources for local weather conditions before deploying field staff. Use the Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for a decision tree on when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-E details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, reporting limits, and holding times for samples from Swales/Strip sites. Appendix III contains the BMP Retrofit Pilot Program Quality Assurance and Quality Control Plan.

A separate logbook is used for each Swale/Strip facility. Pertinent checklists, log forms, and information necessary to conduct a successful monitoring program and to be contained in the site-specific field logbooks are listed in Table 3.1 in Section 3.0. The pertinent checklists and log forms are located in Tabs 1 through 9. Table 3.1 also lists analytical and office forms, contains corresponding form and table numbers, identifies the location in this document, and explains when each form is to be filled out.

Sampling equipment shall be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting stormwater sampling at BMP sites:

- Pre-Storm preparation,
- Storm event sampling (grab samples and composite sample collection of both influent and effluent), and
- Post-Storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1 in Tab 3) for when to mobilize.
2. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).

3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.
4. Decontaminate and assemble decontaminated sample containers, Teflon[®] hose, and other sampling equipment according to the following procedures:

Cleaning Procedures for Sample Bottles

Bottles will be:

- a. Rinsed three times with warm tap water.
- b. Scrubbed with a clean plastic brush.
- c. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
- d. Rinsed three times with tap water.
- e. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
- f. Rinsed three times with hexane while rotating the bottle, and then air-dried.
- g. Rinsed six times with Milli-Q water.
- h. Soaked in 2N nitric acid for a minimum of 24-hours.
- i. Rinsed six times with Milli-Q water.

Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

- a. Teflon[®] hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
 - b. Rinsed three times with warm tap water.
 - c. Rinsed three times with Milli-Q or equivalent water.
 - d. Rinsed three times with 2N nitric acid.
 - e. Soaked at least 24-hours in 2N nitric acid.
 - f. Rinsed three times with Milli-Q water.
5. Inspect monitoring equipment for proper operation (use Form D, Tab 4). At each sampling location do the following:
 - a. Check battery voltages and electrical connections.
 - b. Inspect the pump tubing and replace if necessary.
 - c. Inspect desiccant cartridges in flow meter.
 - d. Inspect intake tubing condition and connections. Make sure intakes, flow structures, and sensors are clear of debris (this is only possible if all confined space requirements are met).
 - e. Make sure the correct user-entered program parameters are entered (use Forms I, J1, J2 and K in Tab 6).
 - f. Set system status flags.

- g. Make sure the automatic sampler is set up properly by verifying that the correct bottle size, number of bottles, hose diameter, hose material, hose length, head height, aliquot volume, number of samples to fill the bottle, and number of pulses to sample has been entered correctly.
 - h. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger.
6. Ice composite bottles.
 7. From the office or field set “Volume-to-Sample” numbers (Exhibit 9.2 in Tab 9) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K, Tab 6).
 8. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected twice per year as directed by the Task Order Manager.

5.1.2 Storm Event and Sample Collection

1. Once onsite, fill out the Empirical Observations Field Data Log and a Field Data Log Sheets (Forms H1 and I in Tab 6) to document storm characteristics.
2. Locate influent/control autosampler and inspect for proper operation.
3. Locate effluent autosampler and inspect for proper operation.
4. Change composite bottles and re-initiate equipment as needed.
5. Take grab samples as needed (two will be taken per monitoring season at the influent and effluent locations of the Swale/Strip).

5.1.3 Post-Storm Sample Analyses

After a storm event has ended, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

Reset the storm monitoring program to prepare for another storm event.

Replace the four 1-gallon autosampler sample bottles and the reset the sampler.

Physically inspect the station to determine if any damage was sustained during the storm event.

Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if all confined space requirements are met).

Check battery voltages; replace batteries that are low.

Retrieve data via field modem interrogator or from the remote monitoring computer.

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

Chain-of-Custody Forms

When all of the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody Forms (see example in Form M, Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.2 Empirical Observations

Complete and succinct empirical observations for both rain/runoff and the BMP, are required during each site visit related to wet season monitoring. These observations will be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). These empirical observations will be recorded on Form H1 in Tab 6.

Observations will be succinct but complete. For a Swale/Strip performance evaluation, the following observations will be taken at the influent location, within the Swale/Strip, and at the effluent location:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water, channelization).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory) to roughly assess changes in water quality.
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Erosion.
- Vegetation condition.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.
- Hydraulic residence time measurements (Swales only).

Refer to Form H1 in Tab 6 for recording empirical observation information.

5.3 Hydraulic Residence Time Evaluation

Removal of pollutants from stormwater is dependent on a variety of design factors including the hydraulic residence time. The hydraulic residence time is the amount of time it takes a slug of stormwater to flow through a Swale, and will be evaluated at each Swale during one storm event during each monitoring season. To determine the hydraulic residence time, a residence time distribution analysis will be carried out by injecting dye into stormwater runoff entering the Swale and monitoring the concentration (absorbance) of the dye in the runoff at the downstream end of the Swale. These results will be plotted to produce a flow-through curve, which will be

used to evaluate performance indices (e.g., time to reach peak concentration and time to reach the centroid of the curve). The following procedure will be used to determine the hydraulic residence time of each Swale.

1. Mobilize a team for a storm event where the amount of rain predicted is greater than or equal to 0.10 inch. This event should **not** be an event during which stormwater monitoring (i.e., sampling) will be conducted.
2. Measure the Swale vegetation height and record it on Form H2.
3. Remove any obstructions from the Swale and its inlet and outlet structures.
4. Initiate the flow monitoring equipment and ensure that it is properly calibrated. Program the bubbler to measure flow after each 1-minute interval (lowest possible setting). Set the flow monitoring equipment so that flow volume is totaled. After calibration and programming, begin data logging flow rates.
5. Pour 10 mL of yellow/green dye liquid (*Formulabs* or equivalent) into the inlet flume.
6. Once the dyed water reaches the beginning of the vegetation, start a stopwatch and begin timing the travel of the dyed water.
7. Record observation of the dyed water as it travels through the Swale.
8. Collect a sample at the downstream end of the Swale and use a colorimeter, or equivalent, to measure the absorbance in the sample.
9. Record the absorbance measurement, the time when the sample was collected, and the flow volume when the sample was collected on Form H2.
10. Repeat Steps 8 and 9 every 2 minutes for a period of 1 hour or until the absorbance decreases to less than or equal to 10 percent of the peak absorbance measured, whichever occurs first.



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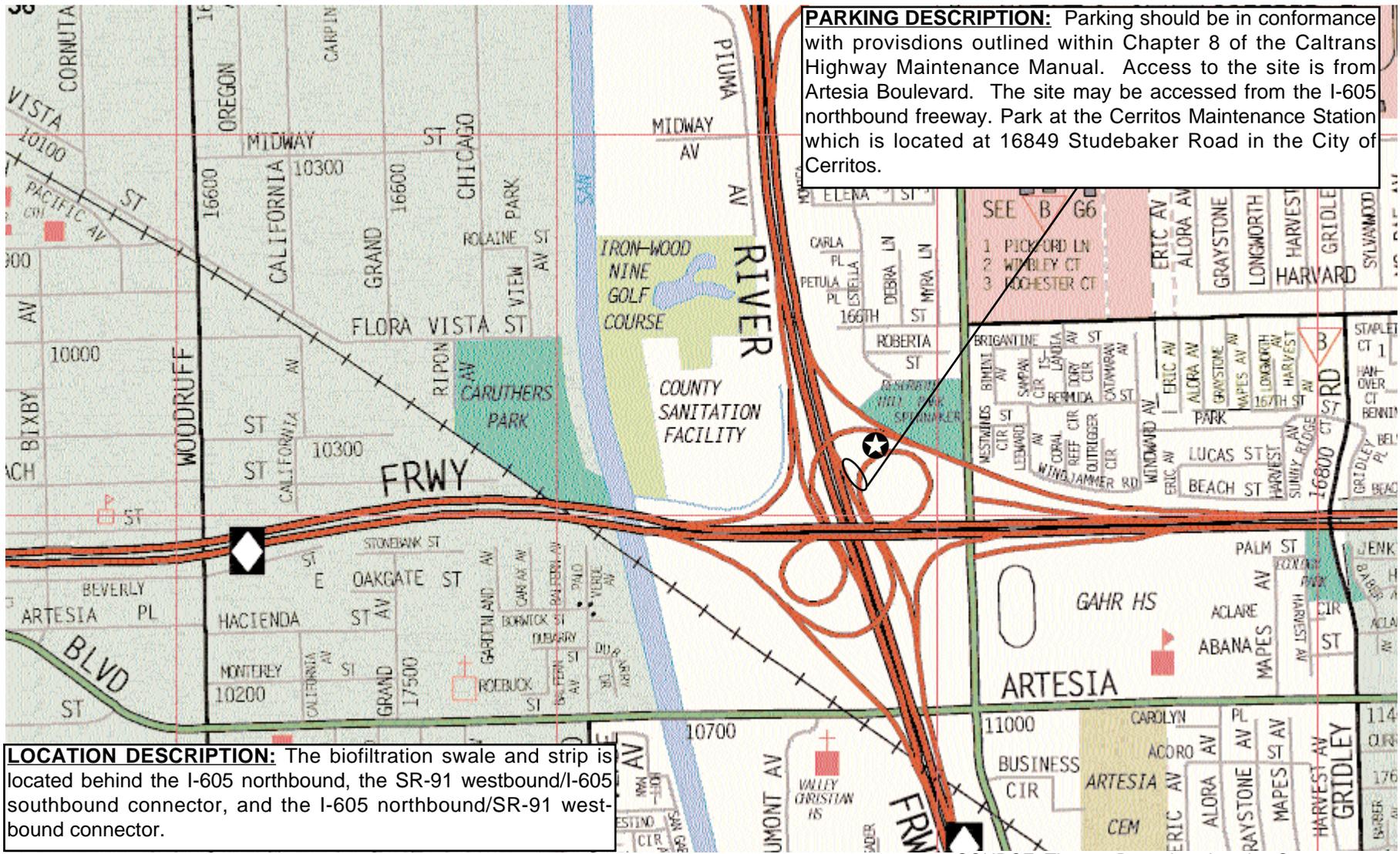


TAB 1

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans**



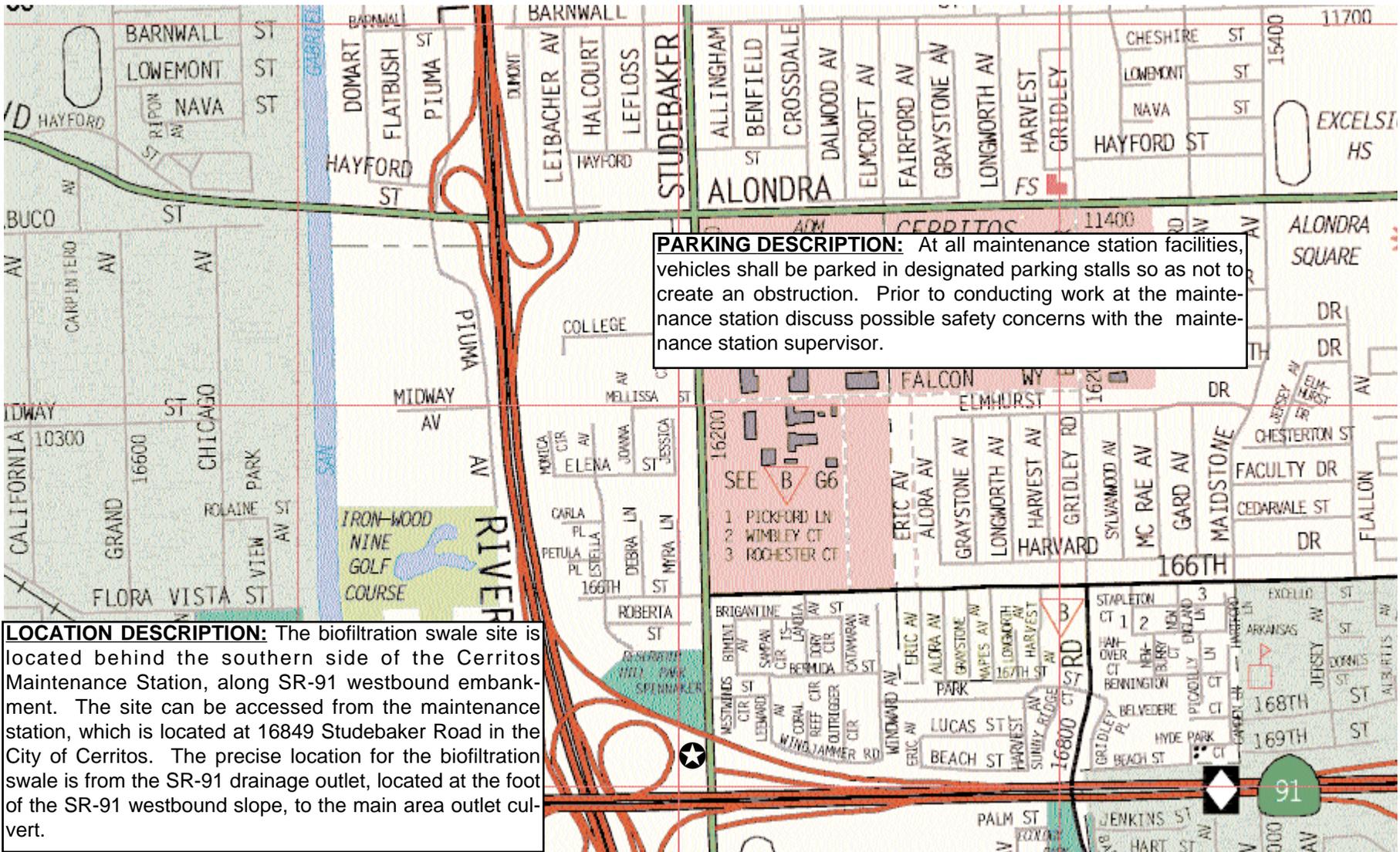
PARKING DESCRIPTION: Parking should be in conformance with provisions outlined within Chapter 8 of the Caltrans Highway Maintenance Manual. Access to the site is from Artesia Boulevard. The site may be accessed from the I-605 northbound freeway. Park at the Cerritos Maintenance Station which is located at 16849 Studebaker Road in the City of Cerritos.

LOCATION DESCRIPTION: The biofiltration swale and strip is located behind the I-605 northbound, the SR-91 westbound/I-605 southbound connector, and the I-605 northbound/SR-91 westbound connector.

SOURCE: Thomas Bros., Los Angeles County, 1997

-  BMP Pilot Site
-  Not to Scale

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-605/SR-91 Interchange
BMP Pilot Study Site #073222a & 073222b
Site Location Map



PARKING DESCRIPTION: At all maintenance station facilities, vehicles shall be parked in designated parking stalls so as not to create an obstruction. Prior to conducting work at the maintenance station discuss possible safety concerns with the maintenance station supervisor.

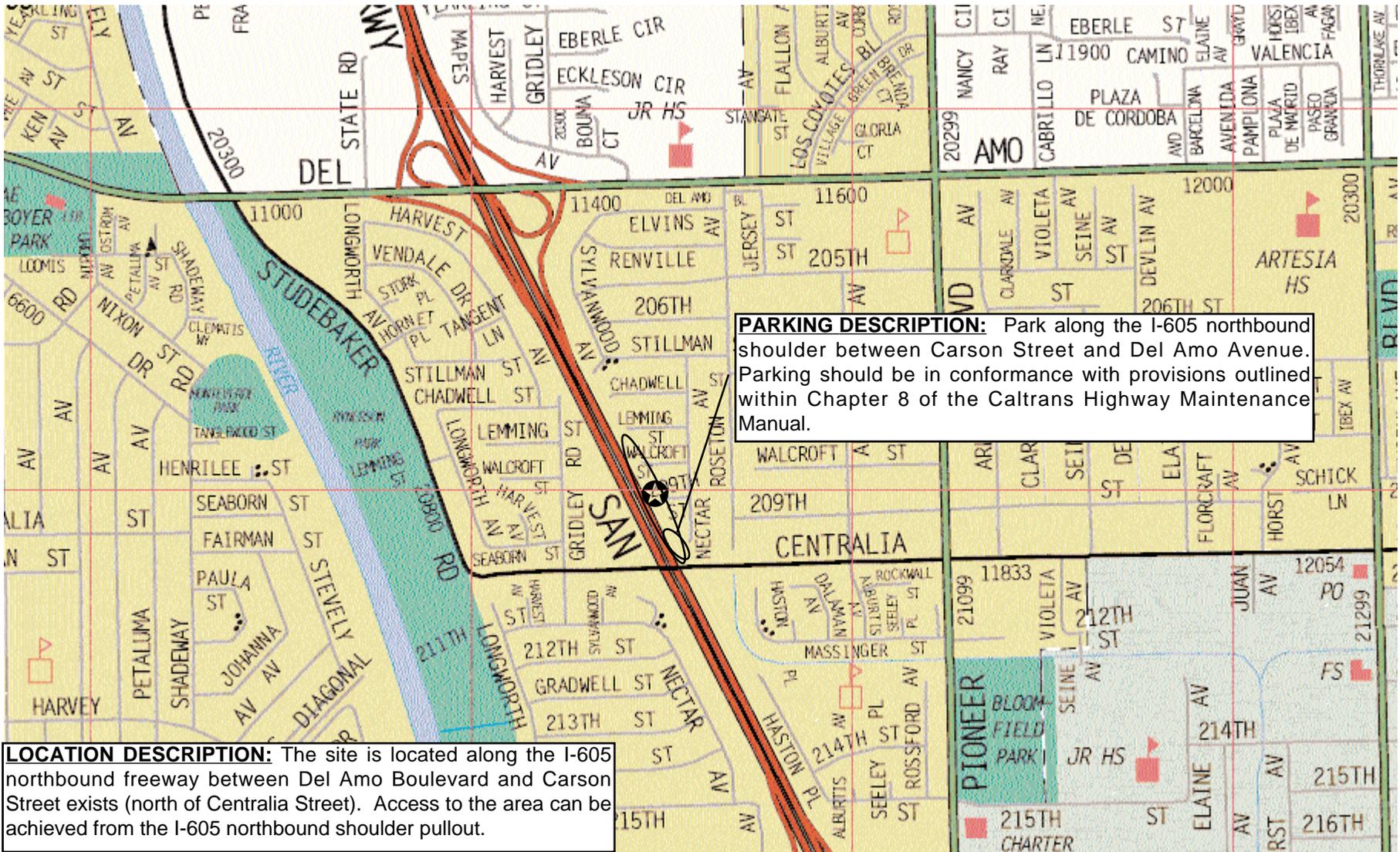
LOCATION DESCRIPTION: The biofiltration swale site is located behind the southern side of the Cerritos Maintenance Station, along SR-91 westbound embankment. The site can be accessed from the maintenance station, which is located at 16849 Studebaker Road in the City of Cerritos. The precise location for the biofiltration swale is from the SR-91 drainage outlet, located at the foot of the SR-91 westbound slope, to the main area outlet culvert.

 BMP Pilot Site

 Not to Scale

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Cerritos Maintenance Station
BMP Pilot Study Site #073223
Site Location Map



SOURCE: Thomas Bros., Los Angeles County, 1997

-  BMP Pilot Site
-  Not to Scale

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-605/Del Amo Avenue
BMP Pilot Study Site #073225
Site Location Map

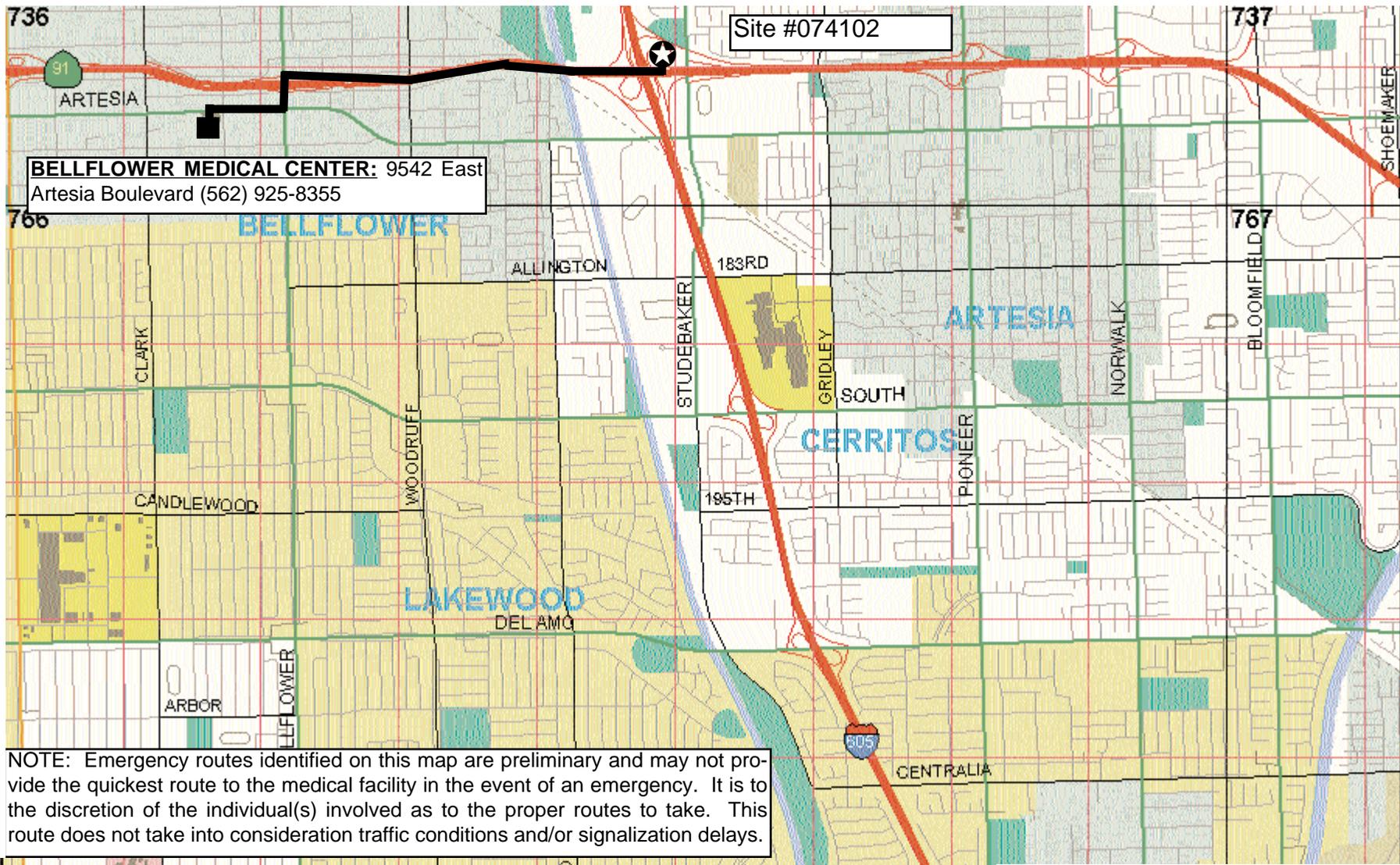


TAB 2

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**



SOURCE: Thomas Bros., Los Angeles County, 1997

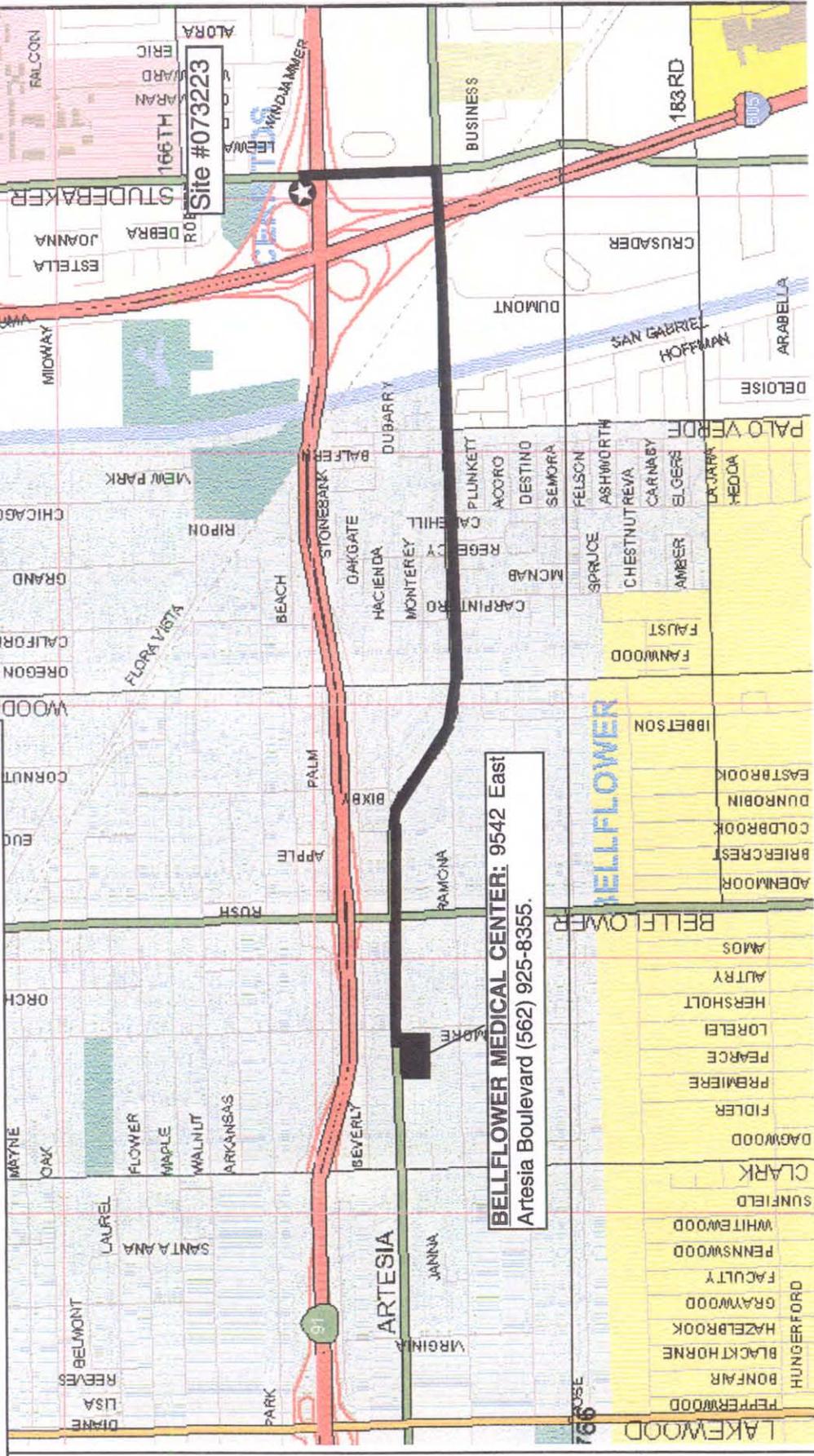
CALIFORNIA DEPARTMENT OF TRANSPORTATION
**I-605/SR-91 Interchange
 Hospital Route Map**

 BMP Pilot Site

 Not to Scale

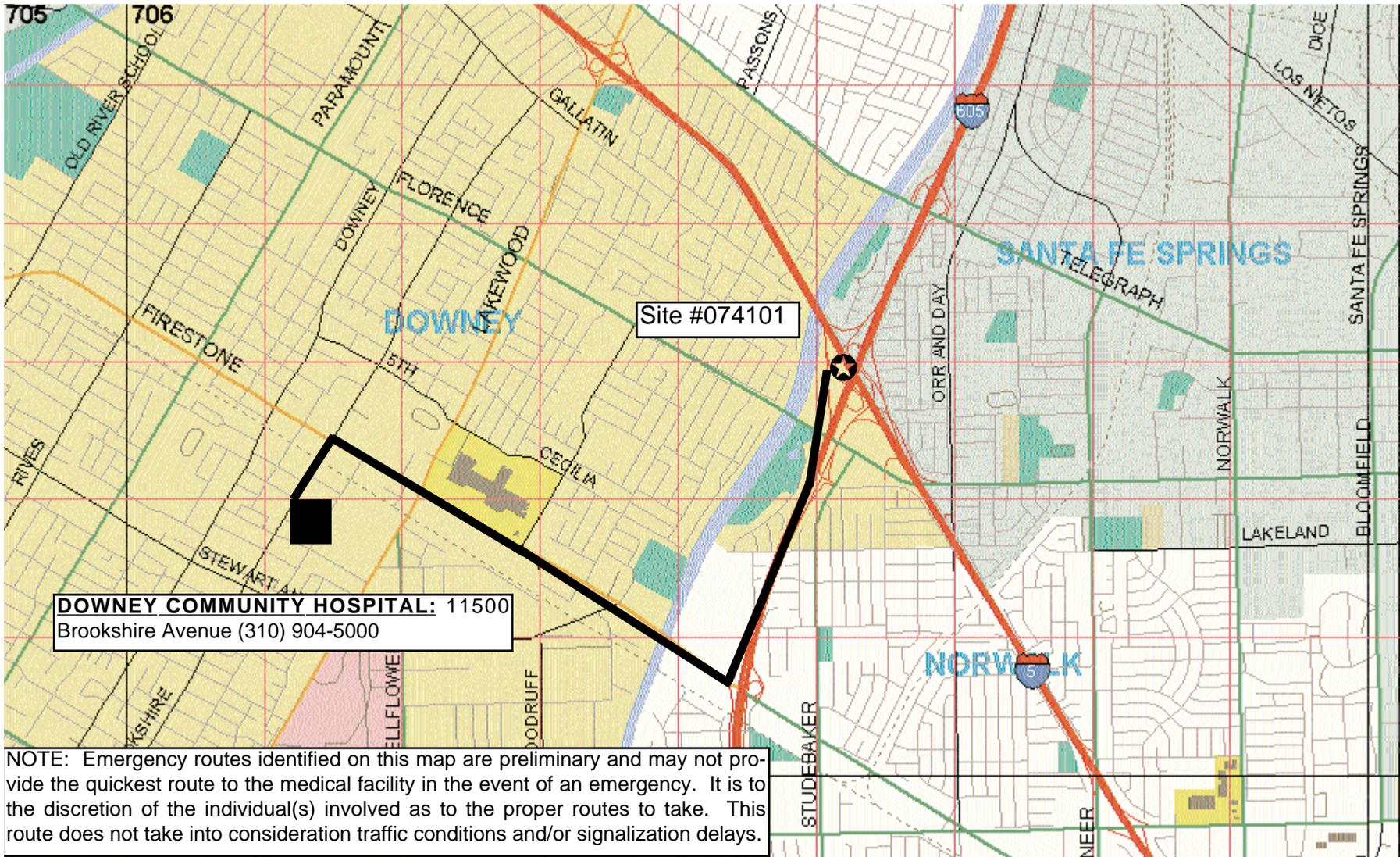

 Potential Emergency Route

NOTE: The emergency route identified on this map is preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.



SOURCE: Thomas Bros., Los Angeles County, 1997
 CALIFORNIA DEPARTMENT OF TRANSPORTATION
Cerritos Maintenance Station
Hospital Route Map

-  **BMP Pilot Site**
-  **Potential Emergency Route**
- Not to Scale**



SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION

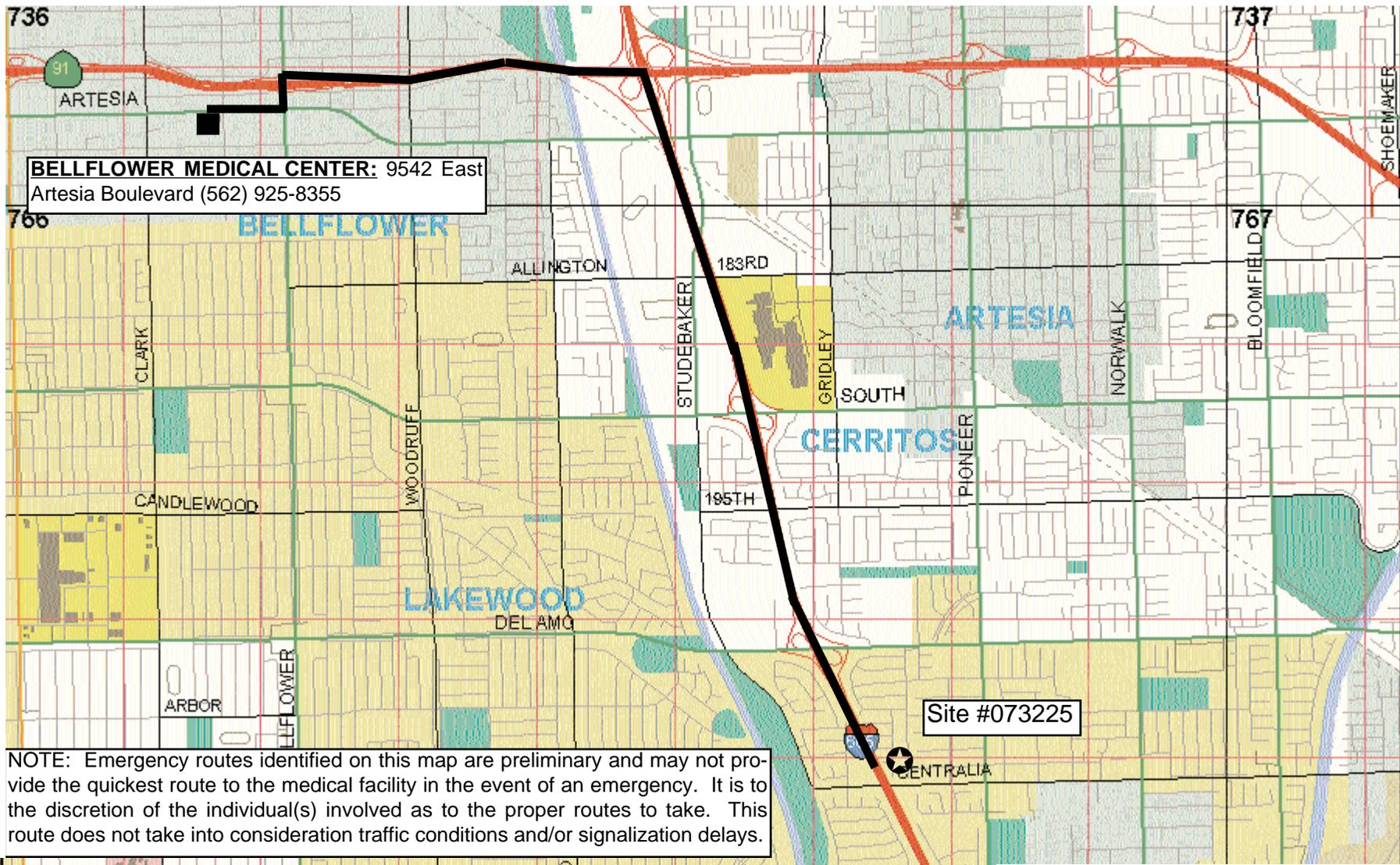
I-5/I-605

Hospital Route Map

 BMP Pilot Site

 Not to Scale


 Potential Emergency Route



SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
**I-605/Del Amo Avenue
 Hospital Route Map**



BMP Pilot Site



Not to Scale


 Potential Emergency Route

Document information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Sites 073222a and 073222b: I-605/SR-91 Interchange Biofiltration Strip and Swale

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 866-9061	From landline phone
Fire Emergency Dispatch	(310) 638-6121	Call immediately in case of fire or hazardous spills
Bellflower Medical Center	(562) 925-8355	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Masoud Nassimi)	(310) 609 0363	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts for Site 073223: Cerritos Maintenance Station Biofiltration Swale

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 866-9061	From landline phone
Fire Emergency Dispatch	(310) 638-6121	Call immediately in case of fire or hazardous spills
Bellflower Medical Center	(562) 925-8355	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Masoud Nassimi)	(310) 609 0363	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Document all information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Site 073224: I-5/I-605 Biofiltration Swale

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 863-8711	From landline phone
Fire Emergency Dispatch	(562) 863-0214	Call immediately in case of fire or hazardous spills
Downey Community Hospital	(562) 904-5000	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Andy Bott)	(626) 301 0742	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts for Site 073225: I-605/Del Amo Avenue Biofiltration Swale

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(562) 866-9061	From landline phone
Fire Emergency Dispatch	(310) 638-6121	Call immediately in case of fire or hazardous spills
Bellflower Medical Center	(562) 925-8355	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Masoud Nassimi)	(310) 609 0363	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Project Contacts List

Name	Organization	Phone	Fax Mobile	Email
Bill Whittenberg	RBF and Associates	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Robert Wu	Caltrans District 7 Program Manager	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Ed Othmer	LAWCRANDALL Task Order Manager	(858) 278-3600 Pg (858) 650-2159	(858) 278-5300-f	eothmer@lawco.com
Byron Berger	LAWCRANDALL Field Manager	(714) 776-9544 - Anaheim (858) 278-3600 – San Diego Pg (858) 650-1958	(714) 776 9541 – Anaheim (858) 278-5300- San Diego	bberger@lawco.com
Bill O’Braitis	LAWCRANDALL	(323) 889-5300	(323) 721-6700-f	wobraitis@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678-f	Peter_vanriper@dot.ca.gov
Donald Kaiser	American Sigma, Inc.	(716) 798-5580	(716) 798-5599-f	sigma@americasigma.com
Internet	National Weather Service	(805) 988-6610	--	www.nwsla.noaa.gov
Tim Root	WeatherWatch, Chief Meteorologist	(619) 223-8163	(619) 223-4245-f	--
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Debbie Frank	MW Laboratories	(626) 568-6449	--	--
Jon Gildersleeve	Quanterra Laboratory	(916) 373 5600	(916) 371 2857	gilderslej@quanterra.com
Pat Brueckner	Pat-Chem Laboratories	(805) 532 0012	(805) 532 0016	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	(530) 753-6400		eanm@lwadavis.com
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(949) 365-0117-f	Geosrcr1@ix.netcom.com
Sal Duarte	United Pumping Service, Inc.	(818) 253 5250	(626) 961-3166-f	salduarte@aol.com



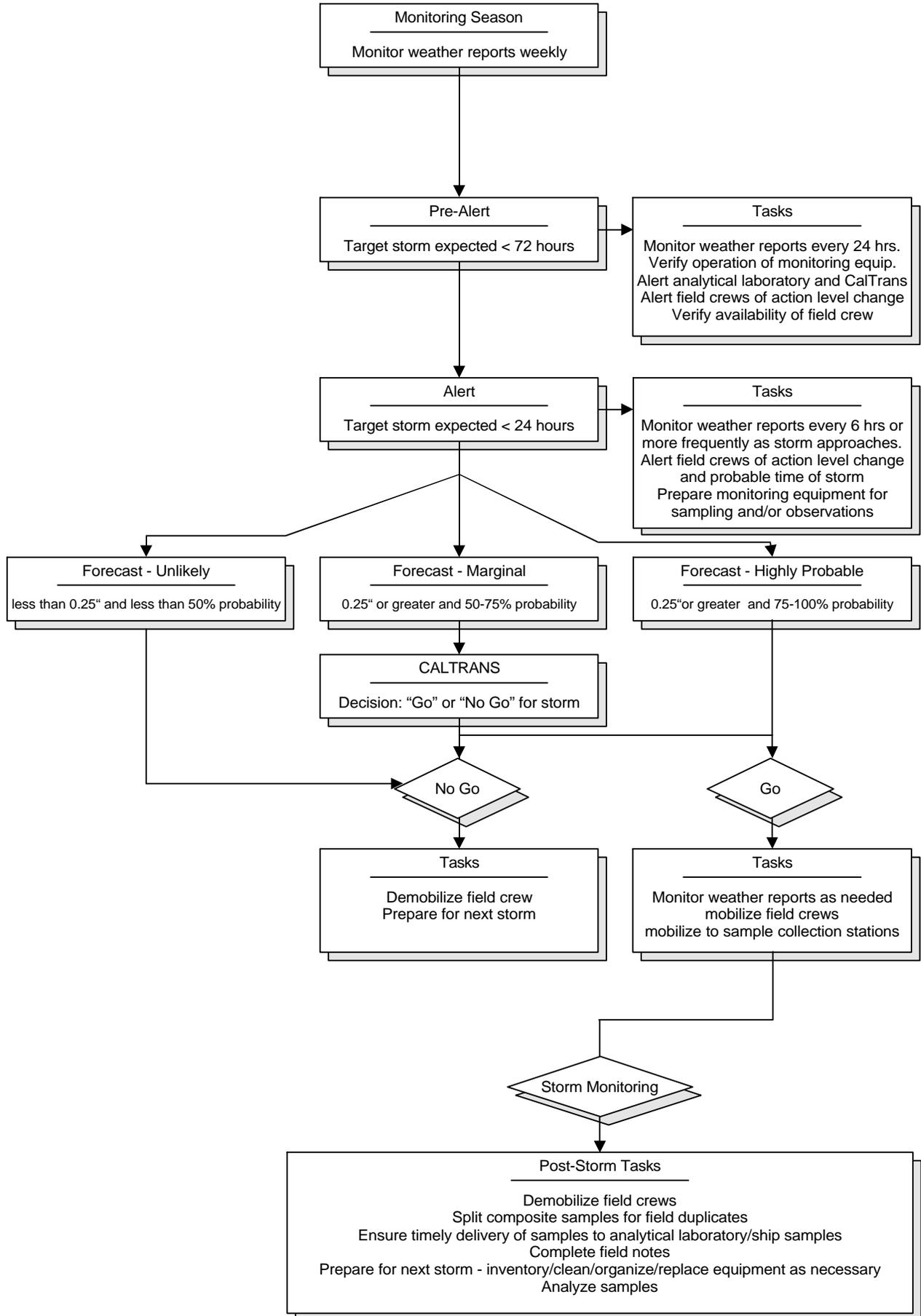
TAB 3

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Phone card	Volume-to-Sample matrix
	Vendor's autosampler manual

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Maps for required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm kit	Log books
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	Four 1-gallon glass bottles
Grab sample bottles (see below)	Coolers and ice (at least one extra)
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Laboratory telephone number
for each QA/QC analysis	Backup laboratory contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
extra bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans BMP Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

- Form C: BMP Site Inspection Checklist for Biofiltration
Swales/Strips**
- Form D: Monitoring Equipment Inspection Checklist for
Biofiltration Swales/Strips**

FACILITY NAME: _____
 DATE: _____ TIME _____
 PAGE _____ of _____

FORM C
 Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Biofiltration Swales/Strips

NON-STORMWATER CONCERNS:

Non-storm water discharge to BMP ? yes ? no
 BMP wet from obvious non-stormwater discharge (no rain) ? yes ? no
 If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678
 From: _____ Contact Number: _____

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

OVERALL:

Other concerns affecting operation:

 Condition of facility: ? acceptable ? not acceptable
 Comments:

 Dates for maintenance to be completed by:

 (Team Leader's Signature)

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Biofiltration Swales/Strips

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		

SAMPLING AND FLOW MEASUREMENT EQUIPMENT:	Maintenance Required?
Is the monitoring station enclosure locked? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the automatic sampler online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the automatic sampler properly programmed and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the peristaltic pump tubing need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the intake tubing and/or connections need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the desiccant cartridge in the flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is internal modem online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the bubbler properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Biofiltration Swales/Strips
(continued)

SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.):	Maintenance Required?
Is the bubbler tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is strainer clean and free of obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no

INFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

EFFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

PHOTOGRAPHS (mandatory if maintenance is required):					
Date	Time	Description	Direction Facing	Roll	Photograph No.

Dates for maintenance to be completed by:

(Team Leader's Signature)



TAB 5

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

**Form E: BMP Site Maintenance Activity Checklist for Biofiltration
Swales/Strips**

**Form F: Monitoring Equipment Maintenance Activity Checklist for
Biofiltration Swales/Strips**

Form G: Stockpile/Sediment Sampling Checklist

Exhibit 5.1: CCR Title 22 Characterization Requirements

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Biofiltration Swales/Strips

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		

SEDIMENT/EROSION CONTROL:

Sediment removal from level spreader, strip, and/or swale
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Clean orifices, and/or cracks in stormwater conveyance system
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Erosion repair (including vegetative stabilization)
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Embankment/slope repair(s)
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

VEGETATION:

Swale/Strip vegetation mowing/trimming and removal of cuttings
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Replant Swale/Strip vegetation
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Biofiltration Swales/Strips (continued)

VEGETATION (cont.):

Weed control

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Leaf collection and removal of dead/rotting vegetation

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

STRUCTURAL:

Structural repairs (describe):

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

ANIMAL CONCERNS:

Burrow control

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

AESTHETIC CONCERNS:

Debris and trash removal

Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Biofiltration Swales/Strips (continued)	
AESTHETIC CONCERNS (cont.):	
<input type="checkbox"/> <i>Graffiti removal or replacement of vandalized or stolen property</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Painting</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
WATER LEVEL MANAGEMENT:	
<input type="checkbox"/> <i>Dewatering</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FORM F
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Maintenance Activity Checklist for Biofiltration Swales/Strips

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		

Clean H-flumes, orifices, and/or cracks

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

Diagnostic test of automatic sampler

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

Replacement of peristaltic pump tubing

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

Replacement of bubbler tubing, pump tubing, or intake tubing

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

Replacement of strainer

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

Replacement of 12-volt marine battery

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

Removal of kinks or obstructions from bubbler tubing

Start time: _____ End time: _____ Total time: _____

More work required? yes no

Equipment used: _____

Comments: _____

FORM F Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Biofiltration Swales/Strips (continued)	
<input type="checkbox"/> <i>Replacement of desiccant cartridge in flow meter</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other maintenance/calibration of automatic sampling equipment (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other maintenance of flow measurement equipment (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FORM G
Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist

GENERAL INFORMATION:

Date:	Time In:	Team Leader's Initials:	Time Out:
-------	----------	-------------------------	-----------

Location: _____

SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:

Depth of sediment: _____

Color: black brown green tan other

Consistency: sandy silty granular other

Odors: petroleum solvents organic (rotten eggs) sewage
 none other

Depth of sediment: _____

SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST

Powder Free Nitrile Gloves	
Soil Probe or equivalent for sample collection	
Labeled 8-ounce glass jars	
Plastic bags, seal bags	
Chilled cooler	
Chain-of-Custody form	
Log book for record keeping	

STOCKPILE/DRUMMED SEDIMENT:	Maintenance Required?
------------------------------------	-----------------------

Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.	<input type="checkbox"/> yes <input type="checkbox"/> no

SEDIMENT COLLECTION:

<10 cubic yards: <i>Minimum of 2 samples, one randomly from each half of the soil mass</i>	
10-20 cubic yards: <i>Minimum of 3 samples, one randomly from each third of the soil mass</i>	
20-100 cubic yards: <i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>	
100-500 cubic yards: <i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>	
Over 500 cubic yards: <i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>	<i>Contact Dept. of Environmental Health for Guidance</i>

FACILITY NAME: _____
 DATE: _____ TIME _____
 PAGE _____ of _____

FORM G
Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist

SEDIMENT SAMPLE COLLECTION	
Observation sheet completed	
Personal and equipment decon completed	
Number of aliquots taken for composite _____	
Sample IDs: 1. _____ Analysis requested: _____ 2. _____ Analysis requested: _____ 3. _____ Analysis requested: _____ 4. _____ Analysis requested: _____ 5. _____ Analysis requested: _____ 6. _____ Analysis requested: _____	
Photos taken:	
Chain of Custody Form attached	
Record information in logbook for record keeping	
Comments: 	_____ (Team Leader's Signature)

Exhibit 5.1: CCR Title 22 Characterization Requirements

Sediment Matrix (Disposal)
Analytical Parameters, Methodologies, Reporting Limits, Holding Times,
Container Volumes and Types, and Preservation

Parameter	Method	Units	Reporting Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) *California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.*
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) *If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.*
- (5) *“Test Methods for Evaluating Solid Waste, Physical /Chemical Method.s” SW-846, Update III.(SW-846)*



TAB 6

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

- Form H1: Empirical Observations Field Data Log Sheet for Storm Events for Biofiltration Swales/Strips**
- Form H2: Hydraulic Residence Time Calculation Checklist**
- Form I: Field Data Log Sheet for Biofiltration Swales/Strips**
- Form J1: User-Entered Program Parameters (Influent/Control)**
- Form J2: User-Entered Program Parameters (Effluent)**
- Form K: Station Phone Log**

FORM H1
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Swales and Strips (continued)

Standing water conditions (*record measurements as appropriate*):

- Water standing over entire Swale/Strip. Depth: _____
 Water standing in one isolated pool. Describe Location: _____
 Depth: _____

Comments:

INLET CONDITIONS:

Describe flow distribution where flow enters vegetated treatment zone:

- Flow is uniformly distributed across full width of the Swale/Strip.
 Flow is not uniformly distributed across full width of the Swale/Strip.

Explain:

Describe any erosion being caused by the flow upstream or at the entrance to the Swale/Strip:

Describe any obstructions or restrictions interfering with inflow/influent:

INLET WATER QUALITY APPEARANCE:

Check all that apply and describe under comments.

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

FORM H1
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Swales and Strips (continued)

SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Over entire Swale/Strip: _____

In one spot: _____

In multiple spots: _____

In outflow/effluent channel: _____

SOLIDS DEPOSITION AND RESUSPENSION (cont.):

Solids resuspension evident (*check all that apply*):

- In inflow/influent channel Near inlet Near outlet In outflow/effluent channel
 Other (describe): _____

Solids deposition and resuspension comments:

EROSION:

For the following locations, record erosion locations, area(s) covered, and depth(s), as applicable:

In inflow/influent channel: _____

Near inlet: _____

Swale bed (Swales only): _____

Swale side slopes (Swales only): _____

Strip slope (Strips only): _____

Near outlet (Swale) or flow discharge (Strip): _____

In outflow/effluent channel: _____

Erosion comments:

FORM H1
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Biofiltration Swales and Strips (continued)

VEGETATION CONDITION:

Swale bed/Strip vegetation cover:

- Complete Few small bare spots Few large bare spots Many small bare spots
 Many large bare spots Large areas bare All or nearly bare

Swale side slopes vegetation cover (Swales only):

- Complete Few small bare spots Few large bare spots Many small bare spots
 Many large bare spots Large areas bare All or nearly bare

Swale bed/Strip vegetation type:

- All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses
 All wetland plants

Extent of woody shrubs or trees: _____

Swale side slopes vegetation type (Swales only):

- All grasses Mostly grasses, some wetland plants Mostly wetland plants, some grasses
 All wetland plants

Extent of woody shrubs or trees: _____

Vegetation condition comments:

OUTLET CONDITIONS:

Describe any obstructions or restrictions interfering with outflow/effluent:

OUTLET WATER QUALITY APPEARANCE:

Check all that apply and describe under comments.

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

FORM H1
Caltrans BMP Retrofit Pilot Program

**Empirical Observations Field Data Log Sheet for Storm Events
 for Biofiltration Swales and Strips (continued)**

VECTORS:

Presence of vectors: Yes No
 If yes, what type: Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):
 Inlet structure damage Outlet structure damage Vandalism
 Comments:

MONITORING EQUIPMENT CONDITION:

Equipment functional: Yes No N/A
 Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: ____

Comments:

Date: ____

Comments:

Date: ____

Comments:

FORM H2
Caltrans BMP Retrofit Pilot Program
Hydraulic Residence Time Calculation Checklist (continued)

Step 8: Record the absorbance measurement, the time when the sample was collected, and the flow volume when the sample was collected.

Time	Absorbance Measurement	Flow Volume	Time	Absorbance Measurement	Flow Volume
1.			16.		
2.			17.		
3.			18.		
4.			19.		
5.			20.		
6.			21.		
7.			22.		
8.			23.		
9.			24.		
10.			25.		
11.			26.		
12.			27.		
13.			28.		
14.			29.		
15.			30.		

 (Team Leader's Signature)

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ of _____

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet for Biofiltration Swales/Strips

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:		
BMP Type:		
Influent or Effluent (circle one)	Storm Event Visit or Maintenance Visit (circle one)	

*Use Facility Inspection Logs and Empirical Observation Field Data Sheets to record observations. These logs **must** be filled out during all station visits.*

SYSTEM STATUS FLAGS (*6-AD; 1=high, 0=low)	PROGRAM SIGNATURE (*6-100)
Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____ Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Arr: _____ Dep: _____

DATA LOGGER INFORMATION (*6)

All Site Visits: Stage (ft) 02: Staff Gauge Velocity (ft/s) 03: Q (cfs) 04: Station ID 21:	Storm Site Visits: Volume (kcf) 05: Strm Sum (kcf) 06: Percent Capture 08: Volume2Sample 14: Sample Count 17:	MaxFlow (day) 51: MaxFlow (time) 52: MaxFlow Q 53: Total Rain (in) 66: Total Strm Vol. 72: Strm Vol. Smpld 75:
--	---	---

12-volt marine battery (for sampler) voltage:	12-volt marine battery (for cell phone) voltage:	internal sampler voltage:
---	--	---------------------------

AUTOSAMPLER INFORMATION (Storm only)	Bottle # in:
Sample ___ of 72 after 1 pulse Bottle # out: Bottle Volume: Volume2Sampl:	

WATER QUALITY (Storm only)
 Time of Manual Grab Samples:
 TPH:
 Bacteria:
 Other Grabs or Measurements _____

SAMPLING EQUIPMENT AND REPAIR NEEDS:

ACTION TAKEN:

Storage Module Data Dump: Start ____ End ____

 (Team Leader's Signature)

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:

Time:

01 Station ID				
03 Volume to sample (kcf)				
04 Level Meter Stage Offset (feet)				
05 Level Meter Multiplier (feet/mv)				
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)				
09 Minimum Stage Threshold (feet)				
10 Storm Stage Trigger Level (feet)				
11 Storm End Factor (times storm trigger stage)				
12 No. of Seq. Trans. Failures Before Raising Flag 6				
13 Time (min.) to wait after 1 st set of trans. Failures				
14 No. samples of depth taken for avg. 1 prog. exe.				
15 No. samples of speed taken for avg. 1 prog. exe.				
17 Amount of rain per bucket tip (inches)				
18 Amt. rain samp. before rain data recorded (in.)				
19 Number of samples collected until bottle is full				
20 No. of times Flag 7 goes high before var. reset				
23 Data avg. int. (min.) when storm conditions exist				
24 Data avg. int. (min.) storm conditions don't exist				
30				
31				
34 Flume Parameter 1				
35 Flume Parameter 2				
36 Cellular phone battery state control parameter				
37 Duration when cellular phone battery is on				
38 Period of cellular phone battery state control				
Program Signature (*B)				

*Subject to Revisions



TAB 7

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Example Chain-of-Custody Form
Exhibit 7.1: Chemical Analysis List**

FORM M: Example CHAIN-OF-CUSTODY FORM

Laboratory:	Laboratory # Date Rec'd	From:
--------------------	----------------------------	--------------

Project: P.O.#:	Project #: Required Completion Date:
---------------------------	--

Sample ID #	Site ID #	Laboratory ID #	Matrix/Analysis	Containers	Pres.	Sample Date/Time	Condition Upon Receipt

Data Reports **WILL** include the following: Sample/Site ID, Analytical Method, Reporting Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.

Special Instructions/Comments:

Relinquished By: Date/Time	Transporter	Received By: Date/Time
Relinquished By: Date/Time	Transporter	Received By: Date/Time
Relinquished By: Date/Time	Transporter	Received By: Date/Time

Exhibit 7.1: Chemical Analyses List

Stormwater Matrix Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/ Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/ Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics⁶									
Total Petroleum Hydrocarbons – Diesel Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Bacteria⁹									
Fecal Coliform	Grab	2	MPN/100 mL	Multiple-tube	SM 9221E	6 hours ⁷	50 mL	1-100 mL plastic	4°C

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification.
6. Total Petroleum Hydrocarbon and Fecal Coliform grab samples will be collected for two storms per year.
7. Attempts will be made to maintain the 6-hour holding time for bacteria samples to the extent possible. When not possible, a maximum holding time of 24 hours will be followed in accordance with “Standard Methods for the Examination of Water and Wastewater”, 18th Edition.



TAB 8

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related Maintenance
Activity Checklist for Affected BMP Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform monitoring.



TAB 9

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

Exhibit 9.1: Runoff Coefficients for Biofiltration Swales/Strips Sites

Exhibit 9.2: “Volume-to-Sample” Tables

Exhibit 9.3: Encroachment Permits

Exhibit 9.1
Runoff Coefficient Matrix Table for Biofiltration Swales/Strips

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
073222a	I-605/SR-91 Interchange (Biofiltration Strip, control)	0.45	0.95
	I-605/SR-91 Interchange (Biofiltration Strip, effluent)	0.47	0.95
073222b	I-605/SR-91 Interchange (Biofiltration Swale)	0.21	0.95
073223	Cerritos Maintenance Station	0.57	0.95
073224	I-5/I-605	0.65	0.95
073225	I-605/Del Amo Avenue	0.74	0.95

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073222a: I-605/SR-91 Interchange (Biofiltration STRIP, effluent)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.47	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	5	2.6	117
0.2	9	2.7	122
0.3	14	2.8	126
0.4	18	2.9	131
0.5	23	3.0	135
0.6	27	3.1	140
0.7	32	3.2	144
0.8	36	3.3	149
0.9	41	3.4	153
1.0	45	3.5	158
1.1	50	3.6	162
1.2	54	3.7	167
1.3	59	3.8	171
1.4	63	3.9	176
1.5	68	4.0	180
1.6	72	4.1	185
1.7	77	4.2	189
1.8	81	4.3	194
1.9	86	4.4	198
2.0	90	4.5	203
2.1	95	4.6	207
2.2	99	4.7	212
2.3	104	4.8	216
2.4	108	4.9	221
2.5	113	5.0	225

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for*Site 073222a: I-605/SR-91 Interchange (Biofiltration STRIP, control)*

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.45	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	4	2.6	112
0.2	9	2.7	116
0.3	13	2.8	121
0.4	17	2.9	125
0.5	22	3.0	129
0.6	26	3.1	134
0.7	30	3.2	138
0.8	34	3.3	142
0.9	39	3.4	147
1.0	43	3.5	151
1.1	47	3.6	155
1.2	52	3.7	159
1.3	56	3.8	164
1.4	60	3.9	168
1.5	65	4.0	172
1.6	69	4.1	177
1.7	73	4.2	181
1.8	78	4.3	185
1.9	82	4.4	190
2.0	86	4.5	194
2.1	91	4.6	198
2.2	95	4.7	203
2.3	99	4.8	207
2.4	103	4.9	211
2.5	108	5.0	216

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073222b: I-605/SR-91 Interchange (Biofiltration SWALE)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.21	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	2	2.6	52
0.2	4	2.7	54
0.3	6	2.8	56
0.4	8	2.9	58
0.5	10	3.0	60
0.6	12	3.1	62
0.7	14	3.2	64
0.8	16	3.3	66
0.9	18	3.4	68
1.0	20	3.5	70
1.1	22	3.6	72
1.2	24	3.7	74
1.3	26	3.8	76
1.4	28	3.9	78
1.5	30	4.0	80
1.6	32	4.1	82
1.7	34	4.2	84
1.8	36	4.3	86
1.9	38	4.4	89
2.0	40	4.5	91
2.1	42	4.6	93
2.2	44	4.7	95
2.3	46	4.8	97
2.4	48	4.9	99
2.5	50	5.0	101

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073223: Cerritos Maintenance Station (Biofiltration Swale)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.57	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	5	2.6	142
0.2	11	2.7	147
0.3	16	2.8	153
0.4	22	2.9	158
0.5	27	3.0	164
0.6	33	3.1	169
0.7	38	3.2	175
0.8	44	3.3	180
0.9	49	3.4	186
1.0	55	3.5	191
1.1	60	3.6	197
1.2	66	3.7	202
1.3	71	3.8	207
1.4	76	3.9	213
1.5	82	4.0	218
1.6	87	4.1	224
1.7	93	4.2	229
1.8	98	4.3	235
1.9	104	4.4	240
2.0	109	4.5	246
2.1	115	4.6	251
2.2	120	4.7	257
2.3	126	4.8	262
2.4	131	4.9	268
2.5	137	5.0	273

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for*Site 073224: I-5/I-605 (Biofiltration Swale)*

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.65	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	6	2.6	162
0.2	12	2.7	168
0.3	19	2.8	174
0.4	25	2.9	181
0.5	31	3.0	187
0.6	37	3.1	193
0.7	44	3.2	199
0.8	50	3.3	205
0.9	56	3.4	212
1.0	62	3.5	218
1.1	68	3.6	224
1.2	75	3.7	230
1.3	81	3.8	237
1.4	87	3.9	243
1.5	93	4.0	249
1.6	100	4.1	255
1.7	106	4.2	262
1.8	112	4.3	268
1.9	118	4.4	274
2.0	125	4.5	280
2.1	131	4.6	286
2.2	137	4.7	293
2.3	143	4.8	299
2.4	149	4.9	305
2.5	156	5.0	311

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073225: I-605/Del Amo Avenue (Biofiltration Swale)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.74	0.95	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)
0.1	7	2.6	184
0.2	14	2.7	191
0.3	21	2.8	198
0.4	28	2.9	206
0.5	35	3.0	213
0.6	43	3.1	220
0.7	50	3.2	227
0.8	57	3.3	234
0.9	64	3.4	241
1.0	71	3.5	248
1.1	78	3.6	255
1.2	85	3.7	262
1.3	92	3.8	269
1.4	99	3.9	276
1.5	106	4.0	284
1.6	113	4.1	291
1.7	121	4.2	298
1.8	128	4.3	305
1.9	135	4.4	312
2.0	142	4.5	319
2.1	149	4.6	326
2.2	156	4.7	333
2.3	163	4.8	340
2.4	170	4.9	347
2.5	177	5.0	354

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE,
AND MONITORING PLAN
VOLUME II

BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
OIL/WATER SEPARATORS



DISTRICT 7, LOS ANGELES

September 1999



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1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel appropriate field evaluation and documentation for the District 7 oil/water separators (OWSs) belonging to the Caltrans Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-F of this guidance document for supporting information on OWS technology and characteristics.

1.1 Data to be Collected

The following data will be collected to assess the performance and maintenance aspects of an OWS:

- Water quality and quantity data of runoff into and discharge from the OWS from first-flush (as soon as possible after the start of runoff) grab samples for at least eight storm events for two wet seasons.
- Rainfall data recorded as a function of time, from rainfall events during the study period.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring and abatement data.
- Records of vector control measures taken.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to be Performed

Field activities that will be performed at the OWS facilities include:

- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Monitoring Observations.
- Facility Maintenance Inspections.
- Vector and Nuisance Animal Control Inspections.
- Stormwater Monitoring.

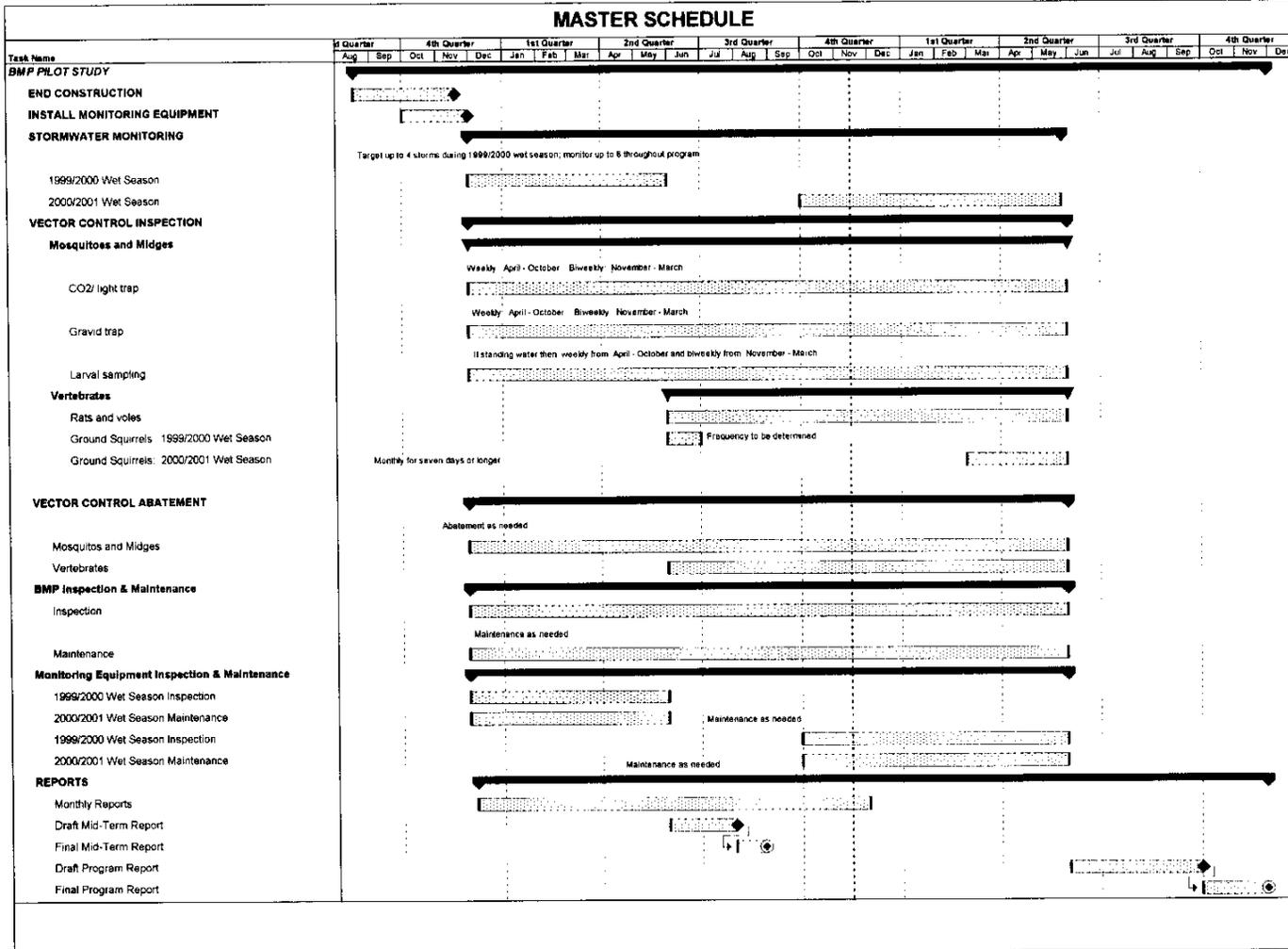


Vector management may also be necessary at OWS facilities, but may be contingent on facility housekeeping and other environmental influences. Please see Appendix IV, Volume II if vector management is necessary.

1.3 Master Schedule

The schedule on the following page shows the time-line for each phase of the OWS OMM program.

MASTER SCHEDULE



2.0 SITE INFORMATION

Access requirements for the site are summarized in Table 2.1, in the encroachment permit found in Tab 9, and in the Site Location Maps in Tab 1. ***Encroachment permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed***.

Check in with appropriate Caltrans personnel before conducting any site fieldwork.

Table 2.1. Caltrans District 7 Oil/Water Separators Site Summary

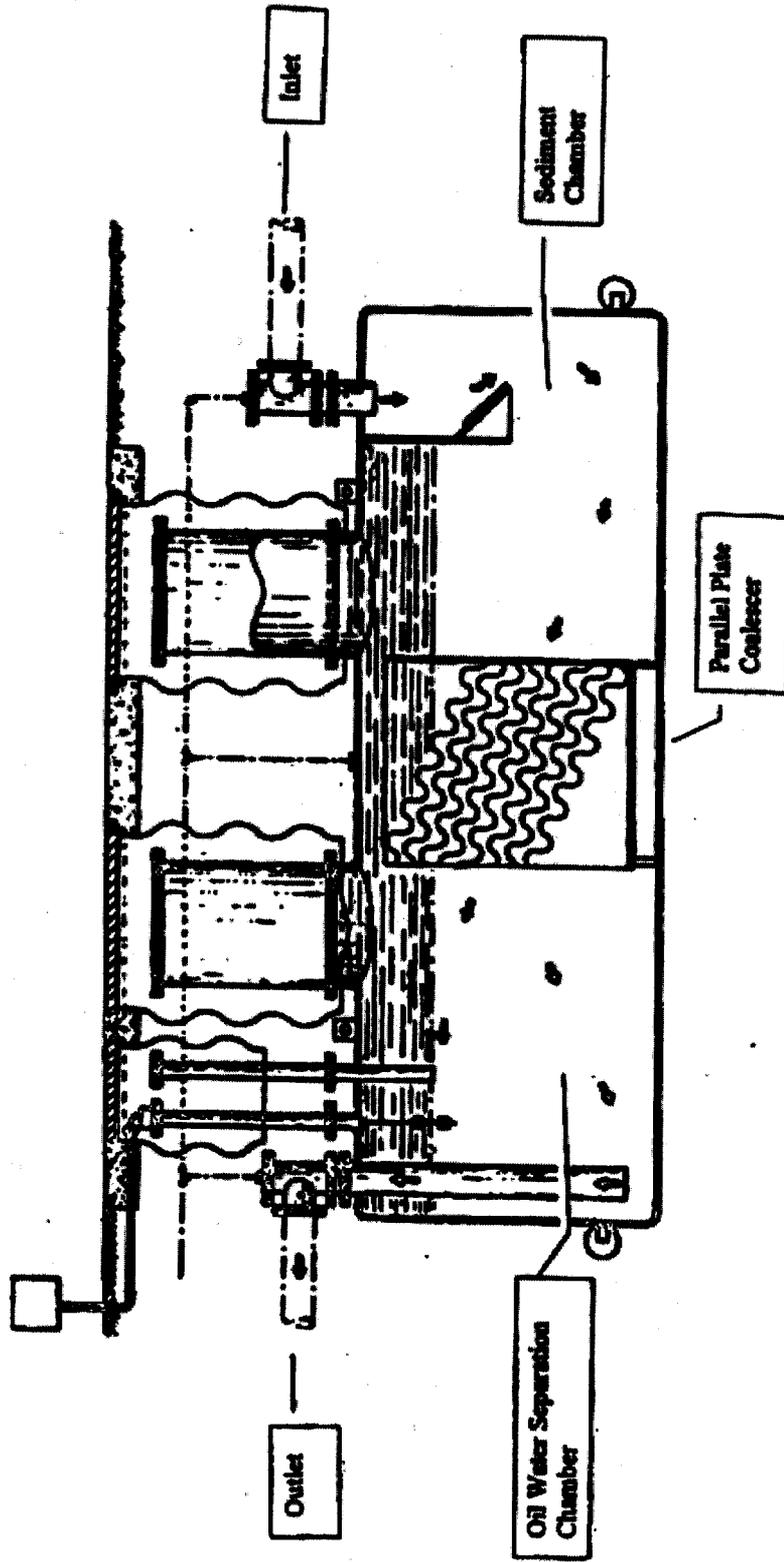
Site No.	Site Name	Site Location	Access and Parking
074201	Alameda Maintenance Station	City of Alameda	Park inside maintenance station.

2.1 Oil/Water Separators

Refer to the accompanying Appendix for a general description of the OWS. The sections below provide site-specific information for each OWS site in District 7.

BMP facility drawings are located under Tab 1. Refer to Tab 9 for a summary of the hydraulic characteristics for these BMPs. Figure 2.1 shows a typical schematic for an OWS.

Figure 2.1
Typical Schematic of an Oil/Water Separator



2.1.1 Site 074201: Alameda Maintenance Station Oil/Water Separator

The OWS at the Alameda Maintenance Station receives runoff from an open rectangular, concrete trench drain. This drain is covered by a grating (see Tab 1, BMP Facility Plan). The influent flows through a 200-mm plastic pipe before it reaches the sampler and OWS. After the stormwater has been treated, a 200-mm plastic pipe conveys discharge.

The influent sampling point will be located at the north end of the OWS. The effluent sampling point will be located at the south end of the OWS (see Site map in Tab 1).

2.2 Emergency Hospital Routes

See the “**Emergency Procedures**” **Tab 2** for maps and descriptions showing the direct routes to the nearest hospitals and for emergency and site-related telephone contacts.

2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Because the OWS site is situated in a Caltrans Maintenance Station, there are no real onsite traffic concerns. Note that at an OWS, field crews will consist of a minimum of 2 people. However, when at a Caltrans Maintenance Station, the following apply:

- Be aware of the Emergency Contacts List in Tab 2 in case of accidents.
- Affiliated personnel must wear an orange safety vest, a hard hat, and appropriate shoes.
- Always park in visitor parking areas. Do not block any access lanes that interfere with daily operations.
- If needed, use cones and barricades to provide a margin of safety from onsite activities. (adhere to specific encroachment permits requirements).
- Barricade any open manholes or ditches.
- Leave nothing behind. Upon completion of the work, the area must be cleaned up and orderly. Remove any extraneous litter.

2.3.2 *General Safety*

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the OWS facility, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Open chamber covers.
- Lifting heavy objects.
- Lightning.
- Transients.
- Fast moving water.
- Poor visibility, especially at night.
- Muggers and other criminals.
- Power tools and heavy equipment.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.
- Confined space entry. Class C or D Confined Space Entry may be required by maintenance contractor personnel (vector truck). Verification of the class of confined space entry will be determined onsite prior to entry (if necessary), using and testing procedures discussed in Appendix II. However, it is expected that confined space entry will not be necessary for routine cleaning, but may be required if major repair or servicing is needed.

Other important field precautions include:

- Always wear a hard hat.
- Wear rain gear, when appropriate.
- Always work in pairs: use the buddy system.
- Always have means of communication nearby.
- Maximize lighting at night.
- Do not sample during lightning.
- Use an extended sample-grabbing device for sampling when possible.
- Do not leave tools or equipment lying around.
- Do not lift heavy objects without help.
- Never use drugs or alcohol while working. Report those who do.
- Do not use power tools or heavy equipment if unless trained in their proper use.
- Avoid leaving materials, tools, and equipment lying around where it creates a tripping hazard.
- Always wear eye protection when hammering or working with power tools.
- Never leave open holes unattended or unbarricaded.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 to find appropriate forms and information required for aspects of the field OMM program, including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is to review and assemble each item in Table 3.1 pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks: facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
For Oil/Water Separators

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Maps	NA	Prior to site visits.
	BMP Layout Diagrams	NA	Prior to site visits.
	Sampling Point Diagrams	NA	Prior to site visits and sampling.
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist	Form F	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and basin.
	Field Data Log Sheet	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet for Influent/Control Sampling Point	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet for Effluent Sampling Point	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses List	Ex. 7.1	Reference for each sampling event and lab analysis request submittal.
8	Vector Control Checklists	Forms O1-O2	Fill out for each site visit when vectors are observed.
9	Runoff Coefficient Listing	Ex. 9.1	Reference: for calculations.
	“Volume-to-Sample” Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.

NA=Not Applicable

4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

At a minimum, each OWS will be inspected:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.5 inches of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Form C (Tab 4).*

1. Contact appropriate Caltrans District 7 personnel in accordance with Encroachment Permit requirements (see Tab 9, Exhibit 9.3).
2. Completely walk around the site while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - ♦ General aesthetics (graffiti, vandalism).
 - ♦ BMP performance (fouling, blockage, damage).
 - ♦ Equipment repair/maintenance (BMP components, autosampler).
 - ♦ Sediment accumulation (within BMP, at influent confluence).
 - ♦ Storage of accumulated sediment or other wastes.
 - ♦ Vector control.
4. Log field activities and their corresponding time accurately.
5. Call the appropriate contacts (Project Contacts List, Tab 2) if immediate corrective or preventative maintenance is needed.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.
- Vector Control.
- Vandalism.
- Standing Water

Maintenance activities at the OWS facilities will be conducted in accordance with Appendix V, the Maintenance Indicator Document. See the manufacturer's operation and maintenance manual for more details on operation and maintenance of an OWS.

Maintenance activities performed will be documented using the Forms E and F in Tab 5. See Section 2.0 of Appendix I-F for full details on maintenance activities.

4.3 Vegetation Management

OWS installations are below ground, and will not require the maintenance and control of vegetation. However, if a site accommodates vegetation, use the maintenance checklists (Form C, Tab 4 and Form E, Tab 5) whenever vegetation management is applicable. See Sections 2.0 and 4.0 of Appendix I-F for specific details on controlling vegetation.

4.4 Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs is critical. When sediment removal is required, chemical characterization must be conducted to determine appropriate land disposal requirements (LDRs). Such chemical characterization testing will be conducted *in-situ* to minimize disturbance and exposure potentials. That is, sediment samples from the BMP will be collected in-place without their removal (unless catastrophic BMP failure occurs or other emergency measures are required).

When sampling sediments, document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

At times possible, an outside contractor should be hired to physically remove, handle, transport, and dispose of BMP sediments. These service contractors often will provide sediment characterization and proper disposal as part of the contracting fee, which would eliminate the need for independent sediment testing.

Sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the sediment chamber.
3. Collect the sample using a submersible sediment sampler or equivalent. Ensure that the sample is collected near the center of the sediment layer and at the location that was randomly selected. Great care must be taken not to make contact with the metal casing.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.



8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.5 Vector and Nuisance Animal Control

Vector control and management will be performed in accordance with Appendix IV by subcontracted Vector Control Districts.

5.0 STORM MONITORING

Careful preparation and planning is critically important. High quality samples *must* be obtained for each storm event. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, **be sure** that onsite rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours is preferable).
2. Deployment criteria defined in Exhibit 3.1.

Check the sources for local weather conditions before deploying field staff. Use Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for determining when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-F details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, detection limits, and holding times for stormwater sampling. Appendix III details the quality assurance and quality control requirements of this program.

Checklists, log forms, and information necessary to conduct a successful monitoring program at OWS facilities are listed in Table 3.1 (Section 3.0), and shall be completed.

Sampling equipment shall be inspected (if wet season) and documented. There are two principal phases of documenting stormwater sampling at BMP sites:

- Pre-Storm preparation.
- Storm event sampling (grab sample collection).
- Post-Storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Inspect the pump tubing and replace if necessary.
2. Inspect intake tubing condition and connections.
3. Inspect desiccant cartridges in sampler and flow meter.
4. Check electrical connections.
5. Consult the Storm Monitoring Decision Tree (Exhibit 3.1) for when to mobilize.
6. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).
7. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.

8. Assemble sample containers for influent and effluent sampling.
9. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected twice per year.

5.1.2 Storm Event and Sample Collection

Once onsite, fill out Empirical Observation Field Data Log and a Field Data Log Sheet (Forms H and I, Tab 6) to document storm characteristics.

5.1.3 Post-Storm Sample Analyses

After a storm event has ended by physically inspecting the OWS to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if confined space requirements are met).

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

Chain-of-Custody Forms

When the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody forms (Form M, Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.2 Empirical Observations

Complete and succinct empirical observations are required during site visits (rain/runoff and BMP characteristics). Observations shall be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). Particularly note the following:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory).
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Oil skimming and absorbing equipment.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Refer to Form H in Tab 6 for recording empirical observation information.



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TAB 3: FIELD PREPARATION/MOBILIZATION FORMS

- Exhibit 3.1: Storm Monitoring Decision Tree
- Form A: Mobilization Checklist
- Form B: Storm Staffing Plan

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- Form C: BMP Site Inspection Checklist
- Form D: Monitoring Equipment Inspection Checklist

TAB 5: MAINTENANCE FORMS

- Form E: BMP Site Maintenance Activity Checklist
- Form F: Monitoring Equipment Maintenance Activity Checklist
- Form G: Stockpile/Sediment Sampling Checklist
- Exhibit 5.1: Title 22 Characterization Requirements

TAB 6: MONITORING FORMS

- Form H: Empirical Observations Field Data Log Sheet for Storm Events
- Form I: Field Data Log Sheet
- Form J1: User-Entered Program Parameters (Influent/Control)
- Form J2: User-Entered Program Parameters (Effluent)
- Form K: Station Phone Log

TAB 7: LABORATORY ANALYSIS FORMS

- Form M: Chain-of-Custody Form
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TAB 9: TECHNICAL SUPPORT INFORMATION

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- Exhibit 9.2: Volume-to-Sample Tables
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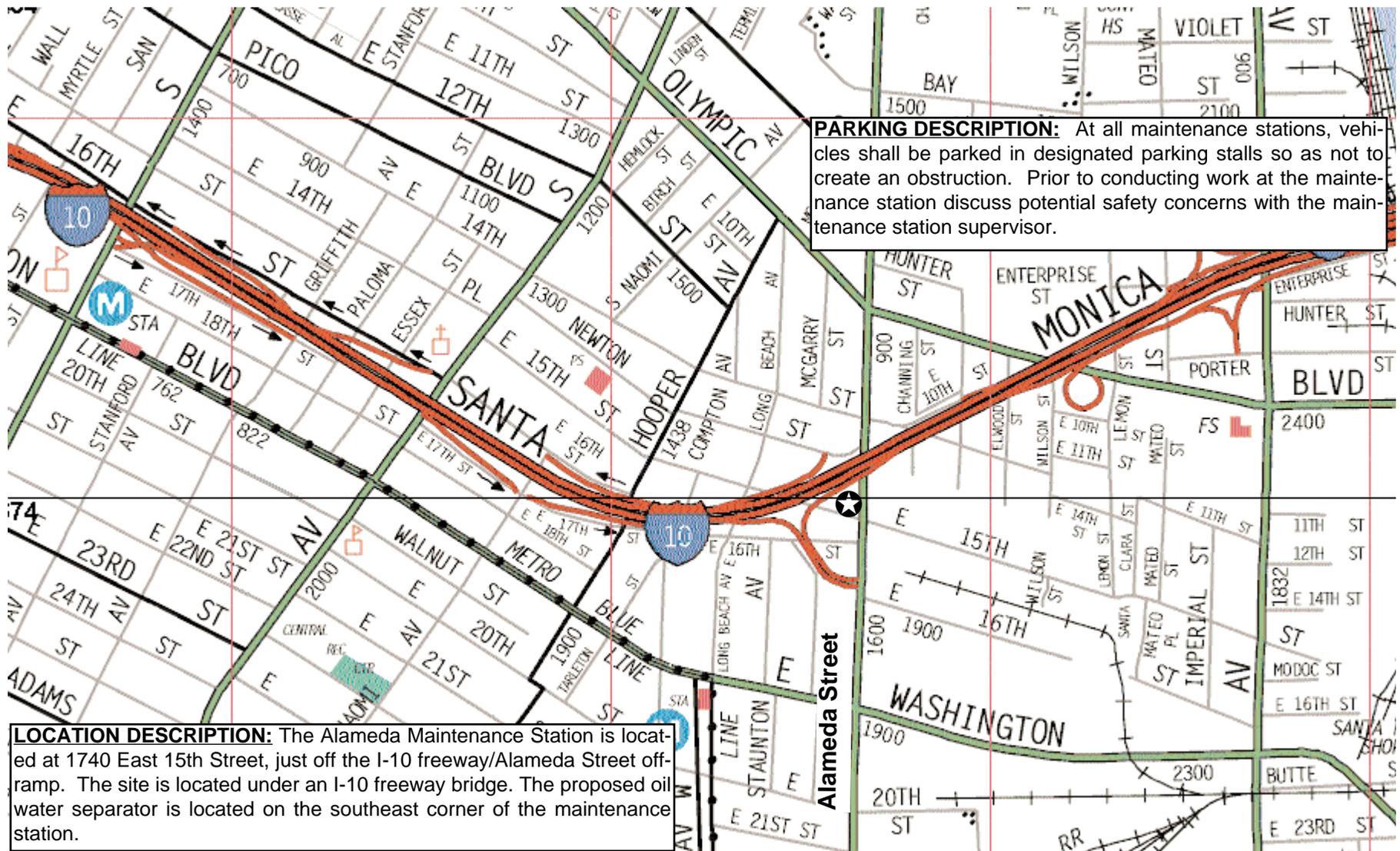


TAB 1

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans
BMP Maintenance Perimeter Maps**



SOURCE: Thomas Bros., Los Angeles County, 1997

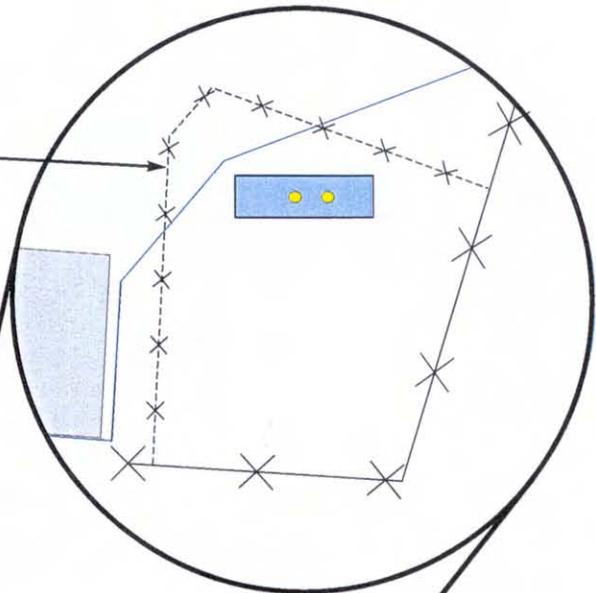
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Alameda Maintenance Station BMP Pilot Study Site #074201 Site Location Map

-  BMP Pilot Site
-  Not to Scale

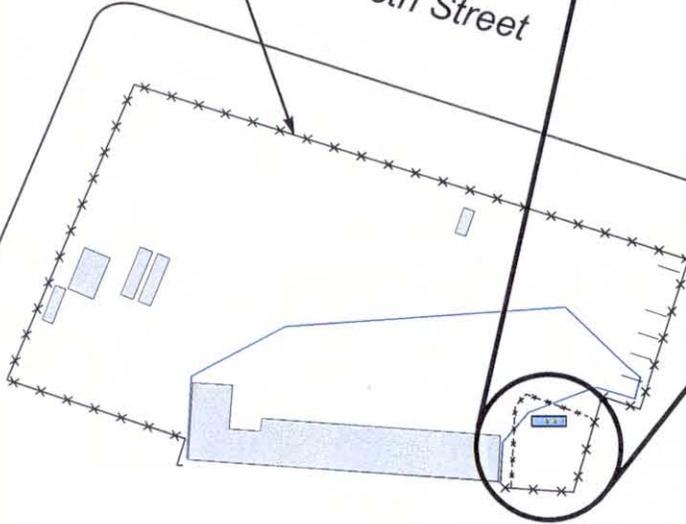


BMP
Maintenance
Area



Site Boundary

15th Street



LEGEND	
	Drainage Area
	O/W Separator Site

1740 E. 15th Street
Los Angeles, CA

BROWN AND
CALDWELL

Site 74201 Alameda Maintenance Station
Drainage Area



TAB 2

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**

Document all information related to any accident or incident that resulted in injury or damage and report it to Mark Williams at Brown and Caldwell at (619) 528-9090.

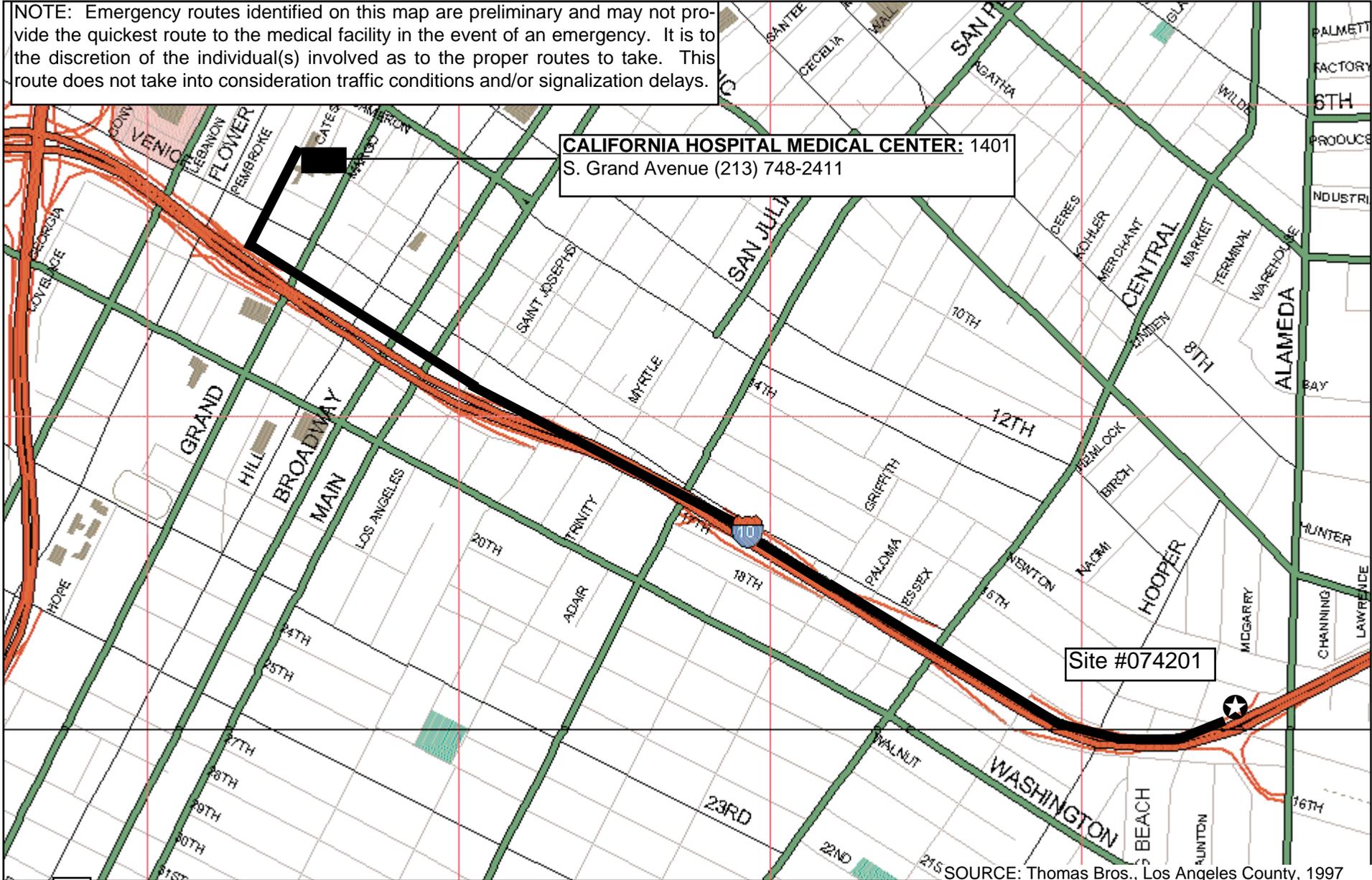
***Emergency Contacts
Site 074201: Emergency Contact Numbers for Alameda Maintenance Station
(Oil Water Separator)***

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Los Angeles Police Department	911	From landline phone
Los Angeles Police Emergency Dispatch	(213) 485-4022	In case of emergency
Los Angeles Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
California Hospital Medical Center	(213) 748-2411	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Tyrone Taylor) 24-hour emergency	(310) 715-2509 (213) 897-0383	Notify for any accident or injury
Area Supervisor for Alameda Maintenance Station (Kevin Sciotto)	(213) 620-2961	Call before visiting site
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans District 7 Program Manager (Robert Wu)	(213) 897-8636	Notify for any accident or injury

NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

CALIFORNIA HOSPITAL MEDICAL CENTER: 1401 S. Grand Avenue (213) 748-2411

Site #074201



BMP Pilot Site

Not to Scale

Potential Emergency Route

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Alameda Maintenance Station
Hospital Route Map

Project Contacts

Name	Organization	Phone	Fax Mobile	Email
Robert Wu	Caltrans Program Manager Dist 7	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Mark Williams	Brown and Caldwell	(619) 528-9090-w	(619) 528-9199-f	mwilliams@brwncald.com
Ed Othmer	Law/Crandall	(619) 278-3600	(619) 278-5300-f	eohtmer@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678	peter_vanriper@dot.ca.gov
Bill Whittenberg	RBF	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Patti Matta	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Patty@dmaipo.attmail.com
Mark Weiner	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Mweiner@dmalabs.com
Chet Reynolds	FLW/R.C. Hoffman Co.	(949) 643-0831	(949) 643-0832	--
John Misisi	American Sigma	(800) 635-4567	(716) 798-5599	Misitiz@aol.com
Anthony Tavano	American Sigma	(716) 798-5580	(716) 798-5599	
Internet	National Weather Service	(805) 988-6610	--	http://nimbo.wrh.noaa.gov/
Internet	Accuweather	--	--	http://www.weather.com
Internet	Los Angeles Doppler Radar	--	--	http://www.weather.com weather/radar/single- site/CA_Los_Angeles.html
Internet	Intellicast	--	--	http://www.Intellicast.com
Internet	Weather Underground	--	--	http://www.wunderground.com
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	530 753-6400	--	deanm@lawdavis.com

Name	Organization	Phone	Fax Mobile	Email
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(909) 365-0117	geoscrc1@ix.netcom.com
Suzanne Klueh	Greater Los Angeles County Vector Control District	(562) 944-9656	(562) 944-7976	--
P. Sue Zuhlke	San Gabriel Valley Mosquito and Vector Control District	(626) 814-9466	(626) 337-5686	Psuez@earthlink.net



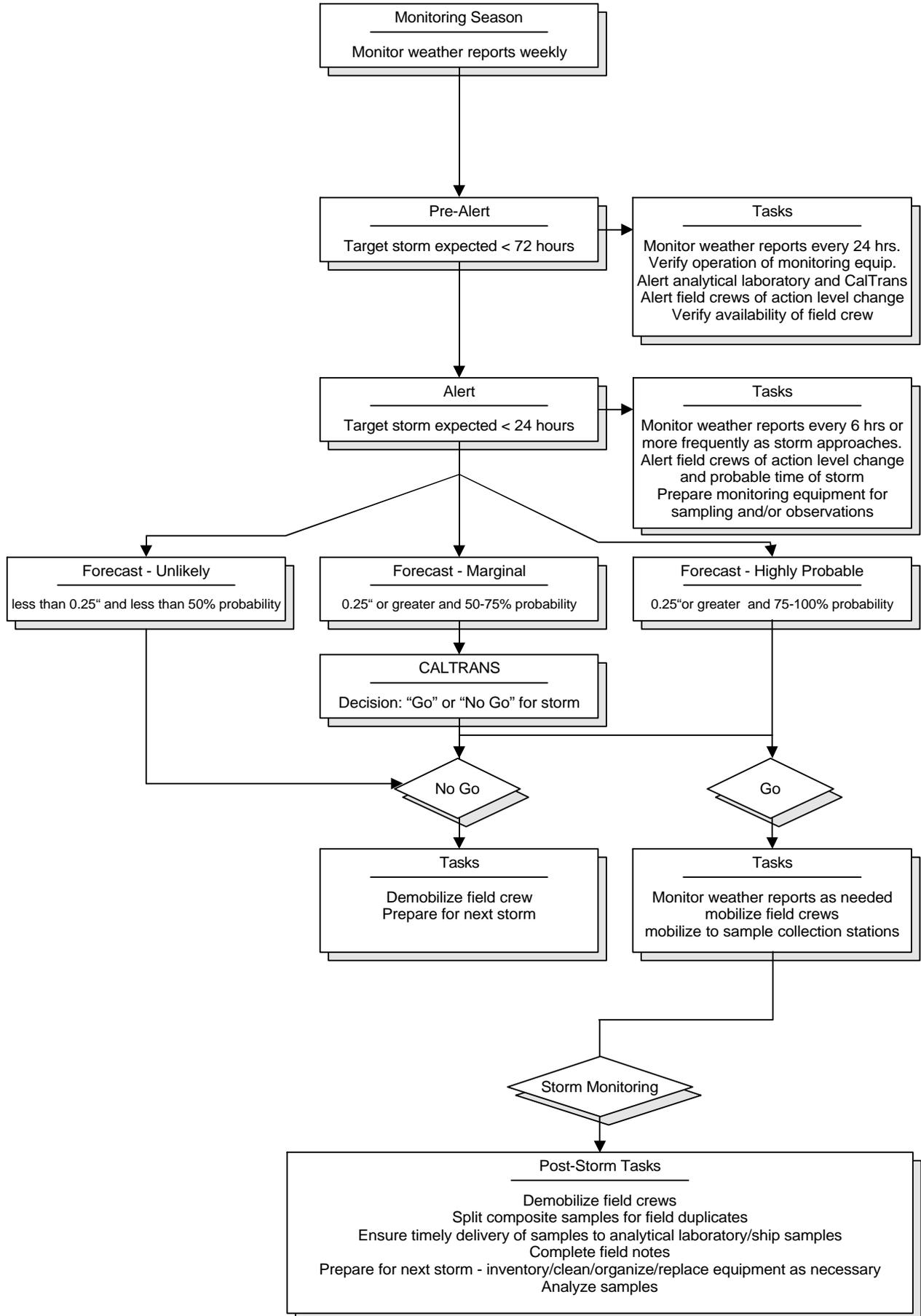
TAB 3

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Mobile phone	Volume to sample matrix
Vendor's autosampler manual	Vendor name and contact

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Maps for all required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm kit	Log books
pH meter	Paper towels (cloth towels)
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
pH grab bottles	Spare sample labels (waterproof)
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	20 liter bottles in 10 gallon containment buckets
Grab sample bottles (see below)	Coolers and ice (at least one extra)
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Lab telephone number
for each QA/QC analysis	Backup lab contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
extra bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

**Form C: BMP Site Inspection Checklist
Form D: Monitoring Equipment Inspection Checklist**

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ of _____

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Oil/Water Separators (Continued)

ANIMAL CONCERNS:	Maintenance Req'd?
Is there evidence of small animals (droppings, trails, gnawing marks, or stained rub marks)? ? yes ? no	? yes ? no
Is there evidence of mosquito or roach activity within the OWS chambers? ? yes ? no	? yes ? no
Comments:	

AESTHETIC CONCERNS:

Debris (non-trash)? ? yes ? no Type, amount and location:

Trash? ? yes ? no Type, amount and location:

Graffiti? ? yes ? no Description and location:

Other general aesthetic concerns:

NON-STORMWATER CONCERNS:

Non-storm water discharge to BMP ? yes ? no

BMP wet from obvious non-stormwater discharge (no rain) ? yes ? no

If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678

From: _____ Contact Number: _____

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction (facing)	Roll	Photograph No.

OVERALL:

Other concerns affecting operation:

Condition of facility: ? acceptable ? not acceptable

Comments:

Dates for maintenance to be completed by:

(Team Leader's Signature)

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ of _____

FORM D		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Oil/Water Separators		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
FLOW MEASUREMENT EQUIPMENT:		Maintenance Required?
Is the monitoring station enclosure locked? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is internal modem online? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the flow meter properly installed? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the flow meter tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
INFLUENT SAMPLING LOCATION:		Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:		<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:		
EFFLUENT SAMPLING LOCATION:		Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:		<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:		<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:		

For Internal Use Only

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ of _____

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Oil/Water Separators

Date	Time	Description	Direction (facing)	Roll	Photograph No.

Dates for maintenance to be completed by:

 (Team Leader's Signature)



TAB 5

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

- Form E: BMP Site Maintenance Activity Checklist**
- Form F: Monitoring Equipment Maintenance Activity Checklist**
- Form G: Sediment Sampling Checklist**
- Exhibit 5.1: Title 22 Characterization Requirements**

FORM E			
Caltrans BMP Retrofit Pilot Program			
BMP Site Maintenance Activity Checklist for Oil/Water Separators			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
<i>Fill out appropriate sections only</i>			
SEDIMENT CONTROL:			
<input type="checkbox"/> <i>OWS chamber sediment removal</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Clean OWS chambers buildup</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other (describe):</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
BUILDUP CONTROL:			
<input type="checkbox"/> <i>OWS oil/grease buildup</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>OWS coalescing plate cleaning</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> <i>Other</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
STRUCTURAL:			
<input type="checkbox"/> <i>Structural repairs (describe):</i>			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			

FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Oil/Water Separators (continued)				
ANIMAL CONCERNS:				
<input type="checkbox"/> <i>Insect control</i>				
Start time:	End time:	Total time:	More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:				
Comments:				
<input type="checkbox"/> <i>Other (describe):</i>				
Start time:	End time:	Total time:	More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:				
Comments:				
AESTHETIC CONCERNS:				
<input type="checkbox"/> <i>Debris and trash removal</i>				
Start time:	End time:	Total time:	More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:				
Comments:				
<input type="checkbox"/> <i>Graffiti removal</i>				
Start time:	End time:	Total time:	More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:				
Comments:				
<input type="checkbox"/> <i>Painting</i>				
Start time:	End time:	Total time:	More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:				
Comments:				
<input type="checkbox"/> <i>Other (describe):</i>				
Start time:	End time:	Total time:	More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:				
Comments:				
_____ (Team Leader's Signature)			General Comments:	

FORM F			
Caltrans BMP Retrofit Pilot Program			
Monitoring Equipment Maintenance Activity Checklist			
for Oil/Water Separators			
GENERAL INFORMATION:			
Date:	Time In:	Time Out:	
Team Leader's Initials:		Stormwater Consultant:	
BMP Location:			
<i>Fill out appropriate sections only</i>			
<input type="checkbox"/> Clean orifices and other sampling inlets			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of flow meter tubing, pump tubing, or intake tubing			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of 12-volt marine battery			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Removal of kinks or obstructions from flow meter			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Other maintenance of flow measurement equipment (describe):			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
<input type="checkbox"/> Other (describe):			
Start time:	End time:	Total time:	More work required? <input type="checkbox"/> yes <input type="checkbox"/> no
Equipment used:			
Comments:			
_____ (Team Leader's Signature)		General Comments:	

FORM G			
Caltrans BMP Retrofit Pilot Program Stockpile/Sediment Sampling Checklist			
GENERAL INFORMATION:			
Date:	Time In:	Team Leader's Initials:	Time Out:
Location:			
SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:			
Depth of sediment:			
Color:	<input type="checkbox"/> black	<input type="checkbox"/> brown	<input type="checkbox"/> green <input type="checkbox"/> tan <input type="checkbox"/> other
Consistency:	<input type="checkbox"/>	<input type="checkbox"/> sandy	<input type="checkbox"/> silty <input type="checkbox"/> granular <input type="checkbox"/> other
Odors:	<input type="checkbox"/> petroleum	<input type="checkbox"/> solvents	<input type="checkbox"/> organic (rotten eggs) <input type="checkbox"/> sewage
	<input type="checkbox"/> none	<input type="checkbox"/> other	
Depth of sediment:			
SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST			
Powder Free Nitrile Gloves			
Soil Probe or equivalent for sample collection			
8-ounce glass jar labeled Total Petroleum Hydrocarbons (TPH)			
Plastic bags, seal bags			
Chilled cooler			
Chain-of-Custody form			
Log book for record keeping			
STOCKPILE/DRUMMED SEDIMENT:			Maintenance Required?
Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.			<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.			<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.			<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.			<input type="checkbox"/> yes <input type="checkbox"/> no
SEDIMENT COLLECTION:			
<10 cubic yards: <i>Minimum of 2 samples, one randomly from each half of the soil mass</i>			
10-20 cubic yards: <i>Minimum of 3 samples, one randomly from each third of the soil mass</i>			
20-100 cubic yards: <i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>			
100-500 cubic yards: <i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>			
Over 500 cubic yards: <i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>			<i>Contact Dept. of Environmental Health for Guidance</i>

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ of _____

FORM G

**Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist**

SEDIMENT SAMPLE COLLECTION

Observation sheet completed

Personal and equipment decon completed

Number of aliquots taken from composite _____

Sample IDs:

- | | |
|----------|---------------------------|
| 1. _____ | Analysis requested: _____ |
| 2. _____ | Analysis requested: _____ |
| 3. _____ | Analysis requested: _____ |
| 4. _____ | Analysis requested: _____ |
| 5. _____ | Analysis requested: _____ |
| 6. _____ | Analysis requested: _____ |

Photos taken:

Chain of Custody form attached

Record information in logbook for record keeping

Comments:

Exhibit 5.1
Title 22 Characterization Requirements, Sediment Matrix
Analytical Parameters, Methodologies, Detection Limits, Holding Times,
Container Volumes and Types, and Preservation

Parameter	Method	Units	Detection Limit	Maximum Holding Time	Preservation	Container Size/Type ⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.
- (5) “Test Methods for Evaluating Solid Waste, Physical /Chemical Methods”. SW-846, Update III.(SW-846)



TAB 6

CALTRANS BMP STORM WATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for
Storm Events**

Form I: Field Data Log Sheet

Form J1: User-Entered Program Parameters (Influent/Control)

Form J2: User-Entered Program Parameters (Effluent)

Form K: Station Phone Log

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Oil Water Separators

Are there any indications of leakage (e.g., falling water level without flow occurring from a chamber)? If so, what indications and where?

Comments:

INLET CONDITIONS:

Describe flow distribution where flow passes weir or baffle at exit of inlet chamber:

- Flow is uniformly distributed
 Flow is not uniformly distributed, if so describe below:

Describe any obstructions or restrictions interfering with inflow/influent:

INFLUENT WATER QUALITY APPEARANCE:

Check all that apply and describe under comments

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In forebay: _____

In coalescing plate pack: _____

In afterbay: _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Oil Water Separators

SOLIDS DEPOSITION AND RESUSPENSION (cont.):

Solids resuspension evident (*check all that apply*):

- Forebay Coalescing plate pack Afterbay
 Other (describe): _____

Solids deposition and resuspension comments:

OIL SKIMMING AND ABSORBING EQUIPMENT CONDITIONS:

Describe any indications that the oil skimmer function is impaired or that the absorbent is near capacity:

OUTLET CONDITIONS:

Describe any obstructions or restrictions interfering with outflow/effluent:

EFFLUENT WATER QUALITY APPEARANCE:

Check all that apply and describe under comments

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

VECTORS:

Presence of vectors:

- Yes No

If yes, what type:

- Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Oil Water Separators

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

Concrete cracking or spalling Metal Corrosion Vandalism

Comments:

MONITORING EQUIPMENT CONDITIONS:

Equipment functional: Yes No N/A

Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: _____

Comments:

Date: _____

Comments:

Date: _____

Comments:

ADDITIONAL COMMENTS:

(Team Leader's Signature)

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet

GENERAL INFORMATION		Julian Day (*5AA): _____
Date: _____	Time in (PST,*5): _____	Team Leader's Initials: _____
Location: La Costa / I-5 Northbound		Crew: _____
<u>Influent or Effluent (circle one)</u>		Storm Event Visit or Maintenance Visit (circle one)

SYSTEM STATUS FLAGS (*6AD; 1=high, 0=low)	PROGRAM SIGNATURE (*B)
Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Arrive: _____
Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Depart: _____

DATA LOGGER INFORMATION (*6)		
<i>All Site Visits:</i>	Samp. Batt Volt 22:	<i>Manual Rain Gauge:</i>
Basin Staff Gauge:	Cell Batt Volt 82:	Total Rain (in.) 25:
Flow Sensor Stage:	Flow Meter Batt Volt 28:	Total Storm Vol. 72:
Stage (ft) 02:	<u>Storm Site Visits:</u>	Strm Vol Smpld 75:
Velocity (ft/s) 03:	Volume (kcf) 05:	Max Stage Day 51:
Flow (cfs) 04:	Storm Sum (kcf) 06:	Max Stage Time 52:
Station ID 21:	Percent Capture 08:	Max Stage (ft) 53:
	Volume2Sample 14:	Date Last Sample 105:
	Sample Count 17:	Time Last Sample 106:

AUTOSAMPLER INFORMATION	
<i>Storm only</i>	Bottle # in: _____
Number of Samples Total: _____	Bottle # out: _____
Number of Samples Remaining: _____	Bottle Volume: _____
	Volume2Sampl: _____

GRAB SAMPLE COLLECTION	CALIBRATIONS and CHECKS
Time: _____	Stage: <input type="checkbox"/>
TPH (Diesel/Oil) _____	Sample Volume: <input type="checkbox"/>
TPH (Gasoline) _____	Rain Gauge: <input type="checkbox"/>
Oil and Grease _____	Other: _____
Conventionals _____	

SAMPLING EQUIPMENT AND REPAIR NEEDS:

ACTION TAKEN:

Team Leader's Signature _____

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:

Time:

01 Station ID				
03 Volume to sample (kcf)				
04 Level Meter Stage Offset (feet)				
05 Level Meter Multiplier (feet/mv)				
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)				
09 Minimum Stage Threshold (feet)				
10 Storm Stage Trigger Level (feet)				
11 Storm End Factor (times storm trigger stage)				
12 No. of Seq. Trans. Failures Before Raising Flag 6				
13 Time (min.) to wait after 1 st set of trans. Failures				
14 No. samples of depth taken for avg. 1 prog. exe.				
15 No. samples of speed taken for avg. 1 prog. exe.				
17 Amount of rain per bucket tip (inches)				
18 Amt. rain samp. before rain data recorded (in.)				
19 Number of samples collected until bottle is full				
20 No. of times Flag 7 goes high before var. reset				
23 Data avg. int. (min.) when storm conditions exist				
24 Data avg. int. (min.) storm conditions don't exist				
30				
31				
34 Flume Parameter 1				
35 Flume Parameter 2				
36 Cellular phone battery state control parameter				
37 Duration when cellular phone battery is on				
38 Period of cellular phone battery state control				
Program Signature (*B)				

*Subject to Revisions



TAB 7

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Chain-of-Custody Form
Exhibit 7.1: Chemical Analyses List**

FORM M
Chain-of-Custody Form

Laboratory: <div style="text-align: right; margin-right: 20px;"> Lab # Date Received </div>	From:
--	--------------

Project: P.O.#:	Project #: Required Completion Date:
----------------------------------	---

Sample ID #	Site ID #	Lab ID #	Matrix/ Analysis	Containers	Pres.	Sample Date/Time	Condition Upon Receipt

Data Reports **WILL** include the following: Sample/Site ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.

Special Instructions/Comments:

Relinquished by: Date/Time	Transporter	Received by: Date/Time
Relinquished by: Date/Time	Transporter	Received by: Date/Time
Relinquished by: Date/Time	Transporter	Received by: Date/Time

Exhibit 7.1
Stormwater Matrix
Analytical Parameters, Methodologies, Detection Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/ Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Organics⁽⁴⁾									
Total Petroleum Hydrocarbons – Diesel/Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Oil and Grease	Grab	5	mg/L	IR/Gravimetric	EPA 413.2/1664HEM	28 days	1 L	2-1L amber glass	4°C and H ₂ SO ₄ to pH<2

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. TPH grab samples will be collected for two storms each monitoring year.



TAB 8

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

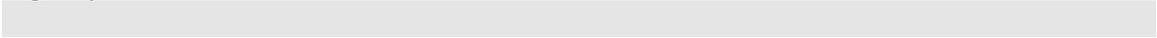
VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related
Maintenance Activity Checklist for Affected BMP
Facilities by Type**

VECTOR CONTROL AND MONITORING FORMS

Vector Control and Monitoring Forms will be provided by the applicable Vector Control Agency.





TAB 9

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

- Exhibit 9.1: Runoff Coefficients**
- Exhibit 9.2: Volume-to-Sample Tables**
- Exhibit 9.3: Encroachment Permits**

Exhibit 9.1

**Runoff Coefficient Matrix Table for Oil/Water Separator
Caltrans District 7**

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
074201	Alameda Maintenance Station	0.75	1

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
Alameda Maintenance Station (OWS)

Number of Sample Aliquots 72			
Acreage 0.75			
Runoff Coefficient 1			
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)
0.1	0.0038	2.6	0.0983
0.2	0.0076	2.7	0.1021
0.3	0.0113	2.8	0.1059
0.4	0.0151	2.9	0.1097
0.5	0.0189	3.0	0.1134
0.6	0.0227	3.1	0.1172
0.7	0.0265	3.2	0.1210
0.8	0.0303	3.3	0.1248
0.9	0.0340	3.4	0.1286
1.0	0.0378	3.5	0.1323
1.1	0.0416	3.6	0.1361
1.2	0.0454	3.7	0.1399
1.3	0.0492	3.8	0.1437
1.4	0.0529	3.9	0.1475
1.5	0.0567	4.0	0.1513
1.6	0.0605	4.1	0.1550
1.7	0.0643	4.2	0.1588
1.8	0.0681	4.3	0.1626
1.9	0.0718	4.4	0.1664
2.0	0.0756	4.5	0.1702
2.1	0.0794	4.6	0.1739
2.2	0.0832	4.7	0.1777
2.3	0.0870	4.8	0.1815
2.4	0.0908	4.9	0.1853
2.5	0.0945	5.0	0.1891

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE,
AND MONITORING PLAN
VOLUME II

BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
MULTI-CHAMBERED TREATMENT TRAINS



DISTRICT 7, LOS ANGELES

September 1999



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- Form N3: Field Sheets, Mosquito and Vector Control District
- Form N4: Operations Report, Mosquito and Vector Control
- Form N5: Pesticides Used
- Form O1: Inspection Checklist for Vertebrate Vectors
- Form O2: Vertebrate Vector Control-Related Maintenance Activity Checklist for Affected BMP Facilities by Type
- Form O3: Vertebrate Monitoring and Control Trapping Data Sheet

TAB 9: TECHNICAL SUPPORT INFORMATION

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APPENDICES

APPENDIX I-G: MULTI-CHAMBERED TREATMENT TRAINS

APPENDIX II: HEALTH AND SAFETY PLAN

APPENDIX III: QUALITY ASSURANCE/QUALITY CONTROL PLAN

APPENDIX IV: VECTOR CONTROL PLAN

APPENDIX V: MAINTENANCE INDICATOR DOCUMENT



1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel appropriate field evaluation and documentation for the District 7 multi-chambered treatment trains (MCTTs) belonging to the Caltrans Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-G of this guidance document for supporting information on MCTT technology and characteristics.

1.1 Data to be Collected

The following data will be collected to assess the performance and maintenance aspects of an MCTT:

- Water quality and quantity data of influent and effluent from the MCTT from flow-composite and first-flush (as soon as possible after the start of runoff) grab samples for at least eight storm events for two wet seasons.
- Rainfall data recorded as a function of time, from rainfall events during the study period.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring and abatement data.
- Records of vector control measures taken.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to be Performed

Field activities that will be performed at the MCTT facilities include:

- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Monitoring Observations.
- Facility Maintenance Inspections.
- Facility Maintenance.
- Vector and Nuisance Animal Control Inspections.
- Stormwater Monitoring.

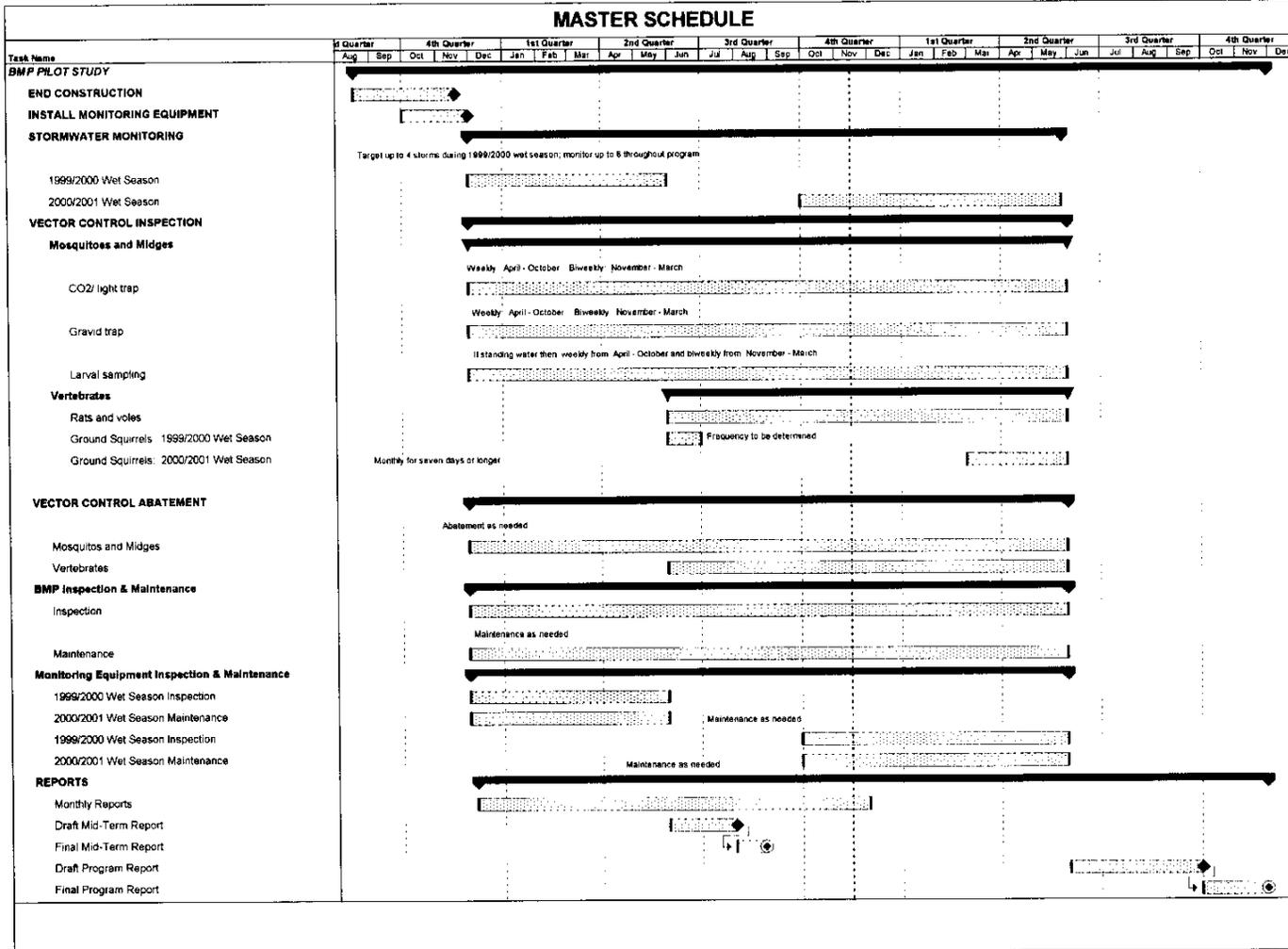


Vector management may also be necessary at MCTT facilities, but may be contingent on facility housekeeping and other environmental influences. Refer to Appendix IV, Volume II if vector management is necessary.

1.3 Master Schedule

The schedule on the following page shows the time-line for each phase of the MCTT OMM program.

MASTER SCHEDULE





2.0 SITE INFORMATION

Access requirements for each site are summarized in Table 2.1, in the encroachment permit found in Tab 9, and in the Site Location Maps in Tab 1. ***Encroachment permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed.***

Check in with appropriate Caltrans personnel before conducting any site fieldwork.

Table 2.1
Caltrans District 7 Multi-Chambered Treatment Trains Site Summary

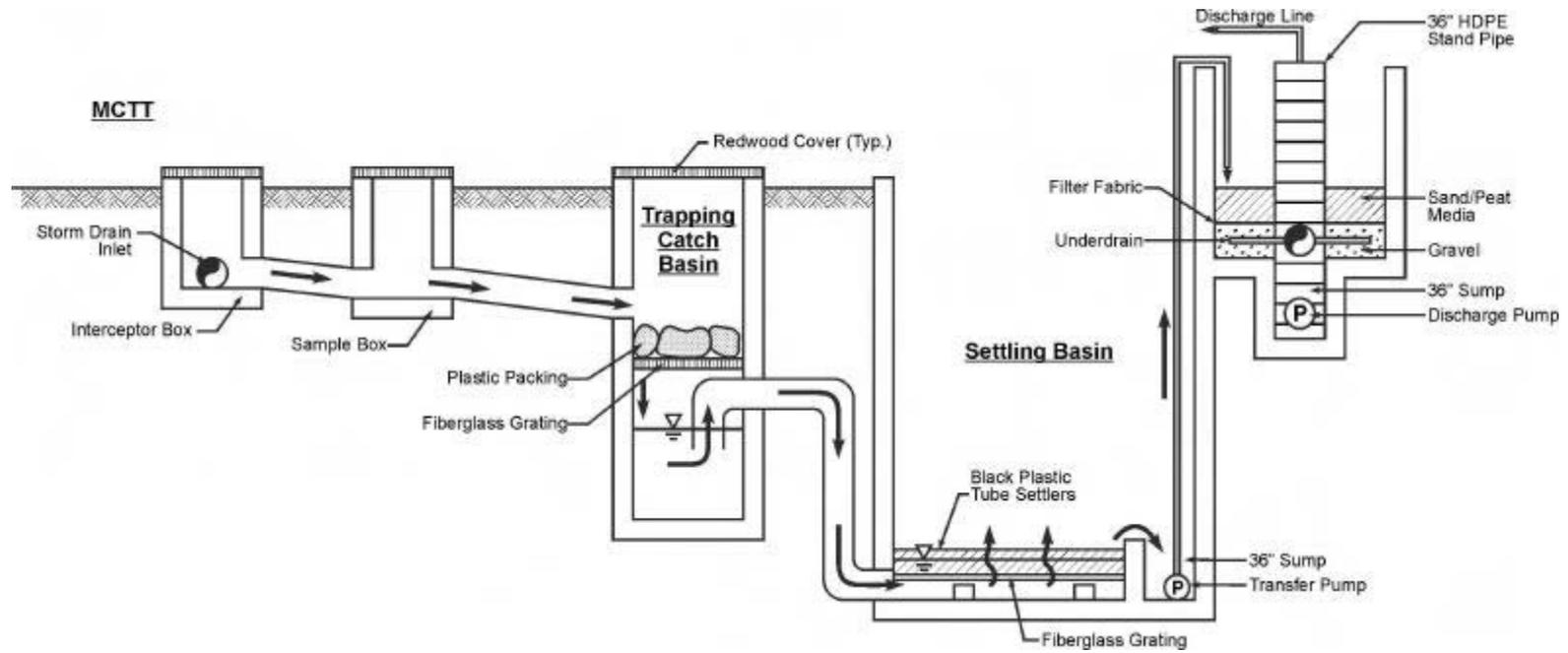
Site No.	Site Name	Site Location	Access and Parking
074104	Metro Maintenance Station	2187 Riverside Drive Los Angeles	Exit Stadium Way from I-5. Park in designated parking stalls.
074206	Via Verde Park and Ride	Via Verde & I-210 City of San Dimas	Exit Via Verde off I-210. Park in designated parking stalls.
074208	Lakewood Park and Ride	I-5 @ Lakewood Blvd. City of Lakewood	Exit off I-105. Park in designated parking stalls.

2.1 Multi-chambered Treatment Trains

Refer to the accompanying Appendix for a general description of the MCTT. The sections below provide site-specific information for each MCTT site in District 7.

Refer to Tab 9 for a summary of the hydraulic characteristics for these BMPs. Refer to Tab 1 for BMP facility plans. A typical schematic of an MCTT is included in Figure 2.1.

Figure 2.1
Typical Schematic of a Multi-Chambered Treatment Train



2.1.1 Site 074104: Metro Maintenance Station

The Metro Maintenance Station MCTT receives runoff through a V-ditch. This ditch is concrete lined. Stormwater flows from northeast to southwest through the ditch. The drain inlet lies on a pier foundation. The influent flows through a 300-mm plastic pipe before it reaches the sampler and the MCTT. The effluent is pumped from the MCTT and through a 50-mm PVC pipe.

The influent sampling point is located near the northwest end of the MCTT. The effluent sampling point is located at the south end of the MCTT (see Site map in Tab 1).

2.1.2 Site 074206: Via Verde Park and Ride

The Via Verde Park and Ride MCTT receives runoff through an open trench. This trench is concrete lined. Stormwater flows from southwest to northeast through the trench. The drain interceptor has a weir as an overflow mechanism. After the stormwater has been treated by the MCTT, the water is pumped through a 50-mm plastic pipe. The effluent exits the site through an existing 450-mm corrugated metal pipe.

The influent sampling point is located near the northeast end of the MCTT. The effluent sampling point is located at the southeast end of the MCTT (see Site map in Tab 1).

2.1.3 Site 074208: I-105/Lakewood Boulevard Park and Ride

The I-105/Lakewood Boulevard Park and Ride MCTT receives runoff through an existing 450-mm reinforced concrete pipe. Stormwater flows from northwest to southeast through the pipe. The drain interceptor has a weir as an overflow mechanism. From the inlet, influent is conveyed through a 300-mm plastic pipe before it reaches the sampler and the MCTT. Once the stormwater has been treated, the effluent is conveyed through a 50-mm plastic pipe. The effluent exits the site through an existing drain located near the southeast corner of the park and ride.

The influent sampling point is located near the south end of the MCTT. The effluent sampling point is located at the northwest end of the MCTT (see Site map in Tab 1).

2.2 Emergency Hospital Routes

See the “**Emergency Procedures**” **Tab 2** for maps and descriptions showing the direct routes to the nearest hospitals and for emergency and site-related telephone contacts.

2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at an



MCTT, field crews will consist of a minimum of 2 people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Because MCTT sites are situated in Caltrans Park & Ride and maintenance station locations, there are no real onsite traffic concerns. When at these locations, the following apply:

- Be aware of the Emergency Contacts List in Tab 2 in case of accidents.
- Affiliated personnel must wear an orange safety vest, a hard hat, and appropriate shoes.
- Do not block any access lanes or parking stalls that interfere with daily operations.
- If needed, use cones and barricades to provide a margin of safety from onsite activities. (adhere to specific encroachment permits requirements).
- Barricade any open manholes or ditches.
- Leave nothing behind. Upon completion of the work, the area must be cleaned up and orderly. Remove any extraneous litter.

2.3.2 General Safety

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the MCTT facility, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Fast moving water.
- Ledges.
- Lightning.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Transients.
- Muggers and other criminals.
- Power tools and heavy equipment.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.

Other important field precautions include:

- Always wear a hard hat.
- Wear rain gear, when appropriate.
- Always work in pairs: use the buddy system.



- Always have means of communication nearby.
- Maximize lighting at times, especially at night.
- Do not sample during lightning.
- Use extended sample grabbing devices when possible.
- Do not leave tools or equipment lying around.
- Do not lift heavy objects without help.
- Never use drugs or alcohol while working. Report those who do.
- Do not use power tools or heavy equipment unless trained in their proper use.
- Avoid leaving materials, tools, and equipment lying around where it creates a tripping hazard.
- Always wear eye protection when hammering or working with power tools.
- Never leave open holes unattended or unbarricaded.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 to find appropriate forms and information required for aspects of the field OMM program, including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is to review and assemble each item in Table 3.1 pertaining to the field task at hand.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
For Multi-chambered Treatment Trains

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Maps	NA	Prior to site visits.
	BMP Layout Diagrams	NA	Prior to site visits.
	Sampling Point Diagrams	NA	Prior to site visits and sampling.
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist	Form F	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and basin.
	Field Data Log Sheet	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet for Influent/Control Sampling Point	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet for Effluent Sampling Point	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses List	Ex. 7.1	Reference for each sampling event and lab analysis request submittal.
8	Vector Control Checklists	Forms O1-O2	Fill out for each site visit when vectors are observed.
9	Runoff Coefficient Listing	Ex. 9.1	Reference: for calculations.
	“Volume-to-Sample” Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.

NA=Not Applicable

4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

At a minimum, each MCTT will be inspected:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.5 inches of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Form C (Tab 4).*

1. Contact appropriate Caltrans District 7 personnel in accordance with Encroachment Permit requirements (see Tab 9, Exhibit 9.3).
2. Completely walk around the site while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism).
 - BMP performance (fouling, blockage, damage).
 - Equipment repair/maintenance (BMP components, autosampler).
 - Sediment accumulation (within BMP, at influent confluence).
 - Storage of accumulated sediment or other wastes.
 - Vector control.
4. Log field activities and their corresponding time accurately.
5. Call the appropriate contacts (Project Contacts List, Tab 2) if immediate corrective or preventative maintenance is needed.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.
- Vector Control.
- Vandalism.
- **Standing Water.**

Frequency of individual maintenance activities at the MCTT facilities will be conducted in accordance with Appendix V, the Maintenance Indicator Document. Maintenance



activities performed will be documented using Forms E and F in Tab 5. See Section 2.0 of Appendix I-G for full details on maintenance activities.

4.3 Vegetation Management

MCTT installations will not require the maintenance and control of vegetation. However, if a site accommodates vegetation, use the maintenance checklists (Form C, Tab 4 and Form E, Tab 5) whenever vegetation management is applicable. See Sections 2.0 and 4.0 of Appendix I-G for specific details on controlling vegetation.

4.4 Disposal of Trash and Debris

Trash and debris removal and disposal from the MCTT is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the multi-chambered treatment trains will be responsible for removal, and disposal of waste material by independent contractors. Disposal of trash and debris will be contracted out in accordance with local, county, state, and federal waste-control programs. Table 2.2 in Appendix I-G shows a few possible disposal services for waste material.

4.5 Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs is critical. When sediment removal is required, chemical characterization must be conducted to determine appropriate land disposal requirements (LDRs). Such chemical characterization testing will be conducted from stockpiles in such a fashion as to minimize exposure potentials.

If sediment stockpiles are created, their management must, at a minimum, include the following:

- Sandbags berms are created (8-inch minimum) surrounding the stockpile area.
- At least 0.5-mil plastic is used to contain any dewater liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored at times.

When sampling sediments, document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

Sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the sediment chamber.
3. Collect the sample using a submersible sediment sampler or equivalent. Ensure that the sample is collected near the center of the sediment layer and at the location that

was randomly selected. Great care must be taken not to make contact with the metal casing.

4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl or jar using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on a Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.6 Vector and Nuisance Animal Control

Vector control and management will be performed in accordance with Appendix IV by subcontracted Vector Control Districts.

5.0 STORM MONITORING

Careful preparation and planning is critically important. Representative stormwater samples *must* be obtained for each storm event. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that onsite rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours is preferable).
2. Deployment criteria defined in Exhibit 3.1.

Check appropriate sources for local weather conditions before deploying field staff. Use Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for determining when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-G details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, detection limits, and holding times for stormwater sampling. Appendix III details the quality assurance and quality control requirements of this program.

Checklists, log forms, and information necessary to conduct a successful monitoring program at MCTT facilities are listed in Table 3.1 (Section 3.0), and shall be completed.

Sampling equipment shall be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting storm water sampling at BMP sites:

- Pre-Storm preparation.
- Storm event sampling (grab and composite sample collection).
- Post-Storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1) for when to mobilize.
2. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).
3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.
4. Assemble decontaminated sample containers for influent and effluent autosamplers.

Pre-Wet Season Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

- a. Teflon hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
- b. Rinsed three times with warm tap water.
- c. Rinsed three times with Milli-Q or equivalent water.
- d. Rinsed three times with 2N nitric acid.
- e. Soaked at least 24-hours in 2N nitric acid.
- f. Rinsed three times with Milli-Q water.

Post-Storm Cleaning Procedures for Composite Bottles

Bottles will be:

1. Rinsed three times with warm tap water.
 2. Scrubbed with a clean plastic brush.
 3. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
 4. Rinsed three times with tap water.
 5. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
 6. Rinsed three times with hexane while rotating the bottle, and then air-dried.
 7. Rinsed six times with Milli-Q water.
 8. Soaked in 2N nitric acid for a minimum of 24-hours.
 9. Rinsed six times with Milli-Q water.
5. Inspect monitoring equipment for proper operation (use Form D, Tab 4). At each sampling location do the following:
- a. Inspect the pump tubing and replace if necessary.
 - b. Inspect intake tubing condition and connections.
 - c. Inspect desiccant cartridges in sampler and flow meter.
 - d. Check electrical connections.
 - e. Check battery voltages.
 - f. Make sure intakes, flow structures, and sensors are clear of debris (this is only possible if confined space requirements are met).
 - g. Make sure the correct user-entered program parameters are entered (use Forms I, J and K in Tab 6).
 - h. Set system status flags.
 - i. Verify automatic sampler set up by confirming that the correct bottle size, hose diameter, hose material, hose length, head height, aliquot volume, number of samples to fill the bottle, and number of pulses to sample has been entered correctly.
 - j. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger (sampler should read sample 1 of 78 after 1 pulse).



6. Verify that refrigerated sampler is chilling bottles.
7. From the office set “Volume-to-Sample” numbers (Exhibit 9.2) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K, Tab 6).
8. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected twice per year.

5.1.2 Storm Event and Sample Collection

1. Once onsite, fill out Empirical Observation Field Data Log and a Field Data Log Sheet (Forms H and I, Tab 6) to document storm characteristics.
2. Locate influent/control autosampler and inspect for proper operation.
3. Locate effluent autosampler and inspect for proper operation.
4. Take grab samples as needed.
5. Change composite bottles and re-initiate equipment as needed.
6. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected twice per year.

5.1.3 Post-Storm Sample Analyses

After a storm event has ended, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

1. Reset the storm monitoring program to prepare for another storm event.
2. Replace the sample bottle(s) in the autosampler and the reset the sampler.
3. Physically inspect the station to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if confined space requirements are met).
4. Check battery voltages; replace batteries that are low.
5. Retrieve data via modem from the remote monitoring computer.

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and during dry weather, approximately every month.

Chain-of-Custody Forms

When the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody forms will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms must accompany the samples to the laboratory.



5.2 Empirical Observations

Complete and succinct empirical observations are required during site visits (rain/runoff and BMP characteristics). Observations shall be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). Particularly note the following:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory).
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Treatment medium condition.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Refer to Form H in Tab 6 for recording empirical observation information.



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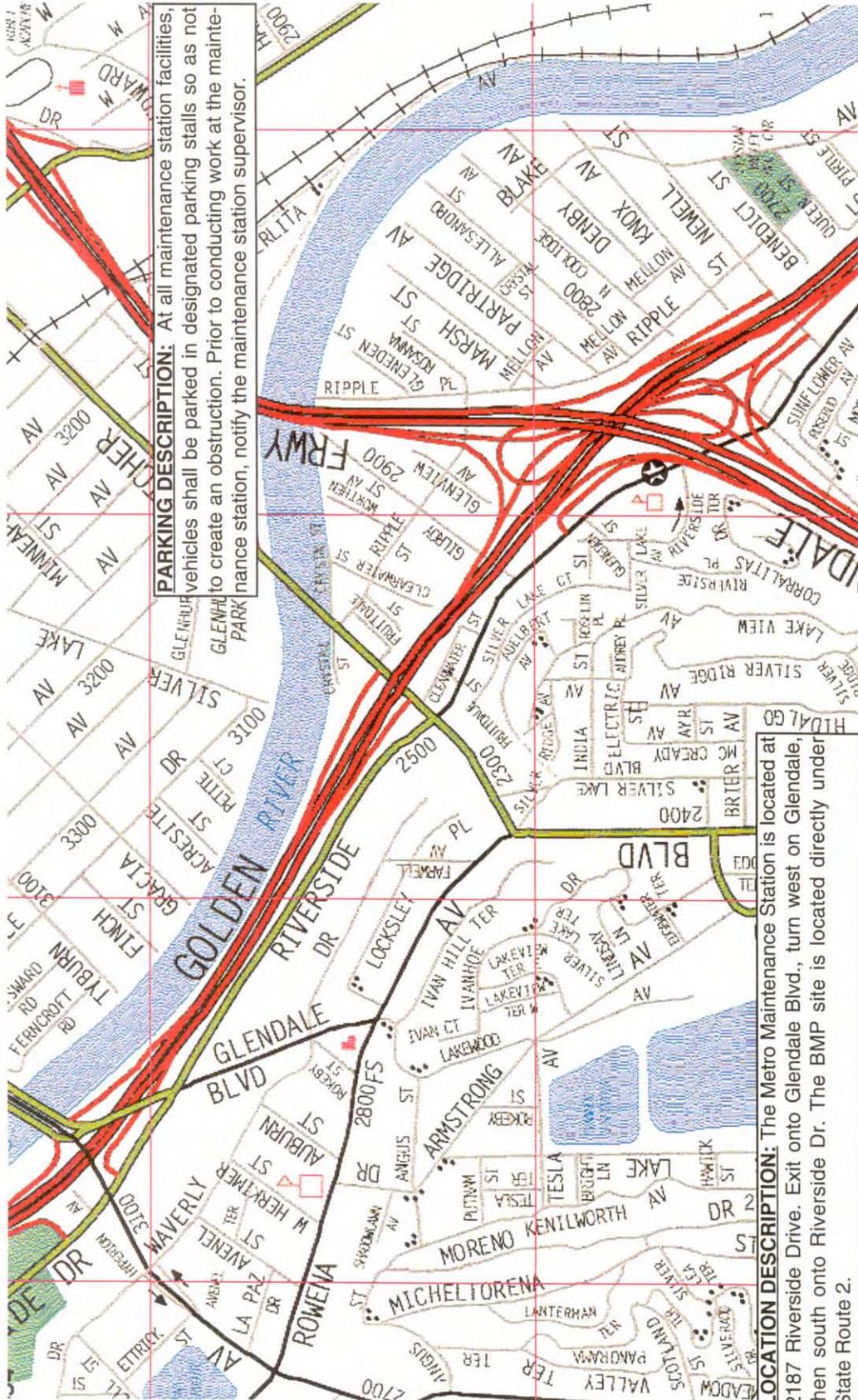


TAB 1

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans
BMP Maintenance Perimeter Maps**



PARKING DESCRIPTION: At all maintenance station facilities, vehicles shall be parked in designated parking stalls so as not to create an obstruction. Prior to conducting work at the maintenance station, notify the maintenance station supervisor.

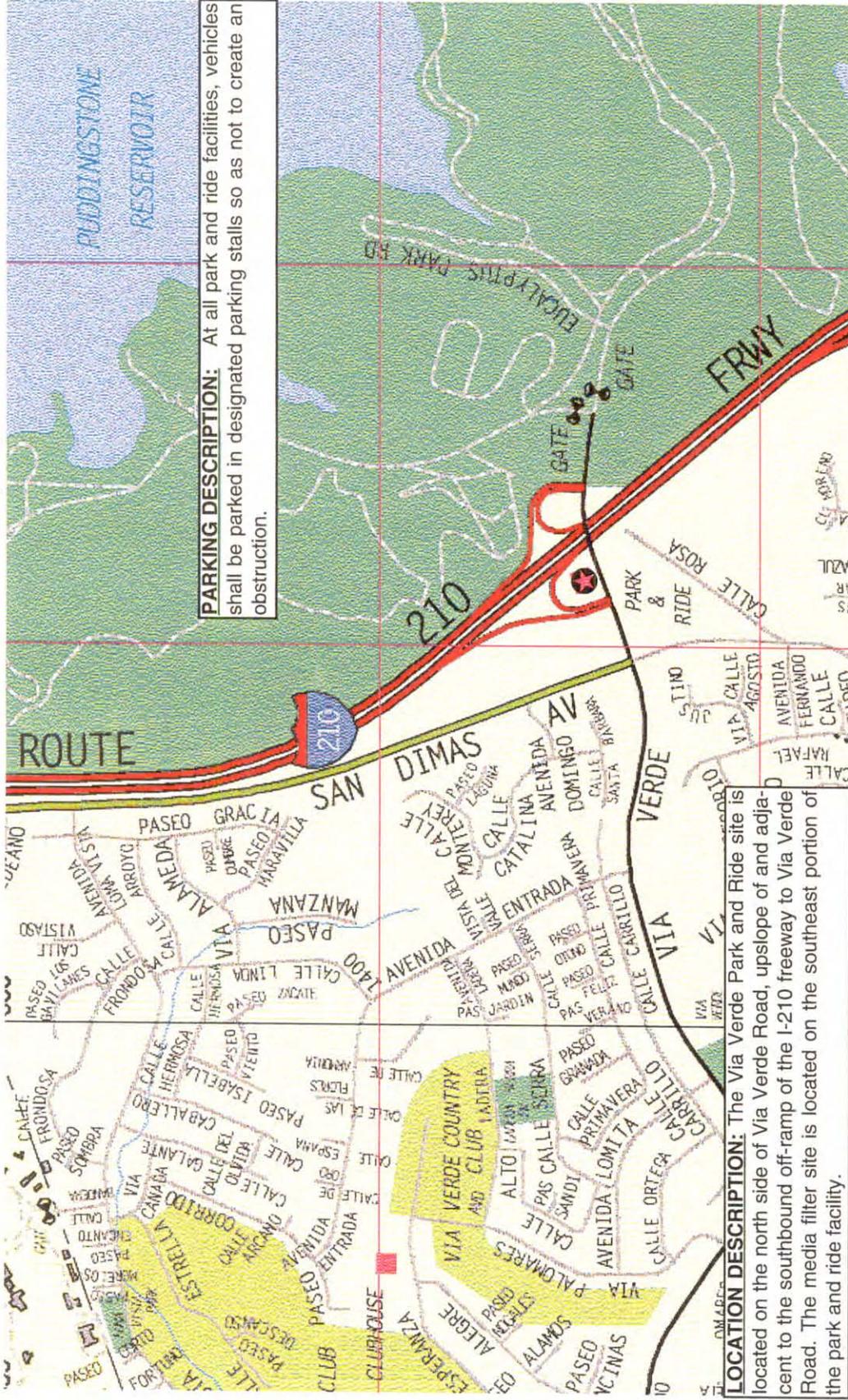
LOCATION DESCRIPTION: The Metro Maintenance Station is located at 2187 Riverside Drive. Exit onto Glendale Blvd., turn west on Glendale, then south onto Riverside Dr. The BMP site is located directly under State Route 2.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Metro Maintenance Station
BMP Pilot Study Site #074207
Site Location Map

 BMP Pilot Site

 Not to Scale



PARKING DESCRIPTION: At all park and ride facilities, vehicles shall be parked in designated parking stalls so as not to create an obstruction.

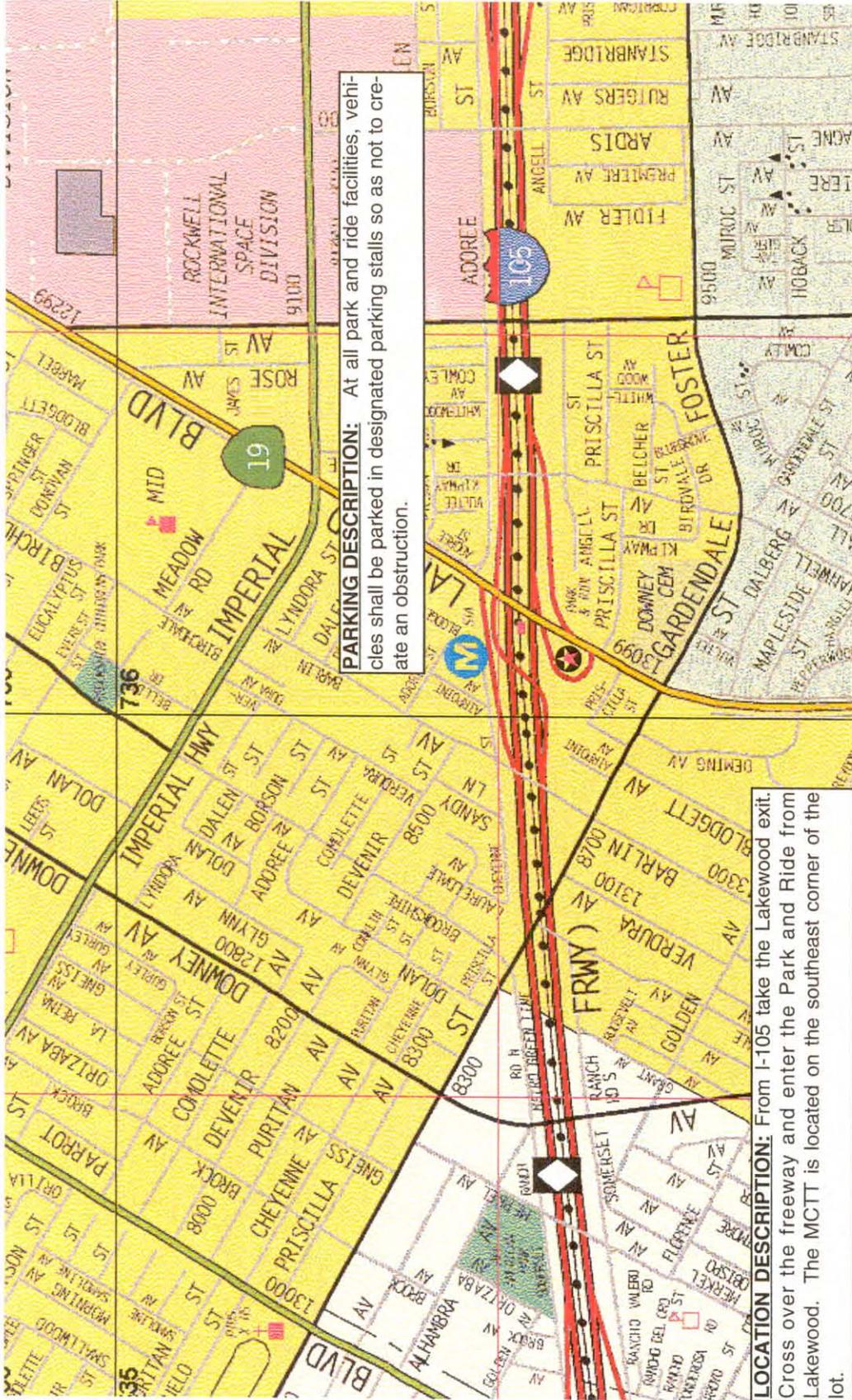
LOCATION DESCRIPTION: The Via Verde Park and Ride site is located on the north side of Via Verde Road, upslope of and adjacent to the southbound off-ramp of the I-210 freeway to Via Verde Road. The media filter site is located on the southeast portion of the park and ride facility.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Via Verde Park & Ride
BMP Pilot Study Site #074206
Site Location Map

 BMP Pilot Site

 Not to Scale



SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-105/Lakewood Park & Ride
BMP Pilot Study Site #074208
Site Location Map



BMP Pilot Site



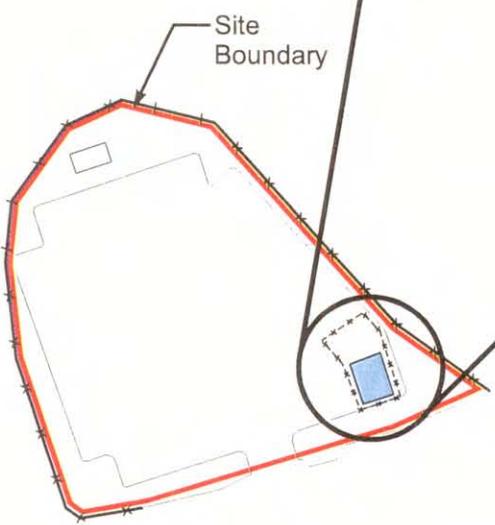
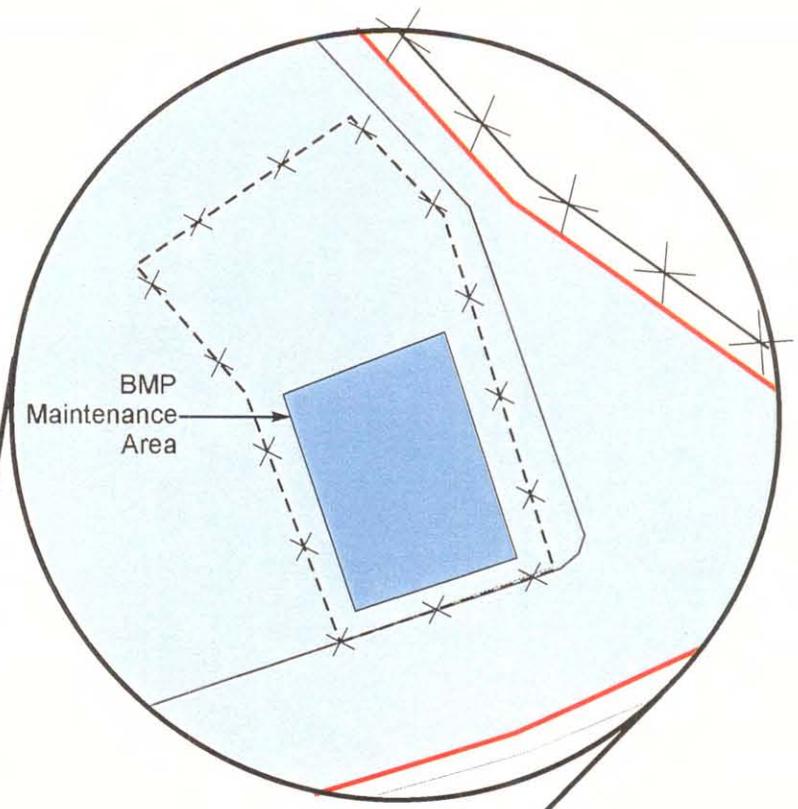
Not to Scale



Robert Bein, William Frost & Associates

698

JN 34618



Site Boundary

BMP Maintenance Area

LEGEND	
	Drainage Area
	MCTT Site

Via Verde Park & Ride
Route 57 / Via Verde Blvd.

BROWN AND
CALDWELL

Site 74206 Via Verde Park & Ride
Drainage Area

MAINTENANCE PERIMETER MAP
TO BE PROVIDED AFTER CONSTRUCTION



TAB 2

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**

Document all information related to any accident or incident that resulted in injury or damage and report it to Mark Williams at Brown and Caldwell at (619) 528-9090.

Emergency Contacts

Site 074104: Metro Maintenance Station Multi-chambered Treatment Train

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Los Angeles Police Department	911	From landline phone
Los Angeles Police Emergency Dispatch	(213) 485-2121	In case of emergency
Los Angeles Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Barlow Respiratory Hospital	(213) 250-4200	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Tyrone Taylor) 24-hour emergency	(310) 715-2509 (213) 897-0383	Notify for any accident or injury
Area Supervisor for Metro Maintenance Station: (Chuck Walsh-North) (Junious Fontenot-South)	North (805) 259-2550 South (213) 775-2716	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans District 7 Program Manager (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts

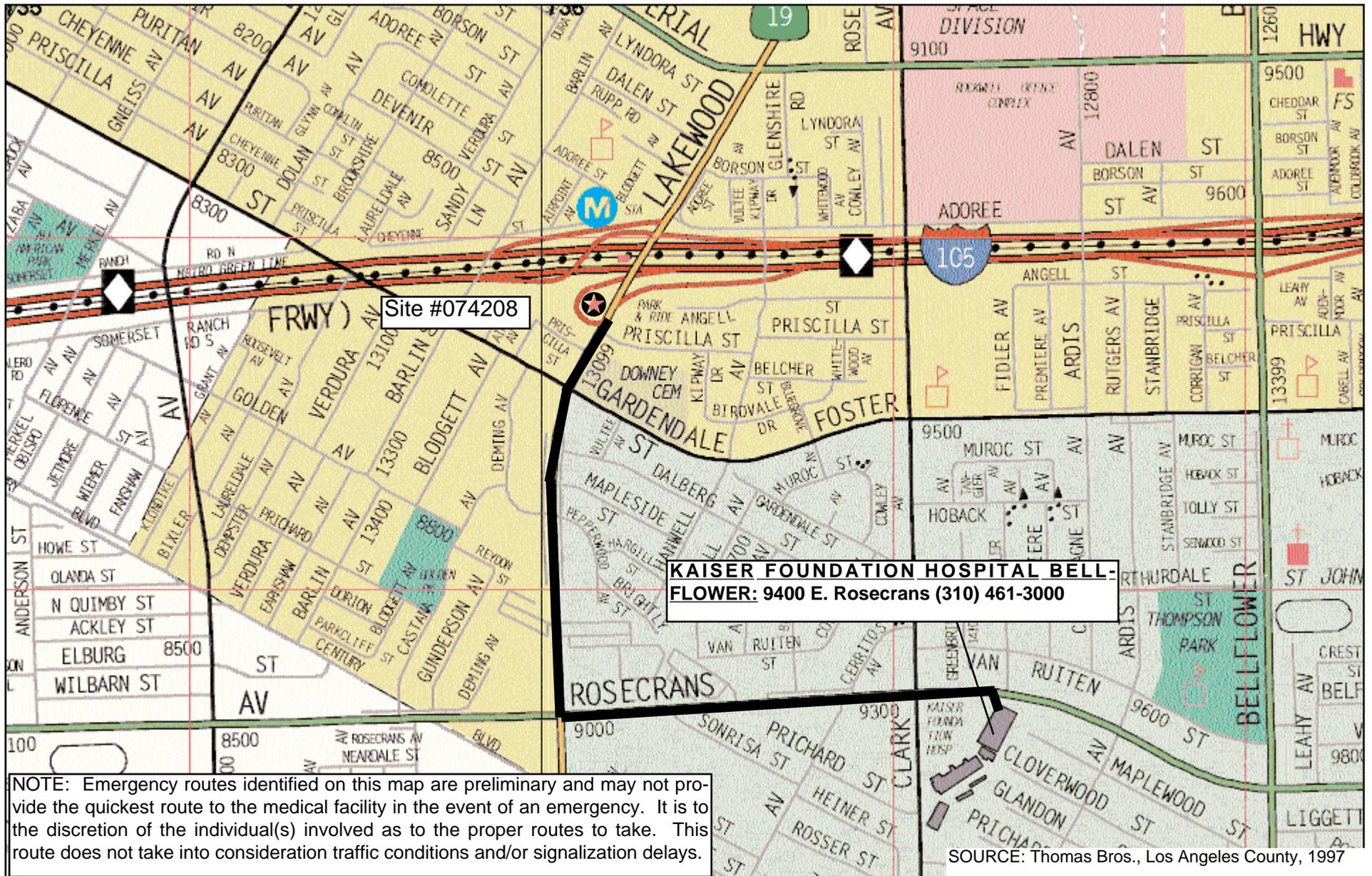
Site 074206: Via Verde Park & Ride Multi-chambered Treatment Train

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Los Angeles Police Department	911	From landline phone
Los Angeles Police Emergency Dispatch	(626) 332-1184	In case of emergency
Los Angeles Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
San Dimas Community Hospital	(909) 599-6811	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Pomona Area) 24-hour emergency	(909) 397-4325 (213) 897-0383	Notify for any accident or injury
Regional Manager (Roy Pool)	(562) 692-0823	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts

Site 074208: I-105/Lakewood Boulevard Park and Ride Multi-chambered Treatment Train

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Los Angeles Police Department	911	From landline phone
Local Police Emergency Dispatch (Sheriff Dept.)	(562) 866-9061	In case of emergency
Los Angeles Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Kaiser Foundation Hospital Bellflower	(310) 461-3000	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
Caltrans Field Inspector (Masoud Nassimi) 24-hour emergency	(310) 609-0363 (213) 897-0383	Notify for any accident or injury
Regional Manager (Roy Pool)	(562) 692-0823	Notify for any Park & Ride maintenance needs
Brown and Caldwell Safety Officer (Mark Williams)	(619) 528-9090	Notify for any accident or injury
Caltrans Project Oversight (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

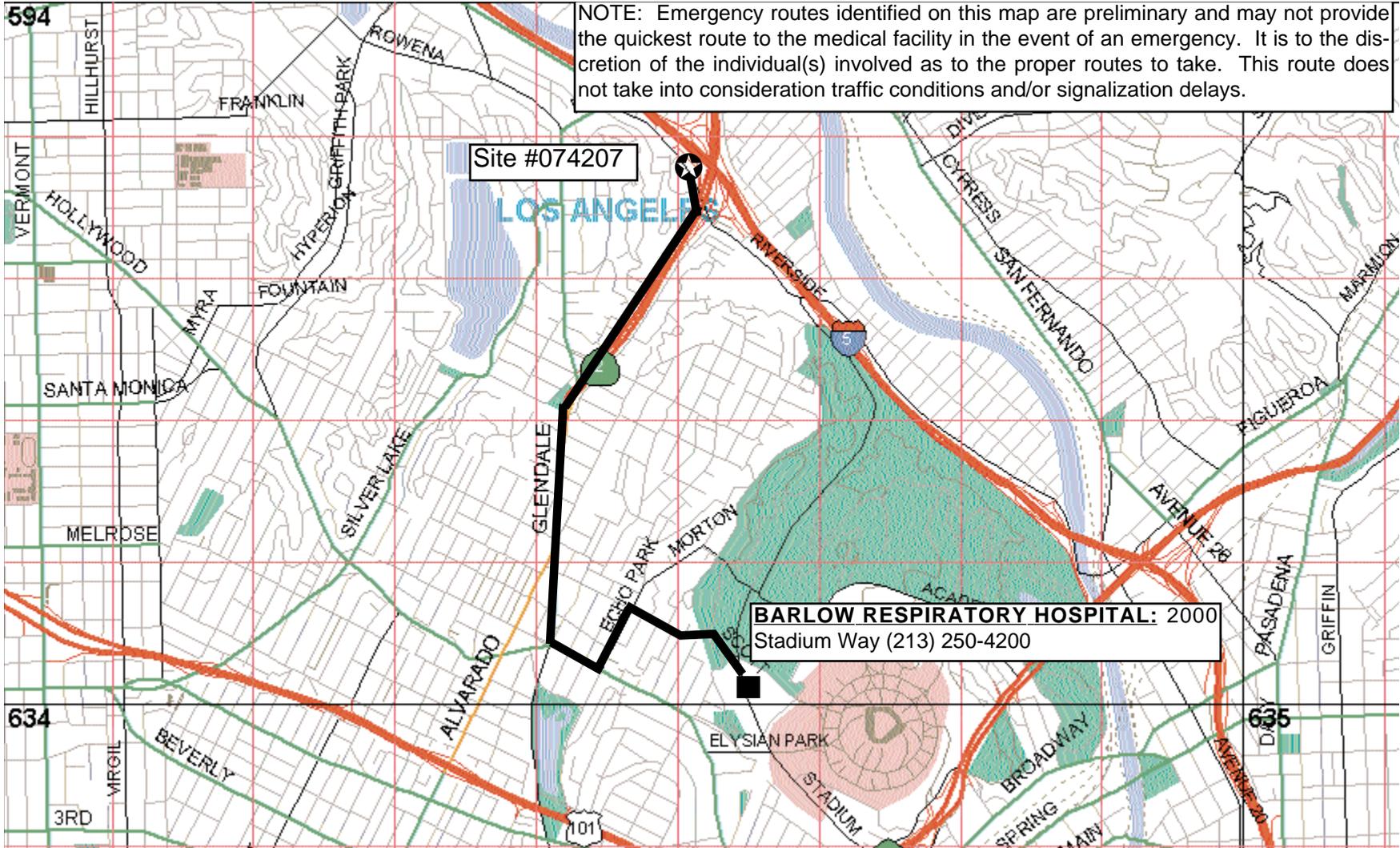


 BMP Pilot Site

 Not to Scale

 Potential Emergency Route

CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-105/Lakewood Park and Ride
Hospital Route Map



NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

Site #074207

BARLOW RESPIRATORY HOSPITAL: 2000
Stadium Way (213) 250-4200

-  BMP Pilot Site
-  Not to Scale


Potential Emergency Route

SOURCE: Thomas Bros., Los Angeles County, 1997
CALIFORNIA DEPARTMENT OF TRANSPORTATION
Metro Maintenance Station
Hospital Route Map

Project Contacts

Name	Organization	Phone	Fax Mobile	Email
Robert Wu	Caltrans Program Manager Dist 7	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Mark Williams	Brown and Caldwell	(619) 528-9090-w	(619) 528-9199-f	mwilliams@brwncald.com
Ed Othmer	Law/Crandall	(619) 278-3600	(619) 278-5300-f	eothmer@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678	peter_vanriper@dot.ca.gov
Bill Whittenberg	RBF	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Patti Matta	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Patty@dmaipo.attmail.com
Mark Weiner	Del Mar Analytical	(714) 261-1022	(714) 261-1228	Mweiner@dmalabs.com
Chet Reynolds	FLW/R.C. Hoffman Co.	(949) 643-0831	(949) 643-0832	--
John Misiti	American Sigma	(800) 635-4567	(716) 798-5599	Misitiz@aol.com
Anthony Tavano	American Sigma	(716) 798-5580	(716) 798-5599	
Internet	National Weather Service	(805) 988-6610	--	http://nimbo.wrh.noaa.gov/
Internet	Accuweather	--	--	http://www.weather.com
Internet	Los Angeles Doppler Radar	--	--	http://www.weather.com weather/radar/single- site/CA_Los_Angeles.html
Internet	Intellicast	--	--	http://www.Intellicast.com
Internet	Weather Underground	--	--	http://www.wunderground.com
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	530 753-6400	--	Deanm@lwadavis.com

Name	Organization	Phone	Fax Mobile	Email
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(909) 365-0117	geoscrc1@ix.netcom.com
Suzanne Kluh	Greater Los Angeles County Vector Control District	(562) 944-9656	(562) 944-7976	--
P. Sue Zuhlke	San Gabriel Valley Mosquito and Vector Control District	(626) 814-9466	(626) 337-5686	Psuez@earthlink.net



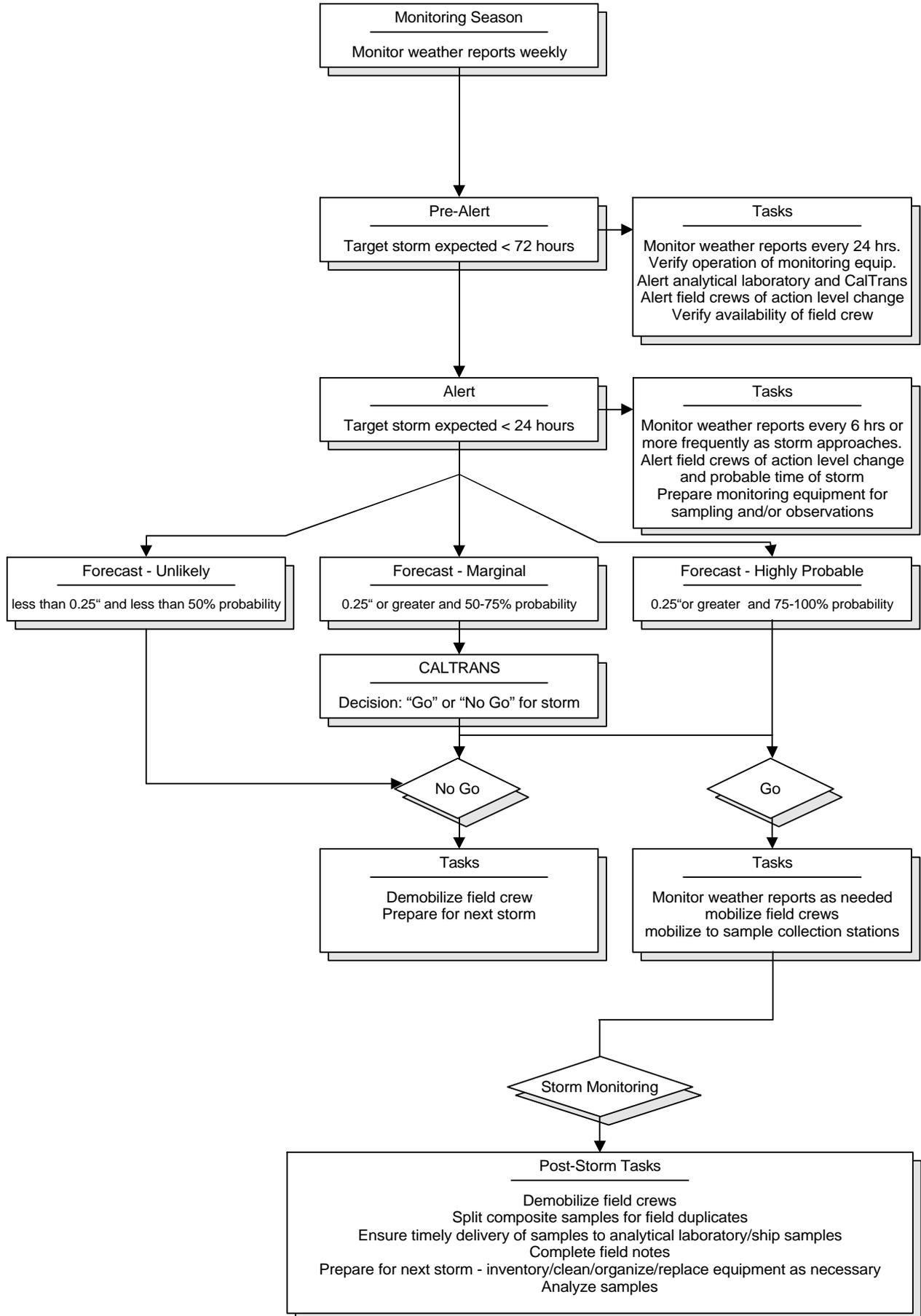
TAB 3

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Mobile Phone	Volume to sample matrix
Vendor's autosampler manual	Vendor name and contact

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Maps for required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Rope, throw rope	Gaff
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm kit	Log books
pH meter	Paper towels (cloth towels)
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
pH grab bottles	Spare sample labels (waterproof)
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	20 liter bottles in 10 gallon containment buckets
Grab sample bottles (see below)	Coolers and ice (at least one extra)
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Lab telephone number
for each QA/QC analysis	Backup lab contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

**Form C: BMP Site Inspection Checklist
Form D: Monitoring Equipment Inspection Checklist**

FORM C	
Caltrans BMP Retrofit Pilot Program	
BMP Site Inspection Checklist for Multi-chambered Treatment Trains	
GENERAL INFORMATION:	
Date:	Time In: _____ Time Out: _____
Team Leader's Initials: _____	Stormwater Consultant: _____
BMP Location: _____	
SEDIMENT BUILD UP/FOULING:	Maintenance Reqd?
Sediment Depth: Chamber 1 (Catch Basin/Grit Chamber) ? yes ? no If yes, list depth _____ <i>(If sediment >2', maintenance is required)</i> Chamber 2 (Main Settling Chamber) ? yes ? no _____ If yes, list depth _____ <i>(If sediment >6", maintenance is required)</i> Chamber 3 (Media Filter) ? yes ? no _____ If yes, list depth _____	? yes ? no
Sediment characteristics, if known (sandy, mucky, gravel, odors, color, etc.): _____	
Standing water? Chamber 1 (Catch Basin/Grit Chamber) ? yes ? no If yes, list depth _____ Chamber 2 (Main Settling Chamber) ? yes ? no If yes, list depth _____ Chamber 3 (Media Filter) ? yes ? no If yes, list depth _____	? yes ? no
Comments: _____	
FILTERS:	Maintenance Reqd?
Media Filter (Chamber 3) : Filter Fabric <i>(If filter drain time exceeds 72 hours, filter fabric blanket needs to be removed and replaced.)</i> What color is the sediment buildup? _____ Does the sediment buildup have an odor? If so, what type? _____	? yes ? no
Media <i>(If cleaning the filter fabric does not lower full drawdown time, media needs to be replaced, mark yes)</i>	? yes ? no
Comments: _____	

FORM C	
Caltrans BMP Retrofit Pilot Program	
BMP Site Inspection Checklist for Multi-chambered Treatment Trains (Continued)	
MECHANICAL:	Maintenance Req'd?
<i>Pumps: (To look for evidence of fouling, pump must be pulled up and out of chambers with the attached chain)</i>	
Pump 1(In Main Settling Chamber): Evidence of fouling? ? yes ? no	? yes ? no
Pump 2 (In Media Filter Chamber): Evidence of fouling? ? yes ? no	? yes ? no
Pump Float Ball (Trigger Mechanism): (If water level is over the float ball, check yes)	? yes ? no
STRUCTURAL;	Maintenance Req'd?
List any damage to fences:	? yes ? no
List any damage to locks:	? yes ? no
Evidence of cracks on inlet piping ? ? yes ? no If yes, please describe degree _____	? yes ? no
Leaky pipes? ? yes ? no If yes, describe location _____	
Evidence of cracks on outlet piping ? ? yes ? no If yes, please describe degree _____	? yes ? no
Leaky pipes? ? yes ? no If yes, describe location _____	
Any damage to inlet channels, grating, etc.? If any, please list.	? yes ? no
Other general maintenance concerns:	
Fences: ? OK ? not OK ? not applicable	? yes ? no
Locks: ? OK ? not OK ? not applicable	? yes ? no
Other general maintenance concerns/comments:	
ANIMAL CONCERNS:	Maintenance Req'd?
Is there evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)? ? yes ? no	? yes ? no
Comments:	
AESTHETIC CONCERNS:	
Debris (non-trash)? ? yes ? no	Type, amount and location:
Trash? ? yes ? no	Type, amount and location:
Graffiti? ? yes ? no	Description and location:

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Multi-chambered Treatment Trains (Continued)

Other general aesthetic concerns:

NON-STORMWATER CONCERNS:

Non-storm water discharge to BMP ? yes ? no
 BMP wet from obvious non-stormwater discharge (no rain) ? yes ? no
 If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678
 From: _____ Contact Number: _____

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction (facing)	Roll	Photograph No.

OVERALL:

Other concerns affecting operation:
 Condition of facility: ? acceptable ? not acceptable
 Comments:
 Dates for maintenance to be completed by:

 (Team Leader's Signature)

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ of _____

FORM D		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Multi-chambered Treatment Trains		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		
SAMPLING AND FLOW MEASUREMENT EQUIPMENT:		Maintenance Required?
Is the monitoring station enclosure locked? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the automatic sampler online? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the automatic sampler properly programmed and calibrated? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the peristaltic pump tubing need replacement? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Does the intake tubing and/or connections need replacement? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Do the desiccant cartridges in sampler and flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is internal modem online? Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the flow meter properly installed (specify type of meter)? <input type="checkbox"/> no	<input type="checkbox"/> yes	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:		

For Internal Use Only

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Multi-chambered Treatment Trains
 (continued)

SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.): Maintenance Required?

Is the flow meter tubing free of kinks, free of obstructions, and properly connected to pump?
 yes no yes no
 Comments:

Is strainer clean and free of obstruction?
 yes no yes no
 Comments:

INFLUENT SAMPLING LOCATION: Maintenance Required?

Sediment in flumes? yes no Amount: yes no

Flow? yes no Rate: yes no

Trash or debris? yes no Amount: yes no

Comments:

EFFLUENT SAMPLING LOCATION: Maintenance Required?

Sediment in flumes? yes no Amount: yes no

Flow? yes no Rate: yes no

Trash or debris? yes no Amount: yes no

Comments:

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction (facing)	Roll	Photograph No.

Dates for maintenance to be completed by:

_____ (Team Leader's Signature)



TAB 5

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

- Form E: BMP Site Maintenance Activity Checklist**
- Form F: Monitoring Equipment Maintenance Activity Checklist**
- Form G: Sediment Sampling Checklist**
- Exhibit 5.1: Title 22 Characterization Requirements**

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Multi-chambered Treatment Trains

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
BMP Location:		

Fill out appropriate sections only

SEDIMENT CONTROL:

Sediment removal from Catch Basin

Start time: End time: Total time: More work required? yes no

Equipment used:

Approximate volume of sediment removed:

Comments:

Sediment removal from Main Settling Chamber

Start time: End time: Total time: More work required? yes no

Equipment used:

Approximate volume of sediment removed:

Comments:

Sediment removal from Media Filter

Start time: End time: Total time: More work required? yes no

Equipment used:

Approximate volume of sediment removed:

Comments:

Clean flumes, orifices, and other components

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

FILTERS:

Clean Filter Fabric

Start time: End time: Total time: More work required? yes no

Equipment used:

Approximate volume of debris removed:

Comments:

Replacement of Filter Media

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

MECHANICAL:

Pumps (indicate its location and specific part)

Start time: End time: Total time: More work required? yes no

Equipment used:

Comments:

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Multi-chambered Treatment Trains

Other (describe):
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

STRUCTURAL:

Structural repairs (describe):
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

ANIMAL CONCERNS:

Irradication and control
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

AESTHETIC CONCERNS:

Debris and trash removal
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Approximate volume of trash removed: _____
 Comments: _____

Graffiti removal
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Painting
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

_____ (Team Leader's Signature)	General Comments:
------------------------------------	-------------------

FORM F
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Maintenance Activity Checklist
for Multi-chambered Treatment Trains

GENERAL INFORMATION:

Date: _____ Time In: _____ Time Out: _____

Team Leader's Initials: _____ Stormwater Consultant: _____

BMP Location: _____

Fill out appropriate sections only

Clean flumes, orifices, and other components
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Diagnostic test of automatic sampler
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of peristaltic pump tubing
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of flow meter tubing, pump tubing, or intake tubing
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of strainer
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of 12-volt marine battery
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Removal of kinks or obstructions from flow meter
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of desiccant cartridges in sampler and flow meter
 Start time: _____ End time: _____ Total time: _____ More work required? yes no
 Equipment used: _____
 Comments: _____

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM F Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Multi-chambered Treatment Trains (continued)	
<input type="checkbox"/> Other maintenance/calibration of automatic sampling equipment (describe): Start time: End time: Total time: More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other maintenance of flow measurement equipment (describe): Start time: End time: Total time: More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other (describe): Start time: End time: Total time: More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> (Team Leader's Signature)	General Comments:

For Internal Use Only

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM G	
Caltrans BMP Retrofit Pilot Program	
Stockpile/Sediment Sampling Checklist	
GENERAL INFORMATION:	
Date:	Time In: Team Leader's Initials: Time Out:
Location:	
SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:	
Depth of sediment:	
Color:	<input type="checkbox"/> black <input type="checkbox"/> brown <input type="checkbox"/> green <input type="checkbox"/> tan <input type="checkbox"/> other
Consistency:	<input type="checkbox"/> <input type="checkbox"/> sandy <input type="checkbox"/> silty <input type="checkbox"/> granular <input type="checkbox"/> other
Odors:	<input type="checkbox"/> petroleum <input type="checkbox"/> solvents <input type="checkbox"/> organic (rotten eggs) <input type="checkbox"/> sewage <input type="checkbox"/> none <input type="checkbox"/> other
Depth of sediment:	
SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST	
Powder Free Nitrile Gloves	
Soil Probe or equivalent for sample collection	
8-ounce glass jar labeled Total Petroleum Hydrocarbons (TPH)	
Plastic bags, seal bags	
Chilled cooler	
Chain-of-Custody form	
Log book for record keeping	
STOCKPILE/DRUMMED SEDIMENT:	Maintenance Required?
Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.	<input type="checkbox"/> yes <input type="checkbox"/> no
SEDIMENT COLLECTION:	
<10 cubic yards: <i>Minimum of 2 samples, one randomly from each half of the soil mass</i>	
10-20 cubic yards: <i>Minimum of 3 samples, one randomly from each third of the soil mass</i>	
20-100 cubic yards: <i>Minimum of 4 samples, one randomly from each quarter of the soil mass</i>	
100-500 cubic yards: <i>Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass</i>	
Over 500 cubic yards: <i>Collect a minimum of 1 sample per 25 c.y. portion of the soil mass</i>	<i>Contact Dept. of Environmental Health for Guidance</i>

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM G
Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist

SEDIMENT SAMPLE COLLECTION	
Observation sheet completed	
Personal and equipment decon completed	
Number of aliquots taken from composite _____	
Sample IDs:	
1. _____ Analysis requested: _____	
2. _____ Analysis requested: _____	
3. _____ Analysis requested: _____	
4. _____ Analysis requested: _____	
5. _____ Analysis requested: _____	
6. _____ Analysis requested: _____	
Photos taken:	
Chain of Custody form attached	
Record information in logbook for record keeping	
Comments:	

Exhibit 5.1
Title 22 Characterization Requirements, Sediment Matrix
Analytical Parameters, Methodologies, Detection Limits, Holding Times,
Container Volumes and Types, and Preservation

Parameter	Method	Units	Detection Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.
- (5) “Test Methods for Evaluating Solid Waste, Physical /Chemical Methods”. SW-846, Update III.(SW-846)



TAB 6

CALTRANS BMP STORM WATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for
Storm Events**

Form I: Field Data Log Sheet

Form J1: User-Entered Program Parameters (Influent/Control)

Form J2: User-Entered Program Parameters (Effluent)

Form K: Station Phone Log

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Multi-chambered Treatment Trains

GENERAL INFORMATION:	
Date:	Time in:
Team leader:	Stormwater Consultant:
Other personnel:	Location of facility:

METEOROLOGICAL CHARACTERISTICS:	
Time since end of previous storm event visit: <input type="checkbox"/> > 72 hours <input type="checkbox"/> 48-72 hours <input type="checkbox"/> 24-48 hours <input type="checkbox"/> < 24 hours	
Present rainfall: <input type="checkbox"/> None <input type="checkbox"/> Mist <input type="checkbox"/> Drizzle <input type="checkbox"/> Sprinkle <input type="checkbox"/> Light, Steady <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy	
Time present rain event started: _____	
Wind speed: <input type="checkbox"/> 0-5 mph (light) <input type="checkbox"/> 5-10 mph (moderate) <input type="checkbox"/> 10-15 mph (brisk) <input type="checkbox"/> >15 mph (strong)	
Cloud cover: _____%	
Distribution of Rainfall: <input type="checkbox"/> Uniform <input type="checkbox"/> Localized cells <input type="checkbox"/> Scattered showers	
Meteorological characteristics comments: 	

HYDROLOGIC AND HYDRAULIC CHARACTERISTICS:	
Flow conditions (<i>check all that apply</i>):	
<input type="checkbox"/> Runoff entering facility	
<input type="checkbox"/> Flow over inlet weir to settling chamber occurring	
<input type="checkbox"/> Flow over settling chambered weir to filter chamber occurring	
<input type="checkbox"/> Facility short circuiting through facility	
<input type="checkbox"/> Facility discharging	Time occurred: _____
<input type="checkbox"/> Flow bypassing facility	Time occurred: _____

Standing water conditions (<i>record measurements as appropriate and check all that apply</i>):	
<input type="checkbox"/> Standing water in inlet chamber	Depth: _____
<input type="checkbox"/> Standing water in settling chamber:	Describe Location: _____
	Depth: _____
<input type="checkbox"/> Standing water in filter chamber:	Describe Locations: _____
	Depths: _____
Are there any indications of leakage (e.g., falling water without flow occurring from a chamber)? If so, what indications and where? _____ _____	

If during a Storm Event:	
Record maximum depth of pooled water: Depth: _____	
Time to drain from the first entrance of runoff? _____	
Time to drain from the maximum depth? _____	
Comments: _____ _____	

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Multi-chambered Treatment Trains

INLET CONDITIONS:
Describe flow distribution where flow passes weir or baffle at exit of inlet chamber:
 Flow is uniformly distributed
 Flow is not uniformly distributed, if so describe below:

Describe any obstructions or restrictions interfering with inflow/influent:

INFLUENT WATER QUALITY APPEARANCE:
Check all that apply and describe under comments

Odor:
 Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:
 Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:
 Sheen Heavy floating concentration Emulsion Deposit None

Color:
 Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity
 None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In inlet chamber: _____

In settling chamber: _____

In filter chamber: _____

Solids resuspension evident (*check all that apply*):
 Inlet chamber Settling chamber Filter chamber
 Other (describe): _____

Solids deposition and resuspension comments:

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Multi-chambered Treatment Trains

TREATMENT MEDIUM CONDITION
 Describe any indications that the plate settlers or filter medium is clogging or that hydraulic capacity is otherwise being reduced:

OUTLET CONDITIONS:
 Describe any obstructions or restrictions interfering with outflow/effluent:

EFFLUENT WATER QUALITY APPEARANCE:
Check all that apply and describe under comments

Odor:
 Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:
 Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:
 Sheen Heavy floating concentration Emulsion Deposit None

Color:
 Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity
 None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

VECTORS:

Presence of vectors: Yes No

If yes, what type: Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

Inlet structure damage Outlet structure damage Vandalism

Comments:

MONITORING EQUIPMENT CONDITIONS:

Equipment functional: Yes No N/A

Comments:

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Multi-chambered Treatment Trains

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: _____	Time: _____
Comments: _____	
Date: _____	Time: _____
Comments: _____	
Date: _____	Time: _____
Comments: _____	

ADDITIONAL COMMENTS:

(Team Leader's Signature)

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ of _____

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet

GENERAL INFORMATION		Julian Day (*5AA): _____
Date: _____	Time in (PST,*5): _____	Team Leader's Initials: _____
Location: La Costa / I-5 Northbound	Crew: _____	
<u><i>Influent or Effluent (circle one)</i></u>	Storm Event Visit or Maintenance Visit (circle one)	
SYSTEM STATUS FLAGS (*6AD; 1=high, 0=low)		PROGRAM SIGNATURE (*B)
Arr: 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____	Arrive: _____	
Dep: 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____	Depart: _____	
DATA LOGGER INFORMATION (*6)		
<i>All Site Visits:</i>	Samp. Batt Volt 22:	Manual Rain Gauge:
Basin Staff Gauge:	Cell Batt Volt 82:	Total Rain (in.) 25:
Flow Sensor Stage:	Flow Meter Batt Volt 28:	Total Storm Vol. 72:
Stage (ft) 02:	<u>Storm Site Visits:</u>	Strm Vol Smpld 75:
Velocity (ft/s) 03:	Volume (kcf) 05:	Max Stage Day 51:
Flow (cfs) 04:	Storm Sum (kcf) 06:	Max Stage Time 52:
Station ID 21:	Percent Capture 08:	Max Stage (ft) 53:
	Volume2Sample 14:	Date Last Sample 105:
	Sample Count 17:	<i>Time Last Sample 106:</i>
AUTOSAMPLER INFORMATION		
<i>Storm only</i>		Bottle # in: _____
Number of Samples Total: _____	Bottle # out: _____	
Number of Samples Remaining: _____	Bottle Volume: _____	
	Volume2Sampl: _____	
GRAB SAMPLE COLLECTION	CALIBRATIONS and CHECKS	
Time: _____	Stage: <input type="checkbox"/>	
TPH (Diesel/Oil) _____	Sample Volume: <input type="checkbox"/>	
TPH (Gasoline) _____	Rain Gauge: <input type="checkbox"/>	
Bacteria _____	Other: _____	
Other: _____		
SAMPLING EQUIPMENT AND REPAIR NEEDS:		
ACTION TAKEN:		
Team Leader's Signature _____		

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:

Time:

01 Station ID				
03 Volume to sample (kcf)				
04 Level Meter Stage Offset (feet)				
05 Level Meter Multiplier (feet/mv)				
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)				
09 Minimum Stage Threshold (feet)				
10 Storm Stage Trigger Level (feet)				
11 Storm End Factor (times storm trigger stage)				
12 No. of Seq. Trans. Failures Before Raising Flag 6				
13 Time (min.) to wait after 1 st set of trans. Failures				
14 No. samples of depth taken for avg. 1 prog. exe.				
15 No. samples of speed taken for avg. 1 prog. exe.				
17 Amount of rain per bucket tip (inches)				
18 Amt. rain samp. before rain data recorded (in.)				
19 Number of samples collected until bottle is full				
20 No. of times Flag 7 goes high before var. reset				
23 Data avg. int. (min.) when storm conditions exist				
24 Data avg. int. (min.) storm conditions don't exist				
30				
31				
34 Flume Parameter 1				
35 Flume Parameter 2				
36 Cellular phone battery state control parameter				
37 Duration when cellular phone battery is on				
38 Period of cellular phone battery state control				
Program Signature (*B)				

*Subject to Revisions



TAB 7

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Chain-of-Custody Form
Exhibit 7.1: Chemical Analyses List**

Exhibit 7.1
Stormwater Matrix
Analytical Parameters, Methodologies, Detection Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics⁶									
Total Petroleum Hydrocarbons – Diesel/Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Bacteria⁶									
Fecal Coliform	Grab	2	MPN/100 mL	Multiple-tube	SM 9221E	6 hours ⁷	50 mL	1-100 mL plastic	4°C

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification.
6. Total Petroleum Hydrocarbon and Fecal Coliform grab samples will be collected for two storms per year.
7. Attempts will be made to maintain the 6-hour holding time for bacteria samples to the extent possible. When not possible, a maximum holding time of 24 hours will be followed in accordance with "Standard Methods for the Examination of Water and Wastewater", 18th Edition.



TAB 8

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors
**Form O2: Vertebrate Vector Control-Related Maintenance
Activity Checklist for Affected BMP Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform monitoring.



TAB 9

**CALTRANS BMP STORM WATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

- Exhibit 9.1: Runoff Coefficients**
- Exhibit 9.2: Volume-to-Sample Tables**
- Exhibit 9.3: Encroachment Permits**

Exhibit 9.1

**Runoff Coefficient Matrix Table for Multi-chambered Treatment Trains
Caltrans District 7**

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient (C)
074207	Metro Maintenance Station	4.58	1.0
074206	Via Verde Park & Ride	1.09	0.9
074208	Lakewood Park & Ride	1.93	1.0

Exhibit 9.2**Volume to Sample in (Kilo-cubic feet) for
Metro Maintenance Station (MCTT)**

Number of Sample Aliquots 72			
Acreage 4.58		Runoff Coefficient 1	
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)
0.1	0.0231	2.6	0.6004
0.2	0.0462	2.7	0.6235
0.3	0.0693	2.8	0.6465
0.4	0.0924	2.9	0.6696
0.5	0.1155	3.0	0.6927
0.6	0.1385	3.1	0.7158
0.7	0.1616	3.2	0.7389
0.8	0.1847	3.3	0.7620
0.9	0.2078	3.4	0.7851
1.0	0.2309	3.5	0.8082
1.1	0.2540	3.6	0.8313
1.2	0.2771	3.7	0.8544
1.3	0.3002	3.8	0.8775
1.4	0.3233	3.9	0.9005
1.5	0.3464	4.0	0.9236
1.6	0.3695	4.1	0.9467
1.7	0.3925	4.2	0.9698
1.8	0.4156	4.3	0.9929
1.9	0.4387	4.4	1.0160
2.0	0.4618	4.5	1.0391
2.1	0.4849	4.6	1.0622
2.2	0.5080	4.7	1.0853
2.3	0.5311	4.8	1.1084
2.4	0.5542	4.9	1.1315
2.5	0.5773	5.0	1.1545

Exhibit 9.2**Volume to Sample in (Kilo-cubic feet) for
Via Verde Park and Ride (MCTT)**

Number of Sample Aliquots 72		Acreage 1.09	Runoff Coefficient 0.9	
Rainfall Amount (inches)	Sample (Kilo-ft³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft³)	
0.1	0.0049	2.6	0.1286	
0.2	0.0099	2.7	0.1335	
0.3	0.0148	2.8	0.1385	
0.4	0.0198	2.9	0.1434	
0.5	0.0247	3.0	0.1484	
0.6	0.0297	3.1	0.1533	
0.7	0.0346	3.2	0.1583	
0.8	0.0396	3.3	0.1632	
0.9	0.0445	3.4	0.1682	
1.0	0.0495	3.5	0.1731	
1.1	0.0544	3.6	0.1781	
1.2	0.0594	3.7	0.1830	
1.3	0.0643	3.8	0.1879	
1.4	0.0692	3.9	0.1929	
1.5	0.0742	4.0	0.1978	
1.6	0.0791	4.1	0.2028	
1.7	0.0841	4.2	0.2077	
1.8	0.0890	4.3	0.2127	
1.9	0.0940	4.4	0.2176	
2.0	0.0989	4.5	0.2226	
2.1	0.1039	4.6	0.2275	
2.2	0.1088	4.7	0.2325	
2.3	0.1138	4.8	0.2374	
2.4	0.1187	4.9	0.2423	
2.5	0.1236	5.0	0.2473	

Exhibit 9.2
Volume to Sample in (Kilo-cubic feet) for
I-105/Lakewood Boulevard Park and Ride (MCTT)

Number of Sample Aliquots 72		Acreage 1.93	Runoff Coefficient 1	
Rainfall Amount (inches)	Sample (Kilo-ft ³)	Predicted Rainfall Amount (inches)	Volume to Sample (Kilo-ft ³)	
0.1	0.0097	2.6	0.2530	
0.2	0.0195	2.7	0.2627	
0.3	0.0292	2.8	0.2725	
0.4	0.0389	2.9	0.2822	
0.5	0.0487	3.0	0.2919	
0.6	0.0584	3.1	0.3016	
0.7	0.0681	3.2	0.3114	
0.8	0.0778	3.3	0.3211	
0.9	0.0876	3.4	0.3308	
1.0	0.0973	3.5	0.3406	
1.1	0.1070	3.6	0.3503	
1.2	0.1168	3.7	0.3600	
1.3	0.1265	3.8	0.3698	
1.4	0.1362	3.9	0.3795	
1.5	0.1460	4.0	0.3892	
1.6	0.1557	4.1	0.3989	
1.7	0.1654	4.2	0.4087	
1.8	0.1751	4.3	0.4184	
1.9	0.1849	4.4	0.4281	
2.0	0.1946	4.5	0.4379	
2.1	0.2043	4.6	0.4476	
2.2	0.2141	4.7	0.4573	
2.3	0.2238	4.8	0.4671	
2.4	0.2335	4.9	0.4768	
2.5	0.2433	5.0	0.4865	

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE,
AND MONITORING PLAN
VOLUME II

BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
CONTINUOUS DEFLECTIVE SEPARATION
UNITS



DISTRICT 7, LOS ANGELES

September 1999



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1.0 INTRODUCTION

This Field Guidance Notebook (*FGN*) gives inspectors, maintenance, and monitoring personnel the appropriate field evaluation and documentation for the District 7 Continuous Deflective Separation Units (CDSs) belonging to the Caltrans BMP Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-H of this guidance document for supporting information on CDS technology and characteristics. If needed, further background information is supplied in the Volume I of the Operations Maintenance & Monitoring Plan (OMM), which provides program-specific requirements and procedures.

1.1 Data to Be Collected

The following data will be collected to assess the performance and maintenance aspects of a CDS:

- Water quality and quantity data of runoff into and discharge from the CDS from flow-composite and first-flush (as soon as possible after the start of runoff) grab samples for at least eight storm events, weather permitting.
- Rainfall data, recorded as a function of time, from rainfall events during the study period.
- Analysis of type, mass, and volume of material collected and bypassed.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring data.
- Records of vector control measures taken.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to Be Performed

Field activities that will be performed at the CDS facilities include:

- Empirical Observation of CDS Operation.
- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Facility Maintenance Inspections and Facility Maintenance.
- Vector and Nuisance Animal Control Inspections.



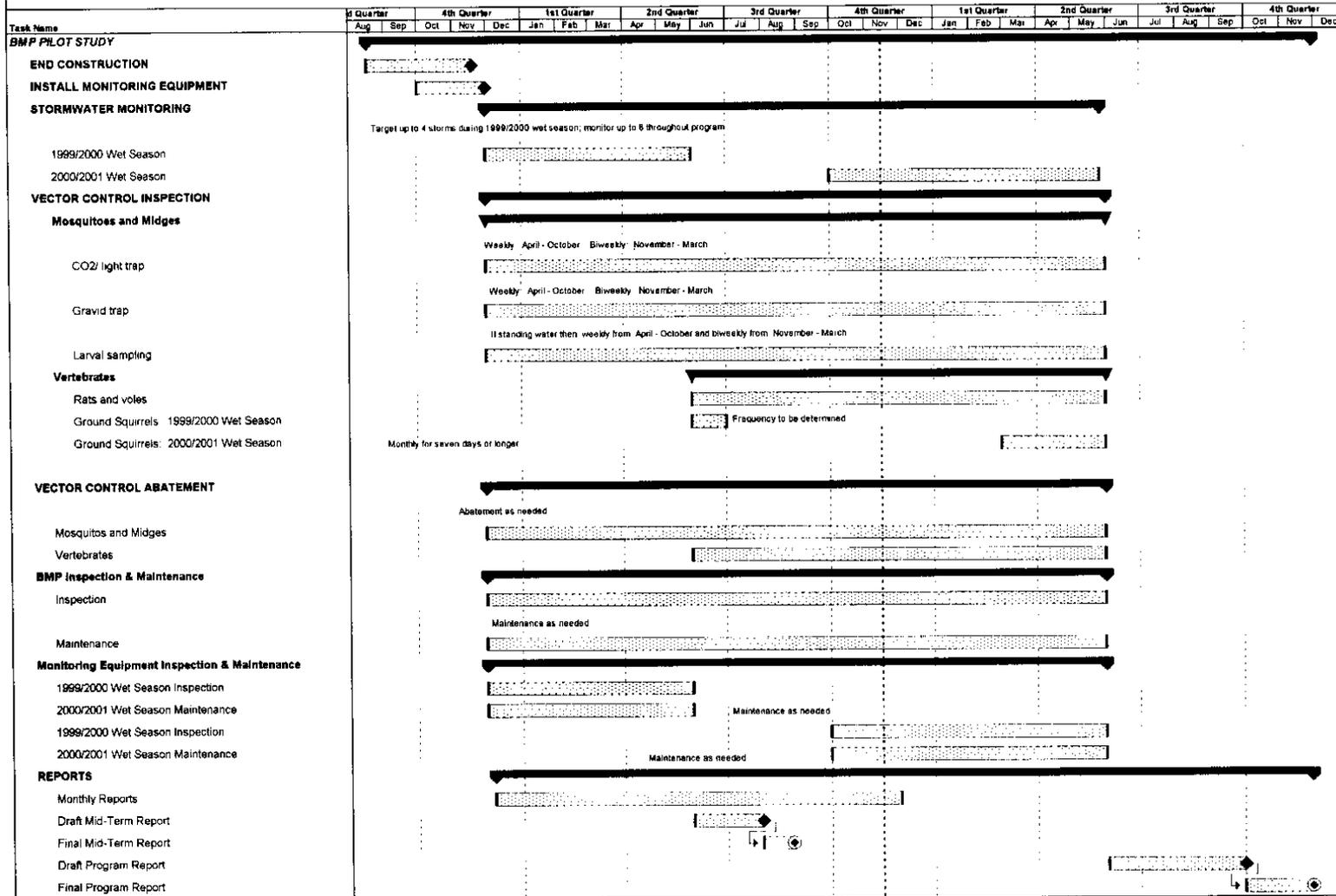
- Stormwater Monitoring.
- Characterization of collected and bypassed material.

Also, vector management may occur at the CDS facilities, but may be contingent on facility housekeeping and other environmental influences. Please see Appendix IV of Volume II for further details.

1.3 Master Schedule

The schedule on the following page shows the time-line for each phase of the CDS OMM program.

MASTER SCHEDULE



Target up to 4 storms during 1999/2000 wet season; monitor up to 8 throughout program

Weekly April - October Biweekly November - March

Weekly April - October Biweekly November - March

If standing water then weekly from April - October and biweekly from November - March

Frequency to be determined

Monthly for seven days or longer

Abatement as needed

Maintenance as needed

Maintenance as needed

Maintenance as needed



2.0 SITE INFORMATION

Access requirements for each site are summarized in Table 2.1, in the Encroachment Permit found in Tab 9, and in the Site Location Maps in Tab 1. ***Encroachment Permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed.***

Check in with appropriate Caltrans personnel before conducting field work.

Table 2.1
Caltrans District 7 Continuous Deflective Separation Unit Site Summary

Site No.	Site Name	Site Location	Access and Parking
073102	I-210/East of Orcas Avenue	Approximately 46 meters [150 feet] east of Orcas Avenue in the City of Lake View Terrace (I-210 PM 8.63). A CDS is located at the toe of embankment slope in a fenced area.	Vehicles will be parked along Orcas Avenue, north of Westbound I-210. Access is by a walkway leading from Orcas Avenue to the monitoring station enclosures.
073103	I-210/East of Filmore Street	East of Filmore Street near the I-210/SR-118 interchange in the City of Lake View Terrace (I-210 PM 6.44). A CDS is located at the toe of embankment slope in a fenced area.	Vehicles will be parked along Van Nuys Boulevard, beneath the I-210 overpass. Access is by a walkway leading from Van Nuys Boulevard to the monitoring station enclosures.



2.1 Continuous Deflective Separation Units

Refer to the accompanying Appendix for a general description of a CDS. The sections below provide site-specific information for each CDS in District 7.

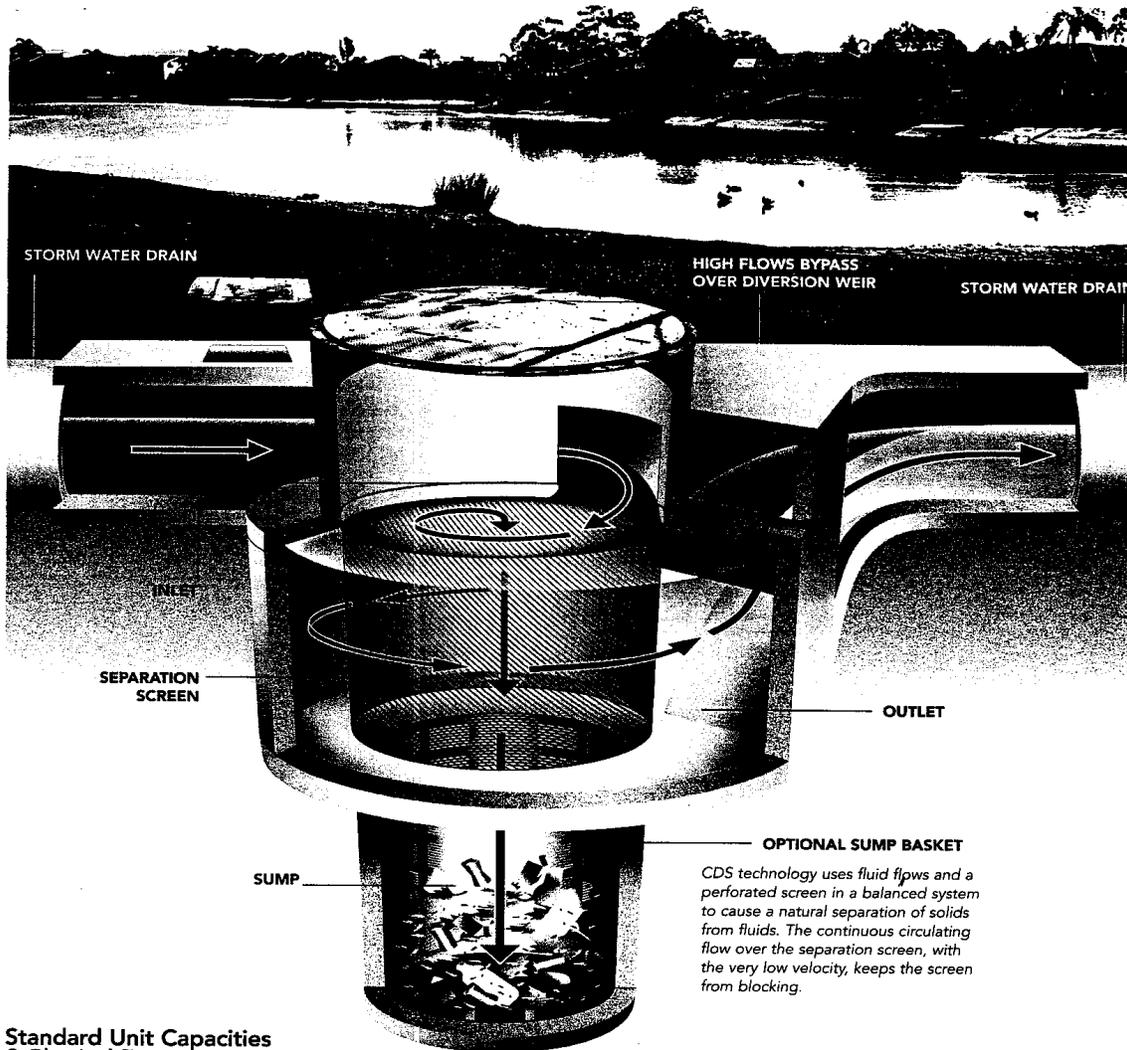
2.1.1 Site 073102: I-210/East of Orcas Avenue

Four tributary drain inlets flow into a common storm drain that connects to a FSW20_20 CDS located at the bottom of the embankment of the Westbound I-210 shoulder. The total tributary area is 4,415 square meters with a 1-year, 24-hour peak flow of 0.007 cubic meters per second. Influent flow will be sampled immediately upstream of the CDS. Effluent flow will be sampled immediately downstream of the CDS and just before the litter collection bypass bag. Due to site constraints, influent and effluent flow rate will be measured using an H-flume and bubbler located downstream of the litter collection bag. Because of the short hydraulic residence time, influent and effluent flow rate differentials are anticipated to be negligible, thus allowing the influent automatic sampler to be triggered by the H-flume on the downstream side of the CDS. Once flow passes through the H-flume, it then will discharge onto the ground, where the natural contours will direct the runoff to its original destination. Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.1.2 Site 073103: I-210/East of Filmore Street

Seven tributary drain inlets flow into a common storm drain that connects to a FSW20_20 CDS located at the bottom of the embankment of the Westbound I-210 shoulder. Five drain inlets are located along the Westbound I-210 shoulder, one drain inlet located along the Eastbound I-210 shoulder, and one drain inlet located on the median between the Eastbound SR-118/Eastbound I-210 connector and the Eastbound I-210. The total tributary area is 10,200 square meters with a 1-year, 24-hour peak flow of 0.017 cubic meters per second. Influent flow will be sampled immediately upstream of the CDS. Effluent flow will be sampled immediately downstream of the CDS and just before the litter collection bypass bag. Due to site constraints, influent and effluent flow rate will be measured using an H-flume and bubbler located downstream of the litter collection bag. Because of the short hydraulic residence time, influent and effluent flow rate differentials are anticipated to be negligible, thus allowing the influent automatic sampler to be triggered by the H-flume on the downstream side of the CDS. Once flow passes through the H-flume, it then will discharge into the existing rectangular channel. Please see the Site Location Map and BMP Facility Plan in Tab 1.

Figure 2.1 Cross-section of a Continuous Deflective Separation Unit



Standard Unit Capacities & Physical Features

Manufacture Material	Model* Designation	Treatment Capacity		Design Head Loss (ft)	Sump Capacity (yd ³)	Depth Below Pipe Invert (ft)	Foot Print Diameter (ft)
		cfs	MGD				
Fiberglass	FSW20_20	1.1	0.7	0.31	0.7	4.5	4.5
	FSW30_28	3.0	2.0	0.43	1.8	5.3	6.0
Prestcast** Concrete	PSW30_28	3.0	2.0	0.43	1.8	7.0	6.5
	PSW50_50	11	7.3	0.78	1.9	9.6	9.5
	PSW70_70	26	17.3	1.10	3.9	14.0	12.5
	PSW100_100	62	41.3	1.55	8.6	16.0	17.5
Cast in Place Concrete	CSW150_134	148	98.7	2.11	Varies	Varies	25.5
	CSW200_164	270	180.0	2.60	Varies	Varies	34.5
	CSW240_150	300	200.0	2.60	Varies	Varies	41.0

*CDS Fiberglass (F), Precast (P), and Cast in Place (C), Stormwater (SW)

**CDS Technologies can customize units to meet specific design flows and sump capacities.



2.2 Emergency Hospital Routes

See the “**Emergency Procedures Support**”, **Tab 2**, for maps and descriptions showing routes to the nearest hospitals and for emergency and site-related telephone contacts.

2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at a CDS, field crews will consist of a minimum of two people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 Traffic Safety Precautions

Activities at a CDS bring up traffic concerns including access and parking. During access and routine visits to the facilities, the following precautions will be taken:

- Minimize the time spent on the shoulder of the highway.
- Park on the facility access road or pullout, as appropriate to the specific site.
- Affiliated personnel shall wear a reflective orange safety vest, a hard hat, and appropriate shoes.
- Rotating amber lights shall be mounted and operational on work vehicles.

According to Chapter 8 (Protection of Workers) of the *Caltrans Maintenance Manual*, working for more than 10 minutes on the shoulder involves a shoulder closure procedure. This shoulder closure procedure will conform to the safety precautions below and the site-specific instruction provided in the Encroachment Permits (Exhibit 9.3 of Tab 9).

- Prior to beginning any work on or adjacent to a major roadway, the local highway patrol traffic control department shall be notified. See the Emergency Contacts List in Tab 2 for a listing of the local highway patrol phone numbers.
- Whenever possible, plan the timing of the work for non-peak traffic congestion periods if long-term parking on the shoulder is required.
- Use enough cones and barricades to sufficiently divert traffic safely around the work area (adhere to specific shoulder closure requirements detailed in the Encroachment Permits).
- Any open manhole or ditch must be barricaded.
- Remember that visibility is the key to minimizing the dangers of working in traffic.
- Upon completion of the work, the area must be cleaned up of materials and left in a clean and orderly state.

2.3.2 General Safety

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the CDS facilities, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Lightning.
- Fast moving water.
- Unstable earth.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Muggers and other criminals.
- Transients
- Power tools and heavy equipment.
- Ledges.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.

Other important field precautions include:

- Stay away from the edges of a fast moving body of water. These edges are usually slippery and unstable during rainy conditions.
- If sampling is required at the edge of a fast moving body of water, use a lifeline and a personal flotation device. Use grabbing devices when possible.
- Never work alone at night and avoid working alone during the day.
- Avoid leaving materials, tools and equipment lying around where someone can trip over them.
- Maximize lighting at all times, especially at night.
- Keep a phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear a hard hat and orange safety vest.
- Do not use power tools and heavy equipment unless trained in the proper use and care of the specific power tools.
- Always wear eye protection when working with tools or chemicals
- Wear rain gear.
- Never leave open holes unattended or unbarricaded.
- Do not sample during lightning.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 on the following page as a guide to find appropriate forms and information required for field visits. This table covers appropriate aspects of the field OMM program including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is by obtaining and going through each item on the table pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks for facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
for Continuous Deflective Separation Units

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Location Maps	NA	Prior to site visits.
	BMP Facility Plans	NA	Prior to site visits.
2	Emergency Contacts Lists	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist for Continuous Deflective Separation Units	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist for Continuous Deflective Separation Units	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist for Continuous Deflective Separation Units	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist for Continuous Deflective Separation Units	Form F	Filled out for each maintenance inspection of sampling equipment.
	Stockpile/Sediment Sampling Checklist	Form G	Complete for any stockpile or waste sampling.
	CCR Title 22 Characterization Requirements	Ex. 5.1	Reference for sediment stockpile sampling.
6	Empirical Observations Field Data Log Sheet for Storm Events Continuous Deflective Separation Units	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and BMP.
	Field Data Log Sheet Continuous Deflective Separation Units	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet (Influent/Control)	Form J1	Each time a program parameter is changed.
	User-Entered Program Parameter Log Sheet (Effluent Sampling)	Form J2	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses List	Ex. 7.1	Reference for each sampling event and laboratory analysis request submittal.
8	Vector Control and Monitoring Forms	Forms O1-O2	Fill out for each site visit related to vector monitoring.
9	Runoff Coefficients Continuous Deflective Separation Units	Ex. 9.1	Reference for calculations.
	“Volume-to-Sample” Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.



4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

Each CDS will be inspected on a regular basis according to the following minimum rates:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Forms C and D (Tab 4).*

1. Prior to arrival, contact the appropriate Caltrans District 7 personnel identified in the Encroachment Permit (Exhibit 9.3 in Tab 9).
2. Completely walk around the BMP while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism),
 - Erosion and slope stability,
 - BMP performance (fouling, blockage, damage),
 - Equipment repair/maintenance (BMP components, autosampler),
 - Sediment, litter, and debris accumulation (within BMP, at influent confluence),
 - Storage of accumulated sediment or other wastes, and
 - Vector control.
4. Complete Form C (see Tab 4) during inspections.
5. Log field activities and their corresponding time accurately.
6. If immediate corrective or preventive maintenance is needed, call the appropriate contacts listed in the Project Contacts List in Tab 2.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Sediment, Trash, and Debris Removal and Management.
- Equipment Maintenance.
- Structural Repairs.



- Vector Control.
- Standing or Stagnating Water.
- Vandalism.

The frequency of individual maintenance activities at the CDS facilities will be conducted according to the schedule listed in the maintenance indicator document, included as Appendix V of Volume II.

Maintenance activities performed will be documented using Forms E and F in Tab 5. See Section 2.0 of Appendix I-H for full details on maintenance activities.

4.3 Vegetation Management

No maintenance or control of vegetation is expected at CDS sites. If during the pilot period the need for vegetation management arises, procedures and checklists will be developed.

4.4 Disposal of Trash and Debris

Trash and debris from a CDS is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the BMP will be responsible for removal, characterization, and disposal of the trash and debris. This disposal will comply with applicable local, county, state, and federal waste control programs. Table 2.1 in the accompanying Appendix for Continuous Deflective Separation Units shows a few possible disposal services for waste material.

4.5 Deposited Sediment Management and Characterization Sampling

Handling and appropriate disposal of sediment residues from BMPs is critical. Stockpiling is only allowed at the facility under the following conditions:

- Sandbag berms are created (8-inch minimum) and are placed around the stockpile area.
- At least 0.5-mil plastic is used to contain any dewatered liquids (overlying sandbags).
- Stockpiles are covered and covers are anchored at all times.

Once sediment stockpile storage has reached disposal quantity, chemical characterization must be conducted to satisfy land disposal requirements (LDRs). Document any evidence of oil and grease, antifreeze, solvents, fuel, hydrogen sulfide, and any other noxious substance (Form G, Tab 5). These observations will assist in determining if hazardous waste disposal analyses are required. Refer to Form G in Tab 5 for additional details on conducting this sampling.

For sediment stockpiles, the minimum number of discrete samples initially required must comply with Form G, Tab 5. Random samples will be selected from locations on a three-dimensional grid. If the presence of materials such as boulders, debris, etc. hinder the application of this



process, the sample will be collected as close as possible to the randomly selected point without altering the essence of the random selection process.

Stockpile sediment samples will be collected in the following manner:

1. Don personal protective equipment.
2. Locate the sample point in the stockpile or drum.
3. Collect the sample using a soil probe or equivalent. Ensure that the sample is collected at the correct depth and location that was randomly selected.
4. Fill one 8-ounce glass jar with a portion of the sample and close the container with the cap, using care not to aerate (volatilize) the sample. This jar will be labeled and analyzed for TRPH and VOCs.
5. Homogenize the other portion of the sample in a disposable bowl using a disposable spatula or spoon. Fill a second 8-ounce glass jar with this portion of the sample and close the container with the cap. This sample will be labeled and analyzed for metals.
6. Wipe the outside of each sample container with a clean paper towel.
7. Record the sampler's initials, date, and time on the pre-labeled sample bottle.
8. Place the sample containers in individual zip-top plastic bags and seal the bags.
9. Immediately pack the samples into a chilled cooler.
10. Record the required information on the Chain-of-Custody Form.
11. Document the sampling event, recording information in the designated field logbook.
12. Repeat the above steps until the minimum number of samples has been collected.

Unless observations indicate additional testing, sediment samples submitted to the laboratory will be analyzed for the list of analytes in Exhibit 5.1 in Tab 5 using CCR Title 22 criteria (State of California, 1985).

4.6 Vector and Nuisance Animal Control

Vector Control Districts have been subcontracted to work in accordance with Appendix IV.

5.0 STORM MONITORING

Careful preparation and planning is critically important. Representative samples *must* be obtained for each storm event. Always double-check that equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that local rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours preferred).
2. Meeting deployment criteria defined in Exhibit 3.1, Tab 3.

Check appropriate sources for local weather conditions before deploying field staff. Use the Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for a decision tree on when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-H details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, reporting limits, and holding times for samples from CDS sites. Appendix III contains the BMP Retrofit Pilot Program Quality Assurance and Quality Control Plan.

A separate logbook is used for each CDS facility. Pertinent checklists, log forms, and information necessary to conduct a successful monitoring program and to be contained in the site-specific field logbooks are listed in Table 3.1 in Section 3.0. The pertinent checklists and log forms are located in Tabs 1 through 9. Table 3.1 also lists analytical and office forms, contains corresponding form and table numbers, identifies the location in this document, and explains when each form is to be filled out.

Sampling equipment shall be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting stormwater sampling at BMP sites:

- Pre-Storm preparation,
- Storm event sampling (grab samples and composite sample collection of both influent and effluent), and
- Post-Storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1 in Tab 3) for when to mobilize.
2. Review the Mobilization Checklist for appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).

3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.
4. Decontaminate and assemble decontaminated sample containers, Teflon[®] hose, and other sampling equipment according to the following procedures:

Cleaning Procedures for Sample Bottles

Bottles will be:

- a. Rinsed three times with warm tap water.
- b. Scrubbed with a clean plastic brush.
- c. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
- d. Rinsed three times with tap water.
- e. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
- f. Rinsed three times with hexane while rotating the bottle, and then air-dried.
- g. Rinsed six times with Milli-Q water.
- h. Soaked in 2N nitric acid for a minimum of 24-hours.
- i. Rinsed six times with Milli-Q water.

Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

- a. Teflon[®] hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
 - b. Rinsed three times with warm tap water.
 - c. Rinsed three times with Milli-Q or equivalent water.
 - d. Rinsed three times with 2N nitric acid.
 - e. Soaked at least 24-hours in 2N nitric acid.
 - f. Rinsed three times with Milli-Q water.
5. Inspect monitoring equipment for proper operation (use Form D, Tab 4). At each sampling location do the following:
 - a. Check battery voltages and electrical connections.
 - b. Inspect the pump tubing and replace if necessary.
 - c. Inspect desiccant cartridges in flow meter.
 - d. Inspect intake tubing condition and connections. Make sure intakes, flow structures, and sensors are clear of debris (this is only possible if all confined space requirements are met).
 - e. Make sure the correct user-entered program parameters are entered (use Forms I, J1, J2 and K in Tab 6).
 - f. Set system status flags.



- g. Make sure the automatic sampler is set up properly by verifying that the correct bottle size, number of bottles, hose diameter, hose material, hose length, head height, aliquot volume, number of samples to fill the bottle, and number of pulses to sample has been entered correctly.
 - h. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger.
6. Ice composite bottles.
 7. From the office or field set "Volume-to-Sample" numbers (Exhibit 9.2 in Tab 9) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K, Tab 6).
 8. Prepare necessary sample bottles for first-flush (as soon as possible after the start of runoff) grab samples. Grab samples will be collected four times per year as directed by the Task Order Manager.

5.1.2 Storm Event and Sample Collection

1. Once onsite, fill out the Empirical Observations Field Data Log and a Field Data Log Sheets (Forms H and I in Tab 6) to document storm characteristics.
2. Locate influent/control autosampler and inspect for proper operation.
3. Locate effluent autosampler and inspect for proper operation.
4. Change composite bottles and re-initiate equipment as needed.
5. Take grab samples as needed (four will be taken per monitoring season at the influent and effluent locations of the CDS).

5.1.3 Post-Storm Sample Analyses

After a storm event has ended, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

Reset the storm monitoring program to prepare for another storm event.

Replace the four 1-gallon autosampler sample bottles and the reset the sampler.

Physically inspect the station to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if all confined space requirements are met).

Check battery voltages; replace batteries that are low.

Retrieve data via field modem interrogator or from the remote monitoring computer.

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

Chain-of-Custody Forms

When all of the grab samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody Forms (see example in Form M, Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.2 Empirical Observations

Complete and succinct empirical observations for both rain/runoff and the BMP, are required during each site visit related to wet season monitoring. These observations will be taken throughout the facility as they apply to the BMP (particularly at the influent and effluent locations). These empirical observations will be recorded on Form H in Tab 6.

Observations will be succinct but complete. For a CDS performance evaluation, the following observations will be taken at the influent location, within the CDS, and at the effluent location:

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water, bypass).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory) to roughly assess changes in water quality.
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Erosion.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Refer to Form H in Tab 6 for recording empirical observation information.

5.3 Characterization of Collected Material

Characterization of material collected within the CDS units will be made when maintenance is required [i.e., annually (at the end of the wet season), or when material is at 85% of CDS' sump capacity, or when the thickness of floatables reaches 10 inches, whichever occurs first]. Up to four characterizations will be made during each wet season. In addition, to determine the amount of material bypassing the CDS, a litter bypass bag will be installed immediately downstream of the CDS. Material collected in the bypass bag will be characterized during four target storm events each wet season and annually (at the end of the wet season).



The CDS is equipped with a basket made from carbon steel shapes and welded wire fabric. The basket contains an inner basket fabricated from nylon that is specially designed with 50 micron openings. The inner basket is fastened into the lifting basket with a steel ring batten that is bolted through the nylon fabric so it is pinched to hold it in place. A steel ring that serves to weight the nylon basket into the bottom of the lifting basket is provided. The ring can fall from the basket when the contents are dumped. If the nylon inner liner gets damaged, it can be replaced. Contact CDS Technologies to get a replacement.

During inspections, measure the amount of sediment accumulation in the sump and floating trash and debris in the separation chamber using a tape measure (Form C in Tab 4).

Prior to removing the basket as described below, remove the floatables and suspended throughout the water column above the basket. Deposit the floatables in a mesh bag, estimate the volume, and then hang the mesh bag containing the material on the security fence to drip-dry for three days. After the material has drip-dried for the three-day period, transport it to the laboratory for characterization. Do not mix floatable material with other material collected in the CDS sump.

To remove the basket, center the davit lifting cable over the CDS unit. The lifting hook from the davit cable needs to be hooked to the basket harness assembly and the basket raised from the unit. When the basket clears the water surface in the unit, stop lifting and allow the water to drain from the basket for 15 minutes. Estimate the volume of material after the water has drained from the basket during the 15-minute period.

The basket, if it is full, will contain up to about 5-6 cubic feet of material and may weigh up to 350-400 pounds, depending on the amount of sediments captured along with the organics and settable trash. Take the material out of the basket by hand and place it in mesh bags, and then hang the mesh bags containing the material on the security fence to drip-dry for three days. After the material has drip-dried for the three-day period, transport it to the laboratory for characterization. Do not mix material removed from the sump with the floatable material. After the material is emptied, reconnect the basket to the davit, swing it over the CDS unit, center and lower it back into the sump.

Estimate the volume of material collected in the bypass bag after the four storm events monitored each wet season and annually, at the end of the wet season. Do not to mix bypassed material with collected material.

Transport material removed from the CDS and collected in the bypass bag to Woodward-Clyde's Litter Management Laboratory for characterization.



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TAB 1

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans**



TAB 2

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**

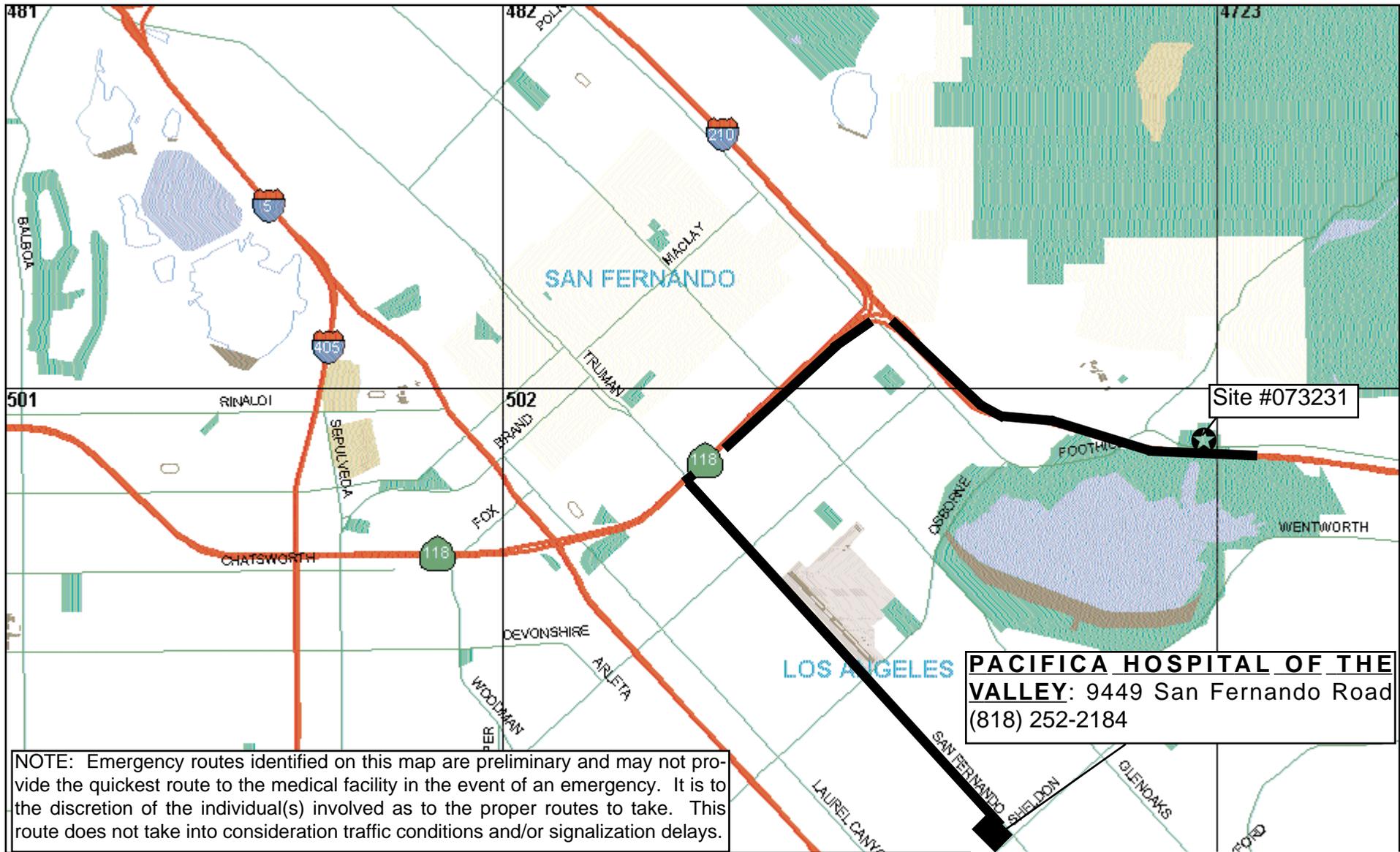
Document information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Site 073102: I-210/East of Orcas Avenue

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(213) 625-3311	From landline phone
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Pacifica Hospital of the Valley	(818) 252-2184	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Al Salinas)	(805) 259-0172	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Emergency Contacts for Site 073103: I-210/East of Filmore Street

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	(213) 625-3311	From landline phone
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Pacifica Hospital of the Valley	(818) 252-2184	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector (Al Salinas)	(805) 259-0172	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury



NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

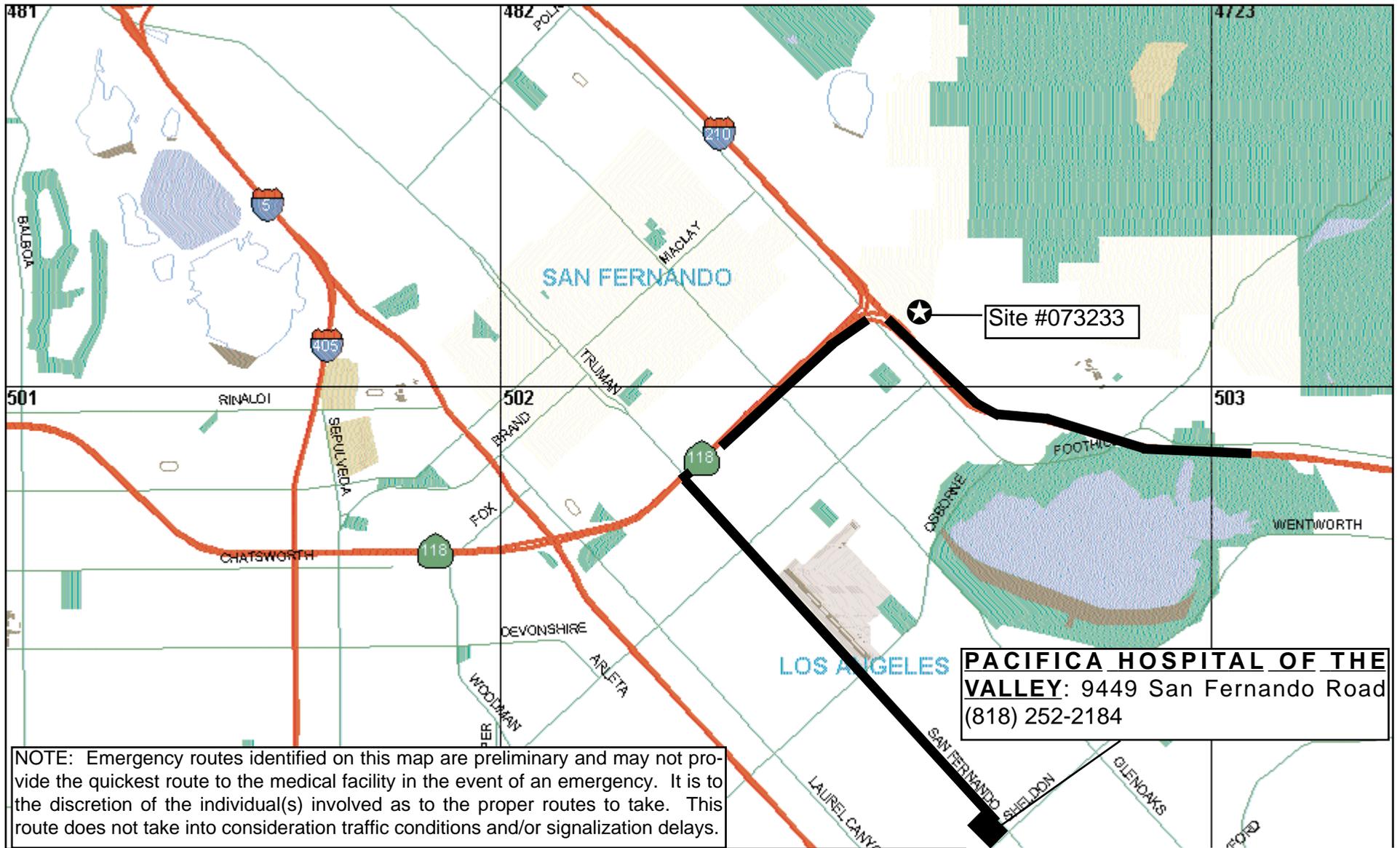
PACIFICA HOSPITAL OF THE VALLEY: 9449 San Fernando Road
(818) 252-2184

 BMP Pilot Site

 Not to Scale


Potential Emergency Route

SOURCE: Thomas Bros., Los Angeles County, 1997
CALIFORNIA DEPARTMENT OF TRANSPORTATION
I-210/West of Orcas Avenue
Hospital Route Map



NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

PACIFICA HOSPITAL OF THE VALLEY: 9449 San Fernando Road
(818) 252-2184

 BMP Pilot Site

 Not to Scale


Potential Emergency Route

SOURCE: Thomas Bros., Los Angeles County, 1997
CALIFORNIA DEPARTMENT OF TRANSPORTATION
**I-210/East of Filmore Street
Hospital Route Map**

Project Contacts List

Name	Organization	Phone	Fax Mobile	Email
Bill Whittenberg	RBF and Associates	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Robert Wu	Caltrans District 7 Program Manager	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Ed Othmer	LAWCRANDALL Task Order Manager	(858) 278-3600 Pg (858) 650-2159	(858) 278-5300-f	eothmer@lawco.com
Byron Berger	LAWCRANDALL Field Manager	(714) 776-9544 - Anaheim (858) 278-3600 – San Diego Pg (858) 650-1958	(714) 776 9541 – Anaheim (858) 278-5300- San Diego	bberger@lawco.com
Bill O’Braitis	LAWCRANDALL	(323) 889-5300	(323) 721-6700-f	wobraitis@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678-f	Peter_vanriper@dot.ca.gov
Donald Kaiser	American Sigma, Inc.	(716) 798-5580	(716) 798-5599-f	sigma@americasigma.com
Internet	National Weather Service	(805) 988-6610	--	www.nwsla.noaa.gov
Tim Root	WeatherWatch, Chief Meteorologist	(619) 223-8163	(619) 223-4245-f	--
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Debbie Frank	MW Laboratories	(626) 568-6449	--	--
Jon Gildersleeve	Quanterra Laboratory	(916) 373 5600	(916) 371 2857	gilderslej@quanterra.com
Pat Brueckner	Pat-Chem Laboratories	(805) 532 0012	(805) 532 0016	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	(530) 743-6400	--	deanm@lwadavis.com
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(949) 365-0117-f	Geosrcr1@ix.netcom.com
Sal Duarte	United Pumping Service, Inc.	(818) 253 5250	(626) 961-3166-f	salduarte@aol.com



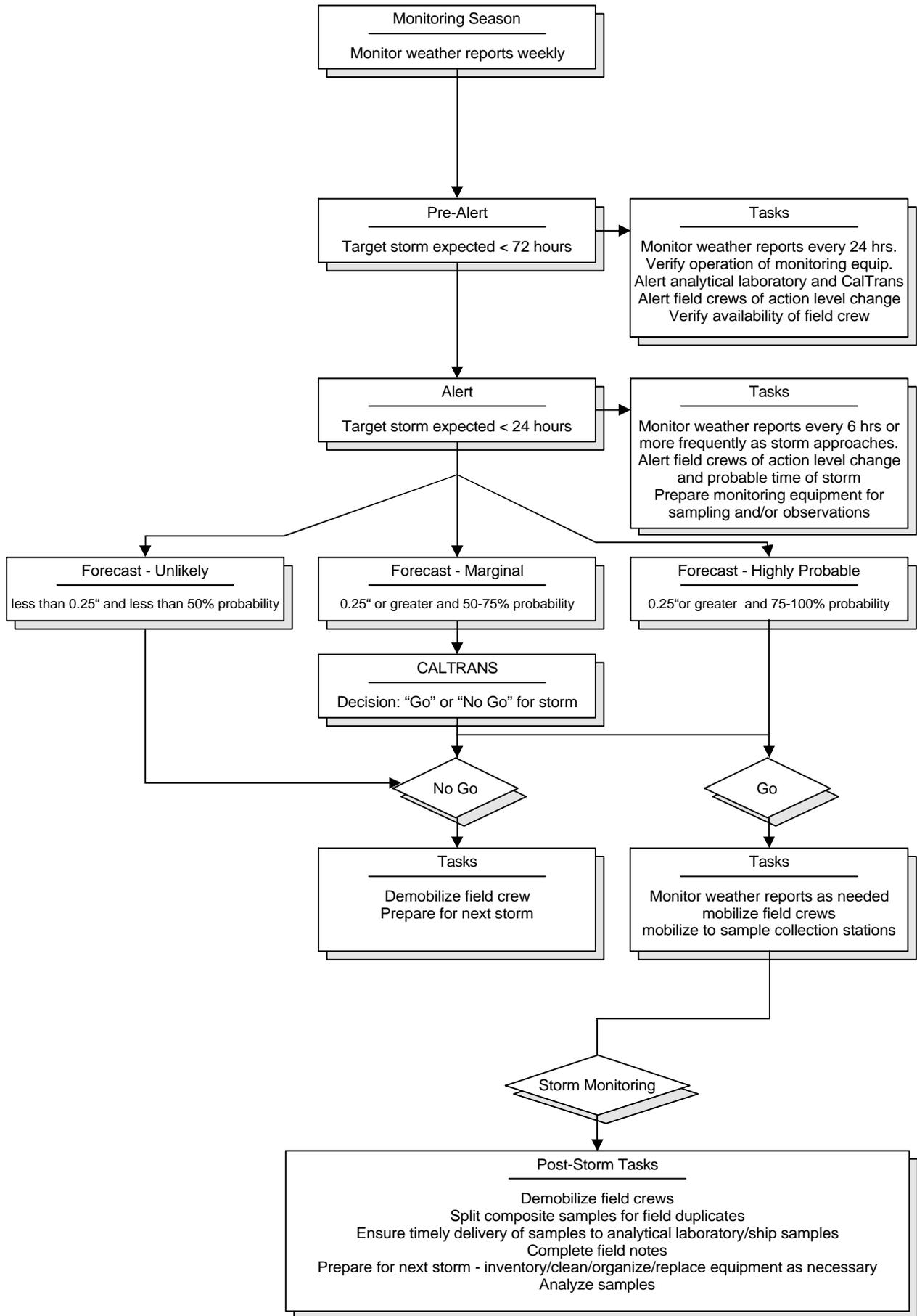
TAB 3

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

General

Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Phone card	Volume-to-Sample matrix
	Vendor's autosampler manual

Storm Kit Equipment List

Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Flashlights (2)
Maps for required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (packages and jar)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands

Storm Mobilization List

Storm kit	Log books
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
Ice scoop	Sample control paperwork (COC)
Extra fine indelible markers	Four 1-gallon glass bottles
Grab sample bottles (see below)	Coolers and ice (at least one extra)
Grab pole and extension	DI water (3-gallon jug)
Two-way radio or cellular phone	Personal rain gear
Any necessary safety gear	Trash bags

Sampling Checklist

Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Laboratory telephone number
for each QA/QC analysis	Backup laboratory contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

FORM B
Storm Staffing Plan

Caltrans BMP Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

**Form C: BMP Site Inspection Checklist for
Continuous Deflective Separation Units**
**Form D: Monitoring Equipment Inspection Checklist for
Continuous Deflective Separation Units**

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Continuous Deflective Separation Units

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		

LITTER AND DEBRIS ACCUMULATION:	Maintenance Reqd?
--	--------------------------

Depth of accumulated litter and debris (<i>If sump is 85 percent full, then maintenance is required</i>):	? yes ? no
Estimated volume of accumulated litter and debris:	

Litter and debris type:	
-------------------------	--

Depth of accumulated floatables (<i>If floatables are 10 inches deep then maintenance is required</i>):	? yes ? no
Estimated volume of accumulated floatables:	

Floatable material type:	
--------------------------	--

Depth of accumulated sediment (<i>If sediment clogs screen then maintenance is required</i>):	? yes ? no
Estimated volume of accumulated sediment:	

Sediment type and location:	
-----------------------------	--

Does the litter collection bypass bag contain <i>material</i> (<i>If more than half full then maintenance is required</i>)?	? yes ? no
Description:	? yes ? no

Depth of standing water below inlet pipe invert (<i>If water level drops below the invert of the inlet pipe between September 15 and October 1 then maintenance is required</i>)	? yes ? no
Comments:	

STRUCTURAL:	Maintenance Reqd?
--------------------	--------------------------

Is the CDS structurally sound?	? yes ? no
If no then describe location and extent of damage:	? yes ? no

Is the screen clogged or damaged?	? yes ? no
If yes then describe location and extent of damage	? yes ? no

Is the weir box free of debris?	? yes ? no
If no then maintenance is required.	? yes ? no

Is corrosion present?	? yes ? no
If yes, extent and location	? yes ? no ? not applicable

FORM C

Caltrans BMP Retrofit Pilot Program

BMP Site Inspection Checklist for Continuous Deflective Separation Units

STRUCTURAL: (continued)				Maintenance Req'd?	
Evidence of concrete scour, spalling, or cracking of structural parts? ? yes ? no					
Fences: ? OK ? not OK ? not applicable				? yes ? no	
Locks: ? OK ? not OK ? not applicable				? yes ? no	
Other general maintenance concerns/comments:					
ANIMAL CONCERNS:				Maintenance Req'd?	
Is there evidence of small animals (burrows, droppings, trails, gnawing marks, or stained rub marks)? ? yes ? no					
Comments:					
VECTOR CONCERNS:				Maintenance Req'd?	
Presence of vectors: ? Yes ? No				? yes ? no	
If yes, what type: ? Mosquitoes ? Blackfly ? Cockroaches ? Rats ? Other _____					
Comments:					
AESTHETIC CONCERNS:				Maintenance Req'd?	
Theft? ? yes ? no		Description and location:		? yes ? no	
Vehicle accident? ? yes ? no		Description and location:		? yes ? no	
Other general aesthetic concerns:					
NON-STORMWATER CONCERNS:					
Non-storm water discharge to BMP				? yes ? no	
BMP wet from obvious non-stormwater discharge (no rain)				? yes ? no	
If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678					
From:			Contact Number:		
PHOTOGRAPHS (mandatory if maintenance is required):					
Date	Time	Description	Direction Facing	Roll	Photograph No.

FACILITY NAME: _____
DATE: _____ TIME: _____
PAGE _____ of _____

FORM C

Caltrans BMP Retrofit Pilot Program

BMP Site Inspection Checklist for Continuous Deflective Separation Units

OVERALL:

Other concerns affecting operation:

Condition of facility: ? acceptable ? not acceptable

Comments:

Dates for maintenance to be completed by:

(Team Leader's Signature)

FORM D		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Continuous Deflective Separation Units		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		
SAMPLING AND FLOW MEASUREMENT EQUIPMENT:		Maintenance Required?
Is the monitoring station enclosure locked? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the automatic sampler online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the automatic sampler properly programmed and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the peristaltic pump tubing need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the intake tubing and/or connections need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the desiccant cartridge in the flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is internal modem online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the bubbler properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Continuous Deflective Separation Units
(continued)

SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.):	Maintenance Required?
Is the bubbler tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is strainer clean and free of obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no

INFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in pipes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

EFFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in flumes? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Litter collection bag more than half full? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

PHOTOGRAPHS (mandatory if maintenance is required):					
Date	Time	Description	Direction Facing	Roll	Photograph No.

Dates for maintenance to be completed by:

(Team Leader's Signature)



TAB 5

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

- Form E: BMP Site Maintenance Activity Checklist for
Continuous Deflective Separation Units**
- Form F: Monitoring Equipment Maintenance Activity Checklist for
Continuous Deflective Separation Units**
- Form G:
Stockpile/Sediment Sampling Checklist**
- Exhibit 5.1: CCR Title 22 Characterization Requirements**

FORM E
Caltrans BMP Retrofit Pilot Program
BMP Site Maintenance Activity Checklist for Continuous Deflective
Separation Units

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
BMP Location:		

LITTER AND DEBRIS ACCUMULATION:

<input type="checkbox"/> <i>Litter and debris removal from CDS</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Sediment removal from CDS</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Clean orifices, and/or cracks in stormwater conveyance system</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Erosion repair (including vegetative stabilization)</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Top of Water Level in CDS(s)</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:

FORM E
 Caltrans BMP Retrofit Pilot Program
**BMP Site Maintenance Activity Checklist for Continuous Deflective
 Separation Units (continued)**

STRUCTURAL:

Structural repairs (describe):
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

ANIMAL CONCERNS:

Burrow control
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

VECTOR CONCERNS:

Mosquito Control
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Other (describe):
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

AESTHETIC CONCERNS:

Debris and trash removal
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

<p>FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Continuous Deflective Separation Units (continued)</p>	
<p>AESTHETIC CONCERNS (cont.):</p>	
<p><input type="checkbox"/> Graffiti removal or replacement of vandalized or stolen property</p> <p>Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: _____ Comments: _____</p>	
<p><input type="checkbox"/> Painting</p> <p>Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: _____ Comments: _____</p>	
<p><input type="checkbox"/> Other (describe):</p> <p>Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: _____ Comments: _____</p>	
<p>_____</p> <p style="text-align: center;">(Team Leader's Signature)</p>	<p>General Comments:</p>

FORM F
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Maintenance Activity Checklist for Continuous
Deflective Separation Units

GENERAL INFORMATION:

Date: _____ Time In: _____ Time Out: _____

Team Leader's Initials: _____ Stormwater Consultant: _____

BMP Location: _____

Clean H-flumes, orifices, and/or cracks
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Diagnostic test of automatic sampler
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of peristaltic pump tubing
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of bubbler tubing, pump tubing, or intake tubing
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of strainer
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Replacement of 12-volt marine battery
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

Removal of kinks or obstructions from bubbler tubing
 Start time: _____ End time: _____ Total time: _____
 More work required? yes no
 Equipment used: _____
 Comments: _____

FORM F Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Continuous Deflective Separation Units (continued)	
<input type="checkbox"/> Replacement of desiccant cartridge in flow meter Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other maintenance/calibration of automatic sampling equipment (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other maintenance of flow measurement equipment (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ of _____

FORM G
Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist

GENERAL INFORMATION:

Date:	Time In:	Team Leader's Initials:	Time Out:
-------	----------	-------------------------	-----------

Location: _____

SEDIMENT CHARACTERISTICS IN BMP PRIOR TO STOCKPILING:

Depth of sediment: _____

Color: black brown green tan other

Consistency: sandy silty granular other

Odors: petroleum solvents organic (rotten eggs) sewage
 none other

Depth of sediment: _____

SEDIMENT SAMPLE COLLECTION MOBILIZATION LIST

Powder Free Nitrile Gloves	
Soil Probe or equivalent for sample collection	
Labeled 8-ounce glass jars	
Plastic bags, seal bags	
Chilled cooler	
Chain-of-Custody form	
Log book for record keeping	

STOCKPILE/DRUMMED SEDIMENT:	Maintenance Required?
------------------------------------	------------------------------

Does the stockpile/drum require additional protection from causing environmental impact? (i.e., is underlying plastic, sandbag berming, and an anchored weather-proof covering in place?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
If not stockpiled, are the drums or other containers adequately stored, protected from weather, and free of damage/leakage? If not, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the amount of onsite sediment reaching an unmanageable quantity? (Is disposal necessary?) If so, check yes.	<input type="checkbox"/> yes <input type="checkbox"/> no
Are onsite equipment and materials sufficient to perform sediment sampling? If not, check no.	<input type="checkbox"/> yes <input type="checkbox"/> no

SEDIMENT COLLECTION:

<10 cubic yards:

Minimum of 2 samples, one randomly from each half of the soil mass

10-20 cubic yards:

Minimum of 3 samples, one randomly from each third of the soil mass

20-100 cubic yards:

Minimum of 4 samples, one randomly from each quarter of the soil mass

100-500 cubic yards:

Minimum of 1 sample per 25 c.y. of each 25 c.y. section of the soil mass

Over 500 cubic yards:

Collect a minimum of 1 sample per 25 c.y. portion of the soil mass

*Contact Dept. of
Environmental Health for
Guidance*

FACILITY NAME: _____

DATE: _____ TIME: _____

PAGE _____ of _____

FORM G

**Caltrans BMP Retrofit Pilot Program
Stockpile/Sediment Sampling Checklist**

SEDIMENT SAMPLE COLLECTION

Observation sheet completed

Personal and equipment decon completed

Number of aliquots taken for composite _____

Sample IDs:

- | | |
|----------|---------------------------|
| 1. _____ | Analysis requested: _____ |
| 2. _____ | Analysis requested: _____ |
| 3. _____ | Analysis requested: _____ |
| 4. _____ | Analysis requested: _____ |
| 5. _____ | Analysis requested: _____ |
| 6. _____ | Analysis requested: _____ |

Photos taken:

Chain of Custody Form attached

Record information in logbook for record keeping

Comments:

(Team Leader's Signature)

Exhibit 5.1: CCR Title 22 Characterization Requirements

Sediment Matrix (Disposal)
Analytical Parameters, Methodologies, Reporting Limits, Holding Times,
Container Volumes and Types, and Preservation

Parameter	Method	Units	Reporting Limit	Maximum Holding Time	Preservation	Container Size/Type⁽¹⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	EPA 418.1	mg/kg	10	28 days	4°C	8 oz glass jar
Volatile Organic Compounds	EPA 8260B	mg/kg	SW – 846 ⁽⁵⁾ requirements	14 days	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Metals ⁽²⁾ :	EPA 6020/7471	mg/kg	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	8 oz glass jar
California Code of Regulations (CCR), Title 22 Waste Extraction Test (WET) Metals ⁽³⁾ :	STLC Extraction	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA
Toxicity Characteristic Leaching Procedure (TCLP) Metals ⁽⁴⁾ :	TCLP 1311	mg/L	SW – 846 ⁽⁵⁾ requirements	180 days 28 days for mercury	4°C	NA

- (1) Each sample will be collected in two 8 oz glass jars
- (2) *California Code of Regulation (CCR), Title 22 Metals (Sb, As, Ba, Be, Cd, Cr (total), Co, Cu, Hg, Pb, Mo, Ni, Se, Ag, Tl, V, and Zn). Initial waste characterization results may lead to a shorter list of metals for subsequent sediment disposal.*
- (3) Any sample for total metals that are below the Total Threshold Limit Concentration [TTLC] but exceed the ten times Soluble Threshold Limit Concentration (STLC) will be further analyzed using the WET procedure. WET extracts will be analyzed only for metals which exceed the ten times STLC criteria. Sediments associated with total metal results that exceed TTLC values are automatically considered hazardous and therefore do not need to undergo the WET procedure.
- (4) *If any of the WET-soluble concentrations are equal to or greater than the TCLP regulatory thresholds, analyze the waste by TCLP.*
- (5) *“Test Methods for Evaluating Solid Waste, Physical /Chemical Methods”. SW-846, Update III.(SW-846)*



TAB 6

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for
Storm Events for Continuous Deflective Separation Units**

Form I: Field Data Log Sheet

Form J1: User-Entered Program Parameters (Influent)

Form J2: User-Entered Program Parameters (Effluent)

Form K: Station Phone Log

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Continuous Deflective Separation Units (continued)

INLET CONDITIONS:

Describe flow distribution where flow enters the CDS:
 Flow entering the CDS without being impeded: Yes No
 Is there evidence of a backwater condition: Yes No
 Explain:
 Describe any erosion being caused by the flow upstream or at the entrance to the CDS:
 Describe any obstructions or restrictions interfering with inflow/influent:

INLET WATER QUALITY APPEARANCE:

Check all that apply and describe under comments.
 Odor:
 Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None
 Floating materials:
 Oil and grease (see below) Trash or debris Surface film Organic material None
 Oil and grease:
 Sheen Heavy floating concentration Emulsion Deposit None
 Color:
 Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____
 Turbidity
 None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque
 Water quality appearance comments:

EROSION:

For the following locations, record erosion locations, area(s) covered, and depth(s), as applicable:
 Near inlet: _____

 Adjacent to CDS: _____

 Near outlet: _____

 Erosion comments:

FACILITY NAME: _____
DATE: _____ TIME _____
PAGE _____ of _____

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Continuous Deflective Separation Units (continued)

LITTER AND SOLIDS DEPOSITION AND RESUSPENSION:

For the following locations, record the type (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable:

In inflow/influent pipe: _____

Within the CDS: _____

In outflow/effluent pipe: _____

Solids resuspension evident (*check all that apply*):

In inflow/influent channel Near inlet Near outlet In outflow/effluent channel

Other (describe): _____

Solids deposition and resuspension comments:

Has any litter or debris bypassed the CDS and collected in litter bypass bag?

If yes, the describe type and quantity:

OUTLET CONDITIONS:

Describe any obstructions or restrictions interfering with outflow/effluent:

OUTLET WATER QUALITY APPEARANCE:

Check all that apply and describe under comments.

Odor:

Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

Sheen Heavy floating concentration Emulsion Deposit None

Color:

Colorless Red Orange Yellow Green Blue Violet Brown Black

Gray White Other: _____

Turbidity

None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

FACILITY NAME: _____
 DATE: _____ TIME _____
 PAGE _____ of _____

FORM H
Caltrans BMP Retrofit Pilot Program

**Empirical Observations Field Data Log Sheet for Storm Events
 for Continuous Deflective Separation Units (continued)**

VECTORS:

Presence of vectors: Yes No

If yes, what type: Mosquitoes Blackfly Cockroaches Rats

Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

Inlet structure damage Outlet structure damage Vandalism

CDS damage Weir box damage Screen damage

Comments:

MONITORING EQUIPMENT CONDITION:

Equipment functional: Yes No N/A

Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: ____

Comments:

Date: ____

Comments:

Date: ____

Comments:

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet for Continuous Deflective Separation Units

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
Location:		
BMP Type:		
Influent or Effluent (circle one)		Storm Event Visit or Maintenance Visit (circle one)

*Use Facility Inspection Logs and Empirical Observation Field Data Sheets to record observations. These logs **must** be filled out during all station visits.*

SYSTEM STATUS FLAGS (*6-AD; 1=high, 0=low)	PROGRAM SIGNATURE (*6-100)
Arr: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Arr:
Dep: 1 ____ 2 ____ 3 ____ 4 ____ 5 ____ 6 ____ 7 ____ 8 ____	Dep:

DATA LOGGER INFORMATION (*6)

All Site Visits:	Storm Site Visits:	
Stage (ft) 02:	Volume (kcf) 05:	MaxFlow (day) 51:
Staff Gauge	Strm Sum (kcf) 06:	MaxFlow (time) 52:
Velocity (ft/s) 03:	Percent Capture 08:	MaxFlow Q 53:
Q (cfs) 04:	Volume2Sample 14:	Total Rain (in) 66:
Station ID 21:	Sample Count 17:	Total Strm Vol. 72:
		Strm Vol Smpld 75:

12-volt marine battery (for sampler) voltage:	12-volt marine battery (for cell phone) voltage:	internal sampler voltage:
---	--	---------------------------

AUTOSAMPLER INFORMATION (Storm only)	Bottle # in:
Sample ____ of 72 after 1 pulse Bottle # out: Bottle Volume: Volume2Sampl:	

WATER QUALITY (Storm only)

Time of Manual Grab Samples:

TPH:

Bacteria:

Other Grabs or Measurements _____

SAMPLING EQUIPMENT AND REPAIR NEEDS:

ACTION TAKEN:

Storage Module Data Dump: Start ____ End ____

 (Team Leader's Signature)

FORM J1

User-Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

INFLUENT

Station Name: _____

Date:

Time:

01 Station ID					
02 Flow Meter Stage Offset (feet)					
03 Volume to sample (kcf)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
08 Flow Meter Speed Offset (feet/second)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
36 Cellular phone battery state control parameter					
37 Duration of cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions

FORM J2

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____

EFFLUENT

Station Name: _____

Date:					
Time:					

01 Station ID					
03 Volume to sample (kcf)					
04 Level Meter Stage Offset (feet)					
05 Level Meter Multiplier (feet/mv)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. Failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
30					
31					
34 Flume Parameter 1					
35 Flume Parameter 2					
36 Cellular phone battery state control parameter					
37 Duration when cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions



TAB 7

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Example Chain-of-Custody Form
Exhibit 7.1: Chemical Analysis List**

Exhibit 7.1: Chemical Analyses List

Stormwater Matrix

Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/ Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/ Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics⁶									
Total Petroleum Hydrocarbons – Diesel Oil	Grab	250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline	Grab	50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2
Bacteria⁷									
Fecal Coliform	Grab	2	MPN/100 mL	Multiple-tube	SM 9221E	6 hours ⁷	50 mL	1-100 mL plastic	4°C

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification.
6. Total Petroleum Hydrocarbon and Fecal Coliform grab samples will be collected for two storms per year.
7. Attempts will be made to maintain the 6-hour holding time for bacteria samples to the extent possible. When not possible, a maximum holding time of 24 hours will be followed in accordance with “Standard Methods for the Examination of Water and Wastewater”, 18th Edition.



TAB 8

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related Maintenance
Activity Checklist for Affected BMP Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform monitoring.



TAB 9

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

TECHNICAL SUPPORT INFORMATION

- Exhibit 9.1: Runoff Coefficients**
- Exhibit 9.2: Volume-to-Sample Tables**
- Exhibit 9.3: Encroachment Permits**

Exhibit 9.1
Runoff Coefficient Matrix Table for Continuous Deflective Separation Units

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
073102	I-210/East of Orcas Avenue	1.09	1.0
073103	I-210/East of Filmore Street	2.52	1.0

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for*Site 073102: I-210/East of Orcas Avenue*

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	1.09	1.0	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	11	2.6	286
0.2	22	2.7	297
0.3	33	2.8	308
0.4	44	2.9	319
0.5	55	3.0	330
0.6	66	3.1	341
0.7	77	3.2	352
0.8	88	3.3	363
0.9	99	3.4	374
1.0	110	3.5	385
1.1	121	3.6	396
1.2	132	3.7	407
1.3	143	3.8	418
1.4	154	3.9	429
1.5	165	4.0	440
1.6	176	4.1	451
1.7	187	4.2	462
1.8	198	4.3	473
1.9	209	4.4	484
2.0	220	4.5	495
2.1	231	4.6	506
2.2	242	4.7	517
2.3	253	4.8	528
2.4	264	4.9	539
2.5	275	5.0	550

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for*Site 073103: I-210/East of Filmore Street*

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	2.52	1.0	
Predicted Rainfall Amount (inches)	"Volume to Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	25	2.6	661
0.2	51	2.7	686
0.3	76	2.8	711
0.4	102	2.9	737
0.5	127	3.0	762
0.6	152	3.1	788
0.7	178	3.2	813
0.8	203	3.3	839
0.9	229	3.4	864
1.0	254	3.5	889
1.1	280	3.6	915
1.2	305	3.7	940
1.3	330	3.8	966
1.4	356	3.9	991
1.5	381	4.0	1016
1.6	407	4.1	1042
1.7	432	4.2	1067
1.8	457	4.3	1093
1.9	483	4.4	1118
2.0	508	4.5	1143
2.1	534	4.6	1169
2.2	559	4.7	1194
2.3	584	4.8	1220
2.4	610	4.9	1245
2.5	635	5.0	1271

CALTRANS
BMP RETROFIT PILOT PROGRAM
BMP OPERATION, MAINTENANCE,
AND MONITORING PLAN
VOLUME II

BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK FOR
DRAIN INLET INSERTS



DISTRICT 7, LOS ANGELES

September 1999



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1.0 INTRODUCTION

This *Field Guidance Notebook (FGN)* gives inspectors, maintenance, and monitoring personnel the appropriate field evaluation and documentation for the District 7 Drain Inlet Inserts (DIIs) belonging to the Caltrans BMP Retrofit Pilot Program. Field observations and conditions must be clearly and concisely documented on the field forms provided.

Refer to Appendix I-I of this guidance document for supporting information on DII technology and characteristics. If needed, further background information is supplied in Volume I of the Operations Maintenance & Monitoring Plan (OMM), which provides program-specific requirements and procedures.

1.1 Data to Be Collected

The following data will be collected to assess the performance and maintenance aspects of a DII:

- Water quality and quantity data of runoff discharged from the DII from flow-composite samples for at least eight storm events during two wet seasons, weather permitting.
- Quality and quantity data of material collected by the DII.
- Rainfall data, recorded as a function of time, from rainfall events during the study period.
- Observations of water quality, weather, antecedent conditions, spills, etc.
- Documentation records of inspections and maintenance activities performed.
- Vector monitoring data.
- Records of vector control measures taken.
- Vegetation management records.

Consultants will be responsible for data management. Overall management of the data will be consistent with established Caltrans procedures for stormwater monitoring projects.

1.2 Field Activities to Be Performed

Field activities that will be performed at the DII facilities include:

- Empirical Observation of DII Operation.
- Monitoring Equipment Installations.
- Monitoring Equipment Maintenance.
- Facility Maintenance Inspections.
- Facility Maintenance.



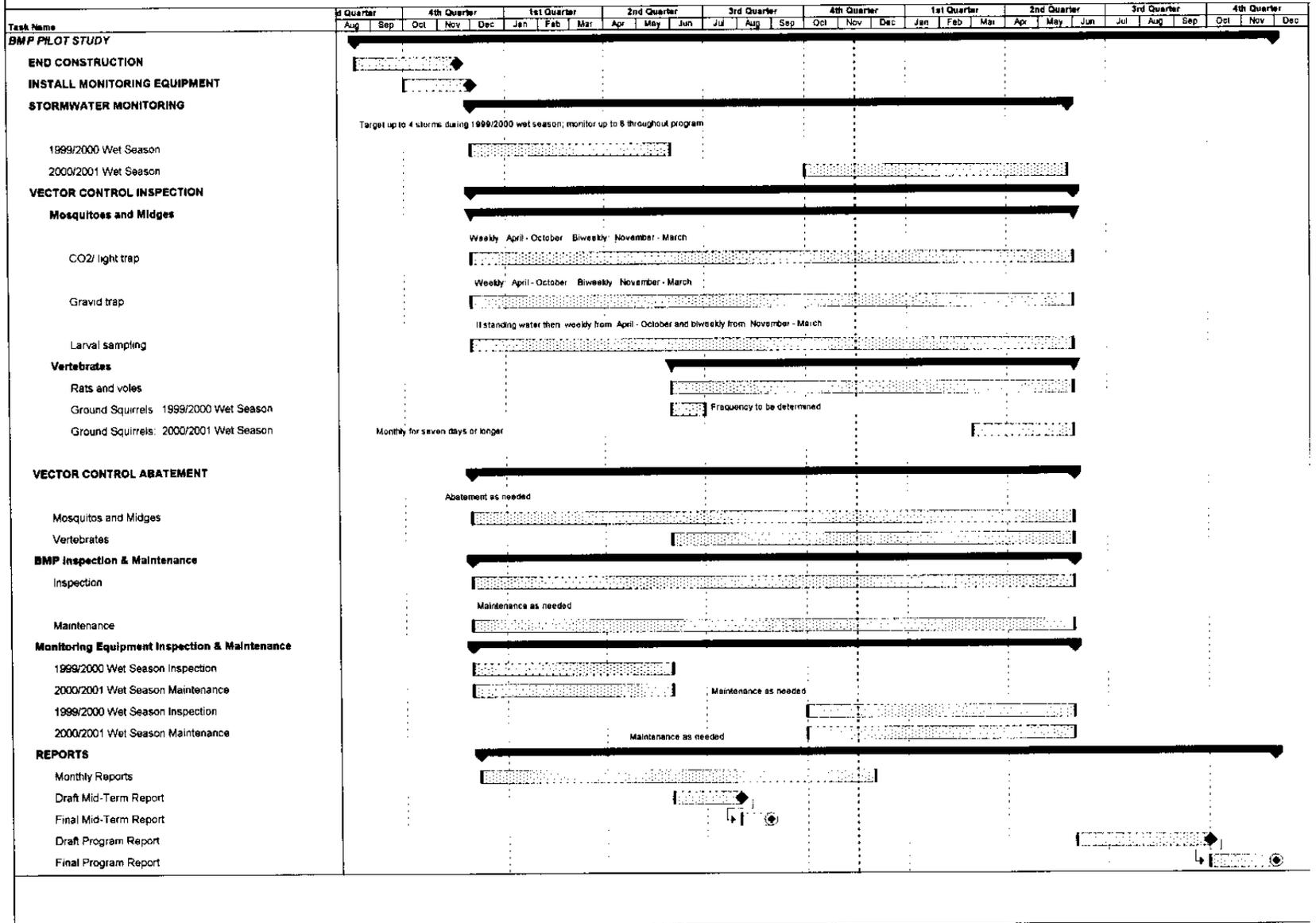
- Vector and Nuisance Animal Control Inspections.
- Stormwater Monitoring.

Also, vector control and/or management may occur at the DII facilities, but may be contingent on facility housekeeping and other environmental influences. Please see Appendix IV for further details.

1.3 Master Schedule

The schedule on the following pages shows the time-line for each phase of the DII OMM program.

MASTER SCHEDULE



Target up to 4 storms during 1999/2000 wet season; monitor up to 6 throughout program

Weekly: April - October Biweekly: November - March

Weekly: April - October Biweekly: November - March

If standing water then weekly from April - October and biweekly from November - March

Frequency to be determined

Monthly for seven days or longer

Abatement as needed

Maintenance as needed

Maintenance as needed

Maintenance as needed



2.0 SITE INFORMATION

Access requirements for each site are summarized in Table 2.1, in the Encroachment Permit found in Tab 9, and in the Site Location Maps in Tab 1. ***Encroachment Permits must be on hand*** for each site visit, and ***notification requirements found in these permits must be followed***.

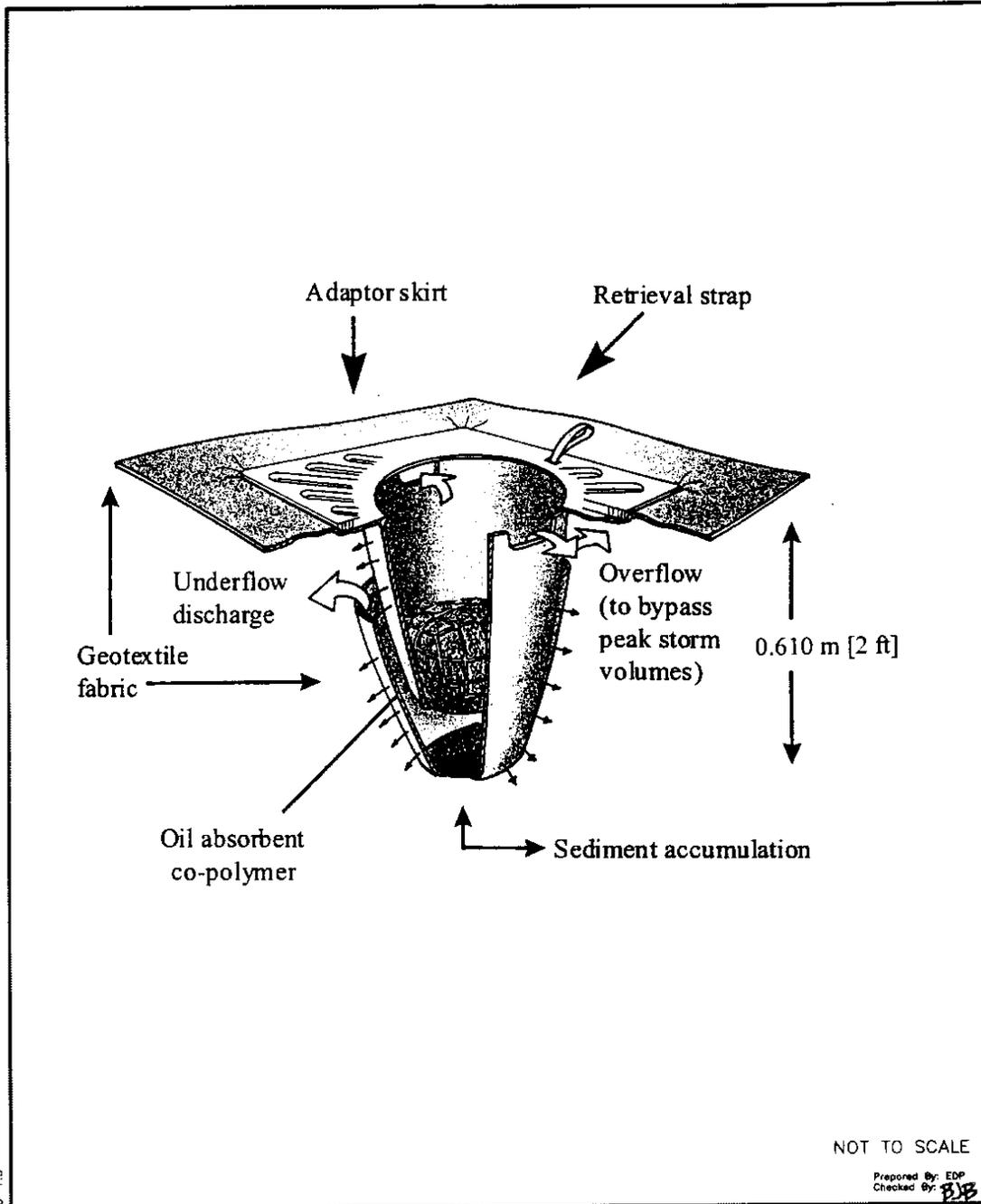
Check in with appropriate Caltrans personnel before conducting field work.

Table 2.1
Caltrans District 7 Drain Inlet Insert Site Summary

Site No.	Site Name	Site Location	Access and Parking
073216	Foothill Maintenance Station	At the Foothill Maintenance Station, located at 850 Huntington Drive, just off the I-210 Freeway/Mountain Avenue off-ramp. (I-210 PM 34.74).	Access to the maintenance station is through the main gate located on Huntington Drive. All vehicles will be parked in designated parking areas and will not impede maintenance station activities.
073217	Las Flores Maintenance Station	At the Las Flores Maintenance Station, located at 2503 Las Flores Canyon Road in the City of Malibu, approximately one-half mile east of Pacific Coast Highway. (SR-1 PM 44.12).	Access to the maintenance station is through the main gate located on Las Flores Canyon Road. All vehicles will be parked in designated parking areas and will not impede maintenance station activities.
073218	Rosemead Maintenance Station	At the Rosemead Maintenance Station, located at 9153 Lower Azusa Road, approximately one mile north of the I-10 Freeway/Rosemead off-ramp. (SR-164 PM 6.64).	Access to the maintenance station is through the main gate located on Lower Azusa Road. All vehicles will be parked in designated parking areas and will not impede maintenance station activities.

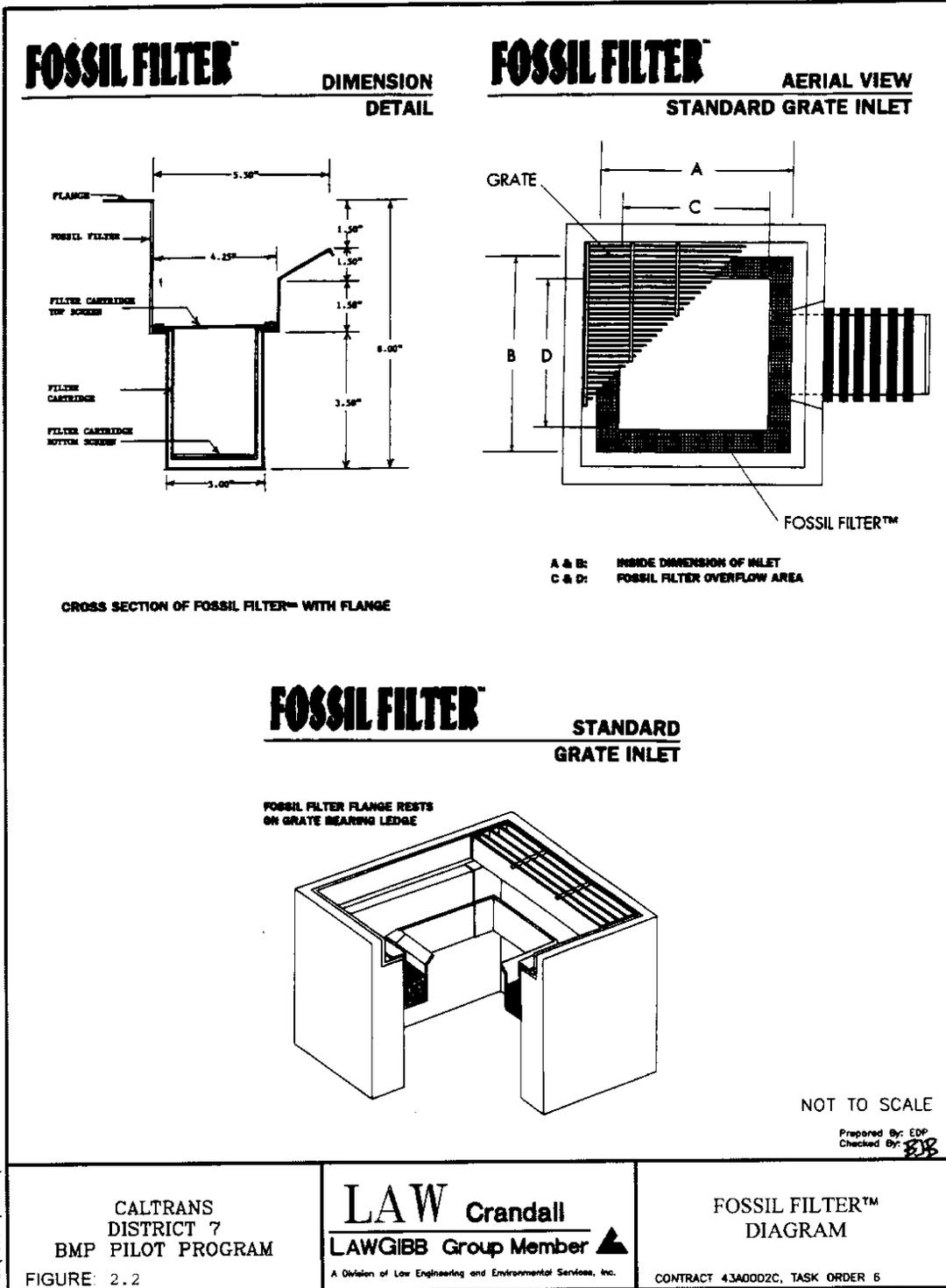
2.1 Drain Inlet Inserts

Refer to the accompanying Appendix for a general description of DIIs. Figures 2.1 and 2.2 below provide a diagram of the two types of inserts used in the Caltrans BMP Retrofit Pilot Program. Sections 2.1.1 through 2.1.3 below provide site-specific information for each DII site in District 7.



D:\70300\80030\FIG-1.3

<p>CALTRANS DISTRICT 7 BMP PILOT PROGRAM FIGURE: 2.1</p>	<p>LAW Crandall LAWGIBB Group Member <small>A Division of Law Engineering and Environmental Services, Inc.</small></p>	<p>STREAMGUARD™ INSERT DIAGRAM CONTRACT 43A002C, TASK ORDER 6</p>
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D:\70300\80030\FIG-1.4



2.1.1 Site 073216: Foothill Maintenance Station

Two drain inlets are retrofitted with DIIs at Foothill Maintenance Station. A StreamGuard™ DII is installed in the northern drain inlet and a Fossil Filter™ DII is installed in the southern drain inlet. Discharges from the DIIs are monitored in downstream monitoring vaults equipped with Palmer-Bowlus flumes.

The northern drain inlet has a tributary area of 0.17 acres. The southern drain inlet has a tributary area of 1.58 acres and receives runoff from a significantly different portion of the maintenance station. Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.1.2 Site 073217: Las Flores Maintenance Station

Two drain inlets are retrofitted with DIIs at Las Flores Maintenance Station. A StreamGuard™ DII is installed in the northern drain inlet and a Fossil Filter™ DII is installed in the southern drain inlet. Discharges from the DIIs are monitored in downstream monitoring vaults equipped with Palmer-Bowlus flumes.

The northern drain inlet has a tributary area of 0.23 acres. The southern drain inlet has a tributary area of 0.78 acres and receives runoff from a significantly different portion of the maintenance station. Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.1.3 Site 073218: Rosemead Maintenance Station

Two drain inlets are retrofitted with DIIs at Rosemead Maintenance Station. A StreamGuard™ DII is installed in the southern drain inlet and a Fossil Filter™ DII is installed in the northern drain inlet. Discharges from the DIIs are monitored in downstream monitoring vaults equipped with Palmer-Bowlus flumes.

The northern drain inlet has a tributary area of 0.25 acres. The southern drain inlet has a tributary area of 1.2 acres and receives runoff from a significantly different portion of the maintenance station. Please see the Site Location Map and BMP Facility Plan in Tab 1.

2.2 Emergency Hospital Routes

See the “**Emergency Procedures Support**”, **Tab 2**, for maps and descriptions showing routes to the nearest hospitals and for emergency and site-related telephone contacts.

2.3 Site-Specific Health and Safety Concerns and Precautions

This subsection only identifies health and safety concerns and precautions. Appendix II provides more extensive health and safety concerns and requirements. Note that at DIIs, field crews will consist of a minimum of two people. Refer to the site Encroachment Permit (Tab 9) for additional health and safety requirements.

2.3.1 *Traffic Safety Precautions*

Although parking at the DII sites is done at the maintenance facilities, care will be taken to be aware of vehicular and other activity in and near the maintenance station.

2.3.2 *General Safety*

In addition to traffic hazards, field crews may face a variety of potential dangers while maintaining the DII facilities, installing equipment, and performing environmental monitoring. Be aware of:

- Slippery conditions.
- Lightning.
- Fast moving water.
- Unstable earth.
- Poor visibility, especially at night.
- Lifting heavy objects.
- Muggers and other criminals.
- Transients
- Power tools and heavy equipment.
- Ledges.
- Sharp edges - broken glass.
- Overhead dangers.
- Dogs and other biological hazards.
- Electrical hazards posed by equipment malfunctions.
- Confined space entry. At DII sites, it is anticipated that Class D Confined Space Entry will be required. Verification of the class of confined space entry will be determined onsite prior to entry, using the testing and procedures discussed in Appendix II.

Other important field precautions include:

- Stay away from the edges of a fast moving body of water. These edges are usually slippery and unstable during rainy conditions.
- If sampling is required at the edge of a fast moving body of water, use a lifeline and a personal flotation device. Use grabbing devices when possible.



- Never work alone at night and avoid working alone during the day.
- Avoid leaving materials, tools and equipment lying around where someone can trip over them.
- Maximize lighting at all times, especially at night.
- Keep a phone or other means of communication nearby.
- Do not use your back to lift heavy objects. Get help.
- Never use drugs or alcohol while working.
- Always wear an orange safety vest and a hard hat
- Do not use power tools and heavy equipment unless trained in the proper use and care of the specific power tools.
- Always wear eye protection when working with tools or chemicals
- Wear rain gear.
- Never leave open holes unattended or unbarricaded.
- Do not sample during lightning.
- Clean up the work area before leaving.



3.0 FIELD PREPARATION

Use Table 3.1 on the following page as a guide to find appropriate forms and information required for field visits. This table covers aspects of the field OMM program including mobilization, observation, and monitoring checklists. The key in preparing for field visits, whether for maintenance or monitoring, is by obtaining and going through each item on the table pertaining to the field task at hand. Prior to the operational phase of this program, items contained in this table will be assembled into separate logbooks for facility operations and maintenance, vector control, storm monitoring, and office monitoring.



Table 3.1
List and Locations of Required Stormwater Monitoring Forms and Checklists
for Drain Inlet Inserts

Tab No.	Item	Form or Exhibit No.	Use and Frequency
1	Site Location Maps	NA	Prior to site visits.
	BMP Facility Plans	NA	Prior to site visits.
2	Emergency Contacts List	NA	Consult for emergency phone numbers.
	Hospital Route Maps	NA	Quick guide to the nearest hospital.
	Project Contacts List	NA	Refer for pertinent support staff.
3	Storm Monitoring Decision Tree	Ex. 3.1	Prior to each monitored storm.
	Mobilization Checklist	Form A	Before each storm and maintenance visit.
	Storm Staffing Plan	Form B	Filled out prior to storm event for crew and equipment assignments.
4	BMP Site Inspection Checklist for Drain Inlet Inserts	Form C	Filled out for each inspection visit.
	Monitoring Equipment Inspection Checklist for Drain Inlet Inserts	Form D	Filled out for each equipment inspection.
5	BMP Site Maintenance Activity Checklist for Drain Inlet Inserts	Form E	Filled out for each maintenance inspection.
	Monitoring Equipment Maintenance Activity Checklist for Drain Inlet Inserts	Form F	Filled out for each maintenance inspection of sampling equipment.
6	Empirical Observations Field Data Log Sheet for Storm Events for Drain Inlet Inserts	Form H	Each time a visit is made during wet weather. Separate observations will be made of the inflow, outflow, and BMP.
	Field Data Log Sheet for Drain Inlet Inserts	Form I	Each storm station visit. Separate logs will be filled out for the inflow and outflow.
	User-Entered Program Parameter Log Sheet	Form J	Each time a program parameter is changed.
	Station Phone Log	Form K	Each time station is contacted.
7	Chain-of-Custody Form	Form M	Whenever samples are collected.
	Chemical Analyses Lists	Ex. 7.1	References for each sampling event and laboratory analysis request submittal.
8	Vector Control and Monitoring Forms	Forms O1-O2	Fill out for each site visit related to vector monitoring.
9	Runoff Coefficients for Drain Inlet Inserts	Ex. 9.1	Reference for calculations.
	“Volume-to-Sample” Tables	Ex. 9.2	Consult to set sampling frequency.
	Encroachment Permits	Ex. 9.3	Explains access and safety requirements. Must always accompany field crews.



4.0 FACILITY OPERATIONS AND MAINTENANCE

4.1 Facility Operation Inspections

Each DII will be inspected on a regular basis according to the following minimum rates:

- Once a month at a minimum.
- After each consecutive storm event producing at least 0.10 inch of rain.
- On a weekly basis during extended periods of wet weather.

Optimal BMP operation is dependent on field inspections. When inspecting the facility, follow the procedural steps below. *Document inspections on Forms C and D (Tab 4).*

1. Prior to arrival, contact appropriate Caltrans District 7 personnel identified in the Encroachment Permit (Exhibit 9.3 in Tab 9).
2. Completely walk around the BMP while looking for obvious problems, damage, or malfunctions.
3. Inspect and assess needs for:
 - General aesthetics (graffiti, vandalism),
 - Erosion and slope stability,
 - BMP performance (fouling, blockage, damage),
 - Equipment repair/maintenance (BMP components, autosampler),
 - Sediment accumulation (within DIIs),
 - Storage of accumulated sediment or other wastes, and
 - Vector control.
4. Complete Forms C and D (Tab 4) during inspections.
5. Log field activities and their corresponding time accurately.
6. If immediate corrective or preventive maintenance is needed, call the appropriate contacts listed in the Project Contacts List in Tab 2.

4.2 Facility Maintenance

Functional (performance and safety) and aesthetic (public acceptance) maintenance is critical. For these BMP sites, focus on:

- Trash and Debris Removal.
- Sediment Removal and Management.
- Equipment Maintenance.
- Structural Repairs.



- Standing or Stagnating Water.
- Vector Control.
- Vandalism.

The frequency of individual maintenance activities at the DII facilities will be conducted according to the schedule listed in Appendix V, the Maintenance Indicator Document.

Maintenance activities performed will be documented using Forms E and F in Tab 5. See Section 2.0 of Appendix I-I for full details on maintenance activities.

4.3 Vegetation Management

Vegetation Management at DIIs consists of controlling weeds and other vegetation to prevent them from impeding stormwater runoff.

4.4 Disposal of Trash and Debris

Trash and debris from DIIs is ultimately the responsibility of Caltrans. Consultants responsible for operating, maintaining, and monitoring the BMP will be responsible for removal and disposal of the trash and debris. Trash and debris removed from the DII will be documented, and stored in sediment collection bins near the DII until the DII is sent to the laboratory for analysis. Analytical data will be used in part to evaluate the overall efficiency of the DIIs. Disposal will comply with applicable local, county, state, and federal waste control programs. Table 2.1 in the accompanying Appendix for DIIs shows a few possible disposal services for waste material.

4.5 Sediment Management and Characterization Sampling

Collected sediment will be stored in sediment collection bins near the DII until the DII is sent to the laboratory for analysis. Analytical data will be used in part to evaluate the overall efficiency of the DIIs.

4.6 Vector and Nuisance Animal Control

Vector Control Districts have been subcontracted to work in accordance with Appendix IV.

5.0 STORM MONITORING

Careful preparation and planning is critically important. Representative samples *must* be obtained for each storm event. Always double-check that appropriate equipment, supplies, and personal protective gear are readied for each field deployment.

Before crews are deployed to the field, be sure that local rainfall meets the sampling criteria:

1. 48 hours of dry weather preceded the storm (72 hours preferred).
2. Meeting deployment criteria defined in Exhibit 3.1

Check appropriate sources for local weather conditions before deploying field staff. Use the Storm Monitoring Decision Tree (Exhibit 3.1, Tab 3) for a decision tree on when and how to mobilize field personnel and equipment.

5.1 Storm Characteristics and Sampling Equipment

Section 5.0 of Appendix I-I details the stormwater equipment, equipment maintenance requirements, stormwater monitoring procedures, sediment sampling procedures, and analytical methods, reporting limits, and holding times for samples collected from DII sites. Appendix III contains the BMP Retrofit Pilot Program Quality Assurance and Quality Control Plan.

Separate logbooks will be used for each of the DII facilities. Pertinent checklists, log forms, and information necessary to conduct a successful monitoring program and to be contained in the site-specific field logbooks are listed in Table 3.1 in Section 3.0. Pertinent checklists and log forms are located in Tabs 1 through 9. Table 3.1 also lists analytical and office forms, contains corresponding form and table numbers, identifies the location in this document, and explains when each form is to be filled out.

All sampling equipment shall be inspected for proper function, staging, and sampling preparation (if wet season) and documented. There are three principal phases of documenting stormwater sampling at BMP sites:

- Pre-storm preparation,
- Storm event sampling (composite sample collection), and
- Post-storm sample analyses.

5.1.1 Pre-Storm Preparation

1. Consult the Storm Monitoring Decision Tree (Exhibit 3.1 in Tab 3) for when to mobilize.
2. Review the Mobilization Checklist for the appropriate equipment, sampling devices, and sample bottles (Form A, Tab 3).
3. Verify sample bottle quantities, number of analyses for each parameter, in-situ sampling equipment, and other necessary gear/support materials.
4. Decontaminate and assemble necessary decontaminated sample containers, Teflon[®] hose, and other sampling equipment according to the following procedures:

Cleaning Procedures for Sample Bottles

Bottles will be:

- a. Rinsed three times with warm tap water.
- b. Scrubbed with a clean plastic brush.
- c. Soaked in a 2% detergent (e.g., Contrad[®]) solution for at least 48-hours.
- d. Rinsed three times with tap water.
- e. Rinsed five times with Milli-Q or equivalent water, rotating the bottle to ensure contact with the entire inside surface.
- f. Rinsed three times with hexane while rotating the bottle, and then air-dried.
- g. Rinsed six times with Milli-Q water.
- h. Soaked in 2N nitric acid for a minimum of 24-hours.
- i. Rinsed six times with Milli-Q water.

Cleaning Procedures for Teflon[®] Hose and Other Sampling Equipment

Teflon[®] hose and other sampling equipment will be:

- a. Teflon[®] hose will be rinsed three times with a 2% Micro[®] solution or equivalent. Other sampling equipment will be washed with a 2% Micro[®] solution and a clean plastic brush.
 - b. Rinsed three times with warm tap water.
 - c. Rinsed three times with Milli-Q or equivalent water.
 - d. Rinsed three times with 2N nitric acid.
 - e. Soaked at least 24-hours in 2N nitric acid.
 - f. Rinsed three times with Milli-Q water.
5. Inspect monitoring equipment for proper operation (use Form D in Tab 4). At each sampling location do the following:

- a. Check battery voltages and electrical connections.
 - b. Inspect the pump tubing and replace if necessary.
 - c. Inspect desiccant cartridge in flow meter.
 - d. Inspect intake tubing condition and connections. Make sure intakes, flow structures, and sensors are clear of debris.
 - e. Make sure the correct user-entered program parameters are entered (use Forms I, J and K in Tab 6).
 - f. Set system status flags.
 - g. Make sure the automatic sampler is set up properly by verifying that the correct bottle size, number of bottles, hose diameter, hose material, hose length, head height, aliquot volume, number of samples to fill the bottle, and number of pulses to sample has been entered correctly.
 - h. Make sure the sampler is set to take a sample automatically after receiving a pulse from the data logger.
6. Ice composite bottles.
 7. From the office or field set “Volume-to-Sample” numbers (Exhibit 9.2 in Tab 9) and initiate equipment to begin sampling automatically when flow is detected. Fill out the phone log (Form K in Tab 6).

5.1.2 Storm Event and Sample Collection

1. Once onsite fill out the Empirical Observations Field Data Log and a Field Data Log Sheets (Forms H and I, Tab 6) to document storm characteristics.
2. Locate effluent autosampler and inspect for proper operation.
3. Change composite bottles and re-initiate equipment as needed.

5.1.3 Post-Storm Sample Analyses

After a storm event has ended, the autosampler stations need to be shut down and left ready for the next storm event in the following manner:

1. Reset the storm monitoring program to prepare for another storm event.
2. Replace the four one-gallon autosampler sample bottles and the reset the sampler.
3. Physically inspect the station to determine if any damage was sustained during the storm event. Inspect the flow sensor and intake for debris blockage or clogging. (This is only possible if all confined space requirements are met).
4. Check battery voltages; replace batteries that are low.
5. Retrieve data via field modem interrogator or from the remote monitoring computer.

Data Retrieval

Data will be retrieved (dumped) from the data logger after each storm event during the storm season, and, during dry weather, approximately every month.

Chain-of-Custody Forms

When the samples have been collected, the paperwork will be filled out to ensure a smooth transfer of samples to the analytical laboratory. Chain-of-Custody Forms (see example in Form M, Tab 7) will be filled out in detail describing the type of sample, the quantity of samples, and the time that the samples were collected. These forms will accompany the samples to the laboratory.

5.2 Empirical Observations

Complete and succinct empirical observations, for both rain/runoff and the BMP, are required during each site visit related to wet season monitoring. These observations will be taken throughout the facility as they apply to the BMP (particularly at the DII and effluent locations). These empirical observations will be recorded on Form H in Tab 6.

All observations will be succinct but also complete. For a DII performance evaluation, the following observations will be taken at the influent location, within the DII, and at the effluent location (i.e., sample collection point):

- Meteorological characteristics (present and preceding period).
- Hydrologic and hydraulic characteristics (flowing and/or standing water).
- Inlet conditions (problems affecting performance).
- Water quality appearance (visual, olfactory) to roughly assess changes in water quality.
- Solids deposition (trash and debris, sediments, organics) and resuspension.
- Treatment medium condition.
- Outlet conditions (problems affecting performance).
- Mosquitoes and other vectors.
- Structural condition of facility.
- Monitoring equipment condition.

Refer to Form H in Tab 6 for recording empirical observation information.

6.0 DRAIN INLET INSERT SAMPLING

Sample collection procedures and analyses for assessing the quantity and quality of material collected by a DII are discussed below:

6.1 Drain Inlet Insert Collection

An unused StreamGuard™ DII (geotextile fabric and absorbent material) will be analyzed to determine background levels of contaminants that may exist. An unused Fossil Filter™ DII (adsorbent material only) will be analyzed to determine background levels of contaminants that may exist. The unused DIIs will be placed in bags, placed in a coolers (or other appropriate container), and transported to the laboratory for analysis. Used DIIs will be removed and analyzed when the manufacturer's replacement criterion has been met. For Fossil Filter inserts, the replacement criterion, according to the manufacturer's instructions, shall be when the granules are dark gray or darker, or the medium is clogged with sediment. For Stream Guard inserts, the replacement criterion, according to the manufacturer's instructions, shall be when the sediment depth is greater than 6 inches, or when evidence of an oily sheen is observed in the insert or downstream of the drain inlet. Also, both types of drain inlet media shall be removed annually at the end of the wet season (April 30) and analyzed. The media shall be replaced before October 1 of each year.

The following steps will be used to remove the used DIIs from their field installations:

6.1.1 StreamGuard™ DII

1. Don powder-free nitrile gloves.
2. Carefully remove the drain inlet grate. While removing the grate, be sure not to allow the DII or the material it collected to drop into the drain inlet.
3. Place the DII and its contents into a large bag.
4. Place a sample label on the bag and record the sampler's initials, date, and time.
5. Immediately pack the samples into a cooler.
6. Record the required information on the Chain-of-Custody Form.
7. Document the sampling event, recording information in the designated field logbook.
8. If Caltrans decides to conduct additional performance testing on the DII, install a new DII and reinstall the drain inlet grate.
9. If no additional testing is required, reinstall the drain inlet grate without the installation of a new DII.

6.1.2 Fossil Filter™ DII

1. Don powder-free nitrile gloves.
2. Carefully remove the drain inlet grate. While removing the grate, be sure not to allow the DII or the material it collected to drop into the drain inlet.



3. Remove the collected sediment from the top of the trough and place it into a sample container.
4. Remove the adsorbent material and place it into a bag.
5. Place a sample label on each bag and record the sampler's initials, date, and time.
6. Immediately pack the samples into a cooler.
7. Record the required information on the Chain-of-Custody Form.
8. Document the sampling event, recording information in the designated field logbook.
9. If Caltrans decides to conduct additional performance testing on the DII replace the adsorbent material to the same level (quantity) as was originally used.
10. If no additional testing is required, then remove the filter assembly and reinstall the drain inlet grate.

6.2 Drain Inlet Insert Analyses

DII's and the material they collected will be analyzed for constituents listed in Exhibit 7.1b (Tab 7). This table also lists the required reporting limits, analytical holding times, required preservation, and container sizes and types. Laboratory turnaround times and data deliverables will be the same as those for the stormwater samples. In addition to these analyses, total weights of each sample will be measured. Weights of samples will be used with analyte concentrations to perform a mass balance calculation, which will be used to determine the DII's pollutant removal efficiency.



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TAB 1

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAPS

**Site Location Maps
BMP Facility Plans**



TAB 2

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

EMERGENCY PROCEDURES SUPPORT

**Emergency Contacts Lists
Hospital Route Maps
Project Contacts List**

Document information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Site 073216: Foothill Maintenance Station

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	911	From landline phone
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Santa Teresita Hospital	(626) 359-3243	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector Pat Gibbons, Glenn Matthews	(909) 397-4325	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

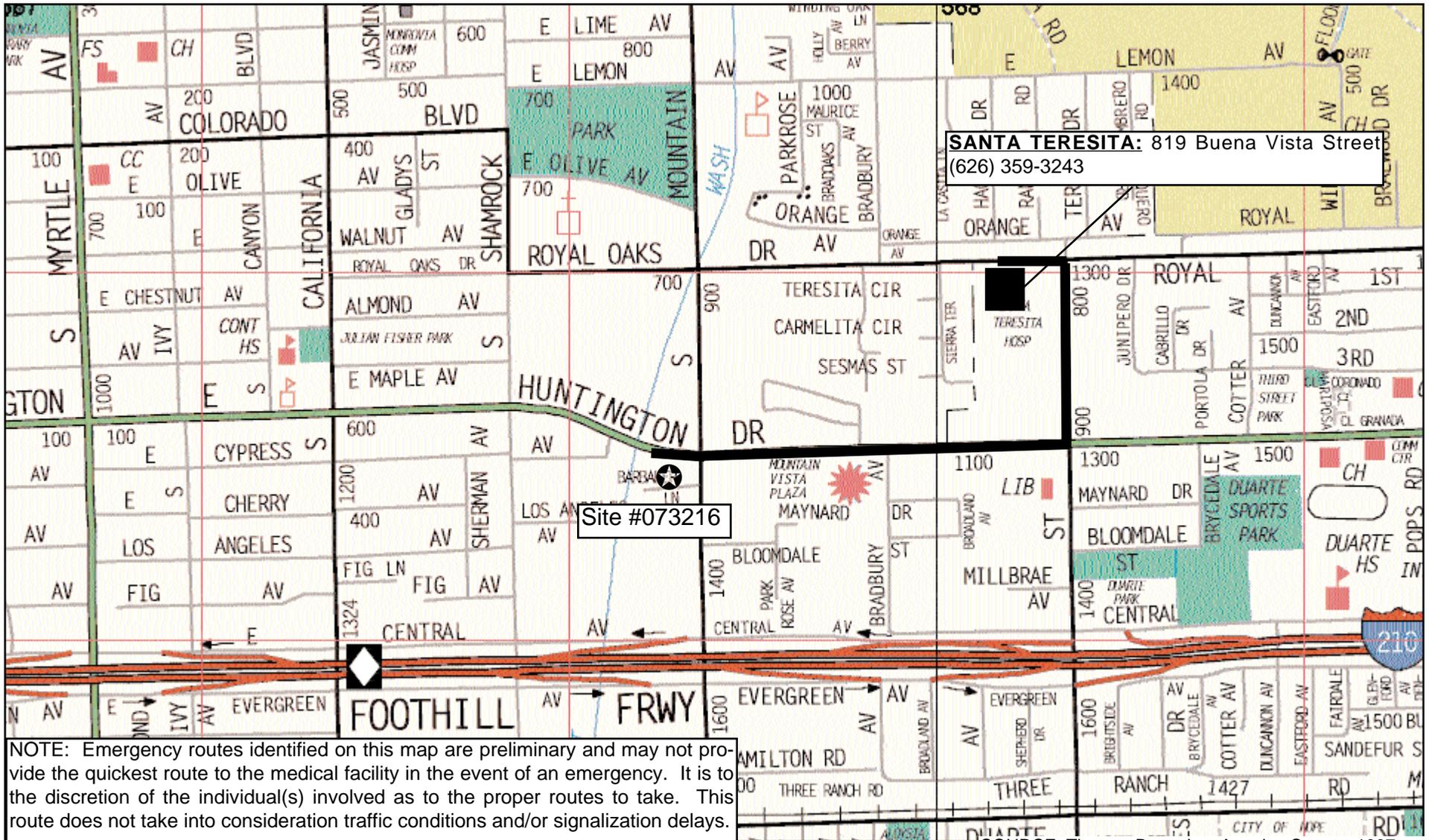
Emergency Contacts for Site 073217: Las Flores Maintenance Station

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	911	From landline phone
Fire Emergency Dispatch	911	Call immediately in case of fire or hazardous spills
Saint John's Hospital and Health Center	911	Use 911 for emergencies. Call (310) 829-5511 for non-emergencies.
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector Ken Pahlevani	(626) 301-9781	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury

Document information related to the accident or incident that resulted in injury or damage and report it to Kurt Myers at LAWCRANDALL at (858) 278-3600

Emergency Contacts for Site 073218: Rosemead Maintenance Station

Name	Phone	Comments
California Highway Patrol	911	From cell phone
Police Department	911	From landline phone
Local Police Emergency Dispatch	911	From landline phone
Fire Emergency Dispatch	(626) 889-5300	Call immediately in case of fire or hazardous spills
San Gabriel Valley Medical Center	(626) 289-5454	Nearest hospital
Department of Transportation's National Response Center (NRC)	(800) 424-8802	Call in case of hazardous spills
California Highway Patrol Los Angeles Communications Center	(213) 669-4400	Call prior to beginning work
Caltrans Permit Inspector Pat Gibbons, Glenn Matthews	(909) 397-4325	Notify for any accident or injury
LAWCRANDALL Program Manager (Stephen Brinigar)	(858) 278-3600	Notify for any accident or injury
LAWCRANDALL Safety Officer (Kurt Myers)	(858) 278-3600	Notify for any accident or injury
Caltrans Program Manager District 7 (Robert Wu)	(213) 897-8636 (916) 506-9018-p	Notify for any accident or injury



NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

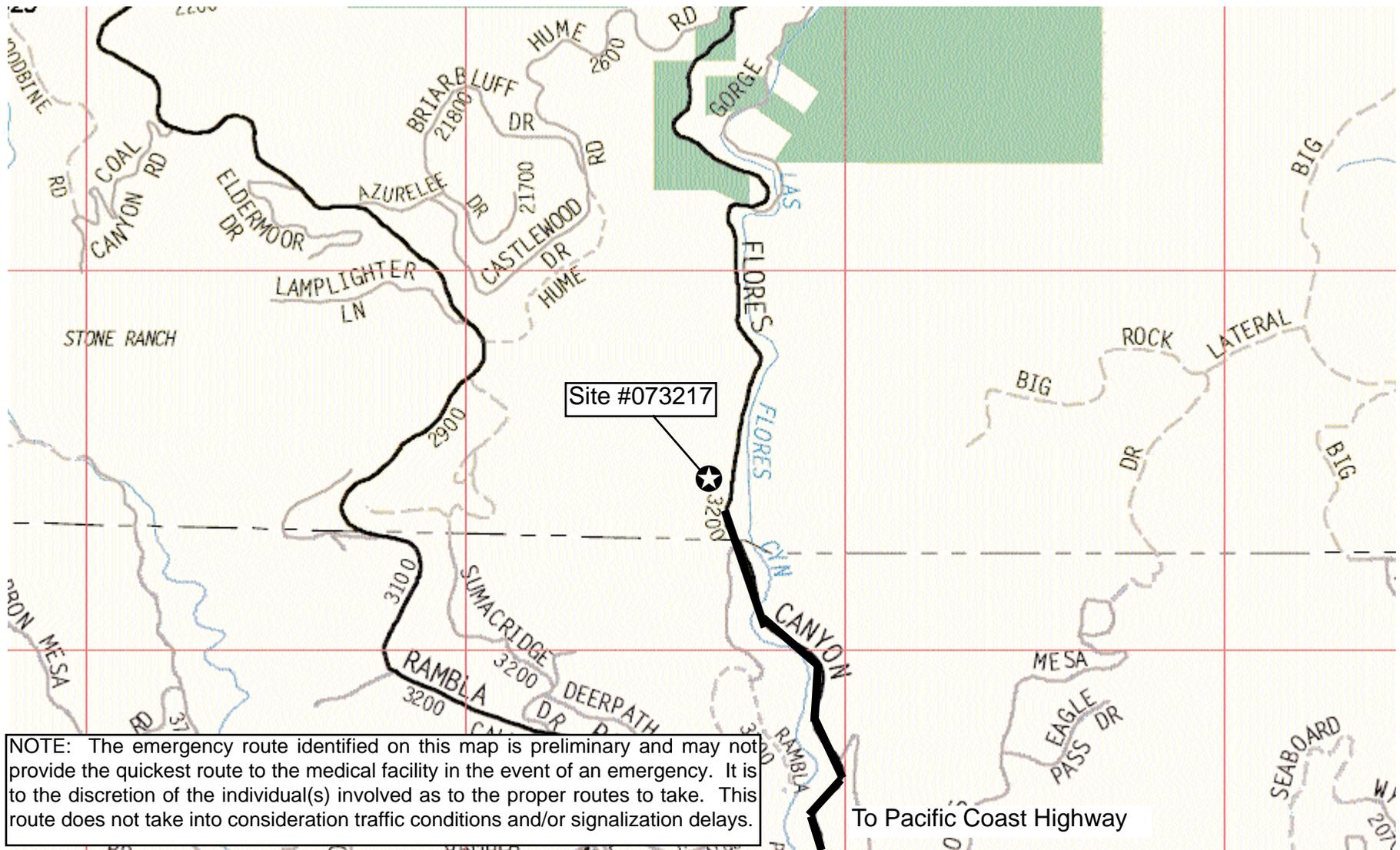
SOURCE: Thomas Bros., Los Angeles County, 1997

 BMP Pilot Site

 Not to Scale

 Potential Emergency Route

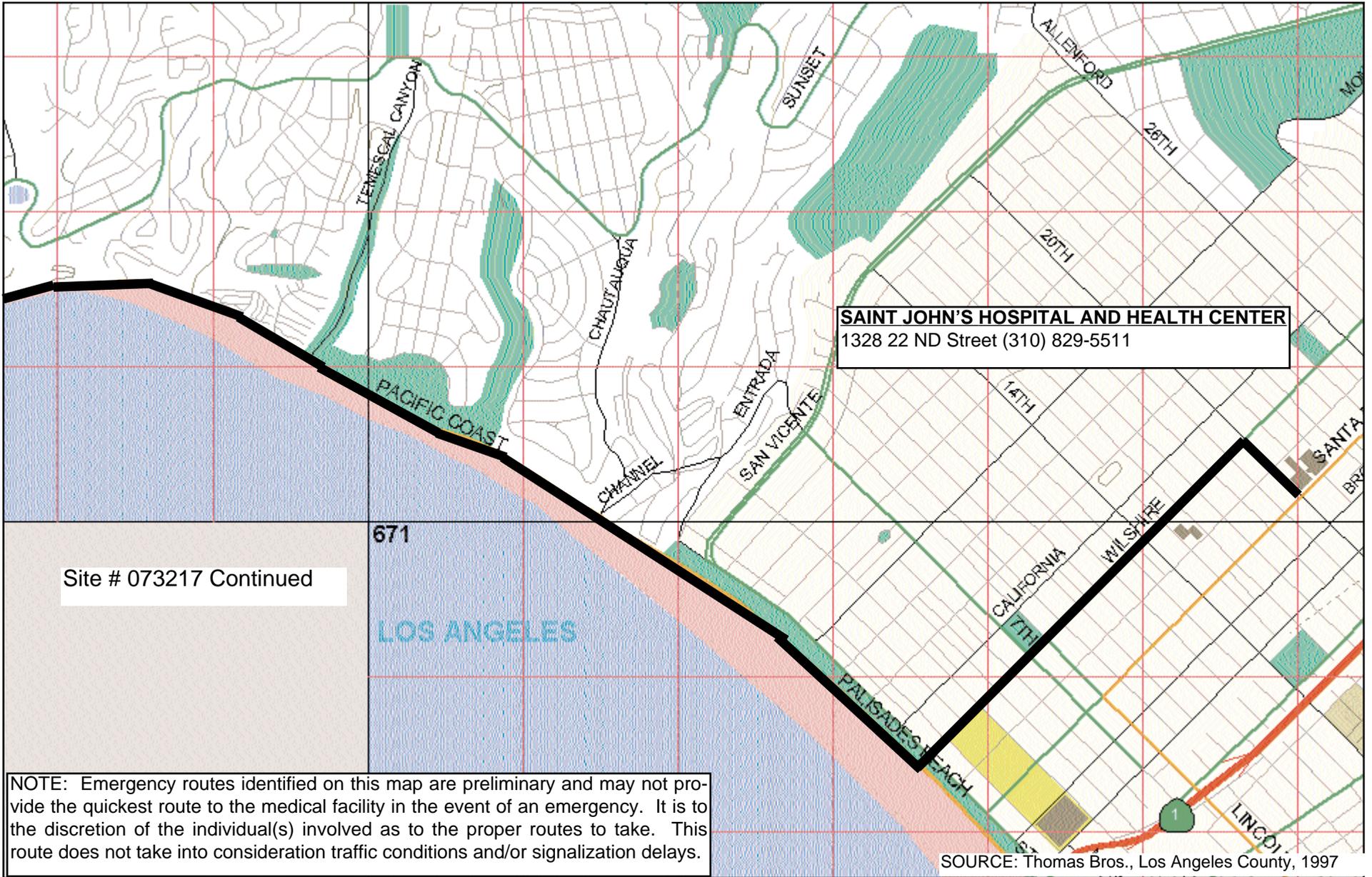
CALIFORNIA DEPARTMENT OF TRANSPORTATION
Foothill Maintenance Station
Hospital Route Map



SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
**Las Flores Maintenance Station
 Hospital Route Map**

-  BMP Pilot Site
-  Not to Scale



Site # 073217 Continued

SAINT JOHN'S HOSPITAL AND HEALTH CENTER
 1328 22 ND Street (310) 829-5511

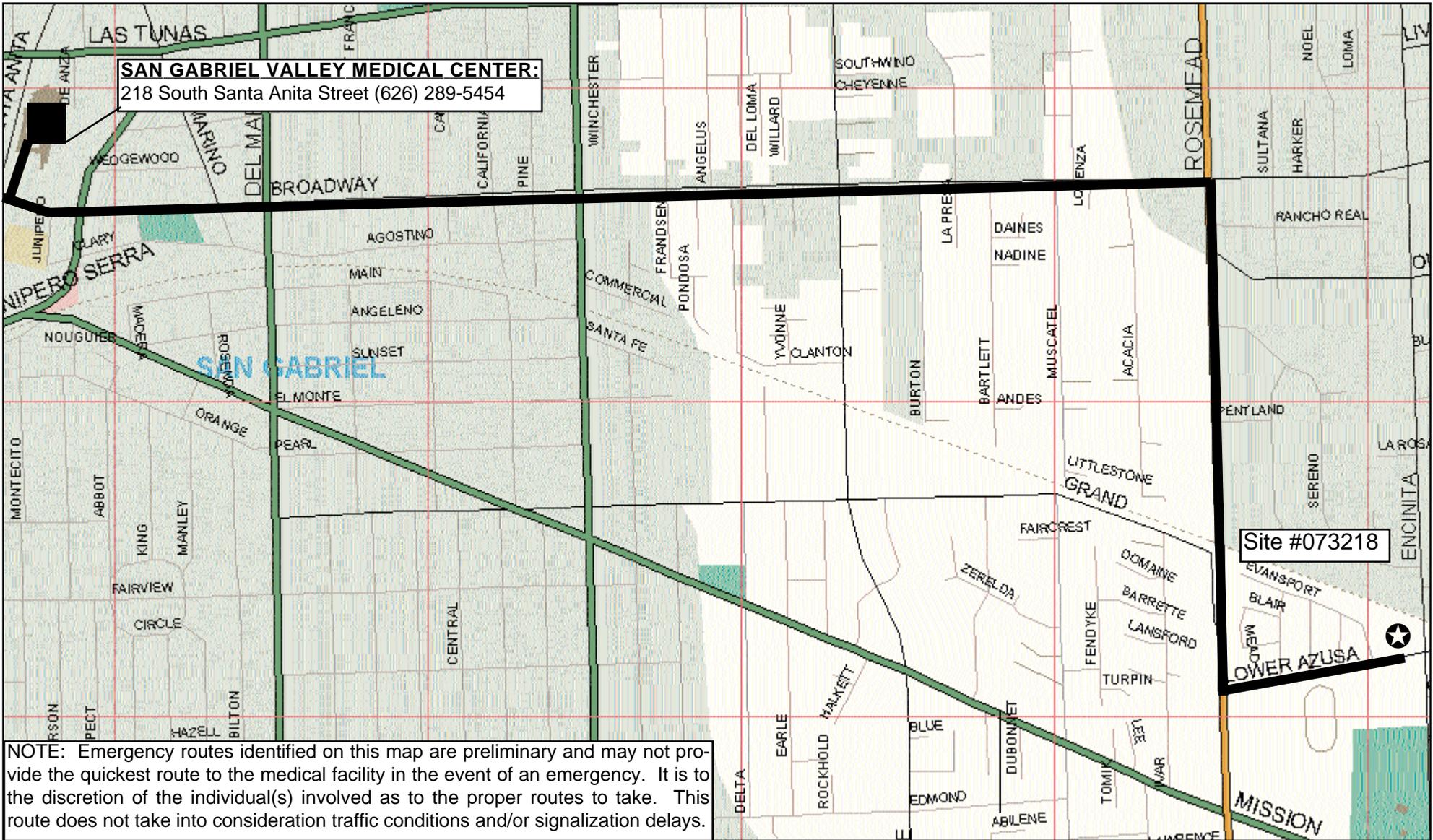
NOTE: Emergency routes identified on this map are preliminary and may not provide the quickest route to the medical facility in the event of an emergency. It is to the discretion of the individual(s) involved as to the proper routes to take. This route does not take into consideration traffic conditions and/or signalization delays.

SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
**Las Flores Maintenance Station
 Hospital Route Map**

 Not to Scale


 Potential Emergency Route



SOURCE: Thomas Bros., Los Angeles County, 1997

CALIFORNIA DEPARTMENT OF TRANSPORTATION
Rosemead Maintenance Station
Hospital Route Map

 BMP Pilot Site

 Not to Scale


 Potential Emergency Route

Project Contacts List

Name	Organization	Phone	Fax Mobile	Email
Bill Whittenberg	RBF and Associates	(949) 855-5771-w	(949) 586-6531-f	whittenberg@rbf.com
Robert Wu	Caltrans District 7 Program Manager	(213) 897-8636	(916) 506-9018-p	robert_wu@dot.ca.gov
Ed Othmer	LAWCRANDALL Task Order Manager	(858) 278-3600 Pg (858) 650-2159	(858) 278-5300-f	eothmer@lawco.com
Byron Berger	LAWCRANDALL Field Manager	(714) 776-9544 - Anaheim (858) 278-3600 – San Diego Pg (858) 650-1958	(714) 776 9541 – Anaheim (858) 278-5300- San Diego	bberger@lawco.com
Bill O’Braitis	LAWCRANDALL	(323) 889-5300	(323) 721-6700-f	wobraitis@lawco.com
Peter K. Van Riper	Caltrans District 7	(213) 897-5638	(213) 897-0678-f	Peter_vanriper@dot.ca.gov
Donald Kaiser	American Sigma, Inc.	(716) 798-5580	(716) 798-5599-f	sigma@americasigma.com
Internet	National Weather Service	(805) 988-6610	--	www.nwsla.noaa.gov
Tim Root	WeatherWatch, Chief Meteorologist	(619) 223-8163	(619) 223-4245-f	--
Jim Vanderswan	Channel 8 Weather Service, Lead Meteorologist	(831) 656-1725	--	--
Debbie Frank	MW Laboratories	(626) 568-6449	--	--
Jon Gildersleeve	Quanterra Laboratory	(916) 373 5600	(916) 371 2857	gilderslej@quanterra.com
Pat Brueckner	Pat-Chem Laboratories	(805) 532 0012	(805) 532 0016	--
Dean Messer	Mosquitoes and Midges Vector Abatement Specialist	(530) 753-6400	--	deanm@lwadavis.com
Fred Beams	Rodents Vector Abatement Specialist	(949) 586-5143	(949) 365-0117-f	Geosrcr1@ix.netcom.com
Sal Duarte	United Pumping Service, Inc.	(818) 253 5250	(626) 961-3166-f	salduarte@aol.com



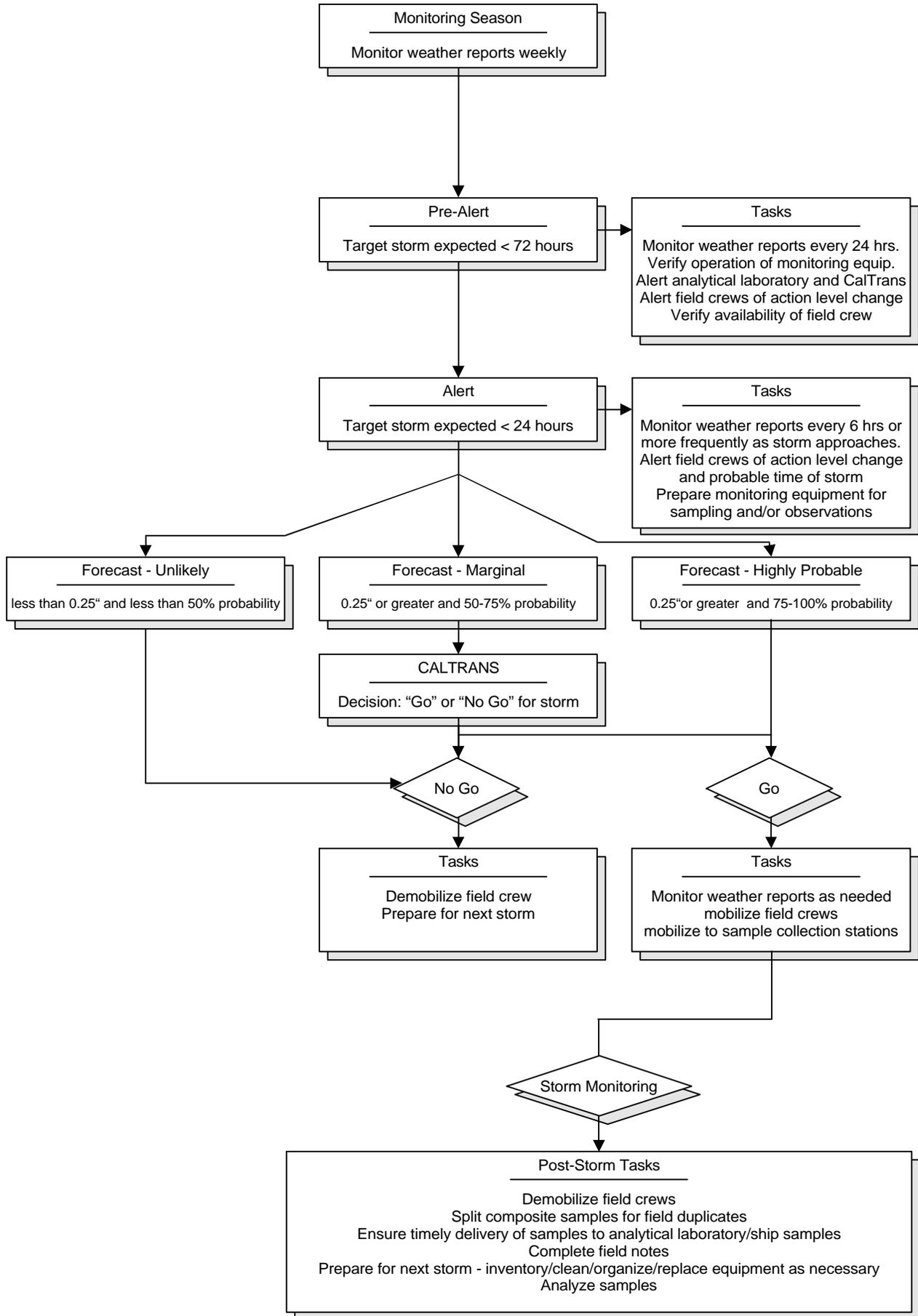
TAB 3

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

FIELD PREPARATION/MOBILIZATION FORMS

**Exhibit 3.1: Storm Monitoring Decision Tree
Form A: Mobilization Checklist
Form B: Storm Staffing Plan**

Exhibit 3.1
Storm Action Levels For BMP Facilities During Wet Season Monitoring





FORM A
Caltrans BMP Retrofit Pilot Program
Mobilization Checklist

<i>General</i>	
Recent storm tracking information (e.g., www.weather.com)	Communication channels established
Staff mobilized	Routes & BMPs identified
Field Guidance Notebook	Emergency/Caltrans contact list
Phone card	Volume-to-sample matrix
	Vendor's autosampler manual
<i>Storm Kit Equipment List</i>	
Keypad/display	9-pin cable from keypad to data logger
Full set of keys (on floatable bobber)	Two flashlights
Maps for all required areas	Large flat screwdriver
Small flat screwdriver	Umbrella
High quality alkaline D-cell batteries	Spare sample labels
Pencils and indelible markers	Desiccant (for samplers and flow meters)
Diagonal clipper	Electrical tape
Cable ties (assorted sizes)	Utility knife
Ziplock baggies (assorted sizes)	Labeling tape
Polyethylene gloves	Rubber bands
<i>Storm Mobilization List</i>	
Storm kit	Paper towels
DI (de-ionized) water squirt bottles	Tape gun with clear packaging tape
Ice scoop	Spare sample labels
Extra fine indelible markers	Sample control paperwork (COC)
Grab pole and extension	1-gallon amber bottles in protective containers
Two-way radio or cellular phone	Coolers and ice (at least one extra)
Any necessary safety gear	DI water (3-gallon jug)
	Personal rain gear
	Trash bags
<i>Sampling Checklist</i>	
Sample bottles w/ preservatives	Analyte list
for each required analysis	Analytical Lab telephone number
for each QA/QC analysis	Backup lab contact number (after hours)
for each BMP site	Sample coolers, plus extra
prelabeled bottles	
<i>extra</i> bottles in case of breakage	

Form B: Storm Staffing Plan

Caltrans BMP Retrofit Pilot Program Stormwater Sampling		Storm Date:	
Zone #1	Zone #2	Zone #3	Zone #4
Estimated Start:		End Time:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Startup	Zone #2 Startup	Zone #3 Startup	Zone #4 Startup
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio
Relief Start:		Relief End:	
Storm Control:		Phone Number:	
Shift Leader:		Phone/Radio:	
Zone #1 Relief	Zone #2 Relief	Zone #3 Relief	Zone #4 Relief
Crew	Crew	Crew	Crew
Vehicle	Vehicle	Vehicle	Vehicle
Phone/Radio	Phone/Radio	Phone/Radio	Phone/Radio



TAB 4

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

INSPECTION FORMS

Form C: BMP Site Inspection Checklist for Drain Inlet Inserts
**Form D: Monitoring Equipment Inspection Checklist for Drain
Inlet Inserts**

FORM C		
Caltrans BMP Retrofit Pilot Program		
BMP Site Inspection Checklist for Drain Inlet Inserts		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:	Type of Insert: ? StreamGuard™ ? Fossil Filter™	
VEGETATION:		Maintenance Req'd?
Are any weeds impeding the DII? ? yes ? no ? not applicable		? yes ? no
Comments:		
STRUCTURAL:		Maintenance Req'd?
Evidence of structural deterioration? ? yes ? no		? yes ? no
Are inlet grates are in good condition? ? yes ? no		? yes ? no
Evidence of concrete spalling, scour, or cracking of structural parts? ? yes ? no		? yes ? no
Fences:	? OK ? not OK ? not applicable	? yes ? no
Locks:	? OK ? not OK ? not applicable	? yes ? no
Other general maintenance concerns/comments:		
ANIMAL CONCERNS:		Maintenance Req'd?
Is there evidence of small animals? (burrows, droppings, trails, gnawing marks, or stained rub marks) ? yes ? no		? yes ? no
Comments:		
FOR STREAMGUARD™ INSERT ONLY		Maintenance Req'd?
Sediment? ? yes ? no		
Depth of sediment in filter cone (<i>if >15 cm [6 in] then maintenance is required</i>):		? yes ? no
Oil, oily water, or other liquid in the cone or downstream monitoring vault (<i>if present mark yes</i>)? ? yes ? no Amount, type and location:		? yes ? no
Flow?	? yes ? no Rate:	? yes ? no
Are there rips or tears of the insert material? ? yes ? no Explain:		? yes ? no
Trash or debris? ? yes ? no Type:		? yes ? no
Comments:		

FACILITY NAME: _____
 DATE: _____ TIME: _____
 PAGE _____ OF _____

FORM C
Caltrans BMP Retrofit Pilot Program
BMP Site Inspection Checklist for Drain Inlet Inserts

AESTHETIC CONCERNS:			Maintenance Req'd?
Debris (non-trash)?	? yes ? no	Type, amount and location:	? yes ? no
Trash?	? yes ? no	Type, amount and location:	? yes ? no
Graffiti or vandalism?	? yes ? no	Description and location:	? yes ? no
Theft?	? yes ? no	Description and location:	? yes ? no
Vehicle accident?	? yes ? no	Description and location:	? yes ? no

Other general aesthetic concerns:

NON-STORMWATER CONCERNS:
 Non-storm water discharge to BMP ? yes ? no
 BMP wet from obvious non-stormwater discharge (no rain) ? yes ? no
 If yes, print your name and contact number below and fax this form to Pete Van Riper at 213-897-0678
 From: _____ Contact Number: _____

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

OVERALL:

Other concerns affecting operation:

Condition of facility: ? acceptable ? not acceptable
 Comments:

Dates for maintenance to be completed by:

 (Team Leader's Signature)

FORM D		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Inspection Checklist for Drain Inlet Inserts		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:	Type of Insert: <input type="checkbox"/> StreamGuard™ <input type="checkbox"/> Fossil Filter™	
SAMPLING AND FLOW MEASUREMENT EQUIPMENT:		Maintenance Required?
Is the monitoring station enclosure locked? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the monitoring station enclosure structurally sound? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the system status of the automatic sampler online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the automatic sampler properly programmed and calibrated? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the peristaltic pump tubing need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the intake tubing and/or connections need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Does the desiccant cartridge in the flow meter need replacement? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is the internal modem online? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are the DC marine battery and connect cable present? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are voltage and current of DC battery within normal parameters? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Are cables to power source present and properly connected, and is AC power available? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no
Is rain gauge installed in a location where no buildings, trees, overpasses, or other objects obstruct or divert rainfall? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable Comments:		<input type="checkbox"/> yes <input type="checkbox"/> no

FORM D
Caltrans BMP Retrofit Pilot Program
Monitoring Equipment Inspection Checklist for Drain Inlet Inserts

SAMPLING AND FLOW MEASUREMENT EQUIPMENT (cont.):	Maintenance Required?
Is rain gauge clean and free of debris? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> not applicable	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the bubbler properly installed? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is the bubbler tubing free of kinks, free of obstructions, and properly connected to pump? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no
Is strainer clean and free of obstruction? <input type="checkbox"/> yes <input type="checkbox"/> no Comments:	<input type="checkbox"/> yes <input type="checkbox"/> no

EFFLUENT SAMPLING LOCATION:	Maintenance Required?
Sediment in Palmer-Bowlus flume? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Flow? <input type="checkbox"/> yes <input type="checkbox"/> no Rate:	<input type="checkbox"/> yes <input type="checkbox"/> no
Trash or debris? <input type="checkbox"/> yes <input type="checkbox"/> no Amount:	<input type="checkbox"/> yes <input type="checkbox"/> no
Comments:	

PHOTOGRAPHS (mandatory if maintenance is required):

Date	Time	Description	Direction Facing	Roll	Photograph No.

OVERALL:
Other concerns affecting operation:
Condition of facility: <input type="checkbox"/> acceptable <input type="checkbox"/> not acceptable Comments:
Dates for maintenance to be completed by:

(Team Leader's Signature)



TAB 5

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MAINTENANCE FORMS

**Form E: BMP Site Maintenance Activity Checklist for Drain Inlet
Inserts**

**Form F: Monitoring Equipment Maintenance Activity Checklist for
Drain Inlet Inserts**

FORM E		
Caltrans BMP Retrofit Pilot Program		
BMP Site Maintenance Activity Checklist for Drain Inlet Inserts		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:	Stormwater Consultant:	
Location:	Type of Insert: <input type="checkbox"/> StreamGuard™ <input type="checkbox"/> Fossil Filter™	
VEGETATION:		
<input type="checkbox"/> Weed control		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Other (describe):		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
STRUCTURAL:		
<input type="checkbox"/> Structural repairs (describe):		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
ANIMAL CONCERNS:		
<input type="checkbox"/> Describe:		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
MAINTENANCE OF STREAMGUARD™ INSERTS:		
<input type="checkbox"/> Replacement of StreamGuard™ insert		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Proper storage of used StreamGuard™ insert (for sampling and analysis)		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		
<input type="checkbox"/> Other (describe):		
Start time:	End time:	Total time:
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no		
Equipment used:		
Comments:		

FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Drain Inlet Inserts			
MAINTENANCE OF FOSSIL FILTER™ INSERTS:			
<input type="checkbox"/> Removal of used Fossil Filter™ adsorbent granules			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> Proper storage of used Fossil Filter™ adsorbent (for sampling & analysis)			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> Removal of sediment from trough			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> Proper storage of sediment from top of trough (for sampling & analysis)			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> Cleaning of trough and metal screens			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> Replacement of Fossil Filter™ adsorbent granules			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			
<input type="checkbox"/> Other (describe):			
Start time:	End time:	Total time:	
More work required? <input type="checkbox"/> yes <input type="checkbox"/> no			
Equipment used:			
Comments:			

FORM E Caltrans BMP Retrofit Pilot Program BMP Site Maintenance Activity Checklist for Drain Inlet Inserts	
AESTHETIC CONCERNS:	
<input type="checkbox"/> <i>Debris and trash removal</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Graffiti removal or replacement of vandalized or stolen equipment</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Painting</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> <i>Other (describe):</i> Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:

FORM F		
Caltrans BMP Retrofit Pilot Program		
Monitoring Equipment Maintenance Activity Checklist for Drain Inlet Inserts		
GENERAL INFORMATION:		
Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
Location:		Type of Insert: <input type="checkbox"/> StreamGuard™ <input type="checkbox"/> Fossil Filter™
<input type="checkbox"/> <i>Clean Palmer-Bowlus flumes, orifices, and/or cracks</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Diagnostic test of automatic sampler</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of peristaltic pump tubing</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of bubbler tubing or intake tubing</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Replacement of strainer</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Removal of debris from rain gauge</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Repair to electrical supply system</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		
<input type="checkbox"/> <i>Removal of kinks or obstructions from bubbler tubing</i>		
Start time:	End time:	Total time:
More work required?	<input type="checkbox"/> yes <input type="checkbox"/> no	
Equipment used:		
Comments:		

FORM F Caltrans BMP Retrofit Pilot Program Monitoring Equipment Maintenance Activity Checklist for Drain Inlet Inserts	
<input type="checkbox"/> Replacement of desiccant cartridge in flow meter Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Removal of kinks or obstructions from bubbler Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other maintenance of automatic sampling equipment (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other maintenance/calibration of flow measurement equipment (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
<input type="checkbox"/> Other (describe): Start time: _____ End time: _____ Total time: _____ More work required? <input type="checkbox"/> yes <input type="checkbox"/> no Equipment used: Comments:	
_____ (Team Leader's Signature)	General Comments:



TAB 6

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

MONITORING FORMS

**Form H: Empirical Observations Field Data Log Sheet for Storm
Events for Drain Inlet Inserts**

Form I: Field Data Log Sheet for Drain Inlet Inserts

Form J: User-Entered Program Parameters

Form K: Station Phone Log

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Drain Inlet Inserts

GENERAL INFORMATION:

Date:	Time In:
Team leader:	Stormwater Consultant:
Other personnel:	Location of facility:
Site ID:	
Type of DII: <input type="checkbox"/> Fossil Filter™ <input type="checkbox"/> StreamGuard™	
<i>A separate Form H must be filled out for each insert type at a DII site.</i>	

METEOROLOGICAL CHARACTERISTICS:

Present rainfall: None Mist Drizzle Sprinkle Light, Steady
 Moderate Heavy

Time present rain event started: _____

Wind speed: 0-5 mph (light) 5-10 mph (moderate) 10-15 mph (brisk) >15 mph (strong)

Cloud cover: ____% Temperature _____

Distribution of Rainfall: Uniform Localized cells Scattered showers

Meteorological characteristics comments:

HYDROLOGIC AND HYDRAULIC CHARACTERISTICS:

Flow conditions (*check all that apply*):

Runoff entering facility
 Flow discharging through DII
 Flow bypassing DII

Time occurred: _____
 Time occurred: _____

Record depth if there is standing water in the drain inlet: _____ No standing water

Record depth if there is standing water within or over the drain inlet insert: _____ No standing water

Comments:

INLET CONDITIONS:

Are there gaps between the drain inlet insert and the drain inlet? Yes No

Comments:

Describe any obstructions or restrictions interfering with inflow/influent:

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Drain Inlet Inserts

INLET WATER QUALITY APPEARANCE:

Check all that apply and describe under comments.

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

SOLIDS DEPOSITION AND RESUSPENSION:

For the insert, record the type(s) (trash or debris, oil and grease, other organics), location(s), area(s) covered, and depth(s), as applicable.

Solids resuspension evident (*check all that apply*):

- Inlet Insert
 Other (describe): _____

Solids deposition and resuspension comments:

OUTLET CONDITIONS:

Is the rubber berm around the effluent sampling chamber intact? Yes No

Comments:

Describe any obstructions or restrictions interfering with outflow/effluent:

OUTLET WATER QUALITY APPEARANCE:

Check all that apply and describe under comments

Odor:

- Hydrogen sulfide Musty Sewage Ammonia Hydrocarbon Pesticide or herbicide None

Floating materials:

- Oil and grease (see below) Trash or debris Surface film Organic material None

FORM H
Caltrans BMP Retrofit Pilot Program
Empirical Observations Field Data Log Sheet for Storm Events
for Drain Inlet Inserts

OUTLET WATER QUALITY APPEARANCE (cont.):

Oil and grease:

- Sheen Heavy floating concentration Emulsion Deposit None

Color:

- Colorless Red Orange Yellow Green Blue Violet Brown Black
 Gray White Other: _____

Turbidity

- None Some cloudiness but transparent Cloudy, translucent Heavy cloudiness, opaque

Water quality appearance comments:

VECTORS:

Presence of vectors:

- Yes No

If yes, what type:

- Mosquitoes Blackfly Cockroaches Rats
 Other _____

Comments:

STRUCTURAL CONDITION OF FACILITY:

Record the presence of the following (*check all that apply and give location in comments*):

- Concrete cracking or spalling Metal corrosion Vandalism

Comments:

MONITORING EQUIPMENT CONDITIONS:

Equipment functional:

- Yes No N/A

Comments:

CHANGES DURING STORM SINCE LAST OBSERVATION:

Date: _____

Comments:

Date: _____

Comments:

Date: _____

Comments:

FORM I
Caltrans BMP Retrofit Pilot Program
Field Data Log Sheet

GENERAL INFORMATION:

Date:	Time In:	Time Out:
Team Leader's Initials:		Stormwater Consultant:
Location:		
BMP Type:		
Control or Effluent (circle one)		Storm Event Visit or Maintenance Visit (circle one)

*Use Facility Inspection Logs and Empirical Observation Field Data Sheets to record observations. These logs **must** be filled out during station visits.*

SYSTEM STATUS FLAGS (*6-AD; 1=high, 0=low)	PROGRAM SIGNATURE (*6-100)
Arr: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	Arr: _____
Dep: 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___	Dep: _____

DATA LOGGER INFORMATION (*6)

All Site Visits:	Storm Site Visits:	
Stage (ft) 02:	Volume (cf) 05:	MaxFlow (day) 51:
Staff Gauge	Strm Sum (cf) 06:	MaxFlow (time) 52:
Velocity (ft/s) 03:	Percent Capture 08:	MaxFlow Q 53:
Q (cfs) 04:	Volume2Sample 14:	Total Rain (in) 66:
Station ID 21:	Sample Count 17:	Total Strm Vol. 72:
		Strm Vol Smpld 75:

12-volt marine battery (for sampler) voltage:	12-volt marine battery (for cell phone) voltage:	internal sampler voltage:
---	--	---------------------------

AUTOSAMPLER INFORMATION (Storm only)	Bottle # in:
Sample ___ of 72 after 1 pulse Bottle # out: Bottle Volume: Volume2Sampl:	

WATER QUALITY (Storm only)
not applicable to DII sites

SAMPLING EQUIPMENT AND REPAIR NEEDS:

ACTION TAKEN:

Storage Module Data Dump: Start _____ End _____

(Team Leader's Signature)

FORM J

User Entered Program Parameters*

(Fill out this form every time a program parameter changes)

Facility Type: _____ **/EFFLUENT**

Station Name: _____

Date:					
Time:					

01 Station ID					
03 Volume to sample (cf)					
04 Level Meter Stage Offset (feet)					
05 Level Meter Multiplier (feet/mv)					
07 Storm Stage Offset (ft.; add to prev. 15 min. avg.)					
09 Minimum Stage Threshold (feet)					
10 Storm Stage Trigger Level (feet)					
11 Storm End Factor (times storm trigger stage)					
12 No. of Seq. Trans. Failures Before Raising Flag 6					
13 Time (min.) to wait after 1 st set of trans. Failures					
14 No. samples of depth taken for avg. 1 prog. exe.					
15 No. samples of speed taken for avg. 1 prog. exe.					
17 Amount of rain per bucket tip (inches)					
18 Amt. rain samp. before rain data recorded (in.)					
19 Number of samples collected until bottle is full					
20 No. of times Flag 7 goes high before var. reset					
23 Data avg. int. (min.) when storm conditions exist					
24 Data avg. int. (min.) storm conditions don't exist					
30					
31					
34 Flume Parameter 1					
35 Flume Parameter 2					
36 Cellular phone battery state control parameter					
37 Duration when cellular phone battery is on					
38 Period of cellular phone battery state control					
Program Signature (*B)					

*Subject to Revisions



TAB 7

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

LABORATORY ANALYSIS FORMS

**Form M: Example Chain-of-Custody Forms
Exhibit 7.1: Chemical Analyses Lists**

FORM M: EXAMPLE CHAIN-OF-CUSTODY FORM

Laboratory: <div style="text-align: right; margin-right: 20px;"> Lab # Date Rec'd </div>	From:
---	--------------

Project: P.O.#:	Project #: Required Completion Date:
----------------------------------	---

Sample ID #	Site ID #	Lab ID #	Matrix/ Analysis	Containers	Pres.	Sample Date/Time	Condition Upon Receipt

Data Reports **WILL** include the following: Sample/Site ID, Analytical Method, Reporting Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.

Special Instructions/Comments:

Relinquished By: Date/Time	Transporter	Received By: Date/Time
Relinquished By: Date/Time	Transporter	Received By: Date/Time
Relinquished By: Date/Time	Transporter	Received By: Date/Time

Exhibit 7.1a: Chemical Analyses List for Stormwater

Stormwater Matrix Analytical Parameters, Methodologies, Reporting Limits, Holding Times, Container Volumes and Types, and Preservation

Analyte	Priority Rank	Reporting Limit	Units	Analytical Technique	Method Number	Holding Time	Minimum Sample Volume	Preferred Volume and Container Type ⁽¹⁾	Preservation
Conventionals									
pH	1	0.1	Unit	Electrode	EPA 150.1	Immediately ⁽²⁾	100 mL	1-100 mL glass/plastic	4°C
Specific Conductance	1	1.0	µmhos/cm	Electrometric	EPA 120.1	Immediately ⁽²⁾	500 mL	1-500 mL glass/plastic	4°C
Hardness	5	2	mg/L	Titrimetric/ Colorimetric	EPA 130.2	6 months	100 mL	1-200 mL glass/plastic	HNO ₃ to pH<2, 4°C
Total Suspended Solids	1	1	mg/L	Dried Filter Weight	EPA 160.2	7 days ⁽³⁾	1 L	1-500 mL glass/plastic	4°C
Nutrients									
Nitrate-Nitrogen	2	0.01	mg/L	Colorimetric Ion Chromatography	EPA 353.3 EPA 300.0	28 days 48 hours	200 mL 200 mL	1-500 mL plastic 1-500 mL plastic	4°C and H ₂ SO ₄ to pH<2 4°C
Total Kjeldahl Nitrogen	3	0.1	mg/L	Titrimetric/ Colorimetric	EPA 351.3	28 days	500 mL	1-1L plastic	4°C and H ₂ SO ₄ to pH<2
Total Phosphorus	4	0.002	mg/L	Colorimetric	EPA 365.3	28 days	100 mL	1-250 mL plastic	4°C and H ₂ SO ₄ to pH<2
Total/Dissolved Metals^{(4),(5)}									
Copper	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Lead	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Zinc	1	1	µg/L	ICP-MS	EPA 200.8	6 months	2 @ 500 mL	2-1L plastic	4°C and HNO ₃ to pH<2 and filter
Organics									
Total Petroleum Hydrocarbons – Diesel Oil		250/200	µg/L	GC	EPA 8015M	14 days	1 L	2-1L amber glass	4°C
Total Petroleum Hydrocarbons - Gasoline		50	µg/L	GC	EPA 8015M	14 days	2-40 mL	3-40 mL VOA vials	4°C, HCl to pH<2

1. Analytes with the same preservative can be combined into a single container if the same laboratory is performing the analyses.
2. pH and Specific Conductance will be measured by the laboratory immediately upon receipt of the samples.
3. 7 days based upon limit for measuring TSS/no regulatory limit.
4. Total and dissolved metals samples are collected in separate containers. Only the total metals container will receive nitric acid.
5. Dissolved metals will be filtered in the laboratory prior to acidification.

Exhibit 7.1b: Chemical Analyses List for Drain Inlet Inserts

**Solid Matrix (Drain Inlet Insert)^{(1),(2)}
Analytical Parameters, Methodologies, Reporting Limits, Holding Times,
Container Volumes and Types, and Preservation**

Parameter	Method	Units	Reporting Limit	Maximum Holding Time	Preservation	Container Size/Type ⁽³⁾
Total Recoverable Petroleum Hydrocarbons (TRPH)	418.1 (IR)/ 1664HEM	mg/kg	10	28 days	None	Sediment: glass jar Other Material: zip-top bag
Total Metals: - Copper - Lead - Zinc	6020	mg/kg	2.5 0.3 2.0	180 days	None	Sediment: glass jar Other Material: zip-top bag

(1) Solid Matrix includes the following:

StreamGuard™
Geotextile fabric
Adsorbent material
Sediment

Fossil Filter™
Adsorbent material
Sediment

(2) The total mass of each solid matrix will be measured.

(3) Sample container will be large enough to hold entire contents of DII and the material it collected.



TAB 8

**CALTRANS BMP STORMWATER MONITORING
FIELD GUIDANCE NOTEBOOK
CALTRANS DISTRICT 7**

VECTOR CONTROL AND MONITORING FORMS

Form O1: Inspection Checklist for Vertebrate Vectors

**Form O2: Vertebrate Vector Control-Related
Maintenance Activity Checklist for Affected BMP
Facilities by Type**

VECTOR MONITORING FORMS

Vector monitoring forms will be provided by the applicable Vector Control Agency subcontracted to perform monitoring.



TAB 9

CALTRANS BMP STORMWATER MONITORING FIELD GUIDANCE NOTEBOOK CALTRANS DISTRICT 7

TECHNICAL SUPPORT INFORMATION

Exhibit 9.1: Runoff Coefficients for Drain Inlet Inserts

Exhibit 9.2: Volume-to-Sample Tables

Exhibit 9.3: Encroachment Permits

Exhibit 9.1
Runoff Coefficient Matrix Table for Drain Inlet Inserts

Site No.	Site Name	Drainage Area (acres)	Runoff Coefficient C
073216	Foothill Maintenance Station Tributary Area A (Fossil Filter™ Insert)	1.58	0.95
	Tributary Area B (StreamGuard™ Insert)	0.17	0.95
073217	Las Flores Maintenance Station Tributary Area A (Fossil Filter™ Insert)	0.78	0.70
	Tributary Area B (StreamGuard™ Insert)	0.23	0.62
073218	Rosemead Maintenance Station Tributary Area A (StreamGuard™ Insert)	1.20	0.95
	Tributary Area B (Fossil Filter™ Insert)	0.25	0.95

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073216 (North Inlet): Foothill Maintenance Station (StreamGuard)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.17	0.95	
Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	2	2.6	42
0.2	3	2.7	44
0.3	5	2.8	46
0.4	7	2.9	47
0.5	8	3.0	49
0.6	10	3.1	50
0.7	11	3.2	52
0.8	13	3.3	54
0.9	15	3.4	55
1.0	16	3.5	57
1.1	18	3.6	59
1.2	20	3.7	60
1.3	21	3.8	62
1.4	23	3.9	64
1.5	24	4.0	65
1.6	26	4.1	67
1.7	28	4.2	68
1.8	29	4.3	70
1.9	31	4.4	72
2.0	33	4.5	73
2.1	34	4.6	75
2.2	36	4.7	77
2.3	37	4.8	78
2.4	39	4.9	80
2.5	41	5.0	81

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073216 (South Inlet): Foothill Maintenance Station (Fossil Filter)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	1.58	0.95	
Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	15	2.6	394
0.2	30	2.7	409
0.3	45	2.8	424
0.4	61	2.9	439
0.5	76	3.0	454
0.6	91	3.1	469
0.7	106	3.2	484
0.8	121	3.3	499
0.9	136	3.4	515
1.0	151	3.5	530
1.1	166	3.6	545
1.2	182	3.7	560
1.3	197	3.8	575
1.4	212	3.9	590
1.5	227	4.0	605
1.6	242	4.1	621
1.7	257	4.2	636
1.8	272	4.3	651
1.9	288	4.4	666
2.0	303	4.5	681
2.1	318	4.6	696
2.2	333	4.7	711
2.3	348	4.8	726
2.4	363	4.9	742
2.5	378	5.0	757

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073217 (North Inlet): Las Flores Maintenance Station (StreamGuard)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.23	0.62	
Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	1	2.6	37
0.2	3	2.7	39
0.3	4	2.8	40
0.4	6	2.9	42
0.5	7	3.0	43
0.6	9	3.1	45
0.7	10	3.2	46
0.8	12	3.3	47
0.9	13	3.4	49
1.0	14	3.5	50
1.1	16	3.6	52
1.2	17	3.7	53
1.3	19	3.8	55
1.4	20	3.9	56
1.5	22	4.0	58
1.6	23	4.1	59
1.7	24	4.2	60
1.8	26	4.3	62
1.9	27	4.4	63
2.0	29	4.5	65
2.1	30	4.6	66
2.2	32	4.7	68
2.3	33	4.8	69
2.4	35	4.9	70
2.5	36	5.0	72

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073217 (South Inlet): Las Flores Maintenance Station (Fossil Filter)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.78	0.70	
Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	6	2.6	143
0.2	11	2.7	149
0.3	17	2.8	154
0.4	22	2.9	160
0.5	28	3.0	165
0.6	33	3.1	171
0.7	39	3.2	176
0.8	44	3.3	182
0.9	50	3.4	187
1.0	55	3.5	193
1.1	61	3.6	198
1.2	66	3.7	204
1.3	72	3.8	209
1.4	77	3.9	215
1.5	83	4.0	220
1.6	88	4.1	226
1.7	94	4.2	231
1.8	99	4.3	237
1.9	105	4.4	242
2.0	110	4.5	248
2.1	116	4.6	253
2.2	121	4.7	259
2.3	127	4.8	264
2.4	132	4.9	270
2.5	138	5.0	275

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for

Site 073218 (North Inlet): Rosemead Maintenance Station (Fossil Filter)

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	0.25	0.95	
Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	2	2.6	62
0.2	5	2.7	65
0.3	7	2.8	67
0.4	10	2.9	69
0.5	12	3.0	72
0.6	14	3.1	74
0.7	17	3.2	77
0.8	19	3.3	79
0.9	22	3.4	81
1.0	24	3.5	84
1.1	26	3.6	86
1.2	29	3.7	89
1.3	31	3.8	91
1.4	34	3.9	93
1.5	36	4.0	96
1.6	38	4.1	98
1.7	41	4.2	101
1.8	43	4.3	103
1.9	46	4.4	105
2.0	48	4.5	108
2.1	50	4.6	110
2.2	53	4.7	113
2.3	55	4.8	115
2.4	57	4.9	117
2.5	60	5.0	120

Exhibit 9.2: "Volume-to-Sample" in Cubic Feet for*Site 073218 (South Inlet): Rosemead Maintenance Station (StreamGuard)*

Number of Sample Aliquots	Acreage	Runoff Coefficient	
36	1.2	0.95	
Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)	Predicted Rainfall Amount (inches)	"Volume-to-Sample" (ft³)
0.1	11	2.6	299
0.2	23	2.7	310
0.3	34	2.8	322
0.4	46	2.9	333
0.5	57	3.0	345
0.6	69	3.1	356
0.7	80	3.2	368
0.8	92	3.3	379
0.9	103	3.4	391
1.0	115	3.5	402
1.1	126	3.6	414
1.2	138	3.7	425
1.3	149	3.8	437
1.4	161	3.9	448
1.5	172	4.0	460
1.6	184	4.1	471
1.7	195	4.2	483
1.8	207	4.3	494
1.9	218	4.4	506
2.0	230	4.5	517
2.1	241	4.6	529
2.2	253	4.7	540
2.3	264	4.8	552
2.4	276	4.9	563
2.5	287	5.0	575