4A Presentation Outline

[*Municipality*]
Urban Runoff Utility Presentation
[*Date*]

I. [*Municipality*] Stormwater Management Program

- Current Problems
  - Capital Replacement/Improvement Program [*funding status, ie: funded, unfunded, underfunded*]
  - Operations & Maintenance [*funding status*]
  - Federal Regulations [*funding status*]

- Water Quality Contaminants
  - Floatables
  - Petroleum Products
  - Heavy Metals
  - Pesticides and Fertilizers (Diazinon, etc.)
  - Fecal Coliform
  - Detergents
  - Erosion (turbidity/sediment)

- Conveyance System Deficiencies & Requirements

- Urban Runoff Program Capital Improvement/Replacement Plan
  [*Table including costs for individual projects*]

- NPDES Phase II History
  - 2/87 Water Quality Act Amendments
  - 11/90 Phase I Regulations
  - 10/92 Permit Deadline for Phase II from 1987 Act
  - 8/7/95 Phase II Rule and Schedule
    - 9/1/97 Proposed Regulations
    - 3/1/99 Final Regulations
    - 8/7/01 Permit Applications Due from Selected Sources

II. EPA Water Quality Requirements (Clean Water Act)
NPDES Phase II (Six minimum measures)

- Public Education & Outreach
  - Education Materials
  - Teacher Education Workshops
  - Best Management Practices Handouts
  - Door Hangers

- Public Involvement
    - Volunteer Storm Drain Stenciling Program
    - Volunteer Storm Water Monitoring Program
    - Volunteer Industry Educators

- Illicit Discharge Detection & Elimination
    - Inspections
    - Utilize Volunteer Monitoring Program for Early Detection and Tracing Pollutants to their Sources

- Construction Site Erosion Control
    - Develop requirements
    - Inspect sites
    - Storm Water Pollution Prevention Plans

- Post-Construction Storm Water Management
    - Develop requirements for new development inclusions for stormwater (detention/retention, maintenance, etc.)
    - Include requirements in site plan review comments
    -Maintenance

- Good Housekeeping/Pollution Prevention for Municipal Operations
    - Employ Pollution Prevention Practices
    - Technical Training for all Staff involved in Urban Runoff Issues

- Additional Staffing Requirements for Urban Runoff Programs

- Solutions
    - Ordinance
        - Prohibit Illicit Discharges
        - Prohibit Illegal Connections
        - Provide for Development and Implementation of BMPs
        - Require Structural Controls for New Development/Redevelopment
    - Comply with NPDES Phase II Permitting Requirements
    - Technical Training
        - Public: BMPs
        - Staff: Good Housekeeping/ Pollution Prevention Practices
    - Public Outreach: [*Monitoring, Storm Drain Stenciling, etc.*]
    - Public Education: [*School Programs, Displays, Media, etc.*]
    - Financing

4B PE/O Framework Summary and Details

FRAMEWORK SUMMARY		
	General Public - page 2	
nonprofits, schools,	Events	roving displays, publications
volunteers, schools, nonprofits	Volunteer Monitoring	storm drain monitoring kit
businesses, schools, volunteers	Storm Drain Stenciling	city stenciling kits
city newsletters, city inspectors	Written Materials	brochures, posters, BMP's
neighborhood groups	Publicity	newspaper, TV, radio, PSA
libraries, schools, DMV's	Roving Displays	storm drain display
nonprofits, volunteers	Points of Purchase	automotive posters
utility bills, city newsletters	Mailing Inserts	various publications
city public works department	BMP's	brochures (BMP)
businesses	Business coupons	coupon incentives
	Teachers - page 5	
schools, parks, nonprofits	Teacher Workshops	WET curriculum, model
nonprofits, interns, educators	School Outreach	enviroscape model, materials
mailing or school distribution	Written Materials	posters, brochures, etc.
schools	Roving Displays	storm drain, model
schools, city officials, students	Storm Drain Stenciling	city stenciling kit
schools, city officials	Volunteer Monitoring	monitoring kit, print matter
	K-12 Students - page 6	
	See teacher outreach methods	
	College Students - page 6	
	See teacher outreach plus:	
city official, students	Business outreach	printed matter
nonprofit, students, volunteers	Earth Day events	model, display, print matter
nonprofit, student	National Coastal Clean Up Day	publicity, beach clean up tools
	Businesses - page 7	
city officials, businesses, volunteer	Storm Drain Stenciling	city stenciling kits
city officials, nonprofits, interns	Clean Seal Business Program	workshops, free publicity
college students	University Outreach	printed matter
monitoring volunteers	Volunteer Outreach	printed matter
city officials, agencies	Targeted Workshops	specific printed matter
business owners, schools	Adopt A Watershed	monitoring kit, publicity
city inspectors, volunteers, interns	Restaurant Owners	food handling posters
city inspectors, volunteers, interns	Automotive Owners	automotive posters
volunteers, nonprofits, interns	Business Owners	business surveys
nonprofits, volunteers, interns	Outreach Presentations	model, printed materials

	City Officials - page 8	
educator, nonprofit, intern	Roving Displays	storm drain exhibit
educator	Presentations	model
city officials, educator,	Printed Materials	posters, brochures, etc.
	Specific Socioeconomic Groups -p.8	
university students, volunteers	Door Knob Hangers	oil recycling jugs, print
educator, volunteer, intern	Presentations	model, printed matter
schools, auto stores, DMV, library	Roving Display	storm drain exhibit, print
nonprofits, volunteers	Point of Purchase	bilingual printed material
Cinco de Mayo, Earth Day	Events	model, roving display, print
businesses	Coupon Incentives	incentive for oil recycling
nonprofits, schools, educators	Teacher Workshop	WET curriculum translated

FRAMEWORK DETAILS FOR PUBLIC EDUCATION PROGRAM

by Maris Sidenstecker - Monterey Bay National Marine Sanctuary (MBNMS)
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The public education program is divided into three sections:
1. Framework Summary (two pages) which is divided by target audience and lists tools and organizations to help reach targeted audience. Page numbers after target audience refer to pages in Framework Details.
2. Framework Details which gives details and suggestions to execute city outreach program including efforts tried in the cities of Monterey and Santa Cruz.
3. Educational Tools & Resources For Public Education Program

PROGRAM OBJECTIVE:

The objective is to offer a framework for cities to begin an urban runoff public education program to educate the public about urban runoff and possible methods to reduce/eliminate sources of pollution. This is achieved through educating various segments of the community through: teacher workshops, educational materials, school presentations, storm drain monitoring, roving educational displays, publicity, and printed materials. This includes but is not limited to the following:

educational tools - teacher watershed curriculum activities, activities with hands-on model, written materials.
target audiences - school children, teachers, general public, Hispanic community, business community, city officials.
outreach methods - events, workshops, radio, print & television media, PSA's, flyers, brochures, posters, videos, student outreach, public presentations, school presentations, roving storm drain exhibit, volunteer monitoring, coupon incentives, point of purchase displays, and storm drain stenciling events.
existing educational tools and resources is included with hands-on tools, curriculum, websites, monitoring kits, printed materials, and contacts.

HOW TO BEGIN:

1. The first step for an educator is to become familiar with how a city functions. Every city is set up differently, with different departments and has various resource constraints. A flow chart of the city will provide an orientation to the various departments within the city. Find the people in the city departments who can help implement and shape your educational outreach program. This may require interviewing and speaking with several people within the public works department to establish a working partnership. Find out what educational materials the city is using for outreach - various departments may use different educational materials. Brainstorm education outreach ideas with city officials based on what they have in place and what is needed.

2. Order a "Stormwater Resource Guide of Public Outreach Materials in California"- see Educational Tools and Resources Section for obtaining a copy.

3. Build strong community partnerships as this will be the heart of your education program. Contact and network with possible partners: organizations, agencies, educators, universities, students, student interns, school groups, cities, and individuals who share an interest in watershed protection / urban runoff issues. Brainstorm with partners on ways to build upon already existing efforts in your community or how you can work together to start new outreach methods.

Strong partnerships utilizing the resources, skills, knowledge and effort of your community will enhance program implementation and longevity. Involving the community from program inception builds community support. Community support is critical for not only the success of your program but also for funding revenues.

4. Partnerships with other organizations and agencies can help maximize funding efforts by writing cooperative grants. Sources to seek funding from: The Integrated Waste Management Board, The Environmental Protection Agency (EPA), The State Water Resources Control Board, and private foundations.

TARGET AUDIENCE:

General Public:

Educating the general public about urban runoff can be done in a variety of ways. Listed below are suggestions to reach the public.

Events: Local fairs and national events are good forums to educate the public about urban runoff. Using an interactive model or demonstration is a good way to draw the public to your booth. One of the most effective tools we have used at a series of events is the Enviroscape model which is described in detail under the Educational Tools and Resources section located toward the end of this document. In one year of use in the Monterey Bay area, a single model has been effective in educating over 5,000 children and adults, many of them at events.

Possible events or existing forums to educate the general public and city councils on the problems and issues of urban runoff.

Events:
Annual Gray Whale Migration (if you are a coastal city)
Car racing events (Laguna Seca - Monterey region)
Cinco de Mayo Day - annual event
Coordinated Resource Management and Planning (CRMP) meetings
Earth Day (National)- annual event (April)
Farmers Market
"First Flush" - first big rainfall
National Coastal Clean Up Day (National) - annual event (September)
Pollution Prevention Week - event
Sanctuary , Park or Reserve Celebrations
Storm Drain Stenciling Events
Watershed Festivals

Fora:
Automotive stores - Point of Purchase displays
City Council Meetings
Conference
Highschool Automotive Presentations
Hospitality Center Meetings
Neighborhood Watch Meetings
Nonprofit organization meetings
Public Works directors meetings
Publicity - print, radio, and television
Volunteer storm drain monitoring
Workshops (Teachers or City Officials)

Volunteer Monitoring: The beauty of this endeavor is it involves community volunteers collecting data for the city in order to locate potential pollutant sources. While volunteers are monitoring they are approached by curious people who ask what they are doing. In turn the volunteers educate the general public about urban runoff.

With the purchase of *"The Urban Watch Kit"* (see Educational Tools and Resources - page 5), recruited volunteers, and an agency, nonprofit, or individuals to process data and oversee the "Urban Watch"monitoring program your city can begin dry weather storm drain monitoring.

Implemented in Monterey city and suggested for Santa Cruz city. The Coastal Watershed Council (CWC) a nonprofit organization, was contracted to work with the city of Monterey to begin a citizen monitoring program. The CWC had experience using the Urban Watch Kit in the Arana Gulch area of Santa Cruz.

This effort was funded by the city of Monterey. It has been a successful effort in terms of community interest , involvement, and obtaining data on storm drain pollution. Baynet (a nonprofit) and the Coastal Watershed Council worked with the city of Monterey and The Monterey Bay National Marine Sanctuary to recruit volunteers to participate in the pilot urban watch monitoring program. Volunteers were recruited through articles in local papers and flyers distributed in the community. A one day training session was led by the Coastal Watershed Council to teach volunteers how to use the kit. From July through October 1997, volunteers were successful in collecting data using the urban watch kit.

The volunteers were able to detect consistent detergent runoff from a storm drain bordered by a large restaurant community.On one occassion, a detergent plume was traced to the source by walking up the street, peering through grates and following suds back to a restaurant. It was concluded that kitchen mats were being washed off into storm drains.

Train volunteers to make restaurant outreach presentations. Meet with restauraunt staff and management to educate them about proper restaurant mat washing techniques and how this can prevent storm drain pollution. Food handling posters (in english/spanish) can be left with the establishment after presentations.

The urban watch volunteer monitoring program can be incorporated around already existing events such as National Coastal Clean Up Day, and Earth Day, in order to maximize publicity and draw attention to storm drain pollution.

Storm Drain Stenciling: Great event to pull in community members, university students, schools, teachers, and local businesses to work with city public works departments to stencil storm drains. Ask local businesses to have their staff volunteer a weekend day to participate. Gives businesses an opportunity for community involvement and this is an activity that people enjoy. It is rewarding to be able to see completed tasks.

Write a press release on storm drain pollution for local papers and ask for volunteers to participate in storm drain stenciling events. Good national events to build attention / events around are Earth Day (April each year) and National Coastal Clean Up Day (September each year).

If the city has a volunteer coordinator work with them to recruit business groups, school groups, and girl & boy scout troops to participate. In Monterey, local businesses (insurance agencies, and the "Gap") sign up their staff to participate in one day storm drain stenciling events. This builds good community ties and is a great way to draw businesses in.

Written Materials: The most extensive list of written materials in California can be found in the Stormwater Resource Guide of Public Outreach Materials in California. See Educational Tools and Resources Section to order. Call agencies and organizations that have printed materials your city is interested in. Request permission from agencies and artists to reprint existing materials, and ask to obtain artwork and text on discs, if possible. This will save financial resources

The Educational Tools and Resources is a compilation of helpful materials based on a extensive review of existing materials. For this Model Urban Runoff Program we adapted storm drain, food handling and automotive posters, and BMP brochure artwork from the city of Los Angeles. They were generous in sharing their print materials and allowing modifications for local names and numbers. We adapted a nonpoint source brochure from the city of Arcata for the Monterey Bay region and had the same artist revamp the artwork done for Arcata to fit the Monterey region, and this saved financial resources. Since there is alot of good information already made it is a matter of finding what will work best for your city and their budget restraints. A few good pieces of printed materials can reach out to many segments of the public.

Publicity: Write a press release on storm drain pollution for local papers and ask for volunteers to participate in storm drain stenciling events. Good national events to build attention / events around are Earth Day (April each year) and National Coastal Clean Up Day (September each year).

Roving Displays: Enviroscape model: (see Educational Tools and Resources) section for more detailed information. At meetings, events, and teacher workshops you can display the model and educate people how to use the model. Publicize availability of model to nonprofits, teachers, and agencies on a check out system.

A check out process has worked out successfully for the Monterey region allowing us to maximize outreach with this roving display. Teachers and nonprofits call in advance to reserve the model. They are responsible for picking up and returning the model after use. Through this check-out method we have reached over 5,000 children and adults in 16 months.

Storm Drain Display: See Educational Tools and Resources for details on how to order.
Storm drain hands-on exhibit approved for replication by the Monterey Bay Aquarium for the cities of Monterey and Santa Cruz. The storm drain grate with a plasticized motor oil can spilled on top of the grate can be lifted up. Text underneath the grate (in english and spanish) explains how motor oil poured down storm drains affects water quality and animal life in the ocean. The exhibit is being used as a mobile regional outreach tool by the cities. The cost to build each exhibit was approximately $4,000 each. The roving storm drain exhibit can be displayed at libraries, DMV's, schools, nonprofit organizations and events. They are free standing and self expanatory and do not need a person in attendance.

Points of Purchase: Tear off motor oil recycling numbers (english/spanish) inserted in the motor oil sections of automotive stores can be an effective tool. This educates the public about local places that will recycle motor oil. Nonprofits and volunteers could help get the information to the automotive stores and assist in keeping up the displays.

Mailing Inserts: Flyers or coupon incentives for motor oil recycling could be mailed with water bills, city newsletters, local nonprofit newsletters, or local newspapers.

BMP Brochures: Best Management Practices brochures that are targeted for specific industries as well as residents can be made available at city public works counters. BMP's have been developed by other cities and could be tailored to fit your own city. The city of Los Angeles offers a good selection of BMP brochures.

Coupon Incentives: Work with local businesses to offer incentives for the general public to recycle motor oil. Offer car wash coupons or food item coupons from a fast food chain to people who bring used motor oil to a certified oil recycling depository. Publicize coupon incentives in local papers and radio spots.

Teachers:

Educators in the community who have a committment to watershed protection are one of your most valuable resources. Contact local educators in your area to see who is already involved in watershed activities.

Teacher Training Workshops : Find educators who are willing to assist with and or present and coordinate workshops. Or you can contact Project WET (Educational Tools and Resources) and have them put together a workshop for you. Setting up a workshop takes a fair amount of time, but is definitely worth the effort. You can impact alot of people to promote positive change for watershed protection and urban runoff prevention.

One teacher taught to use a curriculum will educate hundreds of students. One workshop with 20 teachers can reach thousands of students over the years. This is one activity where you can maximize the number of people you can educate, and in my opinion one of the most effective tools. Once you complete a workshop you can perfect techniques for duplicate workshops and you have the mold for future workshops. Invite local educators to present activities at watershed workshops in order to add their own expertise and knowledge. This will serve as a networking opportunity for teachers to work together on watershed activities.

The Monterey Bay National Marine Sanctuary (MBNMS) and The Monterey Bay Aquarium (a nonprofit organization) co-sponsored two Teacher Watershed Workshops focusing on urban runoff. One workshop was held at the Monterey Bay Aquarium and one at an elementary school in Santa Cruz. The Project WET curriculum with water related activities geared toward grades K-12 was used. The focus was on urban runoff with activities extracted from the curriculum. Local teachers led activities and added their expertise on water monitoring, watersheds, and local water related activities. MBNMS had several of the WET activities translated into Spanish for teachers to be able to take back to their classroom in order to reach bilingual students.

By using school sites as places to hold teacher workshops you can avoid the cost of having to pay for a site space. It also brings in the support of the school which is hosting the workshop. If a school site is not available contact recreation centers, conference centers, town meeting halls, or a library.

To advertise the workshops we used mailing lists on hand from the aquarium and the Sanctuary. We advertised in community newsletters and through county offices of education. Other avenues for publicity include flyer distribution in schools, libraries, or at events where there is a large group of educators. Announce workshops at meetings, and call local groups in your area to get the word out, put a description in their newsletter, or distribute flyers. This is also an activity that can garner publicity. MBNMS also combined efforts with Elkhorn Slough Reserve for a successful one day teacher workshop focusing on agriculture and urban runoff activities. Teachers were shown how to use the urban runoff model which several teachers checked out after the workshop to use in their classroom.

We designed a students urban runoff contest which we gave out to workshop participants for their students. The contest was broken down for younger and older grade levels.

School Outreach: Bringing presentations to the school site is a good way to reach teachers and students. Presentations using hands-on tools such as the Enviroscape model or storm drain exhibit

is a good way to get students and teachers actively involved. Presentations can be made by nonprofit groups, volunteers, and educators.

Written Materials: *(See page 4)* Distributing written materials to teachers and students is an effective outreach tool.

Roving displays - At the workshops you can show teachers how to use the Enviroscape model (see Educational Tools and Resources section for more detailed information) and tell them they can check the model out for their classroom from your office. This check out process has worked out successfully for the Monterey region allowing us to maximize outreach with this roving display. Teachers pick up the model with koolaid pollutants and deliver back to the educator after they have used the model at their school. Through this check-out method we have reached over 5,000 children and adults in 16 months.

Never underestimate the power of the trickle up theory. Educating elementary students also leads to education of adult family memebers. Students often impart what they have learned in school to parents.

Storm Drain Stenciling: see page 3

Monitoring: See page 3 and Educational Tools and Resources for monitoring kits that may be appropriate for schools.

K-12 Students:

Many of the same methods used to reach teachers are also useful to reach K-12 students. Listed below are suggestions to reach this audience.

School Outreach: *See page 5.*

Roving Displays: *See page 4.*

Written Materials: Such as storm drain posters and brochures that can be used by teachers for educating students about urban runoff and watershed pollution. A brochure we created " Who's Polluting Monterey Bay" is a four color brochure with the inside panel becoming a mini poster of a residential area with urban runoff activitites that students have to find and identify. This is an effective teaching tool.

Storm Drain Stenciling: See page 3 .

Volunteer Monitoring: See page 3.

College Students:

A good way to reach college students is to involve them in community events. Listed below are suggestions in ways to reach students.

Storm Drain Stenciling: Contact local colleges/universities to locate students who do community internships and senior projects for college credit. The city of Monterey and MBNMS worked with the volunteer coordinator for the city of Monterey who made the initial contact with the university. Students from Cal State Monterey Bay in an Economics, Policy, & Management Class received semester units by fulfilling a Service Learning Requirement by participating in community activities.

This community outreach entailed many hours of planning, preparation, and clean up time on behalf of the Junior Engineer for the City of Monterey and MBNMS. For program success the university teacher must be actively involved and participate in all the projects the students do.

CSUMB students attended and participated in the following:

Monterey City Council Meeting: students attended the meeting which featured an urban runoff agenda item.

Business outreach: students designed a brief business survey questionnaire for local businesses which asked about their efforts to curtail urban runoff pollution.

Volunteer monitoring: which will serve as a base for ongoing monitoring efforts in the city and help build a data base. See monitoring on page 3.

Earth Day celebration where students set up the urban runoff model at their campus and in the city of Monterey in order to interact and educate the public. Students also handed out urban runoff flyers in english and spanish and participated in a storm drain stenciling event.

Businesses:

Getting businesses involved with preventing urban runoff pollution is perhaps one of the more challenging targeted audiences as there is such a variety of businesses. A long term project with businesses is to begin a "Clean Seal Business Program" which is discussed in more detail below.

Storm Drain Stenciling: See page 3.

Clean Seal Business Program: Based loosely upon the successful "Clean Bay Business Program " in Palo Alto, which has been operating for several years. Business owners would help formulate procedures for their specific business to become involved in energy conservation, solid waste reduction, and pollution prevention. Business owners are invited to work with the team in formulating a workable program.

This progam is in the initial stages of planning and development in Santa Cruz. The Public Works Dept. of Santa Cruz will be involved in possible workshops to teach business owners practical solutions to prevent urban runoff. Businesses who attend and adopt protocols would be given a Seal of recognition which would be displayed in a store front window and receive free publicity.

University Outreach: College students could take information to businesses or a small mobile display to discuss nonpoint source pollution and how the business can become involved. Trained college students could give presentations to businesses on urban runoff reduction and how this is important to their business.

Volunteer Outreach: River Clean Up- San Lorenzo, Down town Santa Cruz. (Suggested) Through the City Serve Program volunteers could:
- Assist citizens and the city in efforts to clean rivers/watersheds on a more regular basis.
- Local business around the river will be informed by the volunteers about urban runoff.

Community volunteers cleaning the area of debris is a way to increase awareness among business owners. This would help build partnerships and help initiate efforts for a "Clean Seal Business Program" in the future.

Targeted Workshops: Target workshops to reach various segments of the business community to cut down urban runoff pollution. Offer technical training and solutions for specific business needs. Work with the city public works departments to put on workshops.

Adopt A Watershed: Ask local business to help support a school that is helping to protect watersheds. This provides good press opportunities and promotes community ties between entities that otherwise may not work together.

Restaurant Owners: Through workshops designed specifically for the food handling industry. Work with the city public works department on solutions for problems in your city. Example: If detergent runoff from restaurants washing kitchen mats in storm drains is a consistent problem - offer solutions in workshops to curtail the problem.

Another way to reach restaurant owners is to train a volunteer group about proper restaurant techniques and possible solutions. In the city of Monterey, since we have a returning volunteer urban monitoring group we will train some of the volunteers to reach out to the restaurants. This builds upon programs in place and helps keep your volunteer staff motivated.

Along with food handling posters, printed in english/spanish volunteers will give presentations to the restaurant staff about urban runoff and how they can help. If the staff has a number of Hispanic employees, have a volunteer fluent in Spanish give the presentation.

Automotive Owners: Reach them through targeted workshops that are specifically for this audience and offer solutions to common problems - such as oil disposal, etc. Work with city officials in designing and implementing the workshop. Distribute educational materials targeted for the automotive industry.

Business Owners: Reach them through targeted workshops that are specifically for this audience and offer solutions to common problems. Work with city officials in designing and implementing the workshop. Distribute educational materials targeted for the specific businesses you are reaching out to.

Outreach Presentations: Train a nonprofit or volunteer staff to give outreach presentations. Work with city officials to formulate a cohesive message that you want presented to the business community. Nonprofit groups and volunteers can give presentations to the entire staff on how to help reduce non point source pollution emphasizing why this is an important issue and distribute information to the business.

<u>City Officials:</u>

Educate city officials about urban runoff pollution and why this is important for the community.

Roving Displays: Using the enviroscape model (see Educational Tools and Resources section) to educate city officials is an effective tool. Having something visual helps the presentation.

Presentations: Work with city officials to schedule a date to give a presentation to city council members. Presentations were given to the to the city council members for the cities of Monterey and Santa Cruz. At each meeting council members were invited the to pollute the enviroscape model (see Educational Tools and Resources), with food pollutants after a discussion about urban runoff pollution. The model helped make a lasting impression and stick out among the many agenda items presented to council members.

Printed Matter: Share printed materials with city officials. Work with city staff to adapt already existing materials to fit your city. See "A Stormwater Resource Guide Of Public Outreach Materials In California" inEducational Tools and Resources, for a comprehensive list of materials.

Specific Socio Economic Groups:

Door Knob Hangers: Proposed by the city of Santa Cruz.
Through City Serve bilingual volunteers or University students will walk Hispanic neighborhoods on weekends and speak to and hand out bilingual door knob hangers with information on motor oil recycling and curbside collection for Santa Cruz. Give residents collection jugs for the Santa Cruz used motor oil curbside collection program.

Presentations: To schools with a bilingual speaker as well as using hands-on models are effective means to reach students. A presentation at auto parts stores with point of purchase information in Spanish is a way to reach out. Have volunteers or nonprofit groups give presentations, after a training session.

Roving Displays: See page 4.

Point of Purchase: See page 4.

Events: See page for 2 for ideas.

Coupon Incentives: See page 4.

Teacher Workshops:
We have had several Project WET (see Educational Tools and Resources) activities translated into Spanish for teachers to be able to take back to their classroom in order to reach the bilingual students.

TOOLS:

The Enviroscape hands-on model (" The Box"): See Educational Tools and Resources on how to order a model.

Urban Watch Storm Drain Monitoring Kit: See Educational Tools and Resources on how to order kit. The kit is produced by NAPCO Chemical Company (approximately $350).

Roving Storm Drain Display: See Educational Tools and Resources for details.

National Coastal Clean Up Day: takes place every year in September. Beaches, lakes, rivers, and waterways are cleaned by volunteers. Debris collected from waterways across the nation are collected on data sheets which are called in to Coastal Commission where the data is tabulated for the nation. In order to build upon this effort we will have volunteers from the Monterey community assist our Urban Watch Volunteer monitoring group in collecting debris from storm drains in Monterey. This twist on National Coastal Clean Up day will help focus attention specifically to storm drains and urban runoff pollutants. **A college student** will assist the Sanctuary staff in coordinating the project Coastal Clean Up day, getting publicity, and interacting with volunteers, for next year.

Publicity: Watershed Report Card: If you have several schools or groups monitoring different watershed areas report cards of watershed health could be printed every year in conjunction with nationwide Coastal Clean Up Day (September) or Earth Day (April). This is a good way to generate publicity. Heal The Bay generates a "Report Card" for the Los Angeles area beaches and puts out an annual report with good information. See Educational Tools and Resources for more information on Heal The Bay.

Publicity: "First Flush": The first big rain of the season is a good time to generate radio, television, and newspaper publicity about urban runoff.
Work with other organizations to generate publicity.

WET curriculum: See Educational Tools and Resources: for detailed information on this excellent watershed curriculum for grades K-12.

City Stenciling Kits:
The city will need to get storm drain stenciling kits together, including stencils. Volunteers need to work with the city public works department.

Written Materials: See Task 5.2 below and Appendix A.

Task 5.2:

Educational Materials:
Develop and distribute educational materials currently being developed by the WQPP:
to the general public and what the public can do to prevent pollution.

Educational Materials on hand in the Sanctuary WQPP:
Pelican Urban Runoff Poster English/Spanish
Watershed activities from Project WET Curriculum translated in Spanish
Urban runoff hands-on model - checked out to teachers/organizations.
Urban runoff flyer English/Spanish
- Auto Repair clean business operating poster
- Food and restaurant clean business operating poster.
- Storm Drain pollution poster

In Progress:

The city of Los Angeles Stormwater Management Division is kindly donating the following products on disc.
- BMP graphics and text (on disc) in english /spanish for 8 trifold brochures for public works counters.

- Urban runoff color brochure "Monterey Bay is Closer than You Think", Spanish version in progress.

- Door Knob Hangers English/Spanish on Oil Recycling and curbside pick up. (City of Santa Cruz)

Target various audiences:

b) general public - through events, Hispanic population with bilingual information, University student outreach, literature distribution, exhibit outreach, and community events: storm drain stenciling, volunteer monitoring programs.
c) K-12 - Teacher workshops and class presentations with urban runoff model and storm drain exhibit.
d) small business - See below list: Workshops targeting restaurants and automotive business as outreach & education methods. Poster distribution.
e) development - through BMP's and workshops.
f) industry - through BMP's and Workshops

D) Small Business To Target:
- Automotive Outlets & Automotive Stores
- Copier Centers
- Dry Cleaners
- Fast Food Chains
- Home & Garden Stores
- Gas Station
- Grocery Stores
- Hair Salons & Nail Salons
- Hotels - door knob hanger, tent, or decal on recycling
- Veternary Clinics
- Paint Stores
- Photo Development Stores
- Restaurants -to see how they wash their mats.

Task 5.4:
Distributing information and continuing outreach activities.

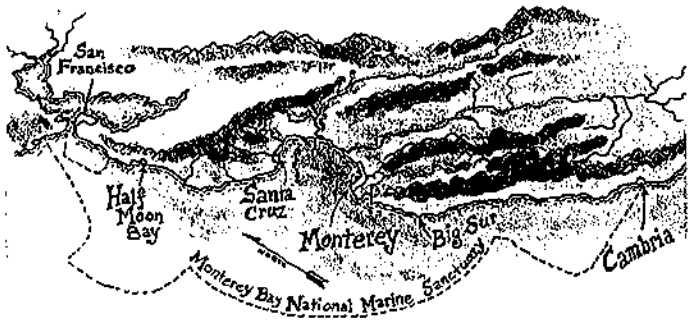
Distribution Centers:

- 4H Groups
- Architecture Firms (BMP's).
- Automotive stores.
- Bingo Groups
- Book Stores
- Boys and Girls Clubs
- Business stores.
- California University Student Information/Travel Centers and Environmental Ed.Departments
- Chamber of Commerce
- Churches
- City information counters.
- City inspectors when they do site visits.

- City Newsletters.
- City Websites.
- College students interacting with public.
- County Santa Cruz Task Force - Economic Development
- Cub Scouts/ Girl Scouts
- Dive stores
- Department of Motor Vehicles with roving storm drain display
- Fire Department Inspectors bring urban runoff information.
- Harbor Masters.
- Hospitality Associations
- Kayaking and Eco Boating Tours.
- Libraries
- Lions Clubs / Kiwanis Clubs
- Local Business Associatians.
- Local groups and nonprofit organizations (in Monterey and Santa Cruz: SOS, CMC, Baynet, Coastal Watershed Council, Ecology Action Network, Surfrider, CRMP - Coordinated Resource Management and Planning, SEP -Sanctuary Education Panel, SAC- Sanctuary Advisory Council, WEC- Watershed Education Committee.)
- Mailing enclosures in various watershed newsletters.
- Networking group for nonprofit volunteer coordinators - (in Monterey "DOVIA")
- Post Offices
- Recreation Centers
- Rotary Club
- Senior Centers
- State Parks Visitor Centers (Elkhorn Slough Visitor Center)
- Surf Shops
- Teachers
- University Campus Service Learning Centers
- Visitor Centers
- Whale watching boats.
- Workshops: teacher, business, city (training for municipal employees), and parks & recreation.
- Youth Centers

4C Sample Outreach Materials

The lead. cause of oil spills in the ocean is NOT from tanker accidents, it's from citizens. Nationwide every year <u>350 million</u> gallons of oil is discarded in storm drains, waterways, and soil. This is 30 times greater than the largest tanker spill!



MONTEREY BAY is the nation's largest Marine Sanctuary, encompassing over 5,300 square miles along the Central California coast from Marin County near San Francisco southward to Cambria in San Luis Obispo County. The Sanctuary protects many habitats, ranging from sand flats along the shoreline to the nation's most extensive kelp forests and one of the world's largest underwater canyons. Surrounding wetlands provide nursery grounds for juvenile fish, help protect against flooding and improve water quality by filtering out harmful pollutants. Nutrient-rich currents nourish the area, supporting a productive and diverse marine ecosystem where countless species, many of them threatened or endangered, make their homes.

INFORMATION SOURCES

For motor oil collection services, household hazardous waste disposal, and recycling — See Yellow Pages under Recycling or call your city public works department.

Please do not mix used motor oil with antifreeze, transmission fluid, gasoline, or other contaminants.

MOTOR OIL RECYCLING:

City of Monterey	(408) 372-7977
City of Salinas	(408) 758-7925
City of Santa Cruz	(408) 429-3666
City of Watsonville	(408) 728-6133
Half Moon Bay	(415) 726-4718
Marin County	(415) 499-7868
Monterey County	(408) 384-5313
	(408) 755-4541
San Benito County	(408) 637-3725
San Luis Obispo County	(805) 782-8530
San Mateo County	(415) 363-4718
Santa Cruz County	(408) 454-2606

For location of local motor oil collection centers throughout the state call: **(800) CLEAN-UP** or on the Internet: **http://www.ciwmb.ca.gov/wpe/usedoil/hotsrch.htm**

For statewide recycling, composting, and household hazardous waste information and referrals to local service sites call: **California Integrated Waste Management Board Recycling Hotline: (800) 553-2962**

For more information on how to prevent polluted runoff and protect watersheds call: The Water Quality Protection Program at the **Monterey Bay National Marine Sanctuary: (408) 647-4201**

This brochure is a joint effort of the Water Quality Protection Program for the Monterey Bay National Marine Sanctuary and the cities of Monterey and Santa Cruz. Funded in part by the United States Environmental Protection Agency Assistance Agreement No. C9-999266-95-0 to the State Water Resources Control Board, contract No. 5-139-253-0, and a used motor oil grant provided by the California Integrated Waste Management Board. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency or the State Water Resources Control Board.

Special thanks to the City of Arcata Environmental Services Department, City of Eureka Utilities Department, Santa Clara Valley Nonpoint Source Pollution Control Program, artist Gary Bloomfield, the County of Monterey and the California Integrated Waste Management Board.

Monterey Bay Begins on Your Street

Help prevent pollution of Monterey Bay waters

Storm Drain Pollution & You!

Even if you live miles from the Sanctuary, you may be contributing harmful pollutants to coastal waters. Urban runoff is caused by chemicals and other materials that are poured or washed down storm drains. Unlike household sewer systems, storm drain pollution is **NOT** cleansed by sewage treatment plants - it flows directly through storm drains and out into Sanctuary waters untreated. You, your friends and family all depend on healthy waterways and oceans. Remember this when you go to the beach, surf, swim in the ocean, go fishing, and eat local sea food.

TYPES OF POLLUTION

Motor oil, pesticides, animal waste, automotive fluids, fertilizers, chemicals, and litter, all make their way into oceans every day.

- One quart of motor oil dumped down a storm drain can contaminate 250,000 gallons of water. Oil from one engine (4-6) quarts can cause an 8 acre slick.
- Every year 350 million gallons of used motor oil is discarded in storm drains, waterways, and soil. This is 30 times greater than the Exxon Valdez oil spill!
- Some wildlife get their water from polluted storm drains. Animals not only get sick from the water, but oil and gasoline stick to feathers and fur. When this happens, feathers and fur lose the ability to provide warmth for the animal.

WHAT YOU CAN DO

RECYCLE

- It takes 42 gallons of crude oil to make two and a half quarts of lubricating oil. The same two and a half quarts can be produced with half as much energy from only one gallon of recycled oil. Take used motor oil and antifreeze to a gas station or hazardous waste site that recycles these products. Call the Recycling Hotline: (408) 384-5313 Monterey County (408) 454-2606 Santa Cruz County
- Recycle plastic, aluminum, and paper. Trash poses a threat to marine animals as they try to eat it or get trapped or tangled in the debris.

REUSE

- Rinse paint brushes in the sink. Filter and reuse paint thinner or brush cleaners. Dispose of used paint and thinners at a hazardous waste site.

REDUCE

- Use pesticides (look for nontoxic alternatives whenever possible) and fertilizers carefully and sparingly. Do not use if rain is forecast.
- Dipose of animal waste in garbage cans or toilets, not in storm drains
- Wash cars with biodegradable, phosphate free detergent.

For more information on urban runoff call the Monterey Bay National Marine Sanctuary (408) 647-4201

CONTAMINACIÓN DE LAS ALCANTARILLAS
(ESCAPE URBANO)
Y TÚ

Incluso si tú vives muchas millas del santuario, es possible que estés contribuyendo a la contaminación peligrosa de las aguas costales. El escape urbano está causado por químicos y otros materiales que son echados, o lavados por el sistema de drenaje/alcatarillas. Desafortunadamente, en el caso del sistema de drenaje de las casas, la contaminación del sistema de drenaje de las lluvias/alcantarillas no es limpiado por una planta de tratamiento de aguas residuales—corre directamente, por medio de las alcantarillas, al agua del santuario sin tratamiento. Tú, tus amigos y familia dependen de canales de agua saludable y los océanos. Recuerda esto cuando vas a la playa, nadas en el mar, pescas, y comes comida del mar local.

TIPOS DE CONTAMINACIÓN

Aceite de motor, pesticidas, heces de animales, fluidos de automovil, fertilizadores, químicos, y basura, todos estos encuentran su camino a los océanos todos los días.

- Un cuarto de aceite de motor botado por las alcantarillas puede contaminar 250,000 galones de agua. Aceite de un motor(4-6) cuartos de galón, puede causar la contaminación de 8 acres.
- Cada año 350 millones galones de aceite usado por motor son desechado en las alcantarillas, canales, y suelo. ¡Esto es 30 veces más grande que el derrame de aceite del Exxon Valdez!
- Alguna vida salvaje consigue su agua de alcantarillas contaminadas. Los animales no sólo se enferman por el agua, pero también el aceite y la gasolina se les pegan a las plumas y pelaje. Cuando esto ocurre, las plumas y pelaje pierden su abilidad de proveer calor al animal.

¿QUÉ PUEDES HACER TÚ?

RECICLAR

- Se necesitan 42 galones de aceite crudo para hacer dos cuartos y medio de aceite lubricante. Esos dos galones y medio pueden ser producidos con la mitad de la energía de un galon de aceite reciclado. Tome su aceite de motor usado y su anticongelante a una gasolinera, o a un sitio de deshechos peligrosos que recicla estos productos. Llame a la línea urgente de reciclaje: (408) 384-5313 Condado de Monterey
  (408) 454-2606 Condado de Santa Cruz
- Recicle plásticos, aluminio, y papel. La basura es una amenaza a la vida marina, ya que ellos tratan de comersela , o quedan atrapados o enredados en los esconbros.

USAR DE NUEVO

- Lave sus brochas de pintura en el lavamanos. Filtre y use de nuevo los aclaradores de pintura, o limpiadores de brochas. Desheche pintura usada e aclaradores de pintura en un sitio de deshechos peligrosos.

REDUCIR

- Use pesticidas (busque alternativas no tóxicas cuando sea posible) y fertilizadores con mucho cuidado y escasamente. No use si el previsión es de lluvia.
- Lave su automovil con detergente biodegradable sin fosfato.
- Desheche las heces de animal en los basureros o tasas de bano, no en los alcantarillados.

Para mas información, lame al número (408) 647-4201

Know Your Enemy!

If you don't know what the pest is, bring a sample of the pest and the damage it is causing, in a closed jar, to:

- a reputable nursery
- County Agricultural Commissioner (510) 670-5232
- U.C. Cooperative Extension Office (510) 670-5200

How Safe Is This Pesticide?

For information on pesticide safety, contact:

- Poison Control Center (415) 476-6600
- National Pesticide Telecommunications Network, EPA-funded. For emergencies and information on health effects, 24-hr hotline: 1-800-858-7378.
- *Citizen's Guide to Pesticides*, EPA; R. Woods, Consumer Information Center-Y. P.O. Box 100, Pueblo CO 81002. (50¢) Request #426X.

How Do I Get Rid of Old Pesticides?

If pesticides cannot be used up, or given to neighbors, community organizations or gardening clubs, they can be stored until one of the Alameda County household hazardous waste collection facilities opens. These facilities will receive hazardous waste, free of charge, from Alameda County residents and certain small businesses. For more information call **1-800-606-6606** (from within the County) or **1-510-670-6460** (from outside the County).

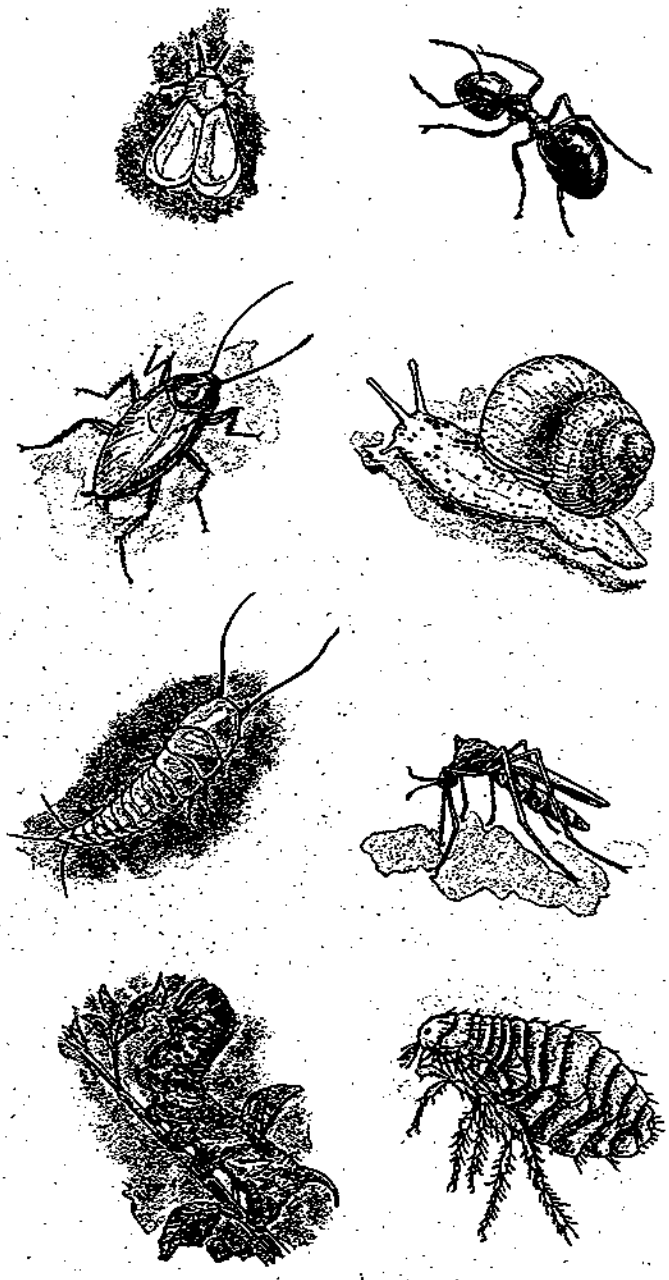
For More Copies of This Brochure, contact:

Alameda County
Urban Runoff
Clean Water Program

399 Elmhurst Street, Hayward CA 94544
(510) 670-5543 FAX (510) 782-1939

Printed on Recycled Paper ♻

Bugged?



Common-Sense Techniques & Less-Toxic Products For Pest Control...

SAMPLE BROCHURE FOR PEST AND PLANT DISEASE CONTROL

Grow It!

The Less-Toxic Garden.

Control Pests & Plant Disease Using Less-Toxic Methods.

B A S M A A

Bay Area Stormwater Management Agencies Association

Congratulations! You have taken the first step to create a safer place for yourself, your family and our environment. This guide will help you create a vibrant garden and do the earth a good turn by showing you how to:

- Create healthy soil
- Plant the right plants
- Reduce toxic chemical use
- Control pests naturally

A word about garden chemicals:

Fish and wildlife are harmed by improper use and disposal of chemicals:

- Chemicals over-applied or not used according to label directions
- Chemicals poured down household drains
- Chemicals washed into storm drains by rain or overwatering
- Chemicals thrown away in the garbage can cause problems for landfills

Local resources for proper disposal of chemicals exist to help you. Keep reading for better alternatives.

For more information to help protect our Bay Area waters call:
1-888-Bay-Wise
(1-888-229-9473)

The Bay Area Stormwater Management Agencies Association (BASMAA) is a group of local water quality agencies focused on regional challenges and opportunities to improving the quality of storm water runoff to the San Francisco Bay and Delta.

SAMPLE BROCHURE FOR HOME MAINTENANCE ACTIVITIES

Printed on Recycled Paper.

Santa Clara Valley
Nonpoint Source
Pollution Control Program

Home Maintenance Tips for a Cleaner Bay

Whether you do the work yourself or hire someone, you can help protect water quality

Santa Clara Valley
Nonpoint Source
Pollution Control Program

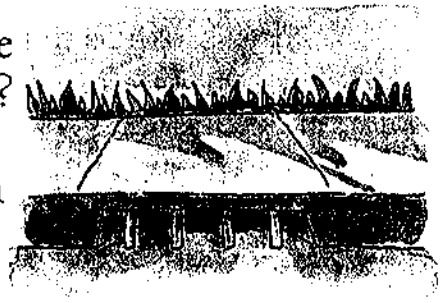
SAMPLE BROCHURE ON DEALING WITH SWIMMING POOL WATERS

KEEP POOL AND SPA WATER OUT OF STORM DRAINS, STREETS, AND CREEKS!

When you're planning to discharge large amounts of pool water, please be sure to call the local wastewater treatment authority for guidance.

Atherton	(415) 321-0384
Belmont	(415) 594-8411 ext. 141
East Palo Alto	(415) 329-2598
Ladera Area	(415) 321-0384
Los Altos	(415) 329-2598
Los Altos Hills	(415) 329-2598
Menlo Park	(415) 321-0384
Mountain View	(415) 329-2598
Palo Alto	(415) 329-2598
Portola Valley	(415) 321-0384
Redwood City	(415) 594-8411 ext. 141
San Carlos	(415) 594-8411 ext. 141
Sunnyvale	(408) 730-7270
Woodside	(415) 321-0384

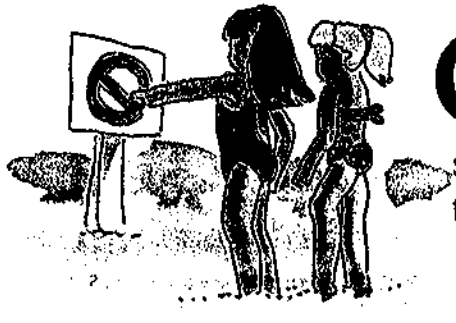
Dirty Words Every Kid Should Know.



Catch Basins—You know those Catch Basins on your street corner? Well, all that trash you see there gets washed down into the Catch Basins and eventually ends up at the beach. So, if you don't want to swim in garbage, don't toss things into the Catch Basins.

Toxins—Toxins are chemicals that can make you sick. Do you know why you can find them at the beach? Because some people break the law and wash Toxins into the Catch Basins. These Toxins end up at the beach in Storm Drains and Toxic Puddles. So look out.

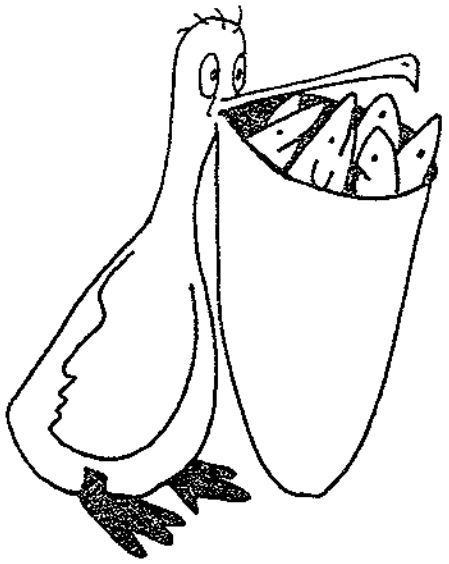
Runoff—After it rains, or people turn on their sprinklers or hoses, you can see water running into catch basins. There it mixes

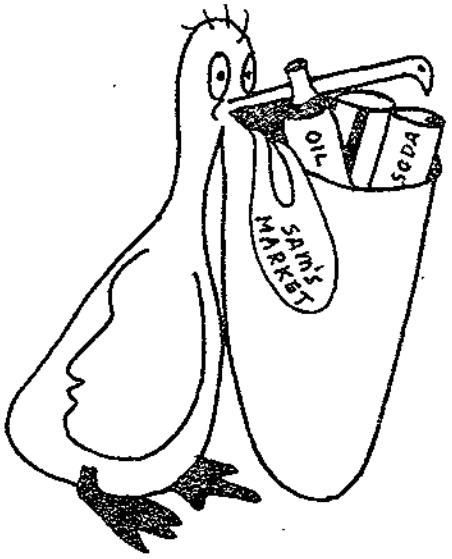


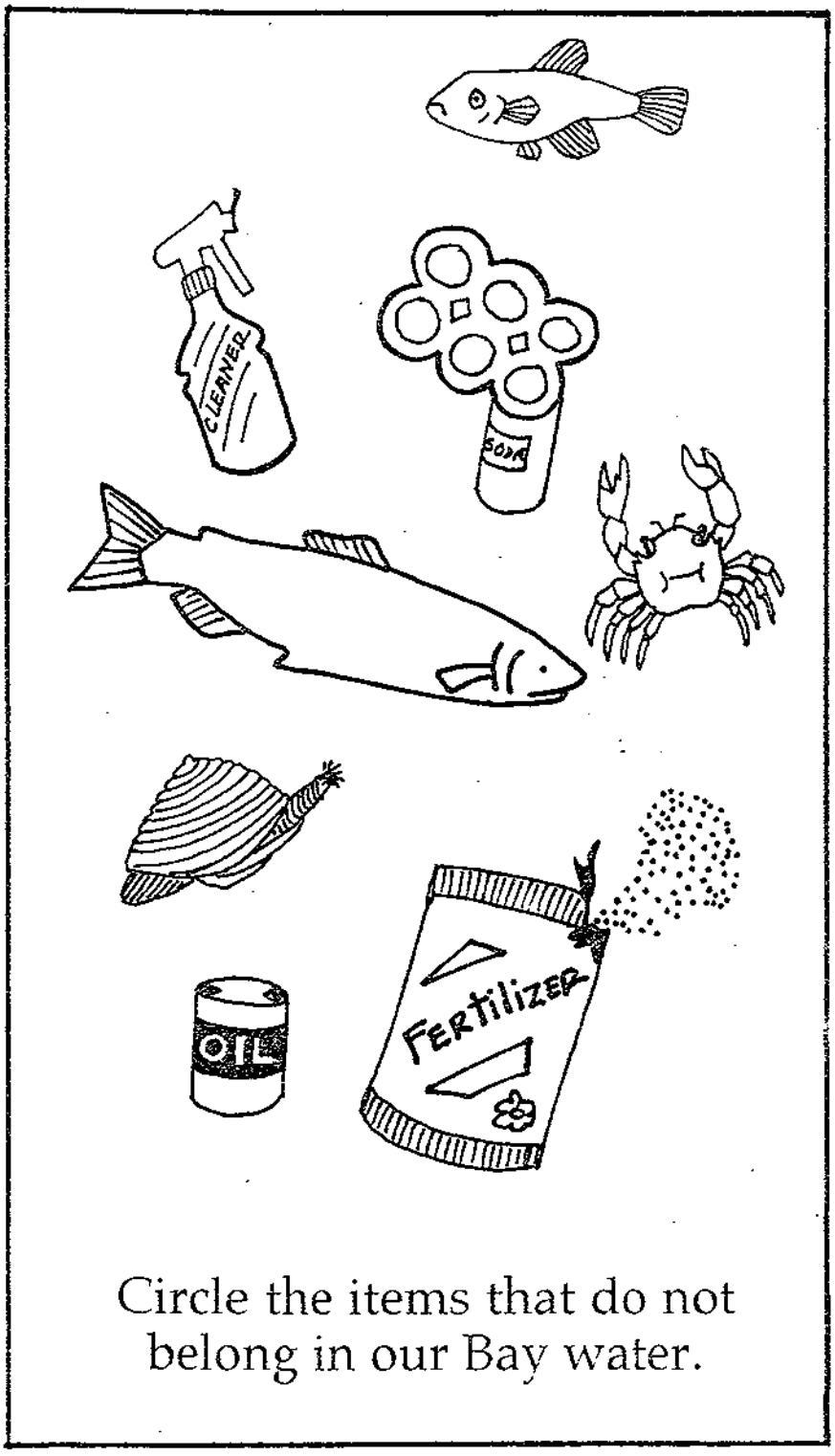
Contamination—When something dirty, unhealthy or toxic gets in the ocean, the ocean becomes Contaminated. Unfortunately that happens whenever

Urban runoff is all the stuff that enters the Bay with storm drain water. If the storm drains contain trash, leaves, and oil in them, then all that junk ends up in the bay. Preschoolers can do both the activities below.

Pelicans eat a lot. Which mouthful do you think the pelican would choose?







Circle the items that do not belong in our Bay water.

GATES © 1997

Mud 'N Fun is a regular feature in your Tidal Tales newsletters by Naturalist Randy Gates. Each month, one or more nature-related activities will be included for children and adults. These activities are designed to heighten your appreciation of the natural world. Adults and children can make these activities into family fun.

CITY OF MONTEREY STORM DRAIN STENCILING

City Contact Person:

Jennifer Hays
Public Works Engineering Division
City Hall- Room 7
(408) 646-3920

Storm Drain Stenciling Materials:

Each kit should contain:

3 traffic cones-	3 orange vests
latex gloves	2 buckets- one for carrying stuff, one for white paint
1 trash bag	paper towels
1 stir stick	1 can blue spray paint
1 scraper	1 wire brush
1 4" roller brush	1 paint brush
masking tape	1 stencil
catch basin map	Wet Paint signs
pencil	

Procedure for Obtaining Kits (team leaders):

1. Please call Jennifer Hays at 646-3920 in advance to request kits. Specify number of kits. Each kit is set up for two or three people. (In high traffic areas please have three people per team for traffic safety.)

2. Stop by City Hall to pick up kits. (Engineering Office is Room 7 above the City Council Chambers.)

3. When your group is done, please clean brushes and rollers (we do reuse the rollers) in a sink (not down a catch basin!)... Also, please try to clean the stencils as well as you can (they are pretty tough to clean off).

4. Return kits to Jennifer Hays at City Hall. Please have your volunteers keep track of which catch basins have been stenciled by marking them on the provided maps. If you find catch basins that are not marked on the maps (and they are on City property) go ahead and stencil them, but please mark on the map as well. We are trying to keep track of how many are getting done.

Stenciling Procedure:

1. Please wear orange vests at all times when stenciling. You will be working in traffic areas. Please place orange cones around the area that you are working. You should not have to close traffic lanes, but make yourself visible to cars that will be driving by.

2. You will be stenciling the concrete area on the curb above the catch basin grate. If there is no curb, either stencil on the concrete "apron" next to the catch basin or on a relatively flat asphalt area behind the grate where a curb would normally be.

3. Clean the area first with the wire brush provided. This will be to get the excess dirt off so that the paint will stick. If there is an old peeling stencil that you are going to paint over, use the scraper to get as much of the peeling paint off as possible.

4. Tape off the boundaries of the area to be painted with masking tape. You will be painting the white background first (with the roller brush provided and/or the paint brush). The white background should be painted about as long as the outer edges of the stencil (approximately 26") and as wide as the curb (6").

5. Put on your latex gloves. Make sure your white paint is stirred well (with you stir stick). Paint the area that you have taped. You can use either the roller or the paint brush (make sure it's not too thick or else it won't dry quickly).

6. After allowing the white paint to dry, have one person hold the plastic stencil in place over the white paint, and have another person use the blue can of spray paint to fill in the stencil. Be careful! This is the trickiest part. The stencil should be positioned so that someone standing in the street can read it right-side up. Make continuous passes with the spray paint approximately 6-8" above the stencil. Make sure everyone is wearing their gloves for this part! It can be very messy.

7. Please leave a "Wet Paint" taped to the curb next to the stencil. When you are done painting and the stencils are all dry please come back and remove them.

8. Go on to the next catch basin and repeat... When you are finished, please go back to all of your catch basins and retrieve "Wet Paint" signs and masking tape and dispose of properly.

Item Number PTNDDTSWBFSH

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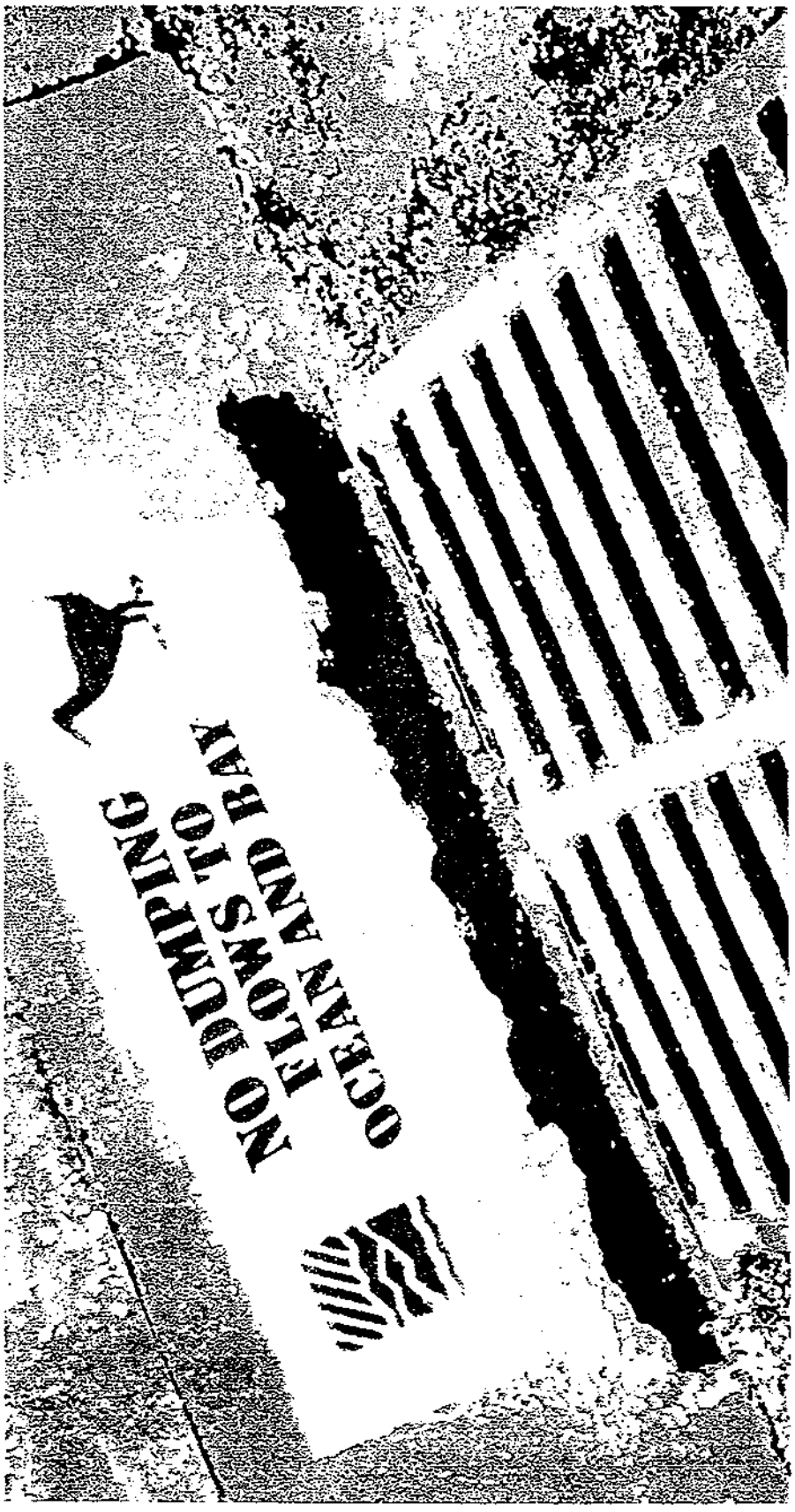
Pave Mark Corporation



Designed by Patrick Urquhart for San Mateo County

4D Educational Tools and Resources for Public Education Program

Educational Tools & Resources For Public Education Program

Compiled by Maris Sidenstecker, Monterey Bay National Marine Sanctuary.
Phone: (408) 647-4216.

The following is a list of quality educational materials that can assist teachers, individuals, park rangers, nonprofit organizations, government, state, city and local agencies in setting up a watershed / urban runoff outreach program for their region.

A Stormwater Resource Guide Of Public Outreach Materials In California
Contact: Joyce Neil
Stormwater Management Division
City of Los Angeles
650 S. Spring St., Suite 700
Los Angeles, CA 90014
(213) 847-4842
Fax: (213) 847-5443

To begin a city outreach program you ***must*** obtain a copy of the Stormwater Resource Guide. This is the most comprehensive list of stormwater related outreach materials in California. Many stormwater programs actively share public information materials. Use this guide to utilize existing materials and share products that your program has developed with others.

Curriculum:

Adopt A Watershed
PO Box 356
Hayfork, CA 96041
Phone: (916) 628-5334
Fax: (916) 628-4212

Offers curriculum for grade levels K-12. Curriculum is divided into the following categories: Biology, Chemistry, Earth Science, Geography, Language Arts, Math, and a fild manual for Water Quality Monitoring which is useful for educators monitoring the effects of urban runoff in local watersheds. Cost varies with each item. Offer a teacher workshop with a maximum of 30 teachers per workshop. Facilitator cost is $375 / day, plus travel expenses.

Water Education Foundation (WET)
717 K. Street, Suite 517
Sacramento, CA 95814
Phone: (916) 444-6240
Fax: (916) 448-7699
Contact: Judy Wheatley

Offer a Project WET curriculum / activity book for educators levels K-12. The WET workbook has several activities related to urban runoff. One of the best curriculums in terms of layout, design, and content. All water Education Foundation classroom materials are consistent with the California State Frameworks for Science and History/Social Science. In addition WET will facilitate a teacher workshop for free, in exchange for the purchase of educator activity books. If funds are unavailable you can find a sponsor and or charge the teachers $9.50 each book. Judy Wheatley will gladly assist your organizing a teacher workshop.

In addition to offering teacher workshop training WET watershed curriculum books, WET has a catalog which has a variety of educational products: A California Water Map, Colorado River Map, Groundwater Map, Videos and slide shows on water issues, water cards, preventing pollution card, stickers, notecards, a No-Know Game - relates to urban runoff isues, Hydroexplorer Computer Games, variety of educational clasroom materials.

Aquatic Project Wild (K-12)
Project Wild Headquarters, Aquatic Project Wild
Western Regional Environmental Education Council
Salina Star Route, Colorado 80302
Phone: 303-444-2390

WILD is an award winning interdisciplinary, conservation and environmental education program.The waters of the earth, in some form, are walking distance from any classroom on the planet. Project WILD Aquatic Education materials serve as an invitation to explore and understand the fascinating worlds of water and the aquatic habitats they support. WILD offers instructional workshops to train teachers how to use the curriculum.

Biological Activity Packet
Colorado River Watch Network
Att: Mary Gilroy H 219
PO Box 220
Austin, TX 78767-0220

A teachers companion to the Biomonitoring Guide with twelve classroom activities emphasizing aquatic ecosystem structure and function. Teaching activities range from traditional lab investigations to cooperative learning activities, simulations, and even a taxonomy card game, "Bug Rummy". Concepts covered in the activities include taxonomy, genetics, biochemistry and ecology. Grade levels 7-12. Fee.

Biomonitoring Guide
See address above

A manual that provides citizens the necessary background and instruction to use benthic macroinvertebrates as key indicators of the health of a water body. Step be step instructions guide the reader through habitat assessment as well as a collection and identification of macroinvertebrates. The dichotomous key and pocket-size key card have simple line drawings to help with field identification of organisms. Fee.

Biological Monitoring Video
See address above
This instructional video explains the use of benthic macroinvertebrates in determining the health of a water body. Fiels procedures are demonstrated for riffle habitat assessment as well as collection and identification of organisms. Microscopic footage of at least 20 species of benthic macroinvertebrates is included to assist with identification. Designed to complement the Biomonitoring Guide, this video is appropriate for middle school through adult. Fee.

Blue Thumb Project
c/o American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235
Phone: 800-926-7337

Offers an assortment of products related to water. Includes pencils, magnets, stickers, brochures, erasers, project kits, flags, guides and resources.

Channing L. Bete Co., Inc.
200 State Road
So. Deerfield, MA 01373-0200
Phone: 800-628-7733
Fax: 800-499-6464

Offers a variety of water education materials including booklets, posters, curriculums, coloring and activity books, water week kits. Fee.

Earth: The Water Planet (grades 6-8) $10.00
The National Science Teachers Association
1742 Connecticut Ave NW
Washington, DC 20009

Educating Young People About Water: A Guide to Goals and Resources with an emphasis on nonformal and school enrichment settings.
Elaine Andrews
University of Wisconsin-Madison
216 Agriculture Hall
1450 Linden Dr.
Madison, WI 53706

A guide for professionals who design and develop water quality training programs and curricula, and for coordinators of water education programs. Coordinators can use it to make initial program decisions or to find complimentary materials for a program already in place.

Hands On Save Our Streams (K-12) SOS Kit $8.00
Izaak Walton League
707 Conservation Lane
Gaithersburg, MD 20878
Phone: 800-BUG-IWLA

Is an interdisciplinary curriculum that can be used to teach social studies, biology, chemistry, math, history, language arts or english and includes all background needed to teach lessons and field studies.

Investigating Streams and Rivers: An Interdisciplinary Curriculum Guide
See the address for Green under Catalogs

A collection of activities to encourage student inquiry, investigation, and action regarding local streams and rivers.

Living In Water (grades 4-6) $4.00
National Aquarium in Baltimore
Education Department, Pier 3
501 E. Pratt Street
Baltimore, MD 21202

S.T.E.P.

Monterey Salmon and Trout Project
c/o Matt MacCaslin
2524 Parker Street
Santa Cruz, CA 95065

Offer curriculum binder, revised lesson packet, Science kit (slides, videos, posters). There is a fee.

The Stream Scene: Watersheds, Wildlife, and People (grades 6-12) $15.00
Oregon Department Fish and Game
Office of Public Affairs
PO Box 59
Portland, OR 97207
Phone: 503-229-5400 Ext: 432

Water, Water Everywhere But.... (grades 7-10)
Hach Company
PO Box 389
Loveland, CO 80539

This material is not intended for use as "text material". It is a reference work to be used by students while interpreting their water test results. Everything was written with the assumption that students have no background in chemistry and only a limited knowledge of mathematics and general science. Hach also offers curriculum, resource materials, resource guide, and monitoring kits (see address under monitoring kits).

Hands-on Educational Tools:

enviroscape Models
c/o JT & A, inc. or
4 Herbert Street
Alexandria, VA 22305
Phone: (703) 519-2180
Fax: (703) 519-2190

Terrene Institute
1717 K Street, NW, Suite 801
Washington, DC 20006
Phone: (202) 833-8317
Fax: (202) 296-4071

Enviroscape is a **three-dimensional, hard plastic model of a miniature city**.This interactive portable model offers a hands-on approach to demonstrate water pollution of watersheds caused by various urban runoff sources. The model is (approximately 25"x 30"x5") and comes complete with a kit containing components you need to demonstrate the movement of water through a watershed. The exhibit includes scaled-down homes, shopping areas, commercial districts and industrial locations placed at different elevations. The lowest point on the model is a water body. Participants spray water on the model to simulate a rain storm which shows how various media simulating motor oil, paint, antifreeze, herbicides, and pesticides drain from upland areas to the water body. The ingredients of cocoa, powdered drink mixes, and cake decorations act as toxic pollutants.

The enviroscape base remains the same and interchangeable add on surfaces can be purchased seperately, including: hazardous waste, wetlands, groundwater, and riparian, urban, coastal, and landfill. Prices range from $299 for base only, with each add on costing approximately the same amount. This has been one of the **most effective tools** to demonstrate non-point source pollution to a variety of target audiences in the cities of Monterey and Santa Cruz.
They also offer a Resource Guide for Wetlands to accompany the model which lists a variety of products, posters, programs and projects.

For approximately $800 you will have a valuable educational outreach tool which makes the topic of urban runoff **fun.** In addition to the buildings supplies with your model you can purchase small plastic animals (from toy stores) found in your local watersheds. Label local watersheds on the model. Perfect the urban runoff pollutants by using different colors of koolaid and cake decorations.

The Sanctuary office checks the model out to educators and nonprofits in order to increase urban runoff awareness. This outreach effort combined with community events has reached over 5,000 children and adults in 18 months. We advertise the availability of the urban runoff model through presentations, word of mouth, newsletter articles, announcements at meetings, events, teacher workshops, and county district school office mailings. In the future we would like to aquire more models to be placed in various cities and school districts in order to expand this outreach to a regional effort.

This is a great tool to be used by schools, community groups, government agencies, nonprofit groups, park services. Due to the cost this is an item that could be shared by a few groups or by soliciting local business for funds, or getting a grant to purchase the enviroscape.

Roving Storm Drain Exhibit (a Replica of Monterey Bay Aquarium exhibit)
Contact: Martha Manson - Exhibit Design Manager
Monterey Bay Aquarium
886 Cannery Row
Monterey, CA 93940-4810
Phone: (408) 648-4889

To have an **interactive storm drain exhibit** built for your city like the one on display at the Monterey Bay Aquarium, Monterey, California. Please call for aquarium approval to duplicate the exhibit. These are displays that can be adapted for bilingual outreach and sturdy enough to be left unattended at libraries, DMV's, schools, and events.The display is approximately three feet tall by two feet wide and sits on rollers. The top of the exhibit is the size of a storm drain. Attached to the grate is a plastic motor oil bottle spilling plasticized oil down the storm drain. The grate lifts up to display text in English and Spanish which explains how motor oil affects water quality and marine life.

The person who built the exhibit is an outside contractor - Chris Poehlman and his phone number is (707) 886-5182. He made modifications to the exhibits built for the cities of Monterey and Santa Cruz, in order to make them more portable for a roving display. The cost is approximately $4,300 for the entire display.

Monitoring Kits/ Resources:

California Directory of Volunteer Monitoring Organizations
Gwen Starrett
Water Resources Education Coordinator
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100
Phone: (916) 657-0518 Fax: (916) 657 -2127

The directory is designed to identify community groups in California that are monitoring aquatic resources such as creeks, rivers, bays, lakes, estuaries, and ocean waters. This serves as an excellent source to connect interested volunteers, potential mentors, and resource managers with existing monitoring groups and increase communication betweeen community groups in order to learn from other successes and challenges.

Urban Watch Kit
NAPCO Chemical Company
Contact :Marilyn Grychka
Phone: (800) 929-5976

The kit used by Urban Watch volunteers was developed jointly by City of Fort Worth staff and Lamotte company. It includes all the parameters required in EPA's NPDES permit regulations for **dry-weather storm drain monitoring** (chlorine, copper, detergents, phenols, pH, turbidity, and color), plus a thermometer and a test for ammonia-nitrogen. Kit cost $310.00. This kit was successfully used by a volunteer monitoring program for the City of Monterey Public Works Department, California.

Hach Company
560 Lindbergh Dr.
PO Box 389
Loveland, CO. 80539
Phone: 800-227-4224
Fax: 303-669-2932

La Motte
PO Box 329
Rt. 213 North
Chestertown, MD 21620
Phone: 800-344-3100
Fax: 410-778-6394

Minnows Monitoring Storm Water
Brian Camp
Fort Worth DEM
5000 Martin Luther King Highway
Fort Worth, TX 76119
Phone: 817-871-5460

The Fort Worth Department of Environmental Management has produced a video and manual explaining how to construct and use the Stream Sentinel, a low cost, long term method of monitoring storm drainage outfalls using six fathead minnows in a two-litter soda bottle. Both are available at no cost from charles Howell, EPA Region 6, First Interstate Bank Tower, Fountain Place, 1445 Ross Ave:, 12th floor, Suite 1200, Dallas, TX 75202-2733. Phone: 214-665-8354.

Chemetrics
Route 28
Calverton, VA 22016
Phone: 800-356-3072

Millipore
80 Ashby Rd
Bedford, MA 01730
800-645-5476

Catalogs:

GREEN
721 East Huron Street
Ann Arbor, Michigan 48104
Phone: 313-761-8142
Fax: 313-761-4951
http://www.econet.apc.org/green/

Offers a catalog of quality watershed education resources, international newsletter, cross cultural watershed opportunities, training and support to help you initiate or enhance local watershed education efforts.

Compendium of Educational Materials on the Water Environment
Alliance For Environmental Education
51 Main Street
PO Box 368
The Plains, VA 22171
Phone: 703-253-5812

A collection of broad range of topics related to water environment and emphasizes diffuse or nonpoint sources of water pollution. It is organized into three major areas: institutions, education, public involvement; pollutants; and resources. Fee.

Terrene Institute
4 Herbert Street,
Alexandria, VA 22305
Phone: 703-548-5473 Fax: 703-548-6299
e-mail: terrene@gnn.com

Offers a wide variety of valuable resources including Projects/Resources, Partnership programs, Teacher kits, Community kits (designed for use by citizen and community groups to increase awareness on watershed issues), Professional kits (assembled by professionals, academics, and government employess for local planners and stormwater issues), Brochures, Buttons, Stickers, Watershed Note Cards, Books, Fact Sheets, Posters, Models and Games, Newsletters, Data Bases.

Water Education Foundation
717 K Street, Suite 517
Sacramento, CA 95814
Phone: 916-444-6240
Fax: 916-448-7699
e-mail wateredfdn@aol.com

Offers a variety of products including one of the best watershed curriculums (see description above under curriculum) and School Programs. Layperson's Guides, Brochures and Bill Stuffers, Maps, Videos and Slide Shows, Water Awareness, Notecards, Computer Games.

Conservation Technology Information Center
1220 Potter Drive, Room 170
West Lafayette, IN 47906
Phone: 317-494-9555
Fax: 317-494-5969
e-mail: CTIC@expert.cc.purdue.edu

CTIC is a nonprofit information/data transfer center. CTIC is represented by an interactive ag-based partnership of individuals, corporations, associations, governmental agencies, foundations, universities, and media. Videos, manuals, directories, brochures, guides, computer disks and fact sheets give information that will help you better manage your natural resources. Manuals about manure management include open lot livestock production, composting and constructed wetlands. Information available on Nutrient, Pest, and Watershed Management, and Wetlands materia

Publications:

City of Palo Alto
Public Works Dept.
Suzanne Healy
2501 Embarcadero Way
Palo Alto, CA 94303
Phone: 415-329-2598
Fax: 415-494-3531

One of the best sources of information on a wide variety of topics. Offers a large selection **Best Management Practices (BMP's)** and Program Reports on a wide range of topics including automotive, food handling services, and construction sites. Also have **Pollution Prevention Outreach Materials** - stickers, posters, postcards, magnets, buttons, utility bill inserts, door hangers, and school workbooks. **Fact Sheets** - describe program design and implementation for auto part stores, construction sites, copper installation, dry cleaners, hospital/medical facilities, metal plating, machine works, pools and spas, volunteers for stencil storm drains, zinc in floor wax. Have extensive information on the **Clean Bay Business Program** which has been successfully growing in poularity among business owners.

Heal The Bay
2701 Ocean Park Blvd. Suite 150
Santa Monica, CA 90405
Phone: (310) 581-4188
Fax: (310) 581- 4195
www.healthebay.org/healthebay

Heal The Bay has excellent brochures including "Dirty Words Every Kid Should Know" which describes storm drain pollution in english/spanish. They also have door hangers on storm drain pollution for Los Angeles county. Provide an **"Annual Beach Report Card"** on water quality health of beaches which is publicized in local papers and the media. This is a good addition to taylor and ~~add to your~~ own monitoring program in order to get media attention for local monitoring efforts. Offer a variety of test kits and portable laboratories for use in the field, laboratory and on site.

Los Angeles County
Department of Public Works
Att: Hulio Fontura
Phone: (626) 458-3531

Los Angeles county has very nice storm drain posters, BMP brochures, information brochures and stickers. If your city is on a limited budget you can purchase posters and brochures from them at a reasonable price.

Wetlands Reading List (Pre-K -12)

EPA
Office of Wetlands, Oceans, and Watersheds
Office of Water
Washington, D.C. 20460
Phone: 800-832-7828

Books are listed and described in sections according to reading level: Primary, Elementary, Intermediate, and Secondary.

The Magic School Bus at the Waterworks (in English and Spanish)
Published by Scholastic Inc.
by Joanna Cole $4.95 Paperback
Purchase at bookstores.
A popular childrens series of books also seen on TV PBS series. This topic takes children on an adventure to find out how cities get their water through the waterworks. A fresh and amusing way to teach kids (and adults) science and concepts.

Field Manual for Water Quality Monitoring
William Stapp
2050 Delaware Ave.
Ann Arbor, MI 48103

Public Opinion Surveys:

Public Opinions Toward Water Issues Among Residential Users Serviced by The City of Watsonville Water Division and The Aromas Water District
February 1996

Research conducted by Pearson Research Associates; Adrian Pearson.
PO Box 1778
Santa Cruz, CA 95061
Phone: (408) 429-9757
Fax: (408) 426-7010

Web Sites:

Water Education Foundation's Web Site:
http://www.water-ed.org

Heal The Bay
www.healthebay.org/healthebay

Educating Young People about Water
http://www.uwex.edu/erc/ywc/index.html

GREEN
WWW:http://www.igc.apc.org/green

EPA internet homepage with basic watershed data from around the country.
"www.epa.gov/surf"

For information on the State Water Resources Control Board monitoring activities.
http: \\www.swrcb.ca.gov

Local:
http://www.santacruz.k12.ca.us/-jpost/projects/Watershed/mbwat1.html

The Wells National Estuarine Research Reserve - an educational telecommunications project that investigates non-point source pollution and supports watershed management.
mewells@alice.terc.edu

Newsletters:

The Volunteer Monitor Newsletter - Twice a year
Eleanor Ely, Editor
1318 Masonic Ave.
San Francisco, CA 94117
Phone: 415-255-8049

Coastal Links
The Water Quality Protection Program for the
Monterey Bay National Marine Sanctuary
299 Foam Street Suite D
Monterey, CA 93940
Phone: 408-647-4201
Fax: 408-647-4250

Coastal Watershed Council - quarterly newsletter
Donna Meyers - Executive Director
204 Laguna Stret
Santa Cruz, CA 95060
Phone: 408-426-9012

California Coast and Ocean - quarterly
State Coastal Conservancy
1330 Broadway, Suite 1100
Oakland, CA 94612
Phone: 510-286-0934

Adopt A Watershed
PO Box 1850
Hayfork, CA 96041
Phone: 916-628-5334
Fax: 916-628-4212

Coastlines
Urban Harbors Institute
UMASS Boston
100 Morrissey Blvd.
Boston, MA 02125-3393
Fax: 617-287-5575

Runoff Report
c/o JT & A, inc.
1000 Connecticut Avenue, NW
Suite 802
Washington, DC 20036
Phone: 202-833-3380

Wetlands Celebration
Terrene Institute
1717 K Street, NW, Suite 801
Washington, DC 20006
Phone: 202-833-8317
Fax: 202-296-4071

Nonpoint Source
News Notes
c/o Terrene Institute
see address above

The Riparian Zone
Longfellow Creek Watershed Project
c/o Camp Long 5200 35th Ave. SW
Seattle, WA 98126
Phone: 206-233-2046

GREEN
721 East Huron Street
Ann Arbor, MI 48104
Phone: 313-761-8142

Biodiversity News
1416 Ninth Street Room 1311
Sacramento, CA 95814

The Water Foundation
PO Box H2O
Brainerd, MN 56401-2000

Outfall
Santa Clara Valley Nonpoint Source Pollution Control Program
5750 Almaden Expressway
San Jose, CA 95118
Phone: 408-265-2600
Fax: 408-266-0271

Visions for the Whippany Watershed
Whippany River Watershed Project
NJ Department of Environmental Protection
Office of Environmental Planning
CN 418
Trenton, NJ 08625-0418
Phone: 609-984-0058

Western Water Magazine
Water Education Foundation
717 K Street, Suite 517
Sacramento, CA 95814
Phone: 916-444-6240

Teaching Water Science Newsletter

4E BMPs for Residential Sources

Residential Sources

Focus of Document

This guidance presents BMPs that address the discharge of pollutants to the storm drain system from residential sources.

Sources of Pollutants

There are several activities conducted in and around residences that can cause the discharge of pollutants. These activities of concern are:

- ✓ Cleaning and maintenance of automobiles
- ✓ Landscaping and irrigation
- ✓ Weed and pest control
- ✓ Pet waste
- ✓ Draining of pools and spas
- ✓ Home repair and remodeling (including painting)

Pollutants of Concern

Some of the pollutants of concern are:

- ✓ Organic matter
- ✓ Oil and grease
- ✓ Toxic chemicals in cleaning products, paints, and related products
- ✓ Pesticides and herbicides
- ✓ Chlorine and other disinfectants

Best Management Practices

BMPs are common sense, environmentally responsible alternatives and good house-keeping measures that can be implemented with relatively low effort and cost to the residents of the Municipality. Structural controls or physical improvements are not recommended here, although opportunities for such improvements should be utilized when homes are remodeled (see New Development/Redevelopment Control Program in the MURP for types of structural improvements).

Home Automobile Maintenance and Repair

- ✓ Don't wash cars on a driveway where soapy water may flow to the storm drain. Wash cars on a lawn or unpaved surface, and use non-toxic/biodegradable soap. Dispose leftover water into a sink/toilet, and not on the street or in the storm drain.

- ✓ If you change motor oil or antifreeze, dispose through your local recycling program. Do not dump into the storm drain or on the ground.

- ✓ Check vehicle for leaks. Soak up spills and leaks with absorbent rags or kitty litter. If you have a leaking car, place a piece of remnant carpet under the leak to capture it while you fix the leak.

- ✓ Show your support of the Urban Runoff Program by washing your vehicles at commercial car washes that recycle water, and taking your vehicle to repair shops that implement environmentally sound practices (to identify these businesses, check to see if they have green stickers, if this green sticker program has been implemented).

General Home Maintenance

- ✓ Dispose of all waters from cleaning of carpets, upholstery, and other surfaces into the sink or toilet and not the storm drain.

- ✓ If you hire someone to clean carpets and upholstery for you, make sure they empty the cleaning water tanks into a sink or toilet, and not the storm drain.

- ✓ Discharge swimming pool or spa water into the sanitary sewer. Call local wastewater treatment plant before you discharge for guidance. Alternatively, dechlorinate the water and reuse for lawn irrigation.

- ✓ Dispose of pool or spa filter rinsewater and backwash into soil or sanitary sewer, and not into the storm drain.

- ✓ Dispose of water-based paint (but do not throw away unused portions if possible) and paint cleaning water into the sink or toilet, and not the storm drain. Empty (clean) paint cans may be disposed in the trash. Oil-based paint and paint cleaning products require disposal at an appropriate waste disposal facility.

- ✓ Sweep walkways and driveways before washing, and use non-toxic soap.

Landscaping, Irrigation, Yard and Other Waste Disposal

- ✓ Minimize use of chemical fertilizers.

- ✓ Limit fertilizer applications to twice a year (fall and spring).
- ✓ Don't apply fertilizer if rain is forecast.
- ✓ Do not over-water and cause irrigation water to runoff into storm drains. This will carry soil, fertilizers, herbicides and pesticides into the storm drain.
- ✓ Collect lawn and garden clippings, pruning wastes, and tree trimmings. Compost or dispose appropriately. Do not place these materials on the sidewalk, street or gutter.
- ✓ Do not blow or rake leaves, etc. into the street.
- ✓ Pick up and dispose of pet waste. Do not leave it on the sidewalks or the street from where it could wash into the storm drain.
- ✓ Sweep street, sidewalk and patios before storm events, and dispose of litter into the trash.

Weed and Pest Control

- ✓ Use pesticides and herbicides only if there is an actual problem (not as a preventative measure).
- ✓ Use the least toxic pesticide if alternatives are available. Products labeled with terms such as "caution" and "danger" are generally toxic.
- ✓ Use minimum amounts of pesticides and herbicides necessary for the job.
- ✓ Don't use pesticides or herbicides if rain is expected.
- ✓ Don't mix or prepare pesticides for application near storm drains.

Minor Concrete, Masonry, and Asphalt Repair

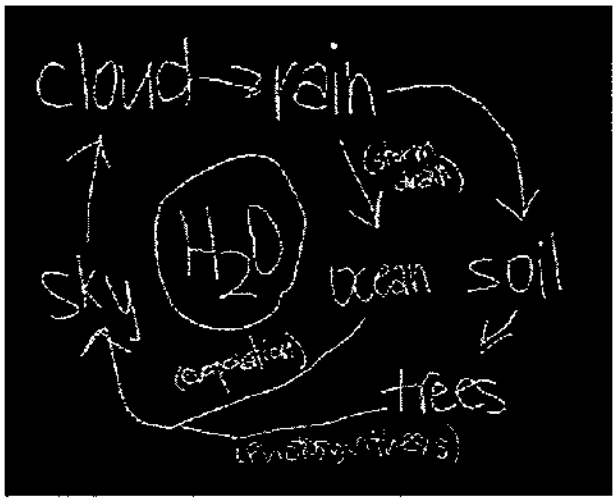
- ✓ Place tarps or dropcloths under mixers or in areas to be used for mixing.
- ✓ Hose down mixers, tools, and other equipment in a dirt area where the rinse water can soak into the ground and not run into the creek or storm drain.
- ✓ Clean up surfaces with a broom at the end of day. Don't hose down to clean.
- ✓ Apply asphalt sealant to driveways when no rain is forecast.
- ✓ If you are contracting the work, inform the contractor of these best management practices.

4F Sample Assembly Programs

Following the success of last year's show "CANOPY"

STOPPP and Will & Co. present

Water Cycle



Design: Minoe Bonere, Ink

A highly interactive assembly for K-6. Water Cycle is a two-person play that introduces children to our urban forest and the natural cycles at work within it. The play reaches for a child's imagination through drama, visual humor and student interaction. Through the use of non-verbal disciplines, students discover they can make a difference and are able to translate what they have learned into new daily habits!

When Nell is sent to the store, her simple journey takes her through the City Forest. She meets Mr. Tree, who is dehydrating, Mr. Squirrel, who's got the blues from lack of food from the trees, Catch Basin, who's choking from the trash in the streets, and Grass-iolio, who mourns the loss of his beloved Chlorophylla.

COST

Water Cycle is a FREE! program to San Mateo County Schools, support provided by STOPPP.

TIME

Water Cycle will be available from May 4 - 6. For booking call (510) 874-3193

LENGTH

Performances are 30-40 minutes long depending on the age range of the audience.

LANGUAGE

Performances are available in English, Spanish or English/Spanish.

ONLY RAIN IN THE STORM DRAIN

To book call
(510) 874-3193

Canopy

Written by Colin Cox & JuliAnn Taylor
Produced in conjunction with TreePeople

Canopy is a two-person play enabling young audiences, through a hands-on experience, to understand the importance of preserving and nurturing the world around us. Melaleuka and Jack Aranda take us on a fabulous journey through the treasures of the city forest, recruiting audience participation and surprise student "guest stars". As they meet the tree surgeon, the treasure man and the litterbug, we discover what needs to be done to preserve our natural heritage. A perfect introduction for primary level, it is a vital piece of theatre supporting the aims of the teacher in the classroom.

photo credit: Fran de Leon

The first in the series of education through interactive theatre, Canopy was co-created by TreePeople and initially contracted by theStormwater Division of the City of Los Angeles. Canopy has played to over 250,000 schoolchidren and parents.

Available in English, Spanish and Spanish/English.
Running Time: 40 minutes
Grade levels: 1-6

Also see:
Oil's Well That Ends Well
Water Cycle: Where Does it Come From Where Does It Go?
Juan & Oona's Math Adventure

Touring Programs Home Page About Will & Company E.Mail

"CANOPY" PRE-ASSESSMENT

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP) welcomes your class to "Canopy," an assembly program which teaches children about the importance of trees in our environment and the purpose of the storm drain system in our communities. To evaluate the effectiveness of the "Canopy" assembly program, STOPPP depends on teacher and student feedback. Students' responses recorded on this pre-assembly gauge will be used to quantify what they learned from the assembly program. Please take a few minutes to go over this gauge and the vocabulary list to introduce "Canopy" to your students before the performance. (Please note that the instructional materials enclosed were developed for 4th grade students. The materials may be adapted accordingly for upper and lower grades.)

Teacher's Name: _____ School: _____

Grade: _____ Number of students in your class: _____

Ask students what some of their favorite beach activities are. Do they fish? Do they surf, jet ski, water ski, swim, play in the sand? *List responses on the board.*
Which beaches do they go to? *List responses on the board.*
Ask students if there has ever been a time when they didn't want to play in the beach water. Ask them to describe the situation. (Maybe it was too cold, the water didn't look clean, or they would rather play in the sand or explore.)

Tell students that an assembly program entitled "Canopy" is coming to their school to talk about trees and how we can help keep our water—the Bay, Ocean, Lagoon—clean. Before they see "Canopy," STOPPP would like their responses to the following questions:

(1) Ask students to think a minute about storm drains, those grates you see along curbsides. When water enters a storm drain, it flows underground through some pipes and channels. Where does it go after that? How many of you think that: *(Count the number of students for each response.)*

_____ a. the water flows directly to the Bay/Lagoon/Ocean.
_____ b. the water gets cleaned at a treatment facility then goes to the Bay/Lagoon/Ocean.
_____ c. other: _____

(2) How about when you flush the toilet, or take a bath, the water flows through the pipes in your home. Where does that wastewater go after it leaves your home? How many of you think that:

_____ a. the water flows directly to the Bay/Lagoon/Ocean.
_____ b. the water gets cleaned at a treatment facility then goes to the Bay/Lagoon/Ocean.
_____ c. other: _____

Review the attached vocabulary list with your students to familiarize them with words they might hear during the assembly.

While supplies last, receive a free gift for each of your students
by mailing your completed pre- and post-assessments (blue sheets) to:
Robin Plutchok, Woodward-Clyde Consultants, 500 12th Street, Suite 500, Oakland, CA 94607.

"CANOPY": POST-ASSESSMENT

In order for the San Mateo Countywide Stormwater Pollution Prevention Program to improve its "Canopy" assembly program, we depend on teacher and student feedback. Please take a few minutes to go over this questionnaire with your students.

Teacher's Name: _____ School: _____

Grade: _____ Number of students in your class who attended the assembly program? _____

After the students watch "Canopy," gauge what they have learned by asking them the following questions:

(1) When water enters a storm drain, it flows underground through some pipes and channels. Where does it go after that? How many of you think that: *(Count the number of students for each response.)*

_____ a. the water flows directly to the Bay/Lagoon/Ocean.
_____ b. the water gets cleaned at a treatment facility then goes to the Bay/Lagoon/Ocean.
_____ c. other: _____

(2) When you flush the toilet, or take a bath, the water flows through the pipes in your home. Where does that wastewater go after it leaves your home? How many of you think that:

_____ a. the water flows directly to the Bay/Lagoon/Ocean.
_____ b. the water gets cleaned at a treatment facility then goes to the Bay/Lagoon/Ocean.
_____ c. other: _____

(3) Ask your students to name some things we can do to prevent stormwater pollution?

(4) What did the students learn that they didn't know before?

(5) What did the students like about the performance?

(6) What did the students not like about the performance?

STOPPP would be very interested in hearing about follow up activities that you have conducted in your class. Please contact Vern Bessey at (415) 579-7751 if you have an exciting project you'd like to share with the County, e.g., videotape of student plays, correspondence with policy makers, pictures of a field trip, journal entries, dioramas... anything showing your students engaged in stormwater pollution prevention activities.
Thank you for your participation.

While supplies last, receive a free gift for each of your students by mailing your completed pre- and post-assessments (blue sheets) to:
Robin Plutchok, Woodward-Clyde Consultants, 500 12th Street, Suite 500, Oakland, CA 94607.

VOCABULARY LIST

Stormwater	⇒ Rain water
Waterways	⇒ Streams, creeks, rivers, the Bay and the Pacific Ocean.
Stormwater Pollution or Urban Runoff	⇒ Water from rain, hoses or sprinklers that falls on roof tops, streets, sidewalks, and yards in urban areas. This water does not get absorbed into the ground but flows to lower areas. Urban runoff normally flows through storm drains directly into local creeks and waterways, without treatment.
Storm Drain System	⇒ A network of aboveground and underground drains, pipes, and ditches that collects stormwater and runoff and carries it to local waterways. The system was designed to protect property and people in case of floods.
Watershed	⇒ The upstream land area whose runoff contributes to a common body of water, e.g., the San Francisco Bay watershed consists of all mountains, hills, cities and towns bordering and upstream from the Bay.
Wastewater	⇒ Sewage water from toilets, sinks, showers, and washing machines, from residential or commercial buildings. Industries also have wastewater, e.g., an oil refinery has a stream of toxic wastewater that must be treated.
Wastewater Collection System	⇒ Through underground pipes, wastewater from homes, industries and businesses is carried to a local treatment plant where it is cleaned before the wastewater reaches local waterways. These pipes are separate from those used in the storm drain system.
Wastewater Treatment Facility	⇒ A facility that cleans sewage water before releasing it into local waterways.

"CANOPY" ASSEMBLY PROGRAM: SUGGESTED FOLLOW-UP CLASS FIELD TRIPS

A visit to any one of the following facilities/locations would provide greater understanding of the importance of clean water.

The **Coyote Point Museum** in San Mateo familiarizes visitors with the Bay Area ecology and environmental issues via live animal presentations, innovative dioramas, and stimulating programs. Programs include on-site, hands-on activities; hikes to the foothills, tidepool explorations; and in-class presentations.
(415) 342-7755

The **Bay Model Visitor Center** in Sausalito, Marin County, displays a hydraulic model of the San Francisco Bay which is used to "examine issues of oil spills, salt water intrusion and the dispersion of pollutants." Guided tours are available.
(415) 332-3871, Ron McDonald

The **Harry Tracy Filter Plant** in San Bruno is a water filtration plant which provides drinking water to residents from San Francisco all the way to Redwood City.
(415) 872-5936, Paul Mazza

The **Pulgas Water Temple,** near the Filoli Flower Center, in Redwood City mimics a Greek temple and was originally built in commemoration of the beginning of the Hetch-Hetchy water system, from Moccasin, California to Palo Alto, California. See your local library for more information. For directions to the site, call the San Francisco Water Department (415) 872-5900.

Local wastewater (sewage) treatment plants: See for yourself how wastewater from residences, businesses and industries is treated before discharged into local waterways.

- Burlingame Wastewater Treatment Facility
  (415) 342-3727
- Daly City, North San Mateo County Sanitation District
  (415) 991-8208
- Half Moon Bay, Sewer Authority Mid-Coastside
  (415) 726-0124
- Millbrae, Wastewater Treatment Plant
  (415) 259-2388
- Pacifica, Wastewater Treatment Plant
  (415) 738-7348
- Redwood City, South Bayside System Authority
  (415) 591-7121
- San Mateo, EMID Wastewater Treatment Plant
  (415) 377-4690
- South San Francisco, Water Quality Control Plant
  (415) 877-8634

The **Palo Alto Baylands Nature Center** promotes habitat preservation and appreciation. This program features nature walks through the Palo Alto Baylands in addition to arts and crafts projects.
(415) 329-2506

The **Hidden Villa Environmental Education Program** "engages children and adults in hands-on, innovative programs promoting environmental awareness and multi-cultural understanding" through participation on a 1600-acre organic farm and wilderness preserve. The HVEEP program shows children the impact of human lifestyles on the environment.
(415) 949-8644

The **Marine Science Institute** provides marine science education to students via a boat trip, a Bayside discovery lab, and a Marine Science Mobile which brings the Bay to the classrooms. Students conduct hands-on activities, explore living organisms in their natural habitats, and learn to appreciate the natural vitality of the area.
(415) 364-2760

The **San Mateo Outdoor Education Program** is a week long residential program for fifth and sixth graders. Conducted in La Honda, California, the program develops students' knowledge about the environment, appreciation of nature, and involvement as citizens in an increasingly interdependent world.
(415) 802-5360

Visit your **local recycling facility** to find out what happens after your waste hauler collects your recyclable paper, cans, plastic bottles, or used motor oil. Students can observe the process of recycling first hand. Call your local recycling facility. See the yellow pages or call the local garbage company.
(415) 637-1411, BFI Recyclery in San Carlos

"CANOPY" ASSEMBLY PROGRAM: SUGGESTED FOLLOW-UP CLASS ACTIVITIES

Be Part of the Solution: Class Action

Participate in local **Coastal Cleanup** activities in September, or adopt-a-beach, local creek or waterway. (415) 904-5200, Chris Perry

Stencil school or local storm drains. The most effective message has been the "No Dumping, Flows to Bay/Lagoon/Ocean" stencil on storm drains. Call your local STOPPP representative for more information.

Atherton	688-6529
Belmont	595-7426
Brisbane	467-1853
Burlingame	696-7230
Colma	997-8300
Daly City	991-8200
East Palo Alto	853-3189
Foster City	349-1200
Half Moon Bay	726-8260
Hillsborough	579-3811
Menlo Park	858-3420
Millbrae	259-2300
Pacifica	738-7348
Portola Valley	851-1700
Redwood City	780-7464
San Bruno	877-8828
San Carlos	595-1456
San Mateo, City of	377-4632
San Mateo County	363-4708
South San Francisco	877-8634
Woodside	851-6790

Write letters to your local elected official. See your local yellow pages for addresses.

Small Group Or Individual Activities: Learn More about the Importance of Keeping Our Local Waterways Clean

Invite a **guest speaker** from STOPPP to your class. Call your local STOPPP representative (see phone number listed under stenciling activities).

Visit your local library for **books or videos** associated with a clean water message, such as:

- Island of the Blue Dolphin
- Magic School Bus: Weather
- Magic School Bus: The Water Works

Create a **diorama, poster, map, slide show, brochure or video** illustrating the difference between the sewage system and the storm drain system.

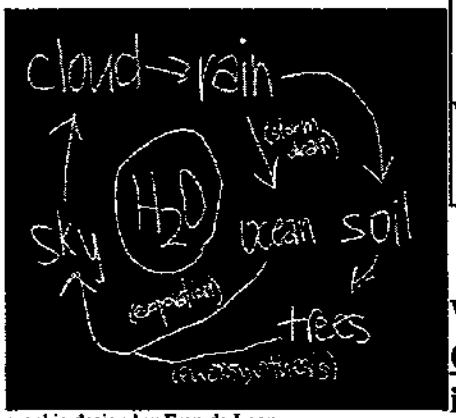
Create a **model of a watershed** (including mountains, towns, rivers, creeks, farms, cities, bay, and the ocean) demonstrating how communities and nature can impact water quality.

Develop a **skit, song, or poem** related to stormwater pollution prevention and perform it to the class (video tape if possible).

Develop and **conduct a survey** to find out how many of your neighbors and family members understand the difference between the storm drain system and the wastewater system. Compare results. Develop a brochure to educate those surveyed.

Have small groups of students **inspect 3 local storm drains** for stormwater pollution. What do they see in or around the storm drain? Have each group present findings. Compare findings among all the groups.

Create a chart of family practices which contribute to storm water pollution (e.g., car washing, changing motor oil, using a lot of fertilizers, etc.). Discuss alternatives which would prevent stormwater pollution (e.g., washing one's car at a car washing facility not in one's driveway; recycling used motor oil; or applying proper amounts of fertilizer).



graphic design by: Fran de Leon

Water Cycle

Where Does It Come From and Where Does It Go?

Written by
Colin Cox & Fran de Leon
in a co-production with
TreePeople

When Nell is sent to the store to pick up some water, her simple journey takes her through the City Forest. She meets Mr. Tree who is dehydrating, Mr. Squirrel who's got the blues from lack of food from the trees, Grass-olio who mourns the loss of his beloved Chlorophylla, and Catch Basin who is choking from the amount of trash in the streets.

A highly interactive theatre assembly for K-6, the audience participates by representing landfills, recycling centers and the earth, with several students making on-stage appearances.

Co-created by TreePeople, "Water Cycle" is the long-awaited follow up to the hit show "Canopy", and once again utilizes Will & Company's trademark style of education through entertainment. Keep 'em laughing while they learn with "Water Cycle: Where Does It Come From and Where Does It Go?".

Running Time: 45 minutes
Available in English, Spanish, and English/Spanish

Also see:
"Canopy"
"Juan & Oona's Math Adventure"

Touring Programs | Home Page | About Will & Company | E.Mail

Canopy

Written by Colin Cox & JuliAnn Taylor
Produced in conjunction with TreePeople

Canopy is a two-person play enabling young audiences, through a hands-on experience, to understand the importance of preserving and nurturing the world around us. Melaleuka and Jack Aranda take us on a fabulous journey through the treasures of the city forest, recruiting audience participation and surprise student "guest stars". As they meet the tree surgeon, the treasure man and the litterbug, we discover what needs to be done to preserve our natural heritage. A perfect introduction for primary level, it is a vital piece of theatre supporting the aims of the teacher in the classroom.

photo credit: Fran de Leon

The first in the series of education through interactive theatre, Canopy was co-created by TreePeople and initially contracted by theStormwater Division of the City of Los Angeles. Canopy has played to over 250,000 schoolchidren and parents.

Available in English, Spanish and Spanish/English.
Running Time: 40 minutes
Grade levels: 1-6

Also see:
Oil's Well That Ends Well
Water Cycle: Where Does it Come From Where Does It Go?
Juan & Oona's Math Adventure

Touring Programs Home Page About Will & Company E.Mail

4G Volunteer Monitoring Information Sources

VOLUNTEER MONITORING INFORMATION SOURCES

California's Directory of Volunteer Monitoring Organizations

State Water Resources Control Board
Contact: Gwen Starrett
(916) 657-0518 or "starg@gwgate.swrcb.ca.gov".

Designed to identify community groups in Califronia that are monitoring aquatic resources such as: creeks, rivers, bays, lakes, estuaries, and ocean waters. Intended to increase communication between the community groups of California so that groups might learn from one another's successes and challenges.

Riparian Station How-to Manual

Contact: Steve Cochran
Friends of the Estuary/San Francisco Estuary Project
2101 Webster Street, Suite 500
Oakland, CA 94612-3060
Phone: (510) 286-6798

Designed to help interested individuals start up a volunteer monitoring group. Addresses key issues which challenge groups as they establish and maintain riparian stations in their watersheds. Not intended as a "cookbook" guide to starting a Riparian Station. ($5.00)

Volunteer Monitoring Protocols

Contact: Steve Cochran
Friends of the Estuary/San Francisco Estuary Project
2101 Webster Street, Suite 500
Oakland, CA 94612-3060
Phone: (510) 286-6798

Lists protocols available for California monitoring. Intended to assist local groups in understanding key elements of their surrounding environment. Some of the protocols included are for rainfall, water quality, low flow profile, vegetation resources, birds, reptiles/amphibians, and macroinvertebrates. Each protocol includes the steps involved and the value and constraints of the data. For each protocol, sample sheets are included to promote consistency in data management. ($5.00)

4H Recordkeeping/Report Forms

PUBLIC EDUCATION/OUTREACH REPORTING AND EVALUATION FORM

Name:_____

City:_____

Date:_____

Summary of Public Education/ Outreach Activities Sponsored/Produced This Year:

Education/Outreach Activity	Target Audience	Location	Date(s)	Was Education/ Outreach Effort Successful?	Changes for Next Year
				☐ Yes ☐ No	
				☐ Yes ☐ No	
				☐ Yes ☐ No	
				☐ Yes ☐ No	
				☐ Yes ☐ No	
				☐ Yes ☐ No	

Summary of Additional Educational/ Outreach Activities Planned for Next Year:

Education/Outreach Activity	Target Audience	Target Start Date

4I Sample Inspection/Reporting Forms

CITY OF_____FIELD DATA SHEET
SANTA CLARA VALLEY ILLEGAL DUMPING PROGRAM

A) GENERAL INFORMATION: LOCATION ID #:_____ SHEET #:_____ DATE:_____
LOCATION NAME:_____ TIME:_____

FIRST VISIT? Y / N TIME SINCE LAST VISIT_____.
WEEKS SINCE LAST RAIN: (≥ 0.1") <1 2 >3 INSPECTION TEAM:_____

B) FIELD SITE DESCRIPTION:

OPEN CHANNEL MANHOLE OUTFALL OTHER_____

DOMINANT WATERSHED LAND USES: INDUSTRIAL COMMERCIAL RESIDENTIAL UNKNOWN OTHER_____
IF KNOWN, LIST THEM:_____

C) FLOW ESTIMATION: FLOW OBSERVED YES NO APPROXIMATE PIPE DIAMETER:_____
see Tables on back of this sheet for calculating flowrates if no calculator is available.

1.) WIDTH OF WATER SURFACE(feet) (1)_____ft.
2.) APPROX DEPTH OF WATER (inches)_____in. DIVIDE BY 12 TO GET feet (2)_____ft.
3.) APPROX FLOW VELOCITY (3a)_____feet in (3b)_____seconds. OR (3a/3b) = feet per second_____ft/s.
4.) FLOW RATE (cubic feet per second) = (1) x (2) x (3a/3b) = _____cfs.

D) VISUAL OBSERVATIONS: PHOTO TAKEN NO YES...ROLL(S) AND PHOTO NUMBER(S)_____

ODOR. NONE MUSTY AMMONIA SEWAGE ROTTEN EGGS SOUR MILK OTHER_____

COLOR: CLEAR RED YELLOW BROWN GREEN GREY OTHER_____

CLARITY: CLEAR CLOUDY OPAQUE SUSPENDED SOLIDS

FLOATABLES: NONE OILY SHEEN GARBAGE/SEWAGE OTHER_____

DEPOSITS / STAINS: NONE SEDIMENTS OILY OTHER_____

VEGETATION CONDITION: NONE NORMAL EXCESSIVE GROWTH INHIBITED GROWTH

STRUCTURAL CONDITION: NORMAL CONCRETE CRACKING/SPAULING METAL CORROSION OTHER_____

BIOLOGICAL: MOSQUITO LARVAE BACTERIA/ALGAE OTHER_____

E) FIELD ANALYSES:

DO:_____ mg/l
WATER TEMP: _____degrees C
pH _____
AMMONIA: _____mg/l
CHLORINE (FREE): _____mg/l
CHLORINE (TOTAL): _____mg/l

FIELD ANALYSES:

CHROMIUM (HEX): _____mg/l
COPPER: _____mg/l
CYANIDE: _____mg/l
GLYCOL: _____mg/l
PHENOL _____mg/l

LABORATORY SAMPLE COLLECTED YES NO IF YES, ATTACH COPY OF CHAIN-OF-CUSTODY RECORD
NOTE LABORATORY SAMPLE ID NUMBERS AND SAMPLE DESCRIPTIONS: _____

F) COMMENTS: _____

DATA SHEET FILLED OUT BY (SIGNATURE):_____

Illicit Discharge/Connection Reporting and Response

Date/Time:

Reported by:

Address:

Phone:

Location:

Report:

Material

- ☐ Hazardous
- ☐ Wastewater
- ☐ Oil/Grease
- ☐ Sediment
- ☐ Other_____
- ☐ Unknown

Land Use

- ☐ Residential
- ☐ Commercial
- ☐ Industrial
- ☐ Public

Est. Quantity:

Direct/Constructed Connections Found? ☐ Yes ☐ No

Description:

Source Investigation Conducted? ☐ Yes ☐ No

Source Identified? ☐ Yes ☐ No

Source/Owner of Discharge/ Connection:

Entered Storm Drain System/Receiving Waters? ☐ Yes ☐ No

Action and Closure

Referred To:

Phone:

City:

Dept.:

Action Taken:

Date Closed:

Performance Standard and Supporting Documents for
Illicit Connection & Illegal Dumping Elimination Activities

Co-permittees should report annually the results of their program using the following standard reporting form. Co-permittees should also maintain documentation of illicit connection and illegal dumping incident type(s); results should be available upon request. See Table 3, pg.12 for model format.

Co-permittee Reporting Form

Resource Commitment

1) Have you identified where responsibility for ICID enforcement is located within your jurisdiction?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

Training/Education/Outreach

2) Have your ICID inspectors received necessary training?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

3) Have you implemented appropriate outreach efforts to reduce non-permissible non-storm storm water discharges?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

4) Have you conducted annual spill response drills (if no event occurred to evaluate your plan) in cooperation with other agencies or industries?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

5) When a responsible party for an illegal dumping incident and/or illicit connection to the storm drain system has been identified, have you educated the party on the impacts of their actions?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

Complaint Referral/Incident Response System

6) Have you followed existing spill response and clean-up programs used within your jurisdiction?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

7) Have you developed and/or are you implementing a formalized inter-agency referral process for internal referrals (within a co-permittee's jurisdiction) and referrals between co-permittees?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

Field Investigations

8) Have you conducted field investigations which include inspecting portions of the municipal storm drain system for potential sources of non-storm water discharges?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

9) Are observed discharges referred to the appropriate agency?

☐ Yes ☐ No If no, provide a detailed explanation and time schedule for implementation.

Alameda Countywide
Clean Water Program
A Consortium of Local Agencies

Illicit Discharge Inspection Quarterly Summary Report

Fiscal Year: _____

Municipality: _____

Contact: _____

Reporting Period: July, August, September — October, November, December
January, February, March — April, May, June

I. Field Activities

1. *Describe field surveys.*

	Industrial Areas	Commercial Areas	Residential Areas
Number of screening points (as defined in the Annual Action Plans)			
Channel Miles			

2. *List how many discharges were identified by the following methods.* Include only discharges that could have been prevented by BMPs. Do not include fluid releases associated with minor traffic accidents.

a. During field surveys at defined screening points:

_____ identified by maintenance crews

_____ identified by illicit discharge inspectors

b. Calls from:

_____ maintenance crews

_____ other agencies

_____ public

3. *List the number of times the following materials were identified.*

_____ Paint

_____ Concrete

_____ Construction Debris

_____ Medical Wastes

_____ Food Wastes

_____ Yard Wastes

_____ Industrial Wastes (solvents, metals, corrosives, cooling tower blowdown, etc.)

_____ Concrete Cutting Slurry/Washwaters

_____ Vehicle Cleaning Washwaters

_____ Building/Sidewalk Washwaters

_____ Other Washwaters

_____ Sewage

_____ Automotive Fluids (antifreeze, used motor oil, fuels, etc.)

_____ Other (describe):

II. Follow-up Activities

1. *Describe whether sources of discharges were identified.*

_____ Number of sources that were identified

_____ Number of incidents when source of discharge was not identified

2. *Describe whether discharges were abated.*

_____ Number of discharge incidents that were abated

_____ Number of new discharge incidents where discharge is continuing, as of the end of the reporting period; Attach the inspection report

_____ Number of continuing discharges that have already been reported in previous quarter(s).

3. *Describe enforcement activities conducted.*

_____ Verbal Notice

_____ Administrative Action

_____ Legal Notice

_____ Warning Notice

_____ Administrative Action w/Penalty &/or Fine

TABLE 3 - Model Format

(Co-permittees Name) Illegal Dumping and Illicit Connection Incident Type(s)

TYPE OF INCIDENT	NUMBER OF INCIDENTS
Auto Dealers	
Washing Cars	
Auto Shops	
Radiator Fluid	
Waste Water	
Auto-Residential	
Fuel Leaking	
Car Washing	
Car Repair	
Radiator Draining	
Oil Dripping	
Residential	
Apartments	
Other	
Commercial	
Irrigation	
Construction	
Sediment	
Asphalt Cuttings	
Other Materials	
Carpet Cleaning	
Cement Washing	
Commercial	
Industrial	
Residential	
Responses to Non-problems	
No Discharge	
Allowable Non-storm Water Discharge	
Cooling Water	
Drums Abandoned	
Equipment Cleaning	
Commercial	
Residential	
Industrial	
Grocery Store	
Dumpsters	
Grey Water	

TYPE OF INCIDENT	NUMBER OF INCIDENTS
Gas Stations and Vehicle Service Facilities	
Washing Cars	
Radiator Fluids	
Industrial	
Fuel Leaking	
Paint	
Parking Lots	
Pools & Spas	
Residential	
Grey Water	
Sediment	
Irrigation	
Restaurants	
Dumpsters	
Grey Water	
Oil & Grease	
RV Waste Dumping	
Sewage Spills	
Shops (Non Auto)	
Washing	
Spills	
Sumps	
Used Oil Dumping	
Res.- Apt.	
Res. - Other	
Comm. - All	
Misc. Incidents (total)	
Resolved	
Under Investigation	
Illegal Dumping (total)	
Resolved	
Under Investigation	
Illicit Connections (total)	
Resolved	
Under Investigation	

4J BMPs for Municipal Operations

Good Housekeeping Practices for Municipal Operations

Focus of Document

This guidance presents BMPs or good housekeeping practices to address the discharge of pollutants to the storm drain system from municipal facilities. These facilities include:

- ✓ Streets, Roads, and Highways
- ✓ Sidewalks, Plazas, and Municipal Parking Lots
- ✓ Street Medians, Other Landscaped Areas, and Golf Courses
- ✓ Storm Drain Systems Including Open Channels, Inlets, Catchbasins, and Storm Drain Pipelines
- ✓ Corporation Yard and Other Municipal Operations Areas
- ✓ Municipal Swimming Pools, Fountains, Lakes, Lagoons and Other Urban Water Bodies

As discussed in Section 4.4 of the MURP, most municipalities have existing municipal programs that involve cleaning and maintenance of these facilities. The BMPs listed below are recommended improvements to existing activities or functions in order to reduce the potential for urban runoff pollution. Also, see Appendix 3L for additional BMPs for Corporation Yards.

Pollutants of Concern and Their Sources

Some of the pollutants of concern from these areas may be:

- ✓ Metals (from roads, sidewalks, parking lots, corporation yard, and other municipal areas)
- ✓ Oil and Grease (from corporation yard)
- ✓ Organic matter (from streets and landscaped areas)
- ✓ Fertilizers, pesticides, and herbicides (from landscaped areas)
- ✓ Chemical products used for disinfection and algae control (from pools, fountains, and water bodies)
- ✓ Gasoline and radiator fluid (from streets, parking lots, and corporation yard)

- ✓ Sediment; asphalt; concrete; trash and debris; and soil (all urban areas)

Street Sweeping and Cleaning

Sweeping Frequency and Timing

- ✓ Establish street sweeping frequency for your municipality, or portions of it, based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc. In general, the following frequencies are recommended:
  - Sweep weekly in high traffic downtown areas
  - Sweep twice a month for moderate traffic collector streets, and
  - Sweep monthly in residential, low traffic areas.

  One way to determine the areas that should be swept more frequently is to collect data on the total volume or weight of materials collected per mile of road swept. Use this data to prioritize areas to be swept more frequently.

- ✓ Where there is a pronounced dry and wet season, sweep streets just before onset of the wet season.

- ✓ Establish and maintain a consistent sweeping schedule.

- ✓ Avoid wet cleaning or flushing of street, and utilize dry methods where possible.

- ✓ If wet cleaning or flushing is absolutely necessary, sweep and remove debris before flushing; plug storm drain inlet and direct washwater to the sanitary sewer. Alternately, allow washwater to drain to the storm drain and collect it downstream at a manhole or storm drain cleanout.

Maximum Access for Sweepers

- ✓ Institute restrictive parking policy to allow sweepers better access to areas close to the curb and storm drain inlets.

- ✓ Post permanent street sweeping signs. If installation of permanent signs is not possible, use temporary signs.

- ✓ Develop and distribute flyers notifying residents of street sweeping schedules.

Equipment

- ✓ Maintain cleaning equipment in good working condition.

- ✓ Use your most effective sweepers in the high sediment and trash areas (typically industrial/commerical).
- ✓ Replace old sweepers with new technologically advanced sweepers (see Appendix 3K for an evaluation of available sweepers).
- ✓ Clean sweepers at a wash rack that drains to the sanitary sewer.

Residuals Disposal

- ✓ Dispose of street sweeping debris and dirt at a landfill.
- ✓ Do not leave street sweeping debris and dirt in piles along the side of the road or by a riparian area.
- ✓ If dewatering of dirt collected is necessary, the water should be discharged to a sanitary sewer.

Sidewalks, Plazas, Structures, and Parking Lot Cleaning

- ✓ Post “No Littering” signs and enforce anti-litter laws.
- ✓ Provide litter receptacles in busy, high pedestrian traffic areas of the community.
- ✓ Clean out and cover litter receptacles frequently to prevent spillage.
- ✓ Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation. Sweep all parking lots at least once before the onset of the wet season.
- ✓ Use dry methods of cleaning such as sweeping and vacuuming to clean sidewalks and other paved surfaces rather than hosing, pressure washing or steam cleaning. If water must be used, implement methods specified in Table 1 to minimize illegal discharges.
- ✓ Use instructions in Table 1 for cleaning of structures.
- ✓ Clean up spills using methods listed below.
  - Prepare a spill response plan.
  - Store spill response materials (containment materials such as booms; absorbents, etc) on municipality’s vehicles (as appropriate) or at a central location.

Table 1. Cleaning of Surfaces and Structures

Type of Surface	Characteristics	Cleaning Technique	Discharge to Storm Drain	Disposal Alternatives
Sidewalks, Plazas	No oily deposits	Sweep, collect and dispose of debris and trash; then wash.	Okay to discharge to storm drain.	
Sidewalks, Plazas, Driveways	Light oily deposits	Sweep, collect and dispose of debris and trash. Clean oily spots with absorbent, place oil-absorbent boom around storm drain, or a screen or filter fabric over inlet.	Okay to discharge to storm drain, provided an oil-absorbent boom or filter fabric is used. No oily sheen should be visible in the water draining into the storm drain.	
Parking lots and driveways	Heavy oily deposits	Sweep, collect and dispose of debris and trash. Clean oily spots with absorbent materials. Use a screen or filter fabric over inlet, then wash surfaces.	Seal storm drains. Can not be discharged to the storm drain.	Vacuum/pump wash water to a tank or discharge to sanitary sewer.
Building exteriors and walls	Glass, steel, or painted surfaces (post1978/no lead in paint	Washing without soap.	Okay to discharge to storm drain provided the drain is sealed first with a fabric filter to capture dirt, paint particles and flakes or oil absorbent boom.	Can alternately be sent to landscape areas.
		Washing with soap.	Can not be discharged to storm drain.	Direct washwater to sanitary sewer or vacuum/pump water to a tank.
Building exteriors	Painted with lead-based or mercury-additive paint	Washing with or without soap.	Seal storm drains. Cannot be dischsrged to storm drain.	Vacuum/pump to a tank. Check with POTW for discharge to sanitary sewer.
Graffiti Removal	Graffiti	Using wet sand blasting. Minimize use of water; sweep debris and sand.	Can be discharged to storm drain if washwater is filtered through a boom.	Can alternately be directed to landscaped areas.
		Using high pressure washing and cleaning compounds.	Seal storm drains. Cannot be dischsrged to storm drain.	Vacuum/pump washwater to sanitary sewer. Check with POTW about pre-treatment.
Masonary	Mineral Deposits	Acid Washing.	Seal storm drains. Cannot be discharged to storm drain.	Rinse treated area with alkaline soap and direct washwater to a landscaped or dirt areas. Alternately, washwater may be collected and neutralized to a pH between 6 and 10, then discharged to landscaping or pumped to sanitary sewer.

Source: Santa Clara Valley Urban Runoff Pollution Prevention Program

- Use dry methods of cleaning including vacuuming, scooping, using rags and absorbents. Avoid hosing where possible. If washing is necessary, clean to extent possible before hosing or power-washing.

- Appropriately dispose of spilled materials and absorbents.

- If a spill occurs on dirt, excavate and remove the contaminated (stained) dirt.

Street Medians, Parks, and Other Municipal Landscaped Areas

Erosion Control

✓ Maintain vegetative cover on medians and embankments to prevent soil erosion. Apply mulch or leave clippings in place to serve as additional cover.

✓ Do not use disking as a means of vegetation management because the practice results in erodable barren soil.

✓ Provide energy dissipators (e.g., riprap) below culvert outfalls to minimize potential for erosion.

Vegetation Management/Irrigation

✓ When conducting vegetation pruning/removal, remove clipped or pruned vegetation from gutter, paved shoulder and area around storm drain inlet.

✓ When conducting mechanical or manual weed control, avoid loosening the soil which could erode into stream or storm drain.

✓ Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

✓ When bailing out muddy water, do not put it in the storm drain; pour over landscaped areas.

Pesticides (Diazinon, Chlorpyrifos, and other Similar Products)

✓ Follow federal, state, and local laws governing the use, storage, and disposal of pesticides/herbicides.

✓ Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).

- ✓ Avoid use of copper-based pesticides if possible. Use the least toxic pesticide for the job if alternatives are available.

  California Department of Pesticide Regulation is conducting a review of pesticidal and non-pesticidal alternatives to diazinon and chlorpyrifos for urban uses (see DPR site on the Internet at www.cdpr.ca.gov).

- ✓ Do not use pesticides if rain is expected.

- ✓ Do not mix or prepare pesticides for application near storm drains.

- ✓ Use the minimum amount needed for the job.

- ✓ Use up pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.

Herbicides

- ✓ Replace existing vegetation with fire-resistant and native vegetation to reduce the need for herbicides.

- ✓ Do not use herbicides if rain is expected.

Fertilizers

- ✓ Minimize use of chemical fertilizers.

- ✓ Calibrate the distributor to avoid excessive application.

- ✓ Check irrigation system to ensure that over-watering and runoff of fertilizer does not occur. Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

Storm Drain System Cleaning

- ✓ Establish a frequency for inspecting all catch basins, inlets, debris basins, and storm drain pipelines, and implement this schedule. Clean facilities where sediment, trash, and other pollutant accumulation is observed. In general, the guidance is as follows:

  - Conduct periodic visual inspections during the dry season to determine if there are problem inlets where sediment/trash accumulate. Clean if necessary. The main objective of the dry season inspections is to identify problem areas.

  - Inspect and clean all inlets and basins before onset of wet season (to ensure drainage capacity and to avoid resuspension of pollutants during a storm event)

- Conduct inspections of storm drain inlets once a month or more frequently during the wet season. The frequency may be as high as once a week for problem areas where sediment or trash accumulates more often. Clean as needed.

✓ Inspect and clean storm drain pipelines and inlets in areas affected by pollutant generating incidents immediately or at a minimum before the wet season (incidents include spills, fires, and other events that may have released pollutants to the storm drain system and residues may be present in the system in the vicinity of the event).

✓ Store wastes collected from the cleaning in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.

✓ Dewater the wastes if necessary with outflow into the sanitary sewer. Do not dewater near a storm drain or stream.

✓ Sediment (less the debris) removed from the catchbasin or inlet cleaning should be analyzed for disposal. Pollutants of concern are lead; oil and grease; and hydrocarbons. In general, based on the analysis of sediments from inlet cleaning, it appears that in older cities all these pollutants have been found at elevated levels whereas, in the newer cities, the main pollutants in inlet sediments are hydrocarbons. If concentrations are elevated, the sediment should be disposed of as hazardous waste.

Municipal Swimming Pools, Fountains, Lakes, and Other Water Bodies

Alternate Discharge Options for Chlorinated Water

✓ Test water for chlorine level and consider using it for irrigation in landscaped area or for dust suppression at a city construction project site, or

✓ If acceptable to the wastewater treatment plant in your community, discharge pool water to the sanitary sewer, or

✓ Discontinue use of chlorine before planned discharge to the storm drain and allow the active chlorine to dissipate through aeration. Test water to see if chlorine can be detected. Also test for residual chlorine every half-hour during the discharge event.

Pool maintenance personnel will have a good idea about the length of time it will take before chlorine reaches non-detect levels. Chlorine testing kits are also available with these personnel because they use these to check the water periodically before adding more chlorine.

Note that the main drawback with this option is the potential for bacteria to grow when the water is left in the pool for chlorine dissipation.

- ✓ Alternately, dechlorinate or neutralize the waters before discharge. Add minimum amounts of neutralizing chemicals necessary to produce a zero chlorine reading (see Table 2 for amounts). Test water before discharge to the storm drain. Monitor for residual chlorine at the discharge point every half hour during the discharge event.

Table 2. Amount of Neutralization Chemical Required to Neutralize 100,000 Gallons of Chlorinated Water

	Chlorine Concentration Before Neutralization			
Neutralization Chemical	**1.0 mg/l**	**2.0 mg/l**	**10.0 mg/l**	**50.0 mg/l**
Sulfur Dioxide (SO_2)	0.8 lbs	1.7 lbs	8.3 lbs	41.7 lbs
Sodium Bisulfite ($NaHSO_3$)	1.2 lbs	2.5 lbs	12.5 lbs	62.6 lbs
Sodium Sulfite (Na_2SO_3)	1.4 lbs	2.9 lbs	14.6 lbs	73.0 lbs
Sodium Thiosulfate ($Na_2S_2O_3$-$5H_2O$)	1.2 lbs	2.4 lbs	12.0 lbs	60.0 lbs

Source: Santa Clara Valley Water District. Water Utility O&M Pollution Prevention Plan

Alternative Methods to Control Algae in Lakes and Lagoons

- ✓ Reduce fertilizer use in areas around the water body.
- ✓ Discourage the public from feeding birds and fish.
- ✓ Consider introducing fish species that consume algae. *Silver carp is being studied in UK for algae control in reservoirs and results appear promising. However, use of silver carp is prohibited in California. Other candidate species are grass carp and black fish. Contact the California Department of Fish and Game for more information on this issue.*
- ✓ Mechanically remove pond scum (blue-green algae) using a 60 micron net.
- ✓ Educate the public on algae and that no controls are necessary for certain types of algae that are beneficial to the water body.

Repair and Maintenance of City Surfaces

Asphalt/Concrete Demolition

- ✓ Schedule asphalt and concrete removal activities for dry weather.
- ✓ Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g., place sand bags around inlets or work areas).

- ✓ After breaking up old pavement, sweep up materials thoroughly to avoid contact with rainfall and storm water runoff. Recycle as much material as possible, and properly dispose of nonrecyclable materials.

- ✓ During saw-cutting and grading operations, use as little water as possible. Block or place berms around nearby storm drain inlets, in drainage channel (if no inlet is nearby), or around work areas (when bordering watercourse) using sand bags or an equivalent appropriate barrier, or absorbent materials such as pads, pillows and socks to contain slurry. If slurry enters the storm drain system, remove material immediately.

- ✓ Remove saw-cut slurry (e.g., with a shovel or vacuum, or sweep up when dry) as soon as possible.

Concrete Installation and Repair

- ✓ Avoid mixing excess amounts of fresh concrete or cement mortar on-site.

- ✓ Store dry and wet materials under cover, protected from rainfall and runoff.

- ✓ Wash out concrete transit mixers only in designated wash-out areas where the water will flow into drums or settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.

- ✓ Whenever possible, return left-over materials in the mixer barrel to the yard for recycling. Dispose of or recycle small amounts of excess concrete, grout, and mortar in the trash. Dispose of excess at landfill site.

Patching, Resurfacing, and Surface Sealing

- ✓ Schedule patching, resurfacing and surface sealing during dry weather.

- ✓ Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.

- ✓ Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.

- ✓ Cover and seal nearby storm drain inlets and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any collected materials from these covered manholes and drains for proper disposal.

- ✓ Designate an area for clean up and proper disposal of excess materials.
- ✓ Use only as much water as necessary for dust control, to avoid runoff.
- ✓ Sweep up as much material as possible and dispose of properly. Only wash down streets if runoff is controlled or contained.
- ✓ After the job is complete, remove stockpiles (asphalt materials, sand, etc.) as soon as possible.
- ✓ If it rains unexpectedly, take appropriate action to prevent pollution of storm water runoff (e.g., divert runoff around work areas, cover materials).

Equipment Cleaning, Maintenance and Storage

- ✓ Inspect equipment daily and repair any leaks.
- ✓ Perform major equipment repairs at the corporation yard, when practical.
- ✓ If refueling or repairing vehicles and equipment must be done on-site, use a location away from storm drain inlets and creeks.
- ✓ Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.
- ✓ Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mudjacking equipment at the end of each day. Conduct cleaning at a corporation or maintenance yard if possible.

Painting and Paint Removal

- ✓ Do not transfer or load paint near storm drain inlets or watercourses.
- ✓ Where there is significant risk of a spill reaching storm drains, plug nearby storm drain inlets prior to starting painting and remove plugs when job is completed.
- ✓ Clean up spills immediately.
- ✓ Capture all clean-up water, and dispose of properly.
- ✓ If sand blasting is used to remove paint, cover nearby storm drain inlets prior to starting work.
- ✓ If the bridge crosses a watercourse, perform work on a maintenance traveler or platform, or use suspended netting or traps to capture paint, rust, paint

removing agents, or other materials, to prevent discharge of materials to surface waters.

- ✓ Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Graffiti Removal

- ✓ When graffiti is removed by painting over, implement the BMPs under Painting and Paint Removal above.

- ✓ Protect nearby storm drain inlets (using tarps in work areas, sand bags, and/or booms or barriers around inlets) prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.

- ✓ Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If a landscaped area is not available, filter runoff through an appropriate filtering device (e.g., filter fabric) to keep sand, particles, and debris out of storm drains.

- ✓ If a graffiti abatement method generates washwater containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump washwater to the sanitary sewer.

- ✓ Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g., gels or spray compounds).

- ✓ Avoid graffiti abatement activities during a rain storm.

Note: For information on storm drain inlet protection, see BMPs for Construction Sites (Appendix 3P).

Outdoor Storage Materials (Hazardous and Nonhazardous Materials)

- ✓ Store hazardous materials and wastes in secondary containment where they are protected from rain and in a way that prevents spills from reaching the sanitary sewer or storm drain.

- ✓ Keep lids on waste barrels and containers, and store them indoors or under cover to reduce exposure to rain.

- ✓ All hazardous wastes must be labeled according to hazardous waste regulations. Consult the Fire Department or your local hazardous waste agency for details.

- ✓ Keep wastes separate to increase your waste recycling/ disposal options and to reduce your costs.
- ✓ Never mix waste oil with fuel, antifreeze, or chlorinated solvents. Consult your hazardous waste hauler for details.
- ✓ Double-contain all bulk fluids and wastes to prevent accidental discharges to the sewer and storm drain. Consult the Fire Department for details.
- ✓ Keep storage areas clean and dry. Conduct regular inspections so that leaks and spills are detected as soon as possible.
- ✓ When receiving vehicles to be parted or scavenged, park them on a paved surface and immediately drain and collect gasoline and other fluids properly. Place drip pans
- ✓ Drain all fluids from components, such as engine blocks, which you may store for reuse or reclamation. Keep these components under cover and on a drop pan or sealed floor.
- ✓ Store new batteries securely to avoid breakage and acid spills during earthquakes. Shelving should be secured to the wall. Store used batteries indoors and in plastic trays to contain potential leaks. Recycle old batteries.to catch leaking fluids.
- ✓ Wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol should be covered with tarps (or stored indoors).

Structural Retrofit of Storm Drain Inlets/Catch Basins

Numerous structural “improvements” are available for the removal of pollutants from storm water, either as a modification to existing catch basins, or as a structural addition to the system. Studies have found these structural devices to be only marginally effective for removing pollutants of concern. Municipalities should, before installing, assess the pollutant of concern, validate effectiveness of the device to reduce those pollutants, and provide guarantee of maintenance.

Structural Retrofit of Storm Drains

Given the distinct dry and wet season climatic regime in California, often the runoff from the first storm carries very high pollutant loads. A potential structural control would be to direct the water from the first storm to the sanitary sewer system for treatment at the wastewater treatment plant. This BMP is not recommended for City-wide application, rather for urban runoff from limited areas where

the runoff is known to be highly polluted. Also, this will need to be coordinated with the local/regional wastewater treatment plant. This has been done in some California communities mainly to handle polluted runoff from industrial areas. The following steps will be necessary:

- ✓ Determine areas where the runoff is extremely polluted.
- ✓ Estimate the drainage area and volume of runoff from a design storm. Note that although the first flush runoff from a storm is generally the worst, runoff from the latter part of the first storm is also polluted. Therefore, estimate the runoff from the entire storm (and not just the first portion of it).
- ✓ Contact the local/regional wastewater treatment plant to determine if the facility has capacity to handle these projected flows.
- ✓ If capacity is available, develop appropriate connections (pipe and valve) between the storm drain and sewer system, after obtaining permission from the local wastewater treatment agency.
- ✓ Designate staff in the Public Works Department to handle the valve system to direct flows just before the first major storm.

Sources of Additional Information

The information presented above is based mainly on information from the Santa Clara Valley Urban Runoff Program. Additional information is available in the publications listed below.

Stormwater Quality Task Force. 1993. California Storm Water Best Management Practice Handbook - Municipal.

Stormwater Quality Task Force. 1993. California Storm Water Best Management Practice Handbook - Industrial/Commercial. (for more information on structural controls)

BASMAA 1997. Compilation of New Development in the San Francisco Bay Area Treatment Controls (for more information on structural controls). June.

King County Surface Management Division 1995. Evaluation of Commercially-Available Catch Basin Inserts for the Treatment of Stormwater Runoff from Developed Sites. October. (for more information on structural controls)

4K Evaluation of Street Sweepers

Table 4-1
SUMMARY OF STREET SWEEPING STUDIES (from Santa Clara Literature Review)

Study Title	Objectives	Equipment Evaluated	Locations	Results on Street Sweeping Effectiveness
Evaluation of Regenerative-air, Vacuum street Sweeping on Geological Contributions to PM^{10} (Chow *et al.* 1990)	Effect of street sweeping on air quality	Tymco 350 regenerative air, FMC mechanical sweeper, mobil AV345L blow air suction, re-circulating air sweeper	Reno, Nevada	Small particles of 10 microns are often impacted back into the street by regenerative air. Regenerative-air ineffective for particles smaller than 10 microns. Mobil sweeper appeared to leave dust after sweeping Regenerative air seems to resuspend more small particles.
Bellevue Urban Runoff Program (Pitt and Bissonette, 1984), and Quantity and Quality of Storm Runoff from Three Urban Catchments in Bellevue, Washington (Pyrch and Ebbert 1986).	Street sweeping effectiveness, equipment performance, across street distribution	Broom, regenerative air	Bellevue, Washington	Water quality is not significantly improved from street sweeping. There is less dirt on swept streets than unswept streets.

Table 4-1
SUMMARY OF STREET SWEEPING STUDIES (from Santa Clara Literature Review)

Study Title	Objectives	Equipment Evaluated	Locations	Results on Street Sweeping Effectiveness
Evaluation of Urban Non-Point Source Pollution Management in Milwaukee County, Wisconsin, Vol. 1 &2 (Bannerman *et al.* 1983).	Compare the following options: 1. Increase frequency during March and October. 2. Increase frequency during March through November. The control and increased sweeping rates were as follows: commercial - weekly, 2 to 3 times per week, residential - monthly, weekly or twice weekly parking Lot - bi-monthly, bi-weekly or weekly	Mechanical	Milwaukee	Street sweeping results in a 10 percent reduction of pollutant loadings. Only a slight reduction for option 2 compared to option 1. Street sweeping is effective at removing winter residue (after snowmelt) and for leaf removal.
An Evaluation of Street Sweeping as a Runoff Pollutant Control (U.S. EPA 1983).	Street pollutant accumulation rate, pollutant particle size across street distribution, street sweeping effectiveness, and water quality effectiveness	Tymco sweepers	Winston-Salem, North Carolina	Average pickup was 393lbs/mi/day in business dist. 281lbs/mi/day in residential Most pollutants are within 1 ft of the curb Smaller particles have a higher concentration of pollutants Highest removal efficiency for particles bigger than 45 microns No benefit to water quality from street sweeping

Table 4-1
SUMMARY OF STREET SWEEPING STUDIES (from Santa Clara Literature Review)

Study Title	Objectives	Equipment Evaluated	Locations	Results on Street Sweeping Effectiveness
Washoe County Urban Stormwater Management Program, Vol. 2: Street Particulate Data Collection and Analysis (CH2MHill 1982).	Street pollutant accumulation rates, no of passes, street texture, equipment performance, speed tests, street distribution of pollutants	Ecolotec vacuum assisted mobil, mechanical sweepers	Reno, Nevada	Rough streets have more particles than others. Street texture, street/gutter interface, and wind are the most important factors for accumulation. Fugitive dust affects accumulation rates. Multiple passes are not better. 4 mph minimizes residual loading. Driving lanes have less particles except on rough surface where they have the most). Driving lane particles are not easily swept or washed off.

Table 4-1
SUMMARY OF STREET SWEEPING STUDIES (from Santa Clara Literature Review)

Study Title	Objectives	Equipment Evaluated	Locations	Results on Street Sweeping Effectiveness
Nationwide Urban Runoff Project, Champaign, Illinois; Evaluation of the Effectiveness of Municipal Street Sweeping in the Control of Urban Storm Runoff Pollution (Terstrierp *et al.* 1982)	Street pollutant accumulation rate, pollutant particle size, water quality effectiveness	1973 Elgin model Pelican S (3-wheeled mechanical sweeper)	Champaign, Illinois	Mechanical sweeping with frequencies of up to 2 times per week is not effective at reducing the mean concentration or load. Mechanical sweeping at a frequency of once per week does reduce the amount and variability of street dirt. The overall removal efficiency for mechanical sweeper was 30 to 67 percent.
A Demonstration of Non-Point Source Pollution Management on Castro Valley Creek (Pitt and Shawley 1981).	Street pollutant accumulation rates, sweeping frequency, equipment performance	Mobil-broom sweeper, regenerative air	Castro Valley, California	Regenerative air sweepers are effective in removing particles from street surfaces for areas that have a low quality of dust/dirt or trash. As the quantity of street dust/dirt increases, regenerative air sweeper effectiveness diminishes. Mechanical sweepers are best for trash and large particles. Broom sweeper efficiency was 40 percent After 2 to 3 sweepings per week, there is little improvement in material removed from the street surfaces.

Table 4-1

SUMMARY OF STREET SWEEPING STUDIES (from Santa Clara Literature Review)

Study Title	Objectives	Equipment Evaluated	Locations	Results on Street Sweeping Effectiveness
Demonstration of Non-Point Pollution Abatement through Improved Street Cleaning Practice (Pitt 1978).	Street pollutant accumulation rates, sweeping frequency, equipment performance	Sweeper, vacuum assisted sweepers	San Jose, California	Graphs to determine street sweeping frequency. 2 passes better than one except for oily areas. Median particle size in hopper larger than on street Street sweeping can reduce particle emission rates from asphalt to the atmosphere by 2/3 if done weekly compared to every 2 to 3 months.
System Analysis of Street Cleaning Techniques (Pitt *et al.* 1976)	Literature review of previous studies			Parking restrictions are needed. 50% of the particles larger than 1/4in. are removed. Fast broom rotations are better
Water Pollution Aspects of Street Surface Contaminants (Sartor and Boyd 1972)	Simulated runoff, removal effectiveness (using control areas and artificial contaminant)	Broom sweepers	Milwaukee, Baltimore, Scottsdale, Atlanta, Tulsa Phoenix, San Jose	Fine particles have a higher concentration of metals, pesticides, and organics than larger particles. Street sweeping effectiveness for removing fine particles is low. Street parking reduces the efficiency of sweepers.

Source: Literature Review for Santa Clara Non Point Source Control Program (WCC 1993)

4L Sample Corporation Yard SWPPP

D1.1 Facility

Maintenance Yard #3
1234 Facilities Way
XYZ, California 99999

Facility Owner: **City of XYZ**

Date Prepared: **June 18, 1997**
Prepared By: **C. Lin**

Updated:

D1.2 Objectives

The municipal stormwater permit for discharges in the County of Los Angeles requires those Permittees who own and operate facilities where vehicle maintenance and/or material storage activities occur, as defined in Section IV.3.a of the Permit, to implement a pollution prevention plan. The purpose of the regulations is to protect water quality by reducing the amount of pollutants that could potentially reach the storm drainage system and receiving waters.

The minimum objectives of the Vehicle Maintenance/Material Storage Facilities Management program are to:

- Identify and evaluate sources of pollutants from public vehicle maintenance/material storage facilities that may affect the quality of stormwater discharges from the facility.
- Identify and implement site-specific best management practices (BMPs) to reduce or prevent pollutants in stormwater discharges.

A copy of this plan should be kept at the facility. It should be reviewed periodically to assure all information and measures are current and accurate and should be updated as conditions change.

D1.3 Planning and Organization

D1.3.1 Pollution Prevention Team

Name	Function
C. Lin Public Works, Streets & Roads Division (999) 555-1212	Program Coordinator / Pollution Prevention Plan Development
A. Martinez Maintenance Staff (999) 555-1222	Pollution Prevention Plan Implementation
D. Jones Maintenance Staff (999) 555-1232	Pollution Prevention Plan Implementation

D.1.2 Site Map

Figure 1 is a detailed site map of the Maintenance Yard #3 facility.

Site Map - Maintenance Yard #3

Area = 4.5 acres
95% impervious (paved/covered)

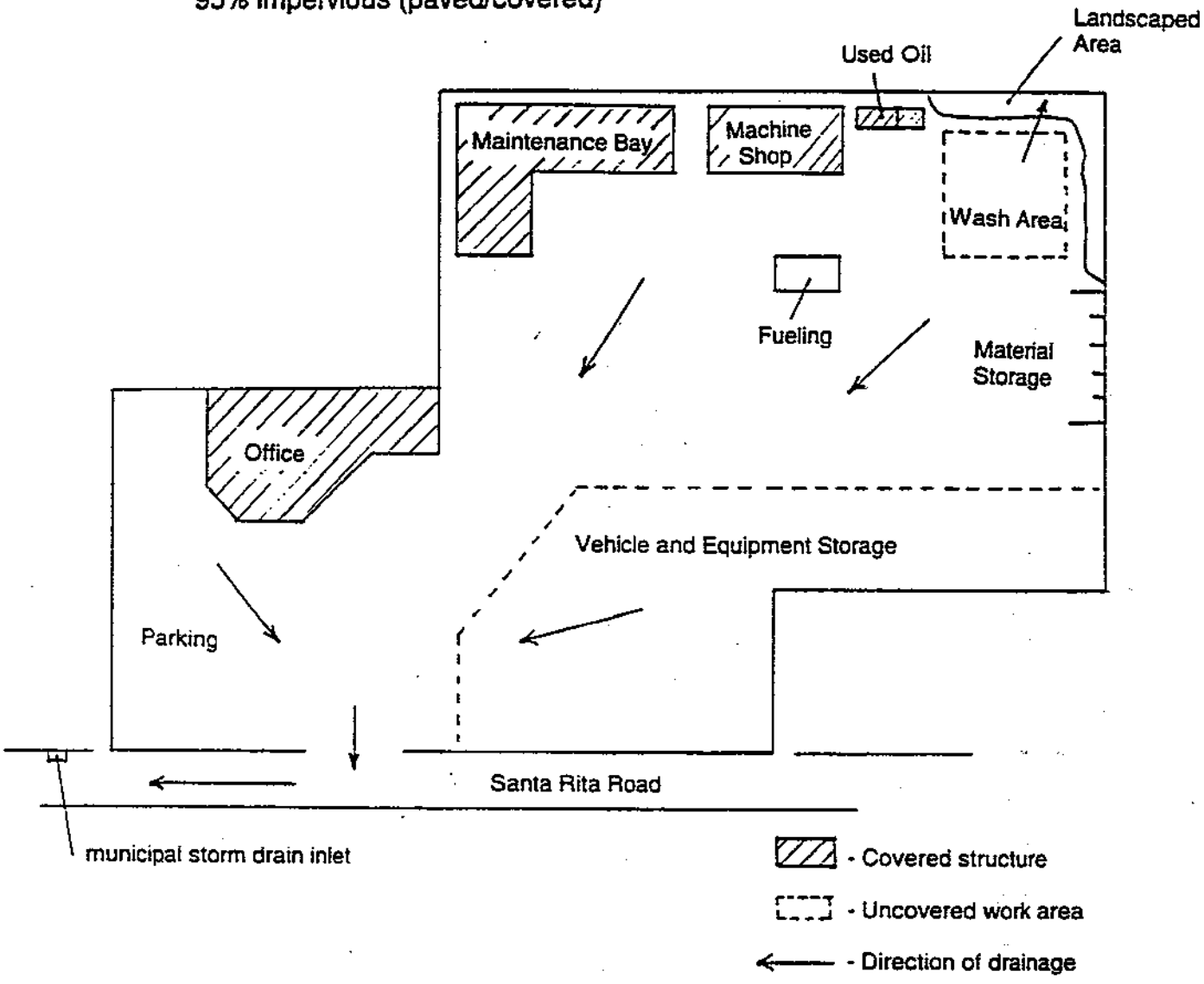


Figure 1
Site Map

D.1.3 List of Significant Materials

Table 1 describes materials that are handled and stored at the Maintenance Yard #3 facility:

Table 1: Significant Materials		
Material	***Handling and Storage Location***	***Typical Quantity/ Frequency***
Gasoline	Center of yard at fueling area	250 gal/day
Diesel fuel	Center of yard at fueling area	200 gal/day
Motor oil	North section of yard in Maintenance Bay	90 gal/wk
Used motor oil	North section of yard in Used Oil Storage Area	30 gal/wk
Lubricants	North section of yard in Maintenance Bay	15 gal/mo
Brake fluid	North section of yard in Maintenance Bay	40 gal/wk
Hydraulic fluid	North section of yard in Maintenance Bay	5 gal/day
Adhesives and sealants	North section of yard in Material Storage Area	10 gal/mo
Antifreeze	North section of yard in Maintenance Bay	30 gal/day
Used Antifreeze	North section of yard in the Used Antifreeze Storage Area	10 gal/day
Solvents	North section of yard in Chemical Storage Area	50 lb/wk
Detergents	North section of yard in Chemical Storage Area	40 lb/wk
Paint	North section of yard in Chemical Storage Area	20 gal/mo
Concrete	East section of yard in Raw Materials Area	1 ton/mo
Gravel	East section of yard in Raw Materials Area	200 lb/wk
Sand	East section of yard in Raw Materials Area	250 lb/wk
Aggregate	East section of yard in Raw Materials Area	100 lb/wk
Pesticides and herbicides	North section of yard in Chemical Storage Area	85 gal/mo
Fertilizers	North section of yard in Chemical Storage Area	100 lb/wk
Soil Amendments	North section of yard in Chemical Storage Area	50 lb/wk

D.1.4 Description of Potential Pollutant Sources

Table 2 describes potential pollutant sources at the Maintenance Yard #3 facility:

Table 2: Potential Pollutant Sources		
Area / Activity	***Pollutant Source***	***Pollutant***
Vehicle and Equipment Fueling performed in the center of the yard at the fueling area; containing both unleaded and diesel fuel for smaller vehicles and large equipment. Both pumps in the fueling area are covered by a raised roof.	Spills caused by topping off fuel tanks	gasoline
	Spills and leaks during deliveries	fuel, oil
	Hosing or washing down fuel area.	fuel, oil
	Rainfall running onto and off of fueling area	fuel, oil
Vehicle and Equipment Maintenance performed at the Maintenance Bay Building in the northwest section of the yard. Activities include fluid changes, vehicle repairs, equipment repairs, and other necessary maintenance.	Vehicle fluid spills or leaks	transmission fluids, luring materials, radiator fluids, etc.
	Container spills or leaks	solvents, degreasers, other cleansers
Vehicle and Equipment Washing performed in the northeast section of the yard. Washing Area is uncovered and not bermed.	Washing particulates and debris off vehicles and equipment	sediment, metals, toxic materials, vehicle fluids
Material, Chemical, Vehicle and Equipment Storage located at the north and east sections of the yard. All areas are covered. See Table 1 for yard materials stored.	Container spills or leaks	antifreeze, oil, pesticides, herbicides, solvents, etc.
	Vehicle and equipment leaks	gasoline, oil

D.1.5 Assessment of Potential Pollutant Sources

Vehicle and Equipment Fueling is a potential source of stormwater pollution at the Maintenance Yard #3 facility. Stormwater runon has the potential to wash away any spills or leaked fluids located at the fueling area and subsequently drain onto the street and into the storm drain. Pollutants located at the fueling area include oil and gasoline (unleaded and diesel). With the washing area currently northeast and upgrade of the fueling area, pollutants may be carried via wash water flows to the storm drain in a non-stormwater discharge.

Vehicle and Equipment Maintenance is a minimal potential source of stormwater pollution. Vehicle and equipment fluids are handled and changed in the Maintenance Bay and may eventually flow into the storm drain only if staff cleans the bay area with the use of water hose. Maintenance pollutants include transmission and radiator fluids, solvents, degreasers, as well as gasoline.

Vehicle and Equipment Washing has a high pollutant potential as alluded to above. Without a bermed area or covered structure for this activity, non-stormwater discharges from washing may flow south-southwest, crossing the fueling area, concentrating pollutant flow even more. Pollutants from washing include sediment, metals, toxic materials, and vehicle fluids such as oil and gasoline.

Material, Chemical, Vehicle and Equipment Storage also has a potential for stormwater pollution. Particularly, vehicles and equipment, stored outside and uncovered, are susceptible to leaking. Rainfall at the facility has the potential to wash leaked fluids into the storm drain system. Material and chemical storage at the facility are covered and carefully protected, minimizing the potential for any stormwater pollution.

D1.6 Stormwater Best Management Practices

Table 3 describes applicable best management practices for the Maintenance Yard #3 facility:

Table 3: Applicable Best Management Practices

Area / Activity	*Pollutant Source*	*Pollutant*	*Best Management Practice*
Vehicle and Equipment Fueling	Spills caused by topping off fuel tanks	gasoline	■ Train employees in proper fueling and cleanup procedures ■ Discourage "topping off" of fuel tanks ■ Install "shut-off" valves on nozzles ■ Use adsorbent materials on spills as opposed to hosing down ■ Install covered spill kits next to fueling area
	Spills and leaks during deliveries	fuel, oil	
	Hosing or washing down fuel area.	fuel, oil	
	Rainfall running onto and off of fueling area	fuel, oil	
Vehicle and Equipment Maintenance	Vehicle fluid spills or leaks	transmission fluids, luring materials, radiator fluids, etc.	■ Train employees in proper cleanup procedures of spills and leaks ■ Keep equipment clean, disallowing excessive grease/oil buildup ■ Use drip pans for any leaking vehicle/equipment ■ Complete all maintenance in proper location (covered) ■ Sweep up daily ■ Install spill kits in Maintenance Bay
	Container spills or leaks	solvents, degreasers, other cleansers	
Vehicle and Equipment Washing	Washing vehicle particulates and debris off	sediment, metals, toxic materials, vehicle fluids	■ Wash vehicles and equipment at an off-site commercial washing location whenever possible ■ If on-site, direct wash water towards surrounding, existing vegetation ■ Evaluate the feasibility of constructing a bermed or covered wash area draining to the sanitary sewer
	Washing equipment particulates and debris off	sediment, metals, toxic materials, vehicle fluids	
Material, Chemical, Vehicle and Equipment Storage	Container spills or leaks	antifreeze, oil, pesticides, herbicides, solvents, etc.	■ Store materials in enclosed or covered areas
	Vehicle and equipment leaks	gasoline, oil	■ Use drip pans underneath leaking vehicles and equipment

4M Sample Reporting Forms

ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM
Municipal Government Maintenance Activities
FY 1995/96 Monthly Record Keeping Form

Month of: _____

Municipality: _____

Completed by: _____ **Date:** _____

STREET CLEANING

1. Sweeping	Volume of material collected (cubic yards)	Miles swept* (curb miles)
Residential Areas:		
Broom	_____	_____
Regenerative Air	_____	_____
Vacuum	_____	_____
Commercial Areas:		
Broom	_____	_____
Regenerative Air	_____	_____
Vacuum	_____	_____
Industrial Areas:		
Broom	_____	_____
Regenerative Air	_____	_____
Vacuum	_____	_____
Other Areas Swept: (e.g., parking lots, major arterials)		
Broom	_____	_____
Regenerative Air	_____	_____
Vacuum	_____	_____
TOTAL	_____	_____

2. Have there been any changes in your street sweeping program? (efforts to have parked cars removed, changed sweeping frequency, new equipment, significant downtime, etc.)

_____

_____

_____

_____

_____

LEAF REMOVAL

Volume of leaves removed by City crews: _____ cubic yards

Leaves bagged by residents and picked up by City: _____ bags

Check box if you do not have a leaf removal program other than routine street sweeping: ☐

F:\AL56-25\MAIN9596.WP5

* Report total miles covered by sweepers including areas operated in tandem or repeated.

EOA, Inc.
November 1995

ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM
Municipal Government Maintenance Activities
FY 1995/96 Monthly Record Keeping Form

Month of: _____

Municipality: _____

Completed by: _____ **Date:** _____

MAINTENANCE OF STORM DRAINAGE FACILITIES

	Inspected		Cleaned	
Number of storm drain inlets	_____		_____	
Number of cross culverts, conduits, and/or culverts used to convey stormwater around street corners	_____		_____	
V ditches	_____	miles	_____	miles
Storm drain lines	_____	miles	_____	miles
Channels	_____	miles	_____	miles
Creeks	_____	miles	_____	miles
Culverts	_____	linear feet	_____	linear feet
Number of junction boxes	_____		_____	
Number of pump stations	_____		_____	

Other (please specify) _____

_____

Total volume of material removed _____ cubic yards or _____ tons

Describe any observed illegal discharges or illicit connections below or check the box if activities are included in the Illicit Discharge Quarterly Summary Form: ☐

_____

_____

_____

_____

Have you responded to complaints or noticed areas which should be targeted for more frequent cleaning?

Yes _____ No _____ If yes, explain _____

_____

_____

_____

LITTER CONTROL

	Areas Targeted	Volume Removed
City/County Personnel (including receptacles)	_____	_____
Court Referred Crews	_____	_____
Other (e.g., contractors)	_____	_____
Total (specify cubic yards or pounds)		_____

SANTA CLARA VALLEY URBAN RUNOFF POLLUTION PREVENTION PROGRAM

PUBLIC STREETS, ROADS, AND HIGHWAYS OPERATION AND MAINTENANCE

Co-permittee Reporting Form

1. Are you implementing best management practices (BMPs) for the street, road, and highway operation and maintenance (O&M) activities that you are responsible for conducting, in order to reduce pollutants in storm water to the maximum extent practicable and eliminate illicit discharges?

   ☐ yes ☐ no If yes, describe any changes in your BMPs during the past year.
   If no, explain:

2. Have you developed and implemented a process for ensuring that any contractors you employ to conduct street, road, and highway O&M activities use the appropriate BMPs adopted by the agency?

   ☐ yes ☐ no If yes, describe any changes in your process during the past year.
   If no, explain:

3. Have you provided training on an annual basis to your municipal staff in the use of appropriate BMPs?

   ☐ yes ☐ no If yes, describe training conducted during the past year.
   If no, explain:

   Have you provided a mechanism for obtaining feedback from municipal staff on the implementation and effectiveness of the BMPs?

   ☐ yes ☐ no If no, explain:

4. Have you informed other parties conducting street, road, and highway O&M activities within your jurisdiction that they are expected to implement BMPs to reduce pollutants in storm water to the maximum extent practicable and eliminate illicit discharges?

   ☐ yes ☐ no If no, explain:

Co-permittee Reporting Form, continued

5. Have you reviewed and evaluated the effectiveness of your BMPs in achieving the goals of reducing pollutants in storm water to the maximum extent practicable and eliminating illicit discharges?

   ☐ yes ☐ no If no, explain:

   Did this review include input from municipal maintenance staff that implement the BMPs?

   ☐ yes ☐ no If no, explain:

   What were your findings from this review? Describe how BMPs have been modified as a result of this evaluation:

4N Sample Ordinance

MANAGEMENT PRACTICES ADMINISTRATIVE RULE R-6.645

R-6.645-A **Purpose and Intent.**

1. **Purpose.** These rules implement Sections 6.625 to 6.645 of the Eugene Code, 1971, which were adopted to restrict the discharge of sediments or other construction related materials, including hazardous substances, into the City's stormwater system in order to:

1.1 Prevent or minimize, to the maximum extent possible, negative impacts to adjacent properties, water quality and related natural resources resulting from construction activities; and

1.2 Maintain the capacity of the City's stormwater system by minimizing sedimentation.

2. **Intent.** The intent of these rules, in implementing sections 6.625 to 6.645 of the Eugene Code, 1971, is to ensure that construction related activities prevent or minimize erosion, sedimentation, and other stormwater related problems identified in subsection 1 above. To carry-out the intent of the these rules, it is the goal of the City's erosion prevention program to review and respond to all erosion permit applications in a timely manner so that these provisions do not increase the time frame for issuing other permits. These rules are designed to provide developers and property owners with broad discretion for addressing potential impacts of construction related activities, so long as the erosion prevention measures achieve the desired outcomes. These rules therefore do not specify or mandate the use of certain erosion prevention measures, and instead, provide applicants with flexibility to choose or design erosion prevention measures subject to review by the City. The issuance of an erosion prevention permit by the City will not necessarily reflect concurrence by the City that the proposed measures will work. Instead, the City's review may be more limited in many cases, relying on the certification of the owners' certified professional that the proposed measures will achieve the mandated outcomes. In such cases, the City's review may be limited to making an evaluation that the proposed measures address anticipated impacts. Where the City is uncertain about the likely success of the proposed measures, the City may issue the permit, and monitor the site to determine whether the measures are achieving the outcomes. If the erosion prevention measures have not been successful in achieving those outcomes, the City will require compliance.

R-6.645-B **Definitions.**

In additions to the definitions contained in Sections 6.405 and 6.625 to 6.645 of the Eugene Code, 1971, as used herein, the following words and phrases mean:

Adjacent property. Property where erosion and/or sedimentation or construction

material impacts are occurring and the cause of impact is directly related to a construction activity from a separate parcel.

Annual landscape activities. Activities necessary to maintain the health and function of developed landscaped areas, including but not limited to: tilling, sodding, mowing, aerating, and pruning.

Certified professional. A person who holds an Oregon license in one of the following professions: engineer, architect, landscape architect, or is in a similar profession as determined by the City Manager; or a person who is certified as a geologist or as a professional in erosion and sedimentation control by the International Erosion Control Association, or any other similar organization, or by the City, as determined by the City Manager.

City Manager. The City Manager of the City of Eugene, or the Manager's designee.

Construction activity. An activity used in the process of developing, redeveloping, enhancing, or maintaining land, including but not limited to: land disturbance, building construction, paving and surfacing, storage and disposal of construction related materials.

Construction footprint. That area of a parcel where disturbance to vegetation and landform is necessary for the construction of buildings, parking lots, walkways, landscaping, utilities, and for staging of construction equipment and other similar uses associated with construction activities.

Construction related materials. Potential water quality pollutants that are used or created during construction activities including, but not limited to; off-site deposits of sediments by vehicles (e.g. tracking, spilling); building material wastes (e.g.. scrap metals, rubber, plastic, glass, masonry, wood; paints and thinners; packaging materials; insulation, plaster grout); hazardous substances (e.g. cleaning solvents; chemical additives; concrete curing compounds; acids for cleaning masonry surfaces; paints, thinners); and concrete washout.

Construction Site Management Plan. A set of maps, data, drawings, and narrative that describes expected runoff from new construction sites and establishes measures to be taken for preventing erosion, sediments, and other pollutants from construction related activities.

Designated buffer. An area established by the Eugene Code, 1971, including but not limited to sections 9.262(3)(b) and 9.264(3), that separates a protected natural resource site, such as a wetland or water feature, from a conflicting use, or its designated buffer area.

Dewatering. The removal and disposal of surface water or groundwater for purposes

of preparing a site for construction.

Directly drains. The conveyance and discharge of stormwater runoff - either on the surface or by an open channel or pipe - into a water feature that is located on or adjacent to the parcel or tax lot of record for which construction activities are planned, or its designated buffer area.

Disturbed area. A parcel or a portion of a parcel of land where the vegetation, landform, or topography is altered due to logging, clearing, grubbing, grading, paving, stock piling, or building.

Emergency condition. An immediate danger to life, property, or the environment due to circumstances beyond the control of the property owner, including, but not limited to, natural and human-caused disasters such as fires, floods, slides, earthquakes, sinkholes, and tree blow-down.

Enforcement Officer. The person designated by the City Manager to enforce the provisions of Sections 6.625 to 6.645 of the Eugene Code, 1971 and these rules.

Erosion prevention. Measures to be taken for preventing and/or minimizing impacts to the City's stormwater system and related natural resources due to soil erosion from water and wind forces, sedimentation, and other potential impacts associated with construction activities such as handling and storage of building materials and disposal of building material wastes.

Fully developed property. A parcel of land that contains buildings, pavement and other facilities, including landscaped areas and due to these uses is not capable of additional expansion.

Highly erodible soils. Soil map units as classified by the Natural Resources Conservation Service (NRCS - formerly the Soil Conservation Service) as being highly erodible. Based on factors from the Universal Soil Loss Equation, the NRCS classification system considers soil erodibility (K factor), climate, slope, steepness, length, and soil loss tolerance (T factor).

Immediate clean-up. Not later than the end of the work shift in which the violation occurred, but in no event shall it occur later than midnight of the day in which it occurred.

Improper disposal. Disposal of any construction related material in a manner that causes, or has the potential to cause, the discharge of pollutants to the City's stormwater system or related natural resource, the depletion of the capacity of the City's stormwater system, or the contamination of soils.

Improper storage. Handling or storing of any construction related materials in a manner that, due to leaks, spills, leachates, deposits or dumps, causes or has the potential to cause the discharge of pollutants to the City's stormwater system or related natural resources, the depletion of the capacity of the City's stormwater system, or the contamination of soils.

Jurisdictional wetlands. Any parcel or portion of a parcel which meets the state or federal definition of wetlands that are under the jurisdiction of state or federal laws. Synonymous with wetlands.

Land disturbance. Activities that can change the physical conditions of landform, vegetation, and hydrology including, but not limited to, clearing, grading, grubbing, excavating, filling, logging, and storing of materials.

Maximum extent practicable. A level of effort to be undertaken where technical feasibility and financial costs to be incurred are appropriate, as determined by the criteria in Section R-6.645-D.2 of this Rule, for the probable negative impacts to water quality to be minimized.

Minor Recurring Activities. Repetitive construction activities that are performed as part of an overall work plan and no individual disturbance exceeds more than 500 square feet of land area and 50 cubic yards of fill or excavated material.

Permit Holder. The property owner or easement holder of record of the parcel or tax lot for which construction activities are planned.

Person. An individual, trust, firm, joint stock company, joint venture, consortium, commercial entity, partnership, association, corporation, commission, state and any agency thereof, political subdivision of the state, interstate body or the federal government, including any agency thereof;

Related Natural Resources. Natural resources located within or adjacent to the City's stormwater system, such as waterways, wetlands, and riparian areas, that provide one or more of the following stormwater functions: flood control, water quality treatment, and streambank stabilization.

Routine Maintenance. Activities and practices that are necessary to maintain the operating capacity, functional integrity, or aesthetics of a place or facility. Routine maintenance includes, but is not limited to, landscaping, repair of recreation facilities (e.g., ball diamonds, play areas, fields), cleaning of stormwater facilities, and patching of streets.

Sensitive area. Sites that meet the criteria contained in R-6.645-E.1.

Template. An example of a construction site management plan provided by the City

of Eugene that - when modified by the erosion prevention permit holder to address site specific conditions - can be used to satisfy permit requirements for a single dwelling or duplex dwelling. The template may be prepared by the permit holder or the permit holder's designee.

Untreated runoff. Contaminated stormwater runoff due to construction activities that has not been filtered, screened, settled, or otherwise treated for the removal of pollutants, prior to discharge into the City's stormwater system or related natural resources.

Water features. Permanent or intermittent bodies of water, including creeks, streams, ponds, rivers, lakes, drainage channels and jurisdictional wetlands.

Vegetative buffer. A strip of land not less than 25 feet in width separating a construction activity from either a water feature or a property line, whichever is nearest, containing a vegetation that covers at least 75% of the buffer area.

Visible or measurable erosion. The deposit of mud, soil, sediment or similar material exceeding one-half cubic foot in volume for every 1,000 square feet of lot size onto public rights of way or private streets, into the City's stormwater system or related natural resources, either by direct deposit, dropping, discharge, or as a result of the action of erosion; evidence of concentrated flows of water over bare soils, turbid or sediment laden flows, or evidence of on-site erosion such as rivulets on bare soil slopes where the flow of water is not filtered or captured on the site using the techniques recommended in the City's Erosion Prevention and Construction Site Management Practices Planning and Design Manual, or comparable techniques; and, earth slides, mud flows, earth sloughing, or other earth movement which leaves the property.

Wetlands. Any parcel or portion of a parcel which meets the state or federal definition of wetlands that are under the jurisdiction of state or federal laws. Synonymous with jurisdictional wetlands.

R-6.645-C **Applicability.**

1. These rules, and Sections 6.625 to 6.645 of the Eugene Code, 1971 apply to all construction related activities that result in any one or all of the following:

1.1 Land disturbance;

1.2 Structural development, including, but not limited to buildings, bridges, roads, and other infrastructure;

1.3 Impervious surfaces, including, but not limited to parking lots, driveways,

walkways, and patios; or

1.4 Dewatering.

2. No person shall engage in any construction related activity covered by Subsection R-6.645-C.1 of these Rules except as allowed by the Eugene Code 1971 and these rules. All persons shall prevent and/or control erosion, sedimentation, and other construction related impacts to stormwater quality in a manner designed to meet the outcomes specified in R-6.645-D. Failure to implement measures that meet those outcomes shall subject the person to the same enforcement provisions as those applicable to a permit holder under section 6.640 of the Eugene Code and R-6.645-F of the Rules. This requirement shall be implemented through one of the following provisions:

2.1 Issuance of an Erosion Prevention Permit in accordance with Section R-6.645-F of these Rules;

2.2 For all other construction activities not subject to the erosion prevention permit requirements, compliance by property owners with the standards for preventing and controlling erosion, sedimentation, and other impacts associated with construction site management practices. The City will make information about these requirements available through a variety of techniques, including public outreach programs, handout materials, and other educational efforts to assist property owners in meeting this obligation.

3. Notwithstanding Subsection 1 above, the following activities are exempt from the provisions of Sections 6.625 to 6.645 of the Eugene Code, 1971 and these rules:

3.1 Actions by a public utility, the City, or any other governmental agency, to remove or alleviate an emergency condition, restore utility service, or reopen a public thoroughfare to traffic; or

3.2 Actions by any other person when the City determines, and documents in writing, that such actions are necessary to remove or alleviate an emergency condition, restore utility service, or reopen a public thoroughfare to traffic.

R-6.645-D **Outcomes.**

1. All persons conducting construction activities covered by R-6.645-C.1. shall employ, to the maximum extent practicable, erosion prevention and construction site management practices which result in the following outcomes:

1.1 No deposit or discharge of sediment from a site onto adjacent properties or into water features and related natural resources in excess of those that occur through natural

processes;

1.2 No degradation of water features due to removal of streambank vegetation from construction sites in excess of those that occur through natural processes;

1.3 No deposit of mud, soil, sediment, concrete washout, trash, or other similar construction related material exceeding one-half cubic foot in volume for every 1,000 square feet of lot size onto public rights of way and private streets, and into the City's stormwater system and related natural resources, either by direct deposit, dropping, discharge, erosion, or tracking by construction vehicles, in excess of those that occur through natural processes. Any such discharge shall be cleaned-up at the end of the current work shift in which the deposit occurred, or at the end of the current work day, whichever comes first.

1.4 No exposure of soils and stockpile areas to stormwater runoff without secondary containment and treatment measures.

1.5 No earth slides, mudflows, earth sloughing, or other earth movement which may leave the property, in excess of those that occur through natural processes;

1.6 No discharge of runoff containing construction related contaminants into the City's stormwater system or related natural resources; and

1.7 No release onto the site of hazardous substances, such as paints, thinners, fuels and other chemicals.

2. Maximum extent practicable. Implementation of a stormwater management practice is considered practicable unless one or more of the following applies:

2.1 The practice is not technically feasible for the proposed use and physical characteristics of the site;

2.2 The cost of implementing the practice would outweigh the benefits of maintaining water quality. Costs are considered to outweigh benefits if they exceed $0.50 per square foot of disturbed area.

Costs to be considered under subparagraph R-6.645-D.2.2 include permit fees, design preparation (construction site management plan/template), construction of construction site management measures, and monitoring by a professional. Costs do not include: maintenance of management measures, actions taken to correct violations, and permanent landscape and associated design fees.

3. When designing and implementing management measures to meet the above outcomes, the applicant shall consider the seasonal variation of rainfall, temperature, and other climatic factors relative to the timing of land disturbance activities. Management measures shall be

adjusted to meet increased stormwater runoff flows and velocities between November 1 and April 30 of the following calendar year.

4. No permit or other approval issued pursuant to these rules shall be deemed to authorize any violation of the above prohibitions.

R-6.645-E **Designation of Sensitive Areas.**

1. **Criteria for Sensitive Area Designation.** For the purposes of administering these Rules, any construction site that meets one or more of the following criteria shall be considered a sensitive area for which an erosion prevention permit will be required:

1.1 The slope of the parcel in the area of disturbance is greater than 10%;

1.2 The site contains highly erodible soils; or

1.3 The parcel or tax lot of record has the potential to directly drain into a water feature or its designated buffer area.

2. **Determination of Sensitive Area.** To assist with the administration of these provisions, the City has prepared a map indicating sites that appear to meet the above criteria. The Public Work s Director, or designee, shall use this map to make a preliminary determination of a site's sensitive area status. The map is on file at the City's Public Works Engineering Department (858 Pearl Street) and Permit & Information Center (99 West 10th Avenue).

An applicant may challenge the Director's preliminary determination that a site is a sensitive area through submission of actual field or site information that demonstrates to the City's satisfaction that the site's existing physical features, such as a continuous vegetative perimeter buffer which prevents discharge of sediments, mitigate potential stormwater quality impacts, and the Director shall thereafter make a final determination of whether the site is a sensitive area.

If an applicant chooses not to contest the designation or is unable to satisfy the above criteria, the site shall be considered a sensitive area and an erosion prevention permit shall be required.

3. **Appeal of designation.** An applicant who disagrees with the Director's final determination may appeal that decision within the time and manner prescribed in section R-6.645-F.11 of these Rules.

R-6.645-F **Erosion Prevention Permits.**

1. **Permit Required.** Except as otherwise provided in these rules or provisions of the

Eugene Code, 1971, no person shall commence any construction related activity without first obtaining from the City an erosion prevention permit if the construction related activity will:

1.1 Disturb five or more acres of land at any one time by one or more phases of development, and the disturbance is located on the same parcel of land or on contiguous parcels of land under the same ownership; or

1.2 Is located in a sensitive area as designated pursuant to R-6.645-E of these rules.

2. **Waiver of Erosion Prevention Permit.** Notwithstanding any other provisions of this section, the following activities shall not require an erosion prevention permit. However, under no circumstances shall this waiver be construed to mean that these activities are exempt from any of the erosion prevention requirements of the Eugene Code, 1971 and these rules other than the requirement to obtain an erosion prevention permit; the following activities are subject to other provisions, including but not limited to Outcome requirements in Section R-6.645-D of this Rule.

2.1 Construction activities involving the disturbance of less than 500 square feet of land surface area, or which consist of the excavation and/or fill of less than 20 cubic yards of material;

2.2 The issuance of permits and/or approvals for land divisions, interior improvements to an existing structure, or other approvals for which there is no physical disturbance to the surface of the land; and

2.3 Annual landscape maintenance activities on fully developed properties, necessary to maintain the existing developed landscape.

3. **Permit Classifications.** A variety of permits may be issued to address different circumstances. Regardless of permit type, the property owner or easement holder of record is the responsible party for the permit. If property ownership changes before the permit is finalized, the new property owner assumes the responsibility of the permit and any outstanding issues associated with the permit. The following permits may be issued to meet the requirements of these rules provided the associated eligibility requirements are met:

3.1 Individual Permit. A property owner or easement holder of record may obtain a separate, individual permit for each construction activity on the same parcel of land. For example, the individual permit allows a property owner to obtain a permit for building construction activities and a utility to obtain a separate permit for utility purposes.

3.2 Umbrella Permit. A property owner or easement holder of record may obtain an umbrella permit for multiple construction activities on the same parcel of land that are proposed in connection with a development, including utility work, private infrastructure,

structures, and other site improvements. This permit allows one permit to be issued for all construction activities and all phases of development.

3.3 Annual Permit. An annual permit may be issued for minor recurring activities. The annual permit is intended to provide a streamlined permit process for entities that perform repetitive activities on a frequent basis. This provision allows one permit to be issued for more than one project within a calendar year. To qualify for an annual permit, the following criteria shall be met:

3.3.1 Construction activities are minor and recur on a frequent basis. Examples include but are not limited to: utility service connections and extensions, repair of utility and infrastructure facilities.

3.3.2 Permits may be issued for a full calendar year, and shall expire on or before December 31 of the year issued.

4. **Application**. In addition to the payment of any required fees, an application for an erosion prevention permit shall include a completed Construction Site Management Plan (except for an Annual Permit, refer to Section R-6.645-F7.4), prepared in accordance with Subsection 7 of this Section, or a template prepared in accordance with subsection 7.3.

5. **Independent Permit Processing**. The application and processing of other City of Eugene permits, such as, but not limited to, grading, privately engineered public improvements, foundation and building permits, are independent of the Erosion Prevention permit process. The City of Eugene shall not issue any of these other permits:

5.1 Unless and until the City has approved and issued a required Erosion Prevention permit;

5.2 Until the City has determined an Erosion Prevention permit is not required; or

5.3 If the property owner or applicant is in violation of an Erosion Prevention permit, or any conditions contained therein.

6. **Completeness Check**. At the time of application submittal, the City shall conduct a completeness check to determine if the application meets all of the submittal requirements. The City shall not accept the application until all requirements have been met. After the application has been accepted, the City may find after a more thorough review that the applicant submitted inadequate or inaccurate information. In that case, the City may require that certain additional information be submitted. A complete application submittal includes:

6.1 Completed and signed application form;

6.2 Fee;

6.3 Construction Site Management Plan prepared by a certified professional, except as provided in subsections 7.3 and 7.4 of these rules.

7. **Construction Site Management Plan.**

7.1 Individual and Umbrella Permits. A Construction Site Management Plan shall be required in order to identify potential water quality impacts associated with the proposed construction activity and ensure that appropriate and effective techniques and methods are utilized to prevent and control erosion and sedimentation and other pollutants associated with construction activities. The Construction Site Management Plan (Plan) shall be prepared by a Certified Professional. The Plan shall outline the techniques and methods to be used to achieve the required outcomes, describe conditions before and after development, and the proposed methods to prevent and control water quality impacts during and after construction. The Certified Professional, as part of the Plan, shall certify that in his or her professional opinion, implementation of the Plan will ensure compliance with R-6.645-D.1. The City shall review the Plan prior to issuance of an erosion prevention permit and may monitor the development thereafter for continued compliance.

7.2 Contents. At a minimum, the Construction Site Management Plan shall consider and address the follow factors as appropriate:

7.2.1 A site location and vicinity map;

7.2.2 A site development drawing at a standardized engineering or architectural scale, such as 1"= 40', containing the following site conditions: (a) soil type; (b) on-site elevations and/or topographic information adequate to determine drainage patterns and slopes; (c) hydrology, including surface drainages and wetlands; (d) existing vegetation; and (e) natural resource sites and designated buffer areas.

7.2.3 Plans that show site control measures for preventing erosion and sedimentation into the City's stormwater system and related natural resources, including supporting calculations, such as hydraulics and soil loss equation, and assumptions for the 5-year or 10-year storm event as required by City design policy;

7.2.4 Off-site and on-site access routes for construction and maintenance vehicles;

7.2.5 Borrow and waste disposal areas;

7.2.6 Debris and garbage disposal areas;

7.2.7 Vegetation specifications for temporary and permanent stabilization;

7.2.8 Construction schedule, including the implementation of construction site management practices and expected time period of land disturbing activities;

7.2.9 Manner of storage and disposal of materials (e.g., sand, lumber, insulation, paints, thinners, fertilizers, fuels);

7.2.10 Temporary and permanent storm drainage facilities;

7.2.11 Measures to be undertaken to minimize the extent of exposed soils;

7.2.12 Areas where construction vehicles' wheels will be washed; and

7.2.13 Methods and places for concrete-wash disposal;

7.2.14 Disturbed areas and other areas that are physically protected from potential disturbance, such as fencing.

7.3 Template. If the proposed construction is for one single family dwelling, or one duplex dwelling, the property owner need not utilize the services of a certified professional in the preparation of the Plan. A template plan may be submitted to satisfy requirements for the single family dwelling and duplex construction activities.

7.4 Annual Permit. If the proposed construction activity qualifies for an annual permit, preparation of a construction site management plan is not necessary. In lieu of a construction site management plan, the applicant shall submit the following information as part of the application submittal:

7.4.1 Description of the scope of work and types of construction activities to be performed; and

7.4.2 Description of the erosion, sedimentation, and construction site management practices to be employed during construction activities for meeting the requirements of the Eugene Code, 1971 and these Rules.

7.5 Availability. The approved Construction Site Management Plan and Template shall be kept at the construction site and be available during on-site inspections.

8. **Review Criteria and Approval.** The City shall review the Erosion Prevention Permit application, including the Construction Site Management Plan, and such other documents as may be submitted, and approve, approve with special conditions, or deny the permit application. If the City finds that the construction related activities will result in visible or measurable erosion, or

will otherwise violate the conditions specified in R-6.645-D.1., then the City shall deny the permit, or approve the permit with special conditions. In the absence of such an affirmative finding, the City shall approve the permit, with or without special conditions.

9. **Conditions.** Every Erosion Prevention Permit shall include as conditions the outcomes set forth in R-6.645-D of these rules.

10. **Permit Duration.** An approved erosion prevention permit shall remain in effect for the full period of construction activity. The permit may be extended for a period of up to, but not to exceed, two years after completion of the construction activities if the City Manager determines the extension is necessary to ensure the construction activity has stabilized in accordance with the outcomes listed in these rules.

11. **Appeal.** An applicant may appeal (a) the denial of a permit, (b) any conditions imposed on a permit, or (c) the designation of a site as a sensitive area within the time and in the manner prescribed in section 2.021 of the Eugene Code, 1971.

R-6.645-G **Construction Site Control Measures and Design Standards.**

1. **Construction Site Practices.** In addition to compliance with specific requirements contained in an approved permit, all permittees shall establish and implement construction site management practices that will prevent toxic materials and other debris from entering the City's storm drainage and waterway systems. The following construction site practices are prohibited and constitute a violation of these rules:

1.1 Improper storage of chemicals (pesticides, fertilizers, fuels, paints, thinners);

1.2 Improper disposal of construction waste material, garbage, rubbish, and sanitary waste, plaster, dry-wall, grout, gypsum;

1.3 Failure to immediately clean up spills of toxic materials;

1.4 Washing excess concrete material into a street, catch basin, or other public facility or a related natural resource;

1.5 Leaving stockpiles uncovered; or

1.6 Allowing construction vehicles to track or spill soil or debris into or onto a street or public right of way.

2. **Prevention Measures and Design Standards.** The City's Erosion Prevention and Construction Site Management Practices Manual may be utilized to obtain ideas as to how to achieve the outcomes mandated by R-6.645-D.1. These ideas include:

2.1 Keep vehicles on gravel or paved surfaces.

2.2 Surface stabilization measures (seeding, sodding, mulching, riprap);

2.3 Runoff control measures (temporary and permanent diversions, grassed-

swales, slope drains, riprap channels);

2.4 Outlet protection measures (energy spreaders/dissipaters);

2.5 Inlet protection measures (fabric-sod type protectors);

2.6 Sediment trap measures (basins, fences, rock dams);

2.7 Stream protection measures (temporary and permanent stream crossings, buffers, vegetated and structural stabilizers);

2.8 Construction timing and sequence;

2.9 Areas not to be disturbed; and

2.10 Other measures such as: subsurface drains, check dams, dust control, practices and procedures of operations.

The Manual is a guidance document only. It is not adopted as part of these rules. It is not necessary to utilize any of the specific concepts contained in the Manual, nor is the use of one or more of those ideas a guarantee that a permit will be issued. Each site and the proposed construction related activities need to be examined to determine what measures are required for that specific site.

R-6.645-H **Enforcement.**

1. **Intervention.** The primary focus of sections 6.625 to 6.645 of the Eugene Code, 1971 and these Rules is to achieve compliance with the outcomes specified in R-6.645-D and prevent erosion and control stormwater impact, and the City will use the amount of enforcement necessary to achieve compliance. Where possible the City will rely on education rather than enforcement. The City Manager may provide educational programs or other informational materials that will assist permittees in meeting the desired erosion and sedimentation controls, and other construction site management practices outcomes.

2. **Stop Work Order.** Whenever any construction related activity is being done contrary to and in violation of Sections 6.625 to 6.645 of the Eugene Code, 1971, these rules, or an erosion prevention permit, the enforcement officer may order the construction related activity stopped by notice in writing, posted on the premises, or served on the permittee. The permittee shall forthwith stop such work until authorized by the enforcement officer to proceed.

3 **Citation for Violation.** Upon a determination that a person is violating Sections 6.625 to 6.645 of the Eugene Code, 1971 or these rules, a citation may be issued to the permittee to appear in Municipal Court.

4 **Administrative Compliance Order.** The City may issue an Administrative Compliance Order for any violation. The Order shall be in writing, specify the violation(s) and require compliance measures. The order also may include a Notice of Imposition of Administrative Civil Penalty Assessment for the violation.

5 **Notice of Imposition of Administrative Civil Penalty.** If a person fails to comply

with applicable provisions of the Eugene Code, 1971, these rules, an erosion prevention permit, conditions imposed thereon, or an administrative compliance order, the enforcement officer may issue to the person a Notice of Imposition of an administrative civil penalty pursuant to the provisions of Section 2.018 of the Eugene Code, 1971.

6. **Service.** All notices/orders shall be served by personal service or sent by certified mail and first class mail. Any notice/order served by mail shall be deemed received for purposes of any time computations hereunder, three days after the date mailed, if to an address within this state, and seven days after the date mailed, if to an address without this state.

7. **Penalties Not Exclusive.** Any administrative civil penalty imposed pursuant to this section shall be in addition to, and not in lieu of, any other penalty authorized by Section 6.992 of the Eugene Code, 1971, or any other action authorized by law.

8. **Settlement of Administrative Civil Penalty Assessment.** Upon receipt of Notice of Administrative Civil Penalty Assessment, the violator may request a conference with the City Manager or designee. The City Manager or designee may compromise or settle any unpaid administrative civil penalty assessment where authorized under Section 2.582 of the Eugene Code, 1971. A request under this paragraph shall not act as a stay, or otherwise affect the filing or processing of an appeal under R-6.645-I.

R-6.645-I **Appeals.**

1. **Stop Work Order, Administrative Civil Penalty, Administrative Compliance Order.** Any person to whom a Stop Work Order, Notice of Imposition of an Administrative Civil Penalty or Administrative Compliance Order is issued pursuant to these rules may appeal that determination to the City Manager. A Stop Work Order or Administrative Compliance Order shall be effective upon issuance, and shall continue in effect during the pendency of any appeal. The notice of appeal must be in writing, and filed with the City Manager within 15 days from the date of the Notice being appealed. The appeal shall state the name and address of the appellant, the nature of the determination being appealed, the reason the determination is incorrect, and what the correct determination of the appeal should be. Failure to file such a statement within the time or in the manner required waives the appellant's objections, and the appeal shall be dismissed. Unless the appellant and City agree to a longer time period, the appeal shall be heard by a hearings official within 30 days of receipt of the notice of appeal. At least ten days prior to the hearing, the City shall mail notice of the time and place of the hearing to the appellant. The hearings official shall hear and determine the appeal on the basis of the appellant's written statement and any additional evidence deemed appropriate. The appellant may present testimony and oral argument at the hearing either personally or by counsel. The hearings official shall issue a written decision within ten days of the date of the hearing. The decision of the hearings official is final, and may include a determination that the appeal fee be refunded to the appellant upon a finding by the hearings official that the appeal was not frivolous.

2. Appeal Fees. Appeals filed under this section shall be accompanied by an appeal fee in an amount established by the City Manager pursuant to Section 2.020 of the Eugene Code, 1971.

The foregoing Rule is adopted this 22nd day of January, 1997, and shall become effective February 1, 1997.

ADMINISTRATIVE ORDER NO. 58-96-27-F
of the
CITY MANAGER PRO TEM

ESTABLISHING FEES FOR PROCESSING EROSION PREVENTION AND CONSTRUCTION SITE MANAGEMENT PRACTICES PERMITS

The City Manager Pro Tem of the City of Eugene finds that:

A. Pursuant to the authority contained in Sections 2.019 and 6.635 of the Eugene Code, 1971, on December 5, 1996 I adopted Administrative Order No. 58-96-27 proposing the adoption of fees for processing erosion prevention and construction site management practices permits. The fee structure provides a basis for determining the amount of cost for an erosion prevention permit for a variety of land use conditions.

B. Notice of the proposed fees was provided to the Mayor and City Councilors, published in the Register Guard, a newspaper of general circulation within the City, and posted at two locations at City Hall on Dec 10, 1996. The Notice was also provided to persons who had requested notice, and made available for inspection by interested persons at the City's Public Works Department, Engineering Division, 858 Pearl Street, Eugene, Oregon 97401 during normal business hours (9:00 a.m. to 5:00 p.m., Monday through Friday, exclusive of holidays), and made available to the general public through Eugene's Home Page on the Internet.

C. The Notice provided that written comments would be received thereon until midnight, January 7, 1997, more than 15 days from the first date of publication and posting. Written comments were received from William Slattery and Robert L. Breeden to which I make the following findings:

Comment 1: How will the fees be used?

Finding: The fees will be used to pay staff costs associated with the review of erosion permit applications, inspection of erosion-related work, and enforcement activities. Two erosion specialists will be hired to implement the program. The fees will cover costs for these resources.

Comment 2: Is there a plan check fee also?

Finding: The fees that were sent out for public comment were listed as permit fees but in reality they are plan check permit and inspection fees combined. The title of the fees will be changed to reflect this reality.

Comment 3: Is there a fee to determine if a lot is in a sensitive area?

Finding: Determination of sensitive area will be done at the Permit and Information Center prior to the submittal of a permit application. Therefore, a fee is not required for this determination. Once the determination is made and finalized, a formal appeal of this determination requires a fee.

Comment 4: Appeal fees are too high.

Finding: The amount of the appeal fee, $175, includes an estimate of time and materials to hire a hearings official. This amount represents a straight forward appeal issue. Therefore, there is no need to adjust the rule at this time.

D. In addition to the specific findings set forth above, I find that the fees set forth in Exhibit A hereto are consistent with applicable policies and directives of the City Council, including policies developed during the Eugene Decisions process; are comparable to the fees charged for similar services; and are necessary t o comply with the Council's directive to recover the City's costs and expenses in administering such programs from the beneficiaries of the services.

Based on the above findings, which are hereby adopted, I order that:

The fees set forth in the Erosion Prevention and Construction Site Management Practices Permits Fee Schedule attached as Exhibit A hereto are hereby established as the fees to be charged for the services set forth therein, effective February 1, 1997.

Dated this 29th day of January, 1997.

EROSION PREVENTION AND CONSTRUCTION SITE MANAGEMENT PRACTICES PERMITS FEE SCHEDULE
(Effective February 1, 1997)

Plan Check/Inspection Fee:	
Single & Two-Family Residential (new)	$100.00
Single & Two-Family Residential (addition)	$ 75.00
Single & Two-Family Residential (utility)	$ 50.00
Multiple Family, Commercial, Subdivisions:	
(a) 1 acre or less of disturbed area	$150.00
(b) >1 acre of disturbed area	$150 + $25/acre or increment of acre over 1 acre
Annual Permit Plan Check/Inspection Fee	$1,500 or $40/hr (whichever is less)
Appeal:	
Permit denial	$175.00
Permit conditions	$175.00
Sensitive area designation	$175.00
Stop work order, administrative civil penalty, administrative compliance order	$175.00
Reinspection:	$40.00/hr (min.1 hr)

4O Sample Brochure

When should the SWPPP be submitted?

The SWPPP, whether an abbreviated SWPPP or a complete SWPPP per the General Permit, must be submitted with the Grading Permit application. One copy of the SWPPP should be submitted to the City, along with the Grading Permit application. A second copy of the SWPPP should be mailed to the Fairfield-Suisun Urban Runoff Management Program (URMP) *(see address on back of this brochure)*.

Additional Requirements for developments covering five acres or more

In addition to local grading and building permits, owners/developers who disturb five or more acres of total land area must obtain coverage under the State General Construction Activity Storm Water Permit. This General Permit requires the owner/developer to do the following:

- Submit a Notice of Intent to the State Water Resources Control Board prior to commencement of construction activity;
- Prepare and Implement a Storm Water Pollution Prevention Plan (SWPPP);
- Conduct inspections of storm water controls before and after storm events;
- Annually certify compliance with the General Permit and SWPPP; and
- File a Notice of Termination at the completion of construction.

Notice of Intent forms, guidelines for SWPPPs and General Permit information can be obtained by calling the State Water Resources Control Board Construction Activity Storm Water Hotline.

Copies of the SWPPP must be submitted to the City and Fairfield-Suisun URMP as stated above.

Where to Get More Information

City of Fairfield	1000 Webster Street Fairfield, CA 94533
Planning & Development Dept	(707) 428-7461
Public Works Dept	(707) 428-7485
City of Suisun City	701 Civic Center Blvd Suisun City, CA 94585
Planning Dept	(707) 421-7335
Public Works Dept	(707) 421-7340
Fairfield-Suisun Urban Runoff Management Program	1010 Chadbourne Rd Fairfield, CA 94585 (707) 429-8930
State Water Resources Control Board Construction Activity Storm Water Hotline	(916) 657-1146

For information about obtaining the California Storm Water BMP Handbooks contact:

Blue Print Service	1700 Jefferson Street Oakland, CA 94612 (510) 444-6771

Additional information available from your Planning or Public Works Department:

- Storm Water Controls in New Development and Redevelopment Projects (brochure)
- Fairfield-Suisun URMP Construction BMP Brochures (a series of seven brochures)

Fairfield-Suisun Urban Runoff Management Program, 6/95

Storm Water Controls for Small Construction Sites (less than 5 acres)

or

How to Prepare an Abbreviated Storm Water Pollution Prevention Plan (SWPPP)

A Guidance Brochure for Developers

City of Fairfield

City of Suisun City

Fairfield-Suisun Sewer District

Why are storm water controls needed?

Storm water pollution is a growing concern in the Fairfield-Suisun area. Storm water pollution results when contaminants such as oil, wastes and sediment flow through the storm drain system into our creeks and ultimately into the Suisun Marsh and San Francisco Bay.

How do construction activities affect storm water quality?

A primary source of storm water pollution is construction sites. The largest causes of storm water pollution from construction sites are:

- Poor sediment control
  - poor erosion control (especially during the rainy season),
  - mud tracked off-site by vehicles
  - poor management of excavated or stock-piled materials
  - discharge of sediment laden water from dewatering activities
- Poor housekeeping practices
  - uncovered dumpsters
  - poor vehicle maintenance practices
  - improper clean up and wash down practices
  - improper disposal practices
- Poor materials management
  - uncovered or inappropriate storage of fuel, raw materials, waste materials and stock-piles

When is a Storm Water Pollution Prevention Plan (SWPPP) required?

All development sites in the Fairfield-Suisun area must have a SWPPP prior to the start of construction.

<u>For sites less than five acres,</u> an abbreviated SWPPP may be prepared. Guidelines for an abbreviated SWPPP are provided below.

<u>For sites five acres and larger,</u> the owner must obtain coverage under the State General Construction Activity Storm Water Permit by filing a Notice of Intent with the California State Water Resources Control Board and preparing a complete SWPPP (see other side for information).

What information does the abbreviated SWPPP need to contain?

The abbreviated SWPPP (for sites less than 5 acres) should contain the following information:

- General site information
  - Project name and address
  - Type of project (residential, commercial, etc.)
  - Total number of acres to be disturbed by project
  - Contact name, title, address and telephone number
  - Approximate construction schedule with estimated start and finish dates
- Description of site topography and site map showing:
  - Spoils and/or raw materials stock-pile areas
  - Direction of drainage
  - Storm drain inlets or creeks in the vicinity of the site
  - Vehicle fueling and maintenance locations
  - Dumpster location
  - Construction materials storage areas
- Description of sediment control practices
  - Steps to be taken to trap and retain sediment on site during and after construction (*)
  - Methods to stabilize slopes during the rainy season (*)
  - Protection of storm drain inlets from polluted runoff

  (*) Can refer to the site's Erosion Control Plan.
- Description of housekeeping practices
  - Describe proposed practices and how the project supervisor will ensure that these are properly implemented by all job site personnel
- Description of materials management practices
  - Describe how the following will be accomplished without causing storm water pollution:
    - Demolition activities
    - Concrete truck or mixer washout
    - Painting cleanup
    - Plaster and stucco cleanup
    - Sand/water blasting
    - Concrete/asphalt saw cutting and removal
    - Landscaping
  - Describe materials siting and storage practices to be used to prevent storm water pollution

4P BMPs for Construction Sites

Construction Sites

Focus of Document

This guidance lists BMPs for construction sites and indicates the documents where further details can be obtained.

The Municipality should provide informational materials on these BMPs, as well as a general handout that explains the importance of each of the five principles in reducing construction site runoff pollution.

The Municipality should ensure training of its plan review staff and inspectors in all aspects of these BMPs including the details of the BMP, its applicability and effectiveness, and conditions under which it should be recommended or required for a construction site.

Construction Site Planning BMPs

Site Plan

- ✓ Plan the development to fit the topography, soils, drainage pattern and natural vegetation of the site.
- ✓ Remove existing vegetation only when absolutely necessary.
- ✓ Delineate clearing limits, easements, setbacks, sensitive or critical areas, trees, drainage courses, and buffer zones to prevent excessive or unnecessary disturbances and exposure.
- ✓ Avoid construction on steep slopes*
- ✓ Minimize cuts and fills*
- ✓ Align temporary and permanent roads and driveways along slope contours*

Other Measures

- ✓ Phase grading operations to reduce disturbed areas and time of exposure
- ✓ Avoid excavation and grading during wet weather
- ✓ Winterize construction site*

***For additional details, see Erosion and Sediment Control Field Manual prepared by the California Regional Water Quality Control Board, San Francisco. 1997.**

BMPs to Minimize Soil Movement

Soil Cover

- ✓ Install cover materials such as vegetative debris, mulch, crushed stone, geotextile fabric, erosion control blankets*
- ✓ Use soil stabilizers as appropriate*
- ✓ Use temporary seeding and planting to reduce erosion potential*

Tracking Control

- ✓ Construct stabilized access roads and entrances*
- ✓ Construct entrance/exit tire wash*
- ✓ When cleaning sediments from streets, driveways and paved areas on construction sites, use dry sweeping methods where possible. If water must be used to flush pavement, collect runoff in temporary storage tanks to settle out sediments prior to discharge to the storm drains, and protect storm drain inlets.

Structures to Control and Convey Runoff

- ✓ Earth dikes, drainage swales and ditches*
- ✓ Slope drains and subsurface drains*
- ✓ Velocity dissipation devices*
- ✓ Flared culvert end sections*
- ✓ Check dams*

Other Measures

- ✓ Slope roughening/terracing/rounding*
- ✓ Level spreader*

***For details, see Erosion and Sediment Control Field Manual prepared by California Regional Water Quality Control Board, San Francisco, Bay Region, 1997.**

BMPs to Capture Sediment

- ✓ Use terracing, riprap, sand bags, rocks, straw bales, and/or temporary vegetation on slopes to reduce runoff velocity and trap sediments. Do not use asphalt rubble or other demolition debris for this purpose.

- ✓ Protect storm drain inlets from sediment-laden runoff. Storm drain inlet protection devices include sand bag barriers, filter fabric fences, block and gravel filters, and excavated drop inlet sediment traps.*

- ✓ When dewatering the site, remove sediment from the discharge using filtration methods. Mobile units specifically designed for construction site dewatering can be rented for this purpose.

Other Controls

- ✓ Silt fence*

- ✓ Straw bale barrier (other than at storm drain inlets)*

- ✓ Sand bag barrier*

- ✓ Brush or rock filter*

- ✓ Sediment trap*

- ✓ Temporary sediment basin*

***For details, see Erosion and Sediment Control Field Manual prepared by California Regional Water Quality Control Board, San Francisco, Bay Region, 1997.**

Good Housekeeping Practices

All Construction Sites

- ✓ Identify all storm drains, drainage swales and creeks located near the construction site and make sure all subcontractors are aware of their locations to prevent pollutants from entering them.

- ✓ Clean up leaks, drips, and other spills immediately.

- ✓ Refuel vehicles and heavy equipment in one designated location.

- ✓ Wash vehicles at an appropriate off-site facility. If equipment must be washed on-site, do not use soaps, solvents, degreasers, or steam cleaning equipment, and prevent wash water from entering the storm drain.

- ✓ Never wash down pavement or surfaces where materials have spilled. Use dry cleanup methods whenever possible.

- ✓ Avoid contaminating clean runoff from areas adjacent to your site by using berms and/or temporary or permanent drainage ditches to divert water flow around the site.

- ✓ Keep materials out of the rain. Schedule clearing or heavy earth moving activities for periods of dry weather. Cover exposed piles of soil, construction materials and wastes with plastic sheeting or temporary roofs. Before it rains, sweep and remove materials from surfaces that drain to storm drains, creeks, or channels.

- ✓ Place trash cans around the site to reduce litter. Dispose of non-hazardous construction wastes in covered dumpsters or recycling receptacles. Recycle leftover materials whenever possible.

- ✓ Dispose of all wastes properly. Materials that can not be reused or recycled must be taken to an appropriate landfill or disposed of as hazardous waste.

- ✓ Cover open dumpsters with plastic sheeting or a tarp during rainy weather. Secure the sheeting or tarp around the outside of the dumpster. If your dumpster has a cover, close it.

- ✓ Train your employees and inform subcontractors about the stormwater requirements and their own responsibilities.

Construction Projects Involving Paint Work

- ✓ Non-hazardous paint chips and dust from dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash. Chemical paint stripping residue and chips and dust from marine paints or paints containing lead or tributyl tin must be disposed of as a hazardous waste.

- ✓ When stripping or cleaning building exteriors with high-pressure water, cover or berm storm drain inlets. If possible (and allowed by your local wastewater treatment plant), collect (mop or vacuum) building cleaning water and discharge to the sanitary sewer.

- ✓ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or creek.

- ✓ For water-based paints, paint out brushes to the extent possible and rinse to a drain leading to the sanitary sewer (i.e., indoor plumbing).

- ✓ For oil-based paints, paint out brushes to the extent possible, and filter and reuse thinners and solvents. Dispose of unusable thinners and residue as hazardous waste.

- ✓ Recycle, return to supplier or donate unwanted water-based (latex) paint.

- ✓ Dried latex paint may be disposed of in the garbage.

- ✓ Unwanted oil-based paint (that is not recycled), thinners, and sludges must be disposed of as hazardous waste.

Construction Projects Involving Cement and Concrete Work

- ✓ Avoid mixing excess amounts of fresh concrete or cement mortar on-site.

- ✓ Store dry and wet materials under cover, protected form rainfall and runoff.

- ✓ Wash out concrete transit mixers only in designated wash-out areas where the water will flow into settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.

- ✓ Whenever possible, return contents of mixer barrel to the yard for recycling. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

Construction Projects Involving Roadwork/Pavement Construction

- ✓ Apply concrete, asphalt, and seal coat during dry weather to prevent contaminants from contacting stormwater runoff.

- ✓ Cover storm drain inlets and manholes when paving or applying seal coat, slurry seal, fog seal, etc.

- ✓ Always park paving machines over drip pans or absorbent materials, since they tend to drip continuously.

- ✓ When making saw-cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the catch basins. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.

- ✓ Wash down exposed aggregate concrete only when the wash water can: (1) flow onto a dirt area; (2) drain onto a bermed surface from which it can be

pumped and disposed of properly; or (3) be vacuumed from the area along the curb where sediment has accumulated by blocking a storm drain inlet.

- ✓ Allow aggregate rinse to settle, and pump the water to the sanitary sewer if allowed by your local wastewater authority.

- ✓ Never wash sweepings from exposed aggregate concrete into a street or storm drain. Collect and return to aggregate base stockpile, or dispose with trash.

- ✓ Recycle broken concrete and asphalt.

BMPs to Minimize Impacts of Post-Construction Storm Water Discharges

See Appendix 4T of the MURP.

Note: This guidance is primarily based on "Blueprint for a Clean Bay. Best Management Practices to Prevent Stormwater Pollution from Construction-Related Activities," published by BASMAA and the Santa Clara Valley Nonpoint Source Pollution Control Program. 1995.

Sources Of Additional Information

Additional information on Construction Site Controls is available in the publications listed below.

Stormwater Quality Task Force. 1993. California Storm Water Best Management Practice Handbook - Construction.

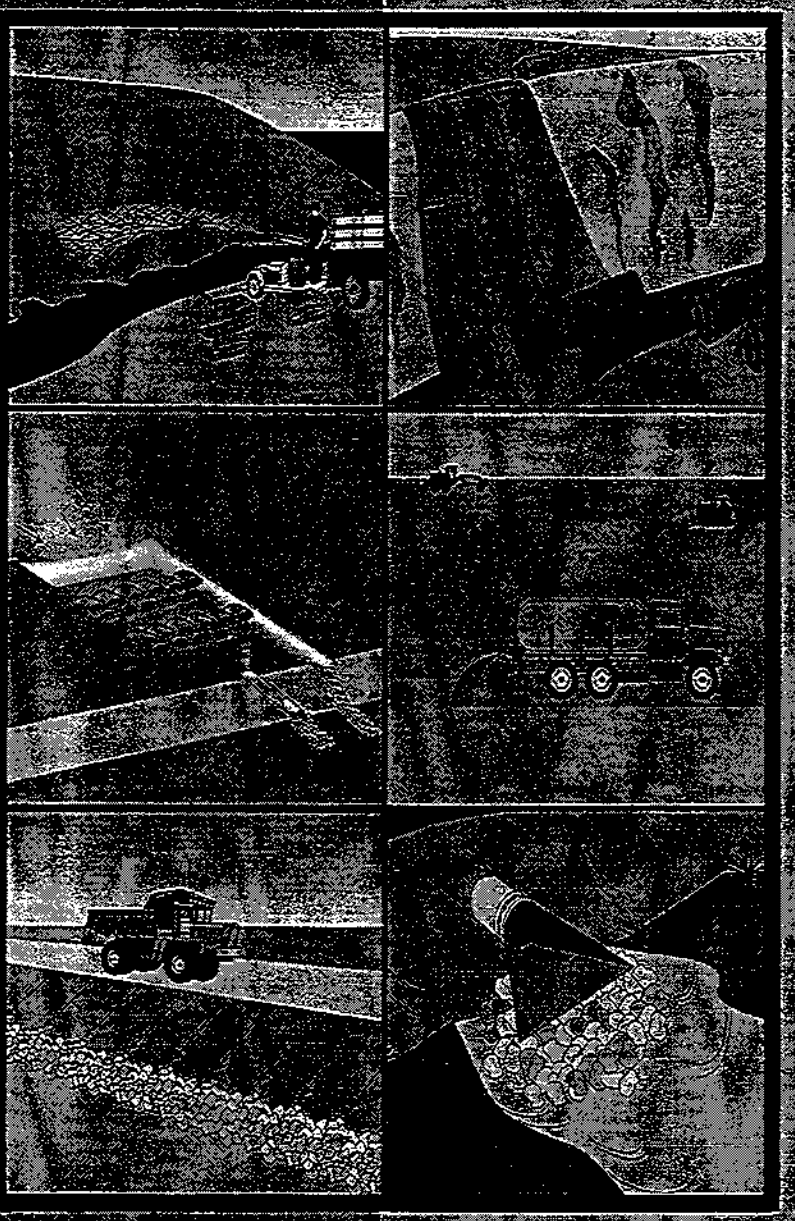
Association of Bay Area Governments. 1995. Manual of Standards for Erosion and Sediment Control Measures. A comprehensive filed guide for controlling soil erosion in California. May.

BASMAA. 1996. Start at the Source — Residential Site Planning and Design Guidance Manual.

Caltrans. 1996. Storm Water Quality Handbooks – Construction Contractors Guide and Specifications. May.

4Q Guidance for Construction SWPPP

Erosion



INFORMATION ON EROSION & SEDIMENT CONTROLS FOR CONSTRUCTION PROJECTS

CALIFORNIA
REGIONAL WATER QUALITY
CONTROL BOARD

SAN FRANCISCO BAY REGION

The State's General Permit

Construction-related erosion and sedimentation can cause problems for downgradient property owners, create nuisance problems on adjacent streets, clog streams and storm drains, and lead to premature silting up of reservoirs. The cumulative toll on the environment can be devastating. Uncontrolled erosion is costly, violates state and federal pollution laws, exposes developers, contractors, and landowners to legal liablilities, and provides ammunition to those who argue that the development process itself is out of control. As more and more development in the San Francisco Bay Area takes place on steep hillsides, the threat from erosion is increasing.

In 1990, the U.S. Environmental Protection Agency published regulations requiring that discharges of storm water runoff associated with construction activities causing soil disturbance of five or more acres must be covered by a federal National Pollution Discharge Elimination System (NPDES) permit. In California, the State Water Resources Control Board (State Board) is responsible for issuing such permits and has adopted a statewide General Permit to address discharges of storm water runoff associated with construction activities. The nine Regional Boards oversee implementation of the General Permit statewide.

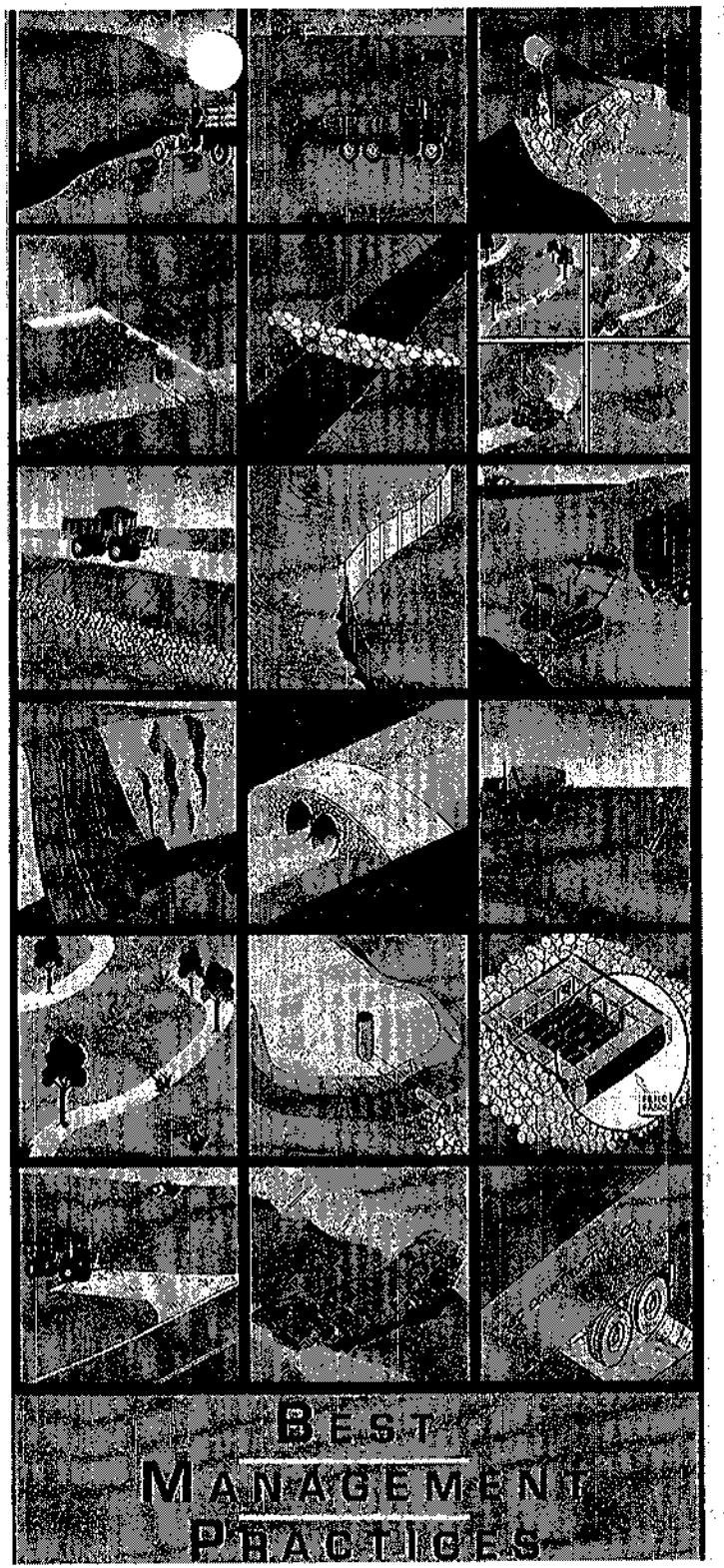
What does the General Permit require?

The General Permit requires all owners of land where storm water discharges associated with construction activity (i.e. clearing, grading, and excavation) results in a land disturbance of five or more acres to:

1. Submit a Notice of Intent (NOI) to comply with the General Permit and the appropriate filing fee to the State Board. A package containing an NOI and the General Permit can be obtained from the Regional Board at (510) 286-0968;
2. Eliminate or minimize non-storm water discharges from the construction site to storm drains and other water bodies. Non-storm water discharges to be eliminated or minimized are primarily silt comprised of earthen materials from erosion and sediment runoff. In addition to non-storm water discharges, runoff from storage and maintenance areas, building materials, and spillage of waste chemicals and materials should be eliminated or minimized.
3. Develop, implement, and update a Storm Water Pollution Prevention Plan (SWPPP) for the site. The Regional Board has prepared "Directions for Preparing a SWPPP," which is available from the Regional Board at (510) 286-0968 (copy attached).
4. Develop a site monitoring program and perform inspections of the measures implemented as part of the SWPPP. If implemented measures do not adequately minimize non-storm water discharges, those measures must be modified;
5. Annually certify, based on inspections, that the site is in compliance with the General Permit.

What activities are not covered by the General Permit?

Construction activity <u>not</u> covered by the General Permit includes routine maintenance, maintaining original line and grade, hydraulic capacity, and original purpose of the facility. In addition, Storm water discharges in the Lake Tahoe Hydrologic Unit will be regulated by a separate permit(s) adopted by the California Regional Water Quality Control Board, Lahontan Region, and may not seek coverage under the State Water Board's general permit. Storm water discharges on Indian lands will be regulated by the U.S. Environmental Protection Agency.



BEST MANAGEMENT PRACTICES

BEST MANAGEMENT PRACTICES FOR CONSTRUCTION PROJECTS

Why Control Erosion?

When raindrops strike bare soil, large amounts of topsoil are eroded and carried downstream in stormwater runoff.

Construction-related erosion can cause problems for downgradient property owners, clog storm drains, create nuisance problems on adjacent streets, and lead to the sedimentation and silting of streams, reservoirs and other water bodies.

Steep and bare slopes have the greatest potential for erosion and sedimentation. Any medium which adequately covers the soil and protects it from raindrop impact will virtually eliminate erosion, reducing it by 90 to 98%. Once erosion has occured, it is extremely difficult to remove the soil suspended in runoff.

By protecting soil from raindrop impact and consequently preventing erosion, the burden on less effective sediment controls is greatly reduced.

Uncontrolled erosion is costly, violates state and federal pollution laws, and exposes developers, contractors, and landowners to legal liabilities.

Fortunately, most erosion and sediment problems can be prevented or greatly reduced through proper planning and implementation of simple and low-cost control practices.

But unless control measures are properly planned, designed and installed, they will not work.

If you are the owner of land associated with construction activit[illegible]using soil disturbance of more than five acres, you are required to file for a National Pollution Discharge Elimination System (NPDES) General Permit from your local Regional Water Quality Control Board.

The General NPDES Permit requires all owners of land where construction activity occurs to:

1) Submit a Notice of Intent agreeing to comply with the General Permit and the appropriate filing fee to the State Water Resources Control Board.

2) Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the site **based on best managent practices.** *Directions for Preparing a SWPPP* is available from your local Regional Board.

3) Develop a site monitoring program and perform inspections of measures implemented as part of the SWPPP. If these measures do not adequately minimize pollutants in stormwater runoff, they must be modified.

4) Annualy certify, based on inspections, that the site is in compliance with he General Permit.

The *Erosion and Sediment Control Field Manual* provides the latest information on Best Management Practices and is intended to help you develop a program in compliance with Storm Water Discharge Requirements.

Order Form

The Field Manual

Erosion & Sediment Control for Construction Projects

California Regional Water Quality Control Board
- San Francisco Bay Region -

$25.00 Donation Required

(Checks payable to Friends of the San Francisco Estuary)

Mail completed Order Form with Full Payment to:

Friends of the San Francisco Estuary
c/o RWQCB
2101 Webster Street, Suite 500
Oakland, California
94612-3060

Number of Copies _____

Name _____

Affiliation _____

Address _____

City _____

State _____ Zip _____

Telephone _____

Questions? Call 510-286-0924

CONTRA COSTA CLEAN WATER PROGRAM

Make a Clear Difference

Donald P. Freitas
Program Manager

ORDER FORM
FOR
CALIFORNIA STORMWATER BEST MANAGEMENT PRACTICE HANDBOOK(S)
AND
BAY AREA PREAMBLE TO THE CALIFORNIA STORMWATER BEST MANAGEMENT PRACTICE HANDBOOK(S) AND NEW DEVELOPMENT RECOMMENDATIONS

Item		Cost	No. of Copies	Total Cost
Municipal Handbook	:	$12.50 ea	_____	$_____
Construction Handbook	:	$12.00 ea	_____	$_____
Industrial/Commercial Handbook:		$13.00 ea	_____	$_____
Bay Area Preamble	:	$10.00 ea	_____	$_____
			Handbook Subtotal	$_____
			Shipping Subtotal	$_____
			Total	$_____

SHIPPING COSTS:

Shipment **within** California can be prepaid by including the cost of $4.25 for UPS-shipping for 1 to 3 handbooks and preamble ($7.20 for 4 to 6 handbooks, etc.). Contact BPS for shipments outside California.

Make checks payable to **"BPS"** to cover costs of handbooks and postage and mail to:

Blue Print Service (BPS)
1700 Jefferson Street
Oakland, CA 94612
Phone: (510) 444-6771
Fax: (510) 444-1262

PLEASE: NO C.O.D.s and allow 4 -6 weeks for delivery.

PRINT OR TYPE:

Name _____ Date _____

Business _____ Phone No. (____) _____

Address _____

City, State, Zip _____

255 Glacier Drive, Martinez, CA 94553-4897 • Tel: (510) 313-2360 Fax: (510) 313-2301

4R Model Construction SWPPP

STORM WATER POLLUTION PREVENTION PLAN

Name of Project _____

Owner and Contractor of Project _____

Waste Discharge Identification Number _____

Contact Person/address/daytime and emergency phone numbers

_____

CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____ _____

Name, Title Date of Preparation

AMENDMENTS

TABLE OF CONTENTS

INTRODUCTION

Type of Project/Project Description

Location of Project

Project Schedule

Start Date _____

End Date _____

Unique Features

Supplemental Documents

SOURCE IDENTIFICATION

Topographic Map (Attachment 1)

Site Map (Attachment 2)

NARRATIVE DESCRIPTIONS

A. Site Estimates and Description of On-site Soil

Size of Construction Site (acres/square feet) _____
Runoff Coefficient before construction _____
Runoff Coefficient after construction _____
Percent Site that is impervious before construction _____
Percent Site that will be impervious after construction _____

B. List of Likely Non-Toxic Pollutants at the Site

Sources/Activities that could release these pollutants into site runoff

C. Toxic Materials to be treated, stored, used, or disposed of, on or near the site.

Methods that will be employed to prevent and control pollution from these toxic materials.

D. Erosion and Sediment Control Practices

1. General Practices

2. Soil Stabilization Practices

3. Practices to Reduce Tracking of Sediment onto public and private streets

4. Practices to address Wind Erosion

a. Dust Control

b. Sweeping

5. Practices to Minimize Contact with Storm Water

a. Construction Vehicles and Equipment

i) Maintenance

Yes No

- ☐ ☐ Maintain all construction equipment to prevent oil or other fluid leaks.
- ☐ ☐ Keep vehicles and equipment clean, prevent excessive build-up of oil and grease.
- ☐ ☐ Use off-site repair shops.
- ☐ ☐ Keep stockpiled spill cleanup materials readily accessible.
- ☐ ☐ Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
- ☐ ☐ Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- ☐ ☐ Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.

ii) Fueling

Yes No

- ☐ ☐ If fueling must occur on-site, use designated areas away from drainage.
- ☐ ☐ Locate on-site fuel storage tanks within a bermed area designed to hold the tank volume.
- ☐ ☐ Cover retention area with an impervious material and install it in a manner to ensure that any spills will be contained in the retention area.
- ☐ ☐ Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- ☐ ☐ Use drip pans for any oil or fluid changes.

iii) Washing

Yes No

- ☐ ☐ Use as little water as possible to avoid installing erosion and sediment controls for the wash area.
- ☐ ☐ If washing must occur on-site, use designated, bermed wash areas to prevent waste water discharge into storm water, creaks, rivers, and other water bodies.
- ☐ ☐ Use phosphate-free, biodegradable soaps.
- ☐ ☐ Do not permit steam cleaning on-site.

b. Materials

Materials to be Stored on-site

_____

_____

Methods that will be employed to minimize the amount of these materials on site.

_____

_____

Methods of Secondary containment of materials stored.

_____

_____

Chemical Storage Methods.

_____

_____

6. Construction Materials Loading, Unloading and Access Areas.

_____

_____

_____

7. Waste Management and Disposal

a. Concrete Wash-Out

_____

_____

b. Miscellaneous Wastes

_____

_____

8. Pre-Construction Control Practices

E. Non-Storm Water Management

F. Maintenance, Inspection, and Repair of Structural Controls

G. Spill Prevention and Control

1. Minor Spills

2. Major Spills

H. Post-Construction Storm Water Management

I. Personnel Training

J. List of Contractors/Subcontractors

K. Other Plans/Permits

L. Monitoring

1. General Plan Summary

2. Site Inspections

3. Compliance Certification

4. Noncompliance Reporting

5. Records

4S Sample Reporting Forms

Contractor Self-Inspection Form

C4.1 Construction Site Inspection Checklist

Inspected By: _____

Project: _____

Contractor: _____

Date: _____

Check "Yes" or "No" or "N/A" if not applicable.

YES	NO	N/A		
_____	_____	_____	1.	Has there been an absence of rain since the last inspection?
_____	_____	_____	2.	Are all sediment barriers (e.g., sandbags, straw bales, and silt fences) in place in accordance with the Plan and are they functioning properly?
_____	_____	_____	3.	If present, are all exposed slopes protected from erosion through the implementation of acceptable soil stabilization practices?
_____	_____	_____	4.	If present, are all sediment traps/basins installed and functioning properly (if applicable)?
_____	_____	_____	5.	Are all material handling and storage areas reasonably clean and free of spills, leaks, or other deleterious materials?
_____	_____	_____	6	Are all equipment storage and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious materials?
_____	_____	_____	7.	Are all materials and equipment properly covered?
_____	_____	_____	8.	Are all external discharge points (i.e., outfalls) reasonably free of any noticeable pollutant discharges?
_____	_____	_____	9.	Are all internal discharge points (i.e., storm drain inlets) provided with inlet protection?

Check "Yes" or "No" or "N/A" if not applicable.

YES	NO	N/A		
_____	_____	_____	10	Are all external discharge points reasonably free of any significant erosion or sediment transport?
_____	_____	_____	11.	Are all BMPs identified on the Plan installed in the proper location and according to the specifications for the plan?
_____	_____	_____	12.	Are all structural control practices in good repair and maintained in functional order?
_____	_____	_____	13.	Are all on-site traffic routes, parking, and storage of equipment and supplies restricted to areas designated in the Plan for those uses?
_____	_____	_____	14.	Are all locations of temporary soil stockpiles or construction materials in approved areas?
_____	_____	_____	15.	Are all seeded or landscaped areas properly maintained?
_____	_____	_____	16.	Are sediment treatment controls in place at discharge points from the site?
_____	_____	_____	17.	Are slopes free of significant erosion?
_____	_____	_____	18.	Are all points of ingress and egress from the site provided with stabilized construction entrances?
_____	_____	_____	19.	Is sediment, debris, or mud being cleaned from public roads at intersections with site access roads?
_____	_____	_____	20.	Does the Plan reflect current site conditions?

If you answered "no" to any of the above questions (except Number 1), describe any corrective action(s) that must be taken to remedy the problem and when the corrective action is to be completed:

C4.2 Inspection Log

The site shall be inspected before and after storm events with 0.25 inches or greater predicted or actual precipitation, and documented on the Construction Site Inspection Checklist. Incidents of noncompliance must be reported to the Engineer.

Date	Inspector	Type of Inspection			Observations (If post-storm inspection, note size of storm in inches)
		Routine	Pre-Storm	Post-Storm	

Attachment C5
Standard Permittee
Inspection Form Requirements

C5.1 Construction Site Inspection Checklist

Inspected By: _____

Project: _____

Contractor: _____

Date: _____

Level I	Yes	No	N/A
1. Are all discharge points reasonably free of any noticeable pollutant discharges? If Yes, go to Question 2. If No, is the project a Priority Project? If Yes, go to Level II. If No, continue below.			
a. Are all material handling and storage areas reasonably clean, and free of spills, leaks, or other deleterious materials?			
b. Are all equipment storage and maintenance areas reasonably clean, and free of spills, leaks, or other deleterious materials?			
c. Are all materials and equipment properly covered?			
If you answered "no" to any of the above questions, describe on the next page any corrective actions that will be required to remedy the problem and when the corrective actions are to be completed.			
2. Are all discharge points reasonably free of any significant deposition of sediment? If Yes, go to Question 3. If No, is the project a Priority Project? If Yes, go to Level II. If No, continue below			
a Are sediment control BMPs installed downslope of all disturbed areas of the site?			
b Are sediment control BMPs in proper repair and free of excessive sediment buildup?			
c Are site entrance and exit points free of tracked sediment?			
d Are all discharge points (e.g., storm drain inlets) provided with inlet protection?			
If you answered "no" to any of the above questions, describe on the next page any corrective actions which will be required to remedy the problem and when the corrective action is to be completed.			
3. Are all discharge points, downstream channels, and slopes not actively under construction free of erosion? If Yes, inspection is complete. If No, is the project a Priority Project? If Yes, go to Level II. If No, continue below.			
a. Are erosion control BMPs in place at or upstream of these locations?			
b. Are erosion control BMPs in proper repair?			
c. Are areas not actively under construction stabilized and access properly restricted from these areas?			
If you answered "no" to any of the above questions, describe on the next page any corrective actions which will be required to remedy the problem and when the corrective action is to be completed.			

Level II - Priority Projects	Yes	No	N/A
4. a. Has a local SWPPP been prepared for the project?			
b. Has the local SWPPP been implemented?			
c. Are the BMPs implemented under the local SWPPP effective at meeting the minimum construction material and waste management requirements?			
If you answered "no" to any of the above questions, describe below any corrective actions which will be required to remedy the problem and when the corrective action is to be completed.			
5. Are soil disturbing activities occurring during the rainy season? If Yes, continue below. If No, inspection is complete.			
a. Has a WWECP been prepared?			
b. Has the WWECP been implemented?			
c. Are the BMPs implemented under the WWECP effective at meeting the minimum sediment and erosion control requirements?			
If you answered "no" to any of the above questions, describe below any corrective actions which will be required to remedy the problem and when the corrective action is to be completed.			

Corrective Action(s) Needed and Schedule for Completion:

Attachment C6
BMP Checklist

C6.1 Erosion Control Practices

BMP Description	*Will BMP Be Used?*		*If Yes, Explain How*
	Yes	*No*	*If No, State Reason*
Site Planning Considerations			
Scheduling			
Preservation of Existing Vegetation			
Vegetative Stabilization			
Seeding & Planting			
Mulching			
Physical Stabilization			
Geotextiles & Mats			
Dust Control			
Temporary Stream Crossing			
Construction Road Stabilization			
Diversion of Runoff			
Earth Dike			
Temporary Drains & Swales			
Slope Drain			
Velocity Reduction			
Outlet Protection			
Check Dams			
Slope Roughening/Terracing			

C6.2 Sediment Control Practices

BMP Description	*Will BMP Be Used?*		*If Yes, Explain How*
	Yes	*No*	*If No, State Reason*
Silt Fence			
Straw Bale Barrier			
Sand Bag Barrier			
Brush or Rock Filter			
Storm Drain Inlet Protection			
Sediment Trap			
Sediment Basin			

C6.3 Tracking Control Practices

BMP Description	*Will BMP Be Used?*		*If Yes, Explain How*
	Yes	*No*	*If No, State Reason*
Tracking Control			
Stabilized Construction Entrance			

C6.4 Non-Stormwater and Material and Waste Management Practices

BMP Description	*Will BMP Be Used?*		*If Yes, Explain How*
	Yes	*No*	*If No, State Reason*
Construction Practices			
Dewatering Operations			
Paving Operations			
Structure Construction & Painting			
Vehicle & Equipment Management			
Vehicle & Equipment Cleaning			
Vehicle & Equipment Fueling			
Vehicle & Equipment Maintenance			
Material Management			
Material Delivery and Storage			
Material Use			
Spill Prevention and Control			
Waste Management			
Solid Waste Management			
Hazardous Waste Management			
Contaminated Soil Management			
Concrete Waste Management			
Sanitary/Septic Waste Management			
Contractor Training			
Employee/Subcontractor Training			

4T Post-Construction Controls

Post-Construction Controls for New Development and Redevelopment

The focus of this guidance is post-construction controls for new development or redevelopment projects. Post-construction controls can be generally grouped into three types: **site planning measures** that avoid or reduce disturbance of the site and limit the addition of impervious surfaces; **pollution prevention/source control measures** that reduce or eliminate potential future sources of pollutants; and **treatment control measures** that treat polluted runoff from new development/redevelopment sites.

This guidance is focused strictly on specific controls that can be incorporated into individual development projects proposed by public and private entities to avoid or reduce the pollutants from the particular project. Where appropriate, pros and cons are described along with typical conditions under which these controls have been found to be effective.

As noted in Section 4.6 of the MURP, the best opportunities for post-construction controls are available in larger projects or when implemented on a regional basis, and most of this guidance emphasizes controls that can be introduced in larger new development/redevelopment projects through the discretionary approval process. The second section of this guidance presents a list of controls that can be employed for small infill-type projects (ministerial approval process) where the opportunities are limited.

Post-Construction Controls for Projects Requiring Discretionary Approvals

Site Planning Measures

This group of post-construction controls includes site planning to protect sensitive resources at or near the site and the use of alternate paving and cover materials to reduce the amount of impervious surfaces added by a new development.

Studies have shown that in single-family residential areas, streets are the primary producers of runoff, and sidewalks and lawns, if properly vegetated, are a minor source. In multi-family developments, streets, parking lots and roofs generate similar quantities of runoff. In commercial/industrial areas, parking lots and roofs are the main generators of runoff. It follows then that to reduce impervious surfaces, in single-family residential areas reduction of street width and driveway lengths should be the primary strategy, while in multi-family developments and industrial/commercial areas, strategies should focus on reducing parking lots and the footprint of buildings. *For more information on site planning, refer to Start at the Source Residential Site Planning and Design Guidance Manual for Stormwater Quality Protection, available from BASMAA.*

Site planning measures that minimize impervious surface and maximize infiltration are described below:

- ✓ **Cluster development** - Concentrate the development on a limited portion of the site and leave the remaining portion undisturbed. This should be used where appropriate without creating other hazards such as those of access during emergencies.

- ✓ **Preserve natural drainages** - This measure includes not filling in the natural drainage features at the site, maintaining invert/streambeds to maximize capacity, and providing vegetated setbacks or buffer strips outside of the maximum water surface level. Main concerns are related to safety especially of children and future need for mosquito/pest control.

- ✓ **Reduce sidewalk widths, especially in low-traffic areas** - This control provides limited runoff reduction benefits, and reduction of width may not possible due to Americans with Disabilities Act (ADA) requirements.

- ✓ **Avoid curb and gutter along driveways and streets where appropriate** - This is recommended in areas where flooding and ponding of water creating mosquito habitat is not a problem. Replace with swales.

- ✓ **Use alternate paving materials/porous/permeable materials, where appropriate** - This measure includes use of alternate paving materials (e.g., porous asphalt, pervious concrete, pavers), landscaping, mulch, gravel and cobbles where appropriate to provide ground cover, and reduce the use of asphalt or other impervious pavement.

  Pavers are recommended for driveways, walkways, and patios in single-family residences where the site does not generate highly polluted runoff (that could contaminate groundwater if it were to infiltrate) and where ADA requirements do not have to be met. In non-residential areas, pavers are recommended for emergency access roads, overflow parking areas, and non-handicapped parking stalls. These are not recommended where heavy loads (e.g. truck movement) are anticipated. *For more information on alternate paving materials, see Post-Construction Controls for New Development Fact Sheets available from BASMAA.*

- ✓ **Reduce the length of driveways or infiltrate driveway runoff** - This control applies mainly to single-family residential units. Note that in most of the large metropolitan areas of California, driveways in new development are generally short due to the high cost of land. If long driveways in the Municipality are due to the fact that the structures have to be set back from the property line per the zoning ordinance, then the Municipality should consider changes in its zoning ordinance. If reduction of the driveway length is not possible, grade and construct driveway so that runoff from driveway is directed to the adjacent landscaped areas.

- ✓ **Reduce street width by eliminating on-street parking (where such actions do not pose a safety hazard)** - This measure can be generally used in new residential areas. In addition to reducing the impervious area, this control has the added benefit of removing cars from streets and making street sweeping easier and more effective. If on-street parking in residential areas is eliminated, the developer must provide adequate off-street visitor parking.

- ✓ **Reduce alley width or use alternate materials for paving alleys** - Alleys are generally not built in residential areas in California due to the high cost of land and concerns regarding safety and maintenance (alleys are often used for illegal dumping). However if alleys are included in a proposed development, width should be minimized or alternate paving materials should be used.

- ✓ **Mandate that all developments set aside open space** - This control is recommended for all developments (residential and non-residential). The main concern with open space relates to maintenance, weed control, and fire prevention.

Source Controls

This group includes controls that can be incorporated into new development/redevelopment projects to avoid pollution in the long run by eliminating sources.

- ✓ **Provide green areas where pets can be exercised** - Pet excrement is a major source of bacteria in urban runoff. In addition to instituting ordinances requiring owners to collect their pet's excrement, provide green areas in new residential developments where people can walk their pets and keep pet excrement away from sidewalks and streets.

- ✓ **Install landscaping or other cover** - Clearing and grading of surfaces in new development can increase potential for erosion. Install landscaping or other cover materials to minimize erosion from graded surfaces. Use of native plant materials is recommended because native plants require less maintenance and irrigation, and are typically more resistant to fires than non-native grasses. Native plants do take longer to cover slopes therefore during the first few years, supplemental protection (erosion blanket, mulch, etc.) will be necessary.

- ✓ **Incorporate low-maintenance landscaping** - At some sites where erosion may not be a concern but landscaping is proposed as part of the development, require or recommend use of low-maintenance landscaping that does not require frequent fertilizer, pesticide and herbicide application. In this regard, the Municipality should identify the types of trees, shrubs, and ground cover that would work in the community based on local climatic and soil conditions, and should make such lists available to municipal staff responsible for reviewing projects.

- ✓ **Require labeling of storm drains (to discourage dumping)** - Developer should be required to label all storm drains with the appropriate legend used in the city, cautioning against dumping.

- ✓ **Where possible, eliminate gutters/roofdrains or direct runoff to landscaped areas** - Roofdrains can be eliminated only in one to two-story buildings. Where these cannot be eliminated, direct the downspout of the gutter to a landscaped area or into an infiltration trench. Install several gutters to distribute the flow.

- ✓ **Construct designated vehicle wash area** - In new residential developments involving more than 50 units, require applicant to construct a designated vehicle wash area that is plumbed to discharge to the sanitary sewer (the Municipality should check with the local wastewater treatment plant before instituting this control).

- ✓ **Encourage underground parking and the construction of multi-storied parking structures** - For commercial projects, encourage developers to build underground or multi-story parking structures so that not only is impervious surface minimized but the parking surfaces are under a roof and not exposed to storm water.

- ✓ **Encourage cooperative or shared parking** - This control is recommended for commercial areas, and can be a cooperative effort between commercial entities or between commercial entities and the Municipality.

- ✓ **Encourage use of alternate paving materials for parking lots** - This control is recommended for overflow parking areas and for less frequently used parking spaces (typically these are spaces along the periphery of the parking lot that will not have to meet ADA requirements and due to low usage there will be less concern regarding pollution of groundwater through infiltration of stall runoff).

- ✓ **Encourage measures to reduce building footprint and increase use of taller structures (where appropriate)** - This control is recommended for commercial and municipal structures.

- ✓ **Require that waste storage areas be bermed** - Require all developments to grade and pave outdoor waste receptacle area to prevent run-on of storm water, and install a low containment berm around it. Alternately, construct a covered enclosure with wash-down capabilities outletting into the sanitary sewer.

- ✓ **Require installation of valves on storm drain inlets in loading dock areas** - At commercial/industrial facilities where loading docks are proposed, require the applicant to install a valve to control runoff in the event of spills.

Treatment Controls

This group includes controls that can be built at new development/redevelopment sites to capture and treat the polluted runoff before it enters the city's storm drain system or other receiving waters.

- ✓ **Rooftop Catchment Systems** - These are rooftops which are designed to pool stormwater, which following the storm, evaporates. This effectively eliminates rooftop runoff from the storm drain system, and thereby reduces the hydraulically-connected impervious area. Another function of these systems is to slow down the runoff to reduce peaks. Problems with rooftop catchment systems are mainly related to leakage. Such systems are usually recommended for large commercial and industrial sites, and in climatic zones where rainfall is intermittent and temperatures are above freezing.

- ✓ **Vegetated Filter Strips** - Vegetated filter strips, buffer strips, or riparian buffer zones are strips of vegetation placed between receiving waters (e.g., along streams) and pollutant sources. The effectiveness of the strips depend primarily on the width of the strip, and the vegetation type and condition. Strips of 100-300 feet in width are often considered. Such strips have been successfully applied to urban, agricultural, and forestry situations. Vegetation type selection in California must take into account the semi-arid climate and usually should be drought-resistant. Maintenance is primarily annual cutting. Such strips are recommended for new development located along receiving waters such as streams, rivers and lakes, but outside the flood control boundary.

- ✓ **Vegetated Swales** - Swales are shallow low gradient channels that are vegetated. They are commonly applied in rural residential areas in lieu of traditional curb/gutters and underground stormwater drainage pipes. Water quality improvement is achieved primarily through filtration, and performance is dependent on the swale hydraulic capacity and vegetation type and condition. Influent water should be relatively free of coarse sediment to avoid burying the vegetation. Where sediment loads are of concern, sediment settling basins can be provided upstream of the swales. Maintenance consists primarily of vegetation management and settling basin cleanouts. Swales are generally recommended for low-density residential developments located in relatively flat terrain.

- ✓ **Infiltration Basins** - Infiltration basins store and infiltrate stormwater into the surficial groundwater aquifer. Performance is critically dependent on soil porosity and adequate depth to groundwater. In California, such conditions are typical of inland valleys, in contrast to low lying coastal areas. In order to maintain recharge rates, influent water may require pretreatment to remove sediments. Infiltration basins are effective at reducing runoff rates and volumes and can provide water supply benefits through aquifer recharge. Maintenance primarily consists of periodic removal of accumulated trash, debris and sediments to maintain recharge rates. Infiltration basins are generally recom-

mended in semi-arid areas where the depth to groundwater is relatively high and the soils are highly pervious. Where such conditions exist, this technology is generally applicable to the entire range of urban development, although the potential for groundwater contamination is often of concern in industrial areas.

- ✓ **Infiltration Trenches** - Infiltration trenches are shallow drains filled with high porosity materials (e.g. gravel). Stormwater discharged to these trenches is stored during the runoff event and infiltrates into the groundwater during dry weather periods. As with infiltration basins, performance requires porous subsoils and adequate depth to the groundwater table. The acceptability and designs of infiltration trenches may be covered by building codes where there is concern that infiltrating water may adversely affect soil strength around foundations. Infiltration trenches are generally not recommended for roof runoff near buildings because of building code requirements; but can be effective as part of the overall open channel drainage system.

- ✓ **Dry Detention Ponds/Basins** - These are basins designed to temporarily store and treat storm water prior to gradually releasing it downstream. Such basins can provide flood control and storm water treatment benefits. Treatment performance depends on storage volume (12-24 hours of residence time is considered a good rule of thumb), and good circulation (avoidance of short circuiting). A major factor limiting good performance is that, during larger storm runoff events, water entering a dry basin may resuspend previously settled material in which case the ponds may act as a source of sediment and associated chemicals. In general dry basins are not as effective as wet basins(discussed below), however, in certain arid areas, wet basins are not feasible. Performance of dry basins can be improved by incorporating slow release outlet structures. Such basins are generally applicable to residential, commercial, and industrial development in arid areas where there is insufficient runoff to maintain wet basins. The cost of urban lands often preclude this type of treatment in the more dense portions of urban areas.

- ✓ **Retention Ponds/Wet Basins** - These are basins that contain a permanent pool of water. Such ponds can provide flood control, ecological, and water quality benefits. The performance of wet basins depends on the size of the basin, watershed characteristics, and influent conditions. The primary treatment process in retention ponds is settling. Maintenance is required for removing debris, vegetation management, and maintaining the inlet and outlet structures. Accumulation rates in such basins typically require that accumulated sediment be removed about once every 10-20 years. Retention ponds are generally applicable to most urban situations, as long as there is adequate space for the facility and acceptable geological conditions. The cost of land often precludes this type of treatment in the more densely developed portions of urban areas.

- ✓ **Constructed/Restored Wetlands** - In addition to providing flood control and water supply benefits through artificial recharge of groundwater, constructed wetlands designed for stormwater management provide water quality benefits

through a number of processes including sedimentation, filtration, absorption, biological processes, and nutrient uptake. Pollutant removal performance depends on the size of the wetland relative to the watershed, the design of the wetland, and the type and composition of wetland vegetation. Wetlands also provide additional ecological and recreational benefits. If a significant amount of sedimentation is anticipated, a deep settling basin could be constructed (which the water would enter prior to reaching the wetland). The basin would require periodic maintenance to remove accumulated sediment. Constructed wetlands require maintenance, especially in the first 5-10 years during which vegetation is growing and natural seeding is occurring. Providing suitable hydrologic conditions for vegetation growth and water treatment is key to successful performance of constructed wetlands. Constructed wetlands are generally applicable to most urban situations, as long as there is adequate space for the facility, an adequate source of water, and appropriate soils. In California, such wetlands would likely be seasonal in nature. The cost of urban lands often preclude this type of treatment in the more densely developed portions of urban areas.

A variation of this control is the use of existing wetlands for urban runoff treatment. Existing wetlands at or downstream of a new development/redevelopment project can be enhanced to improve hydrology, and runoff from the development project can be directed to the wetlands.

Note that the dry detention ponds/basins, retention ponds/wet basins, and the constructed wetlands need to be periodically monitored for accumulation of toxic materials, and provisions made for cleanout and disposal pretreatment may be added (to remove heavy sediment trash and debris) to reduce maintenance. If a significant amount of sediment is anticipated, a deep settling basin could be constructed. This would also need to be periodically cleaned out to maintain capacity.

- ✓ **Filtration Systems -** Filtration systems convey stormwater through filter media (e.g., sand, compost, charcoal) to treat the storm water. The chemicals treated vary depending on the type of media and may include fine sediment, colloidal material, hydrocarbons, organics, nutrients and dissolved metals. Such systems come in many sizes and designs including: (1) inserts placed in individual storm drain inlets, (2) linear units that treat stormwater from small impervious areas such as parking lots, and (3) large 1-2 acre sand filters that treat runoff from urban catchments. Filters are effective as long as the capacity of the filter is not exceeded, and the filter is not allowed to clog. Filter inserts are particularly problematic in this regard, and recent testing and evaluation questions their applicability where material in runoff will clog or block the filter. In stormwater applications filter systems are required to remove blocking materials (leaves, trash, debris, sediments, oil and grease) and storage to better manage flowrates.

Experience to date with filter type inserts for drain inlets suggest that the units are easily clogged with sediment and debris, with resultant bypassing of most of the flows. Therefore, inserts are not recommended unless require frequent inspection and cleaning is performed. Filtration systems will have limited application in small well-maintained parking lots.

✓ **Oil/Grit Separators** - Oil/grit (gravity) separators are usually multi-chambered treatment units that are placed underground and treat stormwater from a drainage catchment. The individual chambers often are designed to trap grit and floatables, and adsorb hydrocarbons. Flows in excess of the design capacity should be diverted around the unit, otherwise there is the possibility that sediment previously trapped in the chambers will be resuspended and flushed downstream. Inspection and maintenance is required to ensure that the units are not filling up with sediment, as accumulation can affect performance. Traditional gravity oil/water separators that utilize skimming devices and coalescing plates (to increase droplet size and capture) are generally not applicable to stormwater conditions where total hydrocarbon concentrations are generally less than 10 mg/l. The performance of oil/grit separators varies depending on the chosen design and cannot be generally recommended at this time, pending more data from ongoing testing. In general, oil/grit separators are useful only at sites where there are chances that oil spills could occur and to a limited degree at development sites that have high oil and grease loadings such as petroleum storage yards and vehicle storage facilities.

General Design Considerations for Treatment Controls

Treatment control design standards, depending on the type of units, are based on either treating a given volume of runoff (e.g., first 0.5 inch of runoff) or a peak flowrate associated with a design storm. The volume approach is often utilized for small catchments where there tends to be a “first flush” condition (e.g., a parking lot). Design storms for storm water controls tend to be small (e.g. recurrence intervals of 3 months to 2 years) compared to flood control designs standards because of the need to minimize the size and cost of the unit, and because most runoff is associated with the more frequent smaller events. Treatment controls must be designed such that volumes and flows in excess of the design standard bypass the unit, otherwise there is the possibility of aggravating flooding and also causing resuspension of previously captured sediments or other constituents. Also, all of the treatment devices above require some inspection, maintenance, and disposal of solids to ensure optimum performance and often to avoid flooding.

Post-Construction Controls for Projects Requiring Administrative Permits

✓ **Incorporate low-maintenance landscaping** - The applicant should be instructed to use low-maintenance drought-tolerant landscaping that does not require frequent fertilizer, pesticide and herbicide application.

- ✓ **Require labeling of storm drains (to discourage dumping)** - The applicant should be instructed to label all storm drains with the appropriate legend used in the municipality, cautioning against dumping.

- ✓ **Where possible, direct gutters to landscaped areas** - Roof drains may be eliminated only in one to two-story buildings. Where these cannot be eliminated, instruct the applicant to direct the downspout of the gutter to landscaped area or into an infiltration trench. Install several gutters to distribute the flow. Note that roof drains may be eliminated in residential and some commercial areas only, and should not be eliminated in industrial areas.

- ✓ **Use alternate paving materials/porous/permeable materials, where appropriate** - Instruct applicant to use alternate paving materials (pavers), landscaping, mulch, gravel and cobbles where appropriate to provide ground cover, and reduce the use of asphalt or other impervious pavement. As noted earlier, pavers are recommended for driveways, walkways, and patios in single-family residences where the site does not generate highly polluted runoff (that could contaminate groundwater if it were to infiltrate) and where ADA requirements do not have to be met. In non-residential areas, pavers are recommended for emergency access roads, overflow parking areas, and non-handicapped parking stalls. These are not recommended where heavy loads (e.g. truck movement) are anticipated. *For more information on alternate paving materials, see Post-Construction Controls for New Development Fact Sheets available from BASMAA.*

Sources of Additional Information

For additional information on post-construction controls for new development and redevelopment projects, see the following:

Bay Area Stormwater Management Agencies Association. 1996. Start at the Source. Residential Site Planning and Design Guidance Manual for Stormwater Quality Protection.

City of Olympia. 1994. Impervious Surface Reduction Study. Conducted by the Public Works Department. Water Resources Program. November. (for information on reducing impervious surfaces such as street widths, sidewalks, and parking facilities).

Wilson, A. 1994. "Stormwater Management, Environmentally Sound Approaches", published in the Environmental Building News, Vol. 3, No. 5, September/October. (for a general discussion of new development controls).

City of San Rafael. 1991. Hillside Residential Design Guidelines Manual. Prepared by Gast Hilmer Associates. (for more information on designing and building residential developments in hilly areas).

Bay Area Stormwater Management Agencies Association (BASMAA). 1997. Compilation of New Development Stormwater Treatment Controls in the San Francisco Bay Area. June. (For treatment controls)

California State Stormwater Quality Task Force. 1993. California Stormwater Best Management Practice Handbook - Municipal. March. (For treatment controls)

US Environmental Protection Agency. 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Issued Under Authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990. EPA 840-B-92-002. January.

Center for Watershed Protection, Watershed Protection Techniques, A Quarterly Bulletin on Urban Watershed Restoration and Protection Tools.

Center for Watershed Protection. 1996. Design of Stormwater Filtering Systems, prepared for Chesapeake Research Consortium, December.

Center for Watershed Protection. 1995. Site Planning for Urban Stream Protection, prepared by T. Schueler for Metropolitan Washington Council of Governments. (For information on cluster development, stream protection buffers, street reduction controls)

4U Sample Standards

City of Pittsburg
Community Development Department
65 Civic Avenue, Pittsburg CA 94565
Phone (510)439-4920, Fax 439-0527

N.P.D.E.S. STANDARD CONDITIONS FOR BUSINESSES

The following are conditions of approval that are required to be placed on all projects to address the Federally mandated **National Pollutant Discharge Elimination System (N.P.D.E.S.)**. All conditions might not apply to each specific project therefore each project must be reviewed individually with a Community Development staff person at the time of application.

- ☐ Restaurants designed with contained areas for cleaning mats and containers. Sinks connected to the sanitary sewer. Any grease disposed to the sanitary sewer must be collected in a contained area and removed regularly by a disposal and recycling service.
- ☐ Trash enclosures and dumpster areas covered (in a non-combustible material) and protected from roof and surface drainage.
- ☐ All areas used for washing, steam cleaning, maintenance, repair or processing to have impermeable surfaces and a sand trap, containment berms, roof covers, recycled water wash facilities, and to discharge into the sanitary sewer, as approved by the City Engineer.
- ☐ Oils, fuels, solvents, coolants, and other chemicals stored outdoors to be in containers and protected from drainage by secondary containment structures such as berms and roof covers. Amounts shall be regulated by the Fire District.
- ☐ Efficient irrigation, appropriate landscape design and proper maintenance (Compliance with Article 7, *Landscaping Ord.*) implemented to reduce excess irrigation runoff, promote surface filtration, and minimize use of fertilizers, herbicides and pesticides.
- ☐ To the extent practicable, drainage from paved surfaces to be routed through grassy swales, buffer strips or sand filters prior to discharge to the storm drain system.
- ☐ A parking lot sweeping program be implemented that, at a minimum, provides for sweeping immediately prior to, and once during, the storm season.
- ☐ All storm drain inlets within the project site shall labeled by stenciling, branding or plaques reading *"No Dumping - Drains to Delta."*

4V Sample Reporting Forms

NEW DEVELOPMENT INSPECTION FORM

Project:_____

BMP:_____

Location:_____

INSTALLATION	MAINTENANCE			
Date Installed:_____	Inspected By:	Date Inspected	Maintenance Satisfactory?	If No, Correction Action Needed
Date Inspected:_____	1)_____	_____	☐ Yes ☐ No	_____
Inspected By:_____	2)_____	_____	☐ Yes ☐ No	_____
Installation Satisfactory?	3)_____	_____	☐ Yes ☐ No	_____
☐ Yes ☐ No	4)_____	_____	☐ Yes ☐ No	_____
If No, Corrective Actions Needed	5)_____	_____	☐ Yes ☐ No	_____
_____				

BMP:_____

Location:_____

INSTALLATION	MAINTENANCE			
Date Installed:_____	Inspected By:	Date Inspected	Maintenance Satisfactory?	If No, Correction Action Needed
Date Inspected:_____	1)_____	_____	☐ Yes ☐ No	_____
Inspected By:_____	2)_____	_____	☐ Yes ☐ No	_____
Installation Satisfactory?	3)_____	_____	☐ Yes ☐ No	_____
☐ Yes ☐ No	4)_____	_____	☐ Yes ☐ No	_____
If No, Corrective Actions Needed	5)_____	_____	☐ Yes ☐ No	_____
_____				

BMP:_____

Location:_____

INSTALLATION	MAINTENANCE			
Date Installed:_____	Inspected By:	Date Inspected	Maintenance Satisfactory?	If No, Correction Action Needed
Date Inspected:_____	1)_____	_____	☐ Yes ☐ No	_____
Inspected By:_____	2)_____	_____	☐ Yes ☐ No	_____
Installation Satisfactory?	3)_____	_____	☐ Yes ☐ No	_____
☐ Yes ☐ No	4)_____	_____	☐ Yes ☐ No	_____
If No, Corrective Actions Needed	5)_____	_____	☐ Yes ☐ No	_____
_____				

4W BMPs for Vehicle Service Facilities

Vehicle Service Facilities

Focus of Document

This guidance presents BMPs to address the discharge of pollutants to the storm drainage system from vehicle service facilities. These facilities include:

- ✓ Vehicle Repair Shops, Body Shops, Car Washes (SIC Major Group 75)
- ✓ Gasoline stations (SIC 5541)

Sources of Pollutants

There are several activities that could potentially cause the discharge of pollutants to the storm drainage system from these facilities. These activities of concern include:

- ✓ Facility maintenance and management (Keeping a clean shop, storage, spill control, outdoor waste receptacle areas, education and training)
- ✓ Changing oil and other fluids
- ✓ Cleaning engines and parts, and flushing radiators
- ✓ Washing cars and other vehicles
- ✓ Body repair and painting
- ✓ Fuel dispensing

Pollutants of Concern

Some of the pollutants of concern from these facilities are:

- ✓ Metals (copper, zinc, chromium, nickel, and lead)
- ✓ Oil and grease
- ✓ Gasoline (e.g. Polyaromatic Hydrocarbons (PAHs) and Methyl Tertiary-Butyl Ether (MTBE))
- ✓ Solvents

Best Management Practices

Best management practices for the most part are common sense, good housekeeping measures that can be implemented without resulting in excessive effort and cost to the facility owner/operator. BMPs listed below apply mainly to the operations of such facilities. Structural controls or physical improvements are generally not recommended for existing facilities although opportunities for structural controls should be utilized when new vehicle service facilities are constructed or existing ones are remodeled.

To assist the City in selecting BMPs for implementation by the vehicle service facility operator/owner, BMPs that are considered high priority are marked "• • •"; medium priority are marked "• •" and low priority are market "•". Rationale used in this prioritization is presented at the end of the section.

Facility Maintenance and Management Practices

Keeping a Clean Shop

• • Use drip pans under leaking vehicles to capture fluids.

• • • Regularly sweep or vacuum the shop floor and other paved surfaces at your facility. Use mopping as an alternative to hosing down or washing work areas. If mopping is used to clean shop floors:

1) Spot clean any spilled oil or fluids using absorbents or rags.

2) Use dry cleanup methods: Sweep the floor using absorbents.

3) After steps 1 and 2 above (if mopping is still needed), mop and dispose of mop water to the sanitary sewer.

4) Do not pour mop water into the paved areas, street, gutter, or storm drain.

(See Rationale 1 at the end of section)

• Remove unnecessary hoses to discourage washing down floors and outside paved areas.

• Collect all metal filings, dust, and paint chips from grinding, shaving, and sanding, and dispose of the waste properly. Never discharge these wastes to the storm drain or sanitary sewer.

- Collect all dust from other activities (e.g. brake pad dust) and dispose of the waste in compliance with local requirements. Never discharge these wastes to the storm drain or sanitary sewer.

- Recycle cleaning rags through an industrial laundry.

- Inspect and clean if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year (see Rationale 2 at the end of section).

- Label storm drains with "No Dumping – Discharges to Ocean" (see Rationale 3 at the end of section).

Storage

- Store hazardous materials and wastes in secondary containment where they are protected from rain and in a way that prevents spills from reaching the sanitary sewer or storm drain (see Rationale 4 at the end of section).

- Keep lids on waste barrels and containers, and store them indoors or under cover to reduce exposure to rain (see Rationale 4 at the end of section).

- All hazardous wastes must be labeled according to hazardous waste regulations. Consult the Fire Department or your local hazardous waste agency for details.

- Keep wastes separate to increase your waste recycling/ disposal options and to reduce your costs.

- Never mix waste oil with fuel, antifreeze, or chlorinated solvents. Consult your hazardous waste hauler for details.

- Double-contain all bulk fluids and wastes to prevent accidental discharges to the sewer and storm drain. Consult the Fire Department for details.

- Keep storage areas clean and dry. Conduct regular inspections so that leaks and spills are detected as soon as possible (see Rationale 4 at the end of section). Document all inspections.

- When receiving vehicles to be parted or scavenged, park them on a paved surface and immediately drain and collect gasoline and other fluids properly. Place drip pans to catch leaking fluids (see Rationale 4 at the end of section).

- Drain all fluids from components, such as engine blocks, which you may store for reuse or reclamation. Keep these components under cover and on a drop pan or sealed floor.

- Store new batteries securely to avoid breakage and acid spills during earthquakes. Shelving should be secured to the wall. Store used batteries indoors and in plastic trays to contain potential leaks. Recycle old batteries.

Spill Control

The Best Spill Control is Prevention

- Maintain and keep current, as required by other regulations, a spill response plan and ensure that employees are trained on the elements of the plan (see Rationale 5 at the end of section).

- Minimize the distance between waste collection points and storage areas.

- Contain and cover all solid and liquid wastes – especially during transfer.

- Purchase and maintain absorbent materials in accordance with local regulations and procedures for containment and cleanup of different spills, and make sure they are easily accessible anywhere in the shop. Saturated absorbents generally must be disposed of as hazardous waste.

- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

- Check floor drains to ensure that they are not connected to or discharge to the storm drain system (see Rationale 6 at the end of section).

Outdoor Waste Receptacle Areas

- Spot clean leaks and drips routinely to prevent runoff of spillage.

- Minimize the possibility of pollution from outside waste receptacles by doing at least one of the following:

  - use only watertight waste receptacle(s) and keep the lid(s) closed, or

  - grade and pave the waste receptacle area to prevent run-on of storm water, and install a low containment berm around the waste receptacle area, or

  - install a roof over the waste receptacle area.

Education and Training

- Train all employees upon hiring - and annually thereafter - on personal safety, chemical management, and proper methods for handling and disposing of waste. Make sure that all employees understand storm water discharge prohibitions, wastewater discharge requirements, and these best management practices. Use a training log or similar method to document training (see Rationale 1 and 5 at the end of section).

- Post instructional/informational signs around your shop for customers and employees. Put signs above all sinks prohibiting discharges of vehicle fluids and wastes. Put signs on faucets (hose bibbs) reminding employees and customers to conserve water and not to use water to clean up spills.

- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an on-site treatment device, directly to the sanitary sewer, or to a storm drain. Labels are not necessary for plumbing fixtures directly connected to the sanitary sewer (see Rationale 3 at the end of section).

- Post emergency telephone numbers of the wastewater treatment plant and the fire department.

Changing Oil and Other Fluids

- Whenever possible, change vehicle fluids indoors and only on floors constructed of non-porous materials. Avoid working over asphalt and dirt floors – surfaces that absorb vehicle fluids.

- If vehicle fluids must be removed outdoors, always use a drip pan. Prevent spills from reaching the street or storm drain by working over an absorbent mat and covering nearby storm drains, or working in a bermed area. If necessary, you can use absorbent socks to create a bermed area.

- When draining fluids into a drain pan, place a larger drip pan (e.g., 3’ x 4’) under the primary drain pan to catch any spilled fluids.

- Transfer fluids drained from vehicles to a designated waste storage area as soon as possible. Drain pans and other open containers of fluids should not be left unattended unless they are covered and within secondary containment.

- Store waste containers of antifreeze and oil within secondary containment. Antifreeze and waste oil should be stored separately and recycled, or disposed of as hazardous waste.

- • • Never pour vehicle fluids or other hazardous wastes into sinks, toilets, floor drains, outside storm drains, or in the garbage. These substances should be kept in designated storage areas until recycled or safely disposed of (see Rationale 4 at the end of section).

- • Drain fluids from leaking or wrecked vehicles as soon as possible, to avoid leaks and spills.

Cleaning Engines and Parts, and Flushing Radiators

- • • Eliminate discharges from engine cleaning and flushing of radiators to the sanitary sewer and storm drains. Use a licensed service to haul and recycle or dispose of wastes (see Rationale 4 at the end of section).

- • Steam cleaning of engines must be done in a closed-loop water recycling system. No steam cleaning water may be discharged to the sanitary sewer or the storm drain.

- • Designate specific areas or service bays for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors.

- • Use self-contained sinks and tanks when working with solvents. Keep sinks and tanks covered when not in use.

- • Inspect degreasing solvent sinks regularly for leaks, and make necessary repairs immediately.

- Avoiding soldering over drip tanks. Sweep up drippings and recycle or dispose as hazardous waste.

- • Rinse and drain parts over the solvent sink or tank, so that solvents will not drip or spill onto the floor. Use drip boards or pans to catch excess solvent solutions and divert them back to a sink or tank.

- • Allow parts to dry over the hot tank. If rinsing is required, rinse over the tank as well.

- Collect and reuse parts cleaning solvent solutions and water used in flushing and testing radiators. When reuse is no longer possible, these solutions are hazardous wastes unless otherwise determined, and must be disposed of properly.

- • Never discharge cleaning solutions used for engines or parts into the sewer sanitary system without adequate treatment. Most facilities have these so-

lutions hauled off-side as hazardous waste because of the permits necessary for on-site treatment.

- Rinsewater may only be discharged to the sanitary sewer after adequate treatment and approval by the sewage treatment plant.

- Never discharge wastewater from steam cleaning, or engine/parts cleaning to a street, gutter, storm drain, or sanitary sewer.

Washing Cars and Other Vehicles

Regular Activity

- If car washing is a central activity of your business, the most desirable option is to treat and recycle the wash water.

- Designate a vehicle washing area and wash cars and trucks only in that area. This "wash pad" should be bermed to prevent discharges to storm drains and should discharge to the sanitary sewer after adequate treatment and approval of the sewage treatment plant.

- Cover an outside wash pad or minimize the area of an uncovered pad to reduce the amount of rainwater reaching the sanitary sewer. Consult your local sewage treatment plant for guidance.

- Acid-based wheel cleaners and other specialized cleaners may be prohibited or require additional treatment before discharge to the sewer.

Occasional Activity

- Even biodegradable soap is toxic to fish and wildlife. Whenever possible, take vehicles to a commercial car wash that recycles.

- If soap is used in washing, the wash water must be collected and discharged, preferably with treatment, to the sanitary sewer. This water cannot be discharged to a storm drain (see Rationale 7 at the end of section).

- Never rinse off spray-on acid-based wheel cleaners where rinsewater may flow to a street, gutter, or storm drain.

Washing New Vehicles

- If cleaning the exterior of new vehicles with water only, the discharged water may go to the storm drain directly unless the vehicle has been coated.

- Always protect the storm drains from solvents used to remove protective coatings from new cars. Discharges of these solvents to the sanitary sewer must receive adequate treatment and approval of the sewage treatment plant.

Body Repair and Painting

- Whenever possible, conduct all body repair and painting work indoors or under cover.

- When receiving damaged vehicles, inspect for leaks. Use drip pans if necessary.

- When cleaning auto body parts before painting, do not use hose-off degreasers. Brush off loose debris and use rags to wipe down parts.

- Use dry cleanup methods such as vacuuming or sweeping to clean up dust from sanding metal or body filler. Debris from wet sanding can be allowed to dry overnight on the shop floor, then swept and vacuumed. Liquid from wet sanding should not be discharged to the storm drain.

- Minimize waste paint and thinner by carefully calculating paint needs based on surface area and using the proper sprayer cup size.

- Do not use water to control overspray or dust in the paint booth unless you collect this wastewater. This water should be treated before discharge into the sanitary sewer system.

- Clean spray guns in a self-contained cleaner. Recycle the cleaning solution when it becomes too dirty to use. Never discharge cleaning waste to the sanitary sewer or storm drain.

Fuel Dispensing

- Maintain fuel dispensing areas using dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills. Fueling areas should never be washed down unless dry cleanup has been done and the wash water is collected and disposed of in the sanitary sewer system (see Rationale 1, 4, and 5 at the end of section.)

- Fit underground storage tanks with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.

- Fit fuel dispensing nozzles with “hold-open latches” (automatic shutoffs) except where prohibited by local fire departments.

- Post signs at the fuel dispenser or fuel island warning vehicle owners/ operators against “topping off” of vehicle fuel tanks.

New or Substantially Remodeled Vehicle Service Facilities

The elements listed below should be included in the design and construction of new or substantially remodeled fuel dispensing facilities.

- Fuel dispensing areas must be paved with portland cement concrete (or, equivalent smooth impervious surface), with a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the “fuel dispensing area” stated above.

- The fuel dispensing area must be covered and the cover’s minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area.

Note*:* Substantially Remodeled Facilities – One of the following criteria must be met before a facility is deemed to be substantially remodeled and’ the design elements described above are required to be included in the new design and construction:

- ✓ the canopy cover over the fuel dispensing area is being substantially replaced (not including cosmetic/facial appearance changes only) and the footing is structurally sufficient to support a cover of the minimum dimensions described above, or

- ✓ one or more fuel dispensers are relocated or added in such a way that the portland cement concrete (or, equivalent) paving and grade break or the canopy cover over the fuel dispensing area do not meet the minimum dimensions as defined above. Replacement of existing dispensers does not, by itself, constitute a substantial remodel.

The following element should be included in the design and construction of new or substantially remodeled vehicle service facilities.

- ✓ Grade and pave the outdoor waste receptacle area to prevent run-on of storm water.

Rationale for assigning high priority to selected BMPs

BMPs that are assigned high priority (•••) are mostly preventative practices that are inexpensive to implement versus collection, treatment and disposal of water that has picked up pollutants. The rationale used in this report is listed below:

1) Rationale: Prevention practices are cost effective and relatively inexpensive to implement vs. collection, treatment and disposal of wastewater. Materials to achieve dry cleaning are readily available and material can be disposed of through existing practices.

2) Rationale: Pollutants from incidental spills and leaks and trash will collect in storm drain facilities during dry weather period and will be a significant source of pollutants during the first significant storm. Cleaning will remove this potential source.

3) Rationale: The public in general do not realize that storm drains flow directly through to the ocean without treatment. Labeling of storm drains is an effective method of public education.

4) Rationale: HAZMAT and HAZWASTE are toxic to aquatic life and waterfowl in streams and ocean and prevention of spills is more cost effective than cleanup.

5) Rationale: Spills are cheaper to clean up when quickly contained. A spill response plan will prepare employees to use equipment and material available for contaminated and cleanup and to ensure their safety while doing the cleanup.

6) Rationale: Improperly plumbed floor drains can become a direct point of discharge of spills that occur indoor and outdoors, to streams and other surface waters.

7) Rationale: Car washing compounds including soaps and wheel cleaners are toxic to aquatic life and wildlife and must be prevented from entering the storm drainage system.

Note: This guidance is based primarily on Best Management Practice Guide – Retail Gasoline Outlets, prepared by California Retail Gasoline Outlet Work Group of SWQTF 1997.

Sources of Additional Information

Additional information on BMPs for vehicle service facilities is available in the following publications:

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City of Sunnyvale, 1994. Automotive Best Management Practices Handbook. City of Sunnyvale Industrial Waste Pretreatment Program. Sunnyvale, California.

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4X BMPs for Food Service Facilities

Food Service Facilities

Focus of Document

This guidance presents BMPs to address the discharge of pollutants to the storm drainage system from food service facilities. These facilities include:

- ✓ Restaurants
- ✓ Institutional cafeterias
- ✓ Grocery stores, bakeries, and delicatessens
- ✓ Any facility requiring a Health Department permit for food preparation

Note: BMPs for drive-through food facilities are discussed under BMPs for shopping centers.

Sources of Pollutants

There are several activities that can potentially cause the discharge of pollutants to the storm drainage system from these facilities. These activities of concern include:

- ✓ Cleaning of equipment
- ✓ Grease handling and disposal
- ✓ Spill cleanup and surface cleaning
- ✓ Dumpster and loading dock area
- ✓ Cooling and refrigeration equipment maintenance
- ✓ Landscaping and grounds maintenance
- ✓ Parking lots
- ✓ Illegal connections
- ✓ Use of toxic cleaners

Pollutants of Concern

Some of the pollutants of concern from these facilities are:

- ✓ Organic materials (food wastes)
- ✓ Oil and grease
- ✓ Toxic chemicals in cleaning products, disinfectants, and pesticides

Best Management Practices

Best management practices are common sense, good housekeeping measures that can be implemented at reasonable effort and cost to the facility owner/operator. Many facility owners/operators are already implementing some of these practices. BMPs listed below apply mainly to the operations of such facilities. Structural controls or physical improvements are generally not recommended for existing facilities although opportunities for structural controls should be utilized when new food service facilities are constructed or existing ones are remodeled.

To assist the Municipality in selecting BMPs for implementation by the food service facility operator/owner, BMPs that are considered high priority are marked "• • •"; medium priority are marked "• •" and low priority are marked "•". Rationale used in this prioritization is presented at the end of the section.

Facility Maintenance and Management Practices

Cleaning Equipment

- • • Clean equipment in a designated indoor area, such as a mop sink, pot sink, or floor area with a drain connected to the sanitary sewer (indoor plumbing).
- • • Clean equipment in a designated covered, bermed outdoor area with a drain connected to the sanitary sewer (indoor plumbing). Don't allow food wastes to accumulate in this area.
- • • Do not clean equipment outdoors in any area where water may flow to a street, gutter, storm drain, or creek.
- • If possible, use floor mats that are small enough to be cleaned inside in a mop sink or near a floor drain.
- • If floor mats are too big to clean indoors, take them to a self-service car wash to clean. Alternately, identify a large enough area in your facility for washing mats, and make sure washwater drains to the sanitary sewer.
- • For hood filter cleaning companies, see "Restaurant Equipment Repairing and Servicing" in the yellow pages.

Grease Handling and Disposal

• • • Never pour oil, grease, or sauces or salad dressings or waste grease down a storm drain, or into a dumpster. Use a recycler or a liquid disposal company.

• For disposal of waste grease from grease interceptors and traps, contact a disposal firm listed under “Grease Traps” and ‘Septic tanks” in the yellow pages. Most landfills will not accept grease or other liquid waste from businesses. It is in your best interest to ensure that your waste grease is disposed of properly. Ask your waste grease hauler where your waste grease is disposed of.

Spill Cleanup and Surface Cleaning

Spill Prevention

• • • Maintain and keep current, as required by other regulations, a spill response plan.

• Minimize the distance between waste collection points and storage areas.

• Contain and cover all solid and liquid wastes — especially during transfer.

• • Purchase and maintain absorbent materials and other spill response equipment in accordance with local regulations and procedures for containment and cleanup of different spills, and make sure they are easily accessible anywhere in the shop. Saturated absorbents generally must be disposed of as hazardous waste.

• • “Spot clean” leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

• • • Check floor drains to ensure that they are not connected to or discharge to the storm drain system (see Rationale 6 at the end ofsection).

Spill Cleanup

• • • First, stop any spill at its source.

• • • Do not clean up spills by hosing down washwater into the gutter or a storm drain.

• • • If the spill could enter a storm drain, protect the drain with sandbags, absorbent rags, or a pile of dirt. You can temporarily seal the storm drain with plastic sheeting.

• • • Use granular absorbents (e.g. cat litter) to absorb the spill. Dry sweep and dispose of used absorbent in the garbage (if hazardous materials are not spilled).

• • • If wet cleaning (including high-temperature or high pressure washing) is required, dry clean first and then mop (or if it is absolutely necessary, wash) and collect water. Dispose of water in sink or other indoor drain, not the storm drain.

• • • If a final rinse is necessary for health reasons, collect the rinse-water and dispose to sink or indoor floor drain. If outdoors, block storm drain before applying water. Mop up or wet-vacuum water, and dispose to sink or indoor drain.

• • • Do not use bleach or disinfectants if there is a possibility that the rinse water could flow to a street, gutter, or storm drain.

Education and Training

• • • Train all employees upon hiring – and annually thereafter – on personal safety, chemical management, and proper methods for handling and disposing of waste. Make sure that all employees understand storm water discharge prohibitions, wastewater discharge requirements, and these best management practices. Use a training log or similar method to document training (see Rationale 1 and 5 at the end of section).

• • Post instructional/informational signs around your shop for customers and employees. Put signs above all sinks prohibiting discharges of vehicle fluids and wastes. Put signs on faucets (hose bibbs) reminding employees to conserve water and not to use water to clean up spills.

• • • Label outdoor drains by paint/stencil (or equivalent) to indicate whether they flow to an on-site treatment device or to a storm drain. Labels are not necessary for plumbing fixtures directly connected to the sanitary sewer (see Rationale 3 at the end of section).

Dumpster and Loading Dock Areas

• • • Keep dumpster lids closed to keep out rainwater.

• • • Keep dumpsters or the dumpster enclosure locked to prevent illegal dumping.

• • • Never place liquid waste or leaky garbage bags into a dumpster.

- Don't hose out dumpster interior in areas that drain to the storm drain system. Apply absorbent if any fluids are spilled in the dumpster. (Dumpster may be hosed if the wash area drains to the sanitary sewer.)

- Leaking dumpsters and compactors, and dumpsters that need to be cleaned out, should be serviced by the dumpster leasing company.

- Make sure tallow bins (cooking oil/meat fat recycling bin), and any containers of waste grease are always tightly covered to prevent contamination of the grease and to prevent problems with rats and insects.

- Have spill cleanup materials handy near the dumpster and loading dock areas.

Cooling and Refrigeration Equipment Maintenance

- Make sure all discharges from cooling and refrigeration equipment go to the sanitary sewer and not to the street, storm drain, or creek.

- Make sure your maintenance contractor is knowledgeable and skilled at minimizing corrosion with correct chemical treatments.

Landscaping and Grounds Maintenance

- Use up pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.

- Collect lawn and garden clippings, pruning waste, and tree trimmings. Chip if necessary, and compost or dispose appropriately. Do not place clippings, pruning waste, or tree trimmings in gutters. Do not blow or rake leaves, etc. into the street.

- In communities with yard waste recycling, leave clippings and pruning waste for pickup in approved bags or containers. Or, take to a landfill that composts yard waste.

New or Substantially Remodeled Food Service Facilities

The elements listed below should be included in the design and construction of new or substantially remodeled food service facilities.

✓ Grade and pave the outdoor waste receptacle area to prevent run-on of storm water.

✓ Alternately, store the waste receptable in a covered enclosure with wash down capability.

Rationale for assigning high priority to selected BMPs

BMPs that are assigned high priority (• • •) are mostly preventative practices that are inexpensive to implement versus collection, treatment and disposal of water that has picked up pollutants. The rationale used in this report is listed below:

1) Rationale: Prevention practices are cost effective and relatively inexpensive to implement vs. collection, treatment and disposal of wastewater. Materials to achieve dry cleaning are readily available and material can be disposed through existing practices.

2) Rationale: Pollutants from incidental spills and leaks and trash will collect in storm drain facilities during dry weather period and will be a significant source of pollutants during the first significant storm. Cleaning will remove this potential source.

3) Rationale: The public in general do not realize that storm drains flow directly through to the ocean without treatment. Labeling of storm drains is an effective method of public education.

4) Rationale: HAZMAT and HAZWASTE are toxic to aquatic life and waterfowl in streams and the ocean and prevention of spills is more cost effective than cleanup.

5) Rationale: Spills are cheaper to clean up when quickly contained. A spill response plan will prepare employees to use equipment and material available for containment and cleanup, and to ensure their safety while doing the cleanup.

6) Rationale: Improperly plumbed floor drains can become a direct point of discharge of spills that occur indoor and outdoors to streams and waterways.

7) Rationale: Cleaning products, disinfectants, and pesticides are toxic to aquatic and wildlife and must be prevented from entering the storm drainage system.

Sources of Additional Information

Additional information on BMPs for food service facilities is available in the following publications:

BASMAA, 1996. *Pollution for Surface Cleaning*. Bay Area Stormwater Management Agencies Association. Oakland, California.

California SWQTF, 1996. *Stormwater Resource Guide*. Prepared by the Public Information/Public Participation Subcommittee.

City of Manhattan Beach, 1994. *How to Become an Ocean Safe Enterprise, A Guide for the Restaurant Industry*. Manhattan Beach, California.

City of Manhattan Beach, 1994. *Ocean Safe Practices for Restaurants.* Manhattan Beach, California.

Eastern Municipal Water District, 1993. *Grease...Help for the Food Service Establishment*. San Jacinto, California.

Los Angeles County, no date. *Good Cleaning Practices for a Cleaner Ocean-Food & Restaurant Industry,* Poster. Los Angeles County, California.

Los Angeles River Watershed Cities, 1996. *Stormwater Best Management Practices (BMPs) - Food Service Industry, Brochure 7, Restaurants, Grocery Stores, Bakeries, Food Producers and Distributors*. Los Angeles County, California.

Regional Water Quality Control Plant-Palo Alto, no date. *Food Service Facilities - Selecting and installing a grease removal device.* Palo Alto, California.

Regional Water Quality Control Plant - Palo Alto, no date. *Water Quality Protection Guidelines for Food Handling Facilities.* Palo Alto, California.

San Antonio Water System, 1996. *Storm Water Pollution Housekeeping Handbook.* San Antonio, Texas.

San Antonio Water System, 1996. *What Temporary Food Establishment Vendors Need to Know About Pollution Prevention.* San Antonio, Texas.

Santa Clara Valley Nonpoint Source Pollution Control Program, 1994. *Good Practices to Protect Our Creeks and Bay, Guidelines for Restaurants, Grocery Stores, Cafeterias, Bakeries, Delicatessens,* Booklet in English and brochures in English, Spanish, Vietnamese, and Chinese. San Jose, California.

Santa Clara Valley Nonpoint Source Pollution Control Program, 1994. *Good Practices to Protect Our Creek and Bay,* Poster. San Jose, California.

4Y BMPs for Shopping Centers

Shopping Centers

Focus of Document

This guidance presents BMPs to address the discharge of pollutants to the storm drain system from shopping centers. Shopping centers include:

- ✓ Single Business (i.e., convenience stores, automotive parts stores)
- ✓ Multi-Business Centers

Sources of Pollutants

There are several activities that can potentially cause the discharge of pollutants to the storm drain system from shopping centers. These activities of concern include:

- ✓ Facility maintenance and management (sidewalk, parking areas, and building cleaning, storage, spills, outdoor waste receptacle areas, landscaping and grounds maintenance)
- ✓ Parking lots

Pollutants of Concern

Some of the pollutants of concern that may originate from shopping centers are:

- ✓ Metals (copper, zinc, chromium, nickel, and lead) (from parking lots and paved surfaces)
- ✓ Petroleum hydrocarbons (from parking lots and paved surfaces)
- ✓ Organic decaying material (from landscaped areas)
- ✓ Fertilizers, pesticides, and herbicides (from landscaped areas)
- ✓ Sediment (from landscaped areas)

Best Management Practices

Best management practices are common sense, good housekeeping measures that can be implemented with reasonable effort and cost to the property owner or management. BMPs listed below apply mainly to the operations of such facilities. Structural controls or physical improvements have generally not been required for retrofit of existing facilities although opportunities for structural controls should be utilized when new stores/ shopping centers are constructed or exteriors of existing shopping centers are remod-

eled.

To assist the Muncipality in selecting BMPs for implementation by the shopping center operator/owner, BMPs that are considered high priority are marked "• • •"; medium priority are marked "• •" and low priority are marked "•". Rationale used in this prioritization is presented at the end of the appendix.

Parking Lots

• • • Littering in parking lots produces parking lot pollution. Signs prohibiting littering, as well as conveniently located trash cans, can help to reduce this problem.

• • • Spot clean by applying absorbent materials to spilled or leaded automotive or similar fluids (i.e., gasoline, oil, antifreeze). Absorbents can be used in any parking lot where leaks are observed, on wet areas or in frequently used stalls.

• • • Saturated absorbent material should be collected in approved disposal containers, and disposed of properly. In some jurisdictions, oil-soaked absorbent is considered a hazardous waste. Check with your local administering agency (usually Department of Health).

• • • Inspect and clean if necessary, storm drain inlets and catch basins within the property boundary before October 1 each year. Inlet cleaning is usually conducted using one of two methods, manual cleaning or by vacuum truck.

- Manual cleaning is the removal of debris and sediment using shovels, buckets, etc. Manual cleaning is recommended for a few (5 or less) small sized inlets (approximately 3' x 3' x 3').

- For sites with greater than 5 small inlets or large sized inlets, the vacuum truck method should be used. The vacuum truck method includes manual removal of debris (trash, branches, etc.) followed by removal of sediment and/or water with a vacuum truck. A vacuum truck company in your area can be found in the Yellow Pages under Sewer Contractors or Pumping Contractors.

• Signs should be posted prohibiting oil changing and other automotive repairs that could lead to a spill of parking lot pollutants.

• Sediment (less the debris) removed from the catchbasin or inlet cleaning should be analyzed for disposal. Pollutants of concern are lead; oil and grease; and hydrocarbons. In general, based on the analysis of sediments from inlet cleaning, it appears that in older cities all these pollutants have been found at elevated levels whereas, in the newer cities, the main pollutants in inlet sediments are hydrocarbons. If concentrations are elevated, the sediment should be disposed of as hazardous waste.

Landscaping and Grounds Maintenance

- • • Follow federal, state, and local laws governing the use, storage, and disposal of pesticides/herbicides.

- • • Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).

- • • Avoid use of copper-based pesticides if possible. Use the least toxic pesticide for the job if alternatives are available.

  California Department of Pesticide Regulation is conducting a review of pesticidal and non-pesticidal alternatives to diazinon and chlorpyrifos for urban uses (see DPR site on WorldWide Web, www.cdpr.ca.gov).

- • • Do not use pesticides if rain is expected.

- • • Do not mix or prepare pesticides for application near storm drains, and use the minimum amount needed for the job.

- • Use up pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.

- • Collect lawn and garden clippings, pruning waste, and tree trimmings. Chip if necessary, and compost.

- • In muncipalities with yard waste recycling, leave clippings and pruning waste for pickup in approved bags or containers. Or, take to a landfill that composts yard waste.

- • • Do not place clippings, pruning waste, or tree trimmings in gutters. Do not blow or rake leaves, etc. into the street.

- • • Protect stockpiles and landscaping materials from wind and rain by storing them under tarps or secured plastic sheeting.

- • • Store pesticides, fertilizers, and other chemicals indoors or in a shed or storage cabinet.

- • • Schedule grading and excavation projects for dry weather.

Storage of Hazardous Materials

- • • Store hazardous materials and wastes where they are protected from rain and in a way that prevents spills from reaching the sanitary sewer or storm drain.
- • • Keep lids on waste barrels and containers, and store them indoors or under cover to reduce exposure to rain.
- • All hazardous wastes must be labeled according to hazardous waste regulations. Consult the Fire Department or your local hazardous waste agency (typically County Environmental Health) for details.
- • Keep wastes separate to increase your waste recycling/ disposal options and to reduce your costs.
- • Never mix waste oil with fuel, antifreeze, or chlorinated solvents. Consult your hazardous waste hauler for details.
- • Double-contain large quantities of hazardous fluids to prevent accidental discharges to the sanitary sewer and storm drain. Consult the Fire Department for details.
- • • Keep storage areas clean and dry. Conduct regular inspections so that leaks and spills are detected as soon as possible.

Outdoor Waste Receptacle Areas

- Spot clean leaks and drips routinely to prevent runoff of spillage.
- Minimize the possibility of pollution from outside waste receptacles by doing at least one of the following:
  - use only watertight waste receptacle(s) and keep the lid(s) closed, or
  - grade and pave the waste receptacle area to prevent run-on of storm water, and install a low containment berm around the waste receptacle area, or
  - install a roof over the waste receptacle area.

Fountain/Cooling Equipment Maintenance

- • • Never discharge fountain water to a street or storm drain.
- • When emptying a fountain, let chlorine dissipate for a few days, and then recycle/reuse water by draining it gradually onto a landscaped area, or
- • • Contact the local sewage treatment authority. You may be able to discharge to the sanitary sewer.

- Do not use copper-based algaecides unless absolutely necessary. Control algae with chlorine or other alternatives to copper-based pool chemicals. Copper is a powerful herbicide. Sewage treatment technology cannot remove all of the metals that enter a treatment plant.

- Make sure all discharges from cooling towers or boiler blowdown go to the sanitary sewer and not to the street, storm drain or creek. It is okay to discharge condensate from cooling equipment into the storm drain.

- Make sure your maintenance contractor is knowledgeable and skilled at minimizing corrosion with proper chemical treatment.

Shopping Center Maintenance

Table 1 lists BMPs that should be used during maintenance of shopping center structures and surfaces, including sidewalks.

Spill Control

- Maintain and keep current, as required by other regulations, a spill response plan and ensure that employees are trained on the elements of the plan.

- Contain and cover all solid and liquid wastes – especially during transfer.

- Purchase and maintain absorbent materials in accordance with local regulations and procedures for containment and cleanup of different spills, and make sure they are easily accessible anywhere in the shop. Saturated absorbents generally must be disposed of as hazardous waste.

- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

- Check floor drains to ensure that they are not connected to or discharge to the storm drain system.

Education and Training

- Train all maintenance employees upon hiring – and annually thereafter - on personal safety, chemical management, and proper methods for handling and disposing of waste. Make sure that employees understand storm water discharge prohibitions, wastewater discharge requirements, and these best management practices. Use a training log or similar method to document training.

- Post instructional/informational signs around your place of business for customers and employees. Put signs above all sinks prohibiting discharges of vehicle fluids and wastes. Put signs on faucets (hose bibbs) reminding employees and customers to conserve water and not to use water to clean up spills.

Table 1. Cleaning of Surfaces and Structures

Type of Surface	Characteristics	Cleaning Technique	Discharge to Storm Drain	Disposal Alternatives
Sidewalks, Plazas	No oily deposits	Sweep, collect and dispose of debris and trash; then wash.	Okay to discharge to storm drain.	
Sidewalks, Plazas, Driveways	Light oily deposits	Sweep, collect and dispose of debris and trash. Clean oily spots with absorbent, place oil-absorbent boom around storm drain, or a screen or filter fabric over inlet.	Okay to discharge to storm drain, provided an oil-absorbent boom or filter fabric is used. No oily sheen should be visible in the water draining into the storm drain.	
Parking lots and driveways	Heavy oily deposits	Sweep, collect and dispose of debris and trash. Clean oily spots with absorbent materials. Use a screen or filter fabric over inlet, then wash surfaces.	Seal storm drains. Can not be discharged to the storm drain.	Vacuum/pump wash water to a tank or discharge to sanitary sewer.
Building exteriors and walls	Glass, steel, or painted surfaces (post1978/no lead in paint	Washing without soap.	Okay to discharge to storm drain provided the drain is sealed first with a fabric filter to capture dirt, paint particles and flakes or oil absorbent boom.	Can alternately be sent to landscape areas.
		Washing with soap.	Can not be discharged to storm drain.	Direct washwater to sanitary sewer or vacuum/pump water to a tank.
Building exteriors	Painted with lead-based or mercury-additive paint	Washing with or without soap.	Seal storm drains. Cannot be dischsrged to storm drain.	Vacuum/pump to a tank. Check with POTW for discharge to sanitary sewer.
Graffiti Removal	Graffiti	Using wet sand blasting. Minimize use of water; sweep debris and sand.	Can be discharged to storm drain if washwater is filtered through a boom.	Can alternately be directed to landscaped areas.
		Using high pressure washing and cleaning compounds.	Seal storm drains. Cannot be dischsrged to storm drain.	Vacuum/pump washwater to sanitary sewer. Check with POTW about pre-treatment.
Masonary	Mineral Deposits	Acid Washing.	Seal storm drains. Cannot be discharged to storm drain.	Rinse treated area with alkaline soap and direct washwater to a landscaped or dirt areas. Alternately, washwater may be collected and neutralized to a pH between 6 and 10, then discharged to landscaping or pumped to sanitary sewer.

Source: Santa Clara Valley Urban Runoff Pollution Prevention Program

• • • Label storm drain inlets within the property boundary, by paint/stencil (or equivalent), to indicate whether they flow to an on-site treatment device, directly to the sanitary sewer, or to a storm drain. Labels are not necessary for plumbing fixtures directly connected to the sanitary sewer.

Rationale for Assigning High Priority to Selected BMPS

BMPs that are assigned high priority (• • •) are mostly preventative practices that are inexpensive to implement versus collection, treatment and disposal of water that has picked up pollutants. The rationale used in this report is listed below:

1) Rationale: Prevention practices are cost effective, already widely used and relatively inexpensive to implement vs. collection, treatment and disposal of wastewater.

2) Rationale: Pollutants from incidental spills and leaks and trash will collect in storm drain facilities during dry weather period and will be a significant source of pollutants during first significant storm. Cleaning will remove this potential source.

3) Rationale: The public in general do not realize that storm drains flow directly through to the ocean without treatment. Labeling of storm drains is an effective method of public education.

4) Rationale: HAZMAT and HAZWASTE are toxic to aquatic life and waterfowl in streams and ocean and prevention of spills is more cost effective than cleanup.

5) Rationale: Spills are cheaper to clean up when quickly contained. A spill response plan will prepare employees to use equipment and material available for cleanup, and to ensure their safety while doing the cleanup.

6) Rationale: Improperly plumbed floor drains can become a direct point of discharge of spills that occur indoor and outdoors to streams and other waterways.

7) Rationale: Cleaning products, disinfectants, and pesticides are toxic to aquatic organisms and wildlife and must be prevented from entering the storm drainage system.

Most of the information on shopping center BMPs was derived from the following sources:

Santa Clara Valley Urban Runoff Pollution Prevention Program

Tahoe Regional Planning Agency Handbook of Best Management Practices

Sources of Additional Information

4Z Program and BMPs for Mobile Cleaners

...is Countywide
Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Stormwater Pollution
Prevention Program

Santa Clara Valley
Nonpoint Source Pollution
Control Program

Vallejo
Sanitation and Flood
Control District

BASMAA

August 22, 1996

David Wyett
Cleaning Equipment Trade Association - San Francisco Bay Area Chapter
1441 Terminal Avenue
San Jose, CA 95112

Dear Mr. Wyett:

This letter serves as our endorsement of the "Mobile Cleaner Best Management Practices for Waste Water Runoff" dated September 23, 1994 developed by the San Francisco Bay Area Chapter of the Cleaning Equipment Trade Association (CETA). This endorsement is based on our recognition that the best management practices (BMPs) are intended to apply to the most common mobile cleaning applications and are based on best professional judgment. As such, we recognize that there will be situations where the recommended procedures will have to be tested to affirm their applicability and effectiveness. We also recognize that the BMPs are recommendations and that the most appropriate, and environmentally and regulatory sound practices must be determined on a case-by-case basis, with consideration of the type and location of actual mobile cleaning applications. The recommended practices provide a sound basis for making such case-by-case determinations.

DRAFT

To that end, we started a source control/recognition program for a subset of mobile cleaners—surface cleaners—to promote use of the BMPs and to establish a model for dealing with discharges of this type. In reviewing the CETA BMPs and developing educational materials for this subset of cleaners, we made small changes to the BMPs for some surface cleaning activities to clarify and simplify decision making for cleaners on the job site. We join with the San Francisco Bay Regional Water Quality Control Board in strongly recommending that surface cleaners participate in the source control/recognition program, become Recognized Mobile Cleaners, and use the BMPs when cleaning.

In conjunction with the Regional Board, BASMAA also fully supports and endorses the practice of no discharge of wastewater to storm drains in all circumstances where soaps or chemicals are used. Such discharges would violate discharge prohibitions established by our member storm water programs. They would also be in violation of the California Water Code and Federal Clean Water Act unless the discharge is specifically authorized by a NPDES permit issued by the State. Please note that this endorsement by BASMAA does not legally authorize any discharge, whether or not a BMP is used.

Bay Area

Stormwater Management

Agencies Association

...Webster Street

...500

Oakland, CA 94612

510.286.0615

B A S M A A

We appreciate CETA's efforts to coordinate the implementation of the BMPs. We believe the best approach to resolving water quality and waste disposal issues is through the involvement and participation of affected parties. This cooperative approach will promote environmental protection while meeting the demand for mobile cleaning services.

If you have any questions, please call BASMAA Executive Director, Geoff Brosseau at (510) 286-0615.

Sincerely,

Donald P. Freitas, Chair
BASMAA Board

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT
MEETING DATE: August 21, 1996

ITEM: 15

SUBJECT: PILOT SOURCE CONTROL AND RECOGNITION PROGRAM FOR MOBILE CLEANERS - Status Report

DISCUSSION: The intent of this item is to inform the Board on this pilot program and to raise issues pertinent to its success. The pilot program is noteworthy for two reasons: it targets a largely unregulated source of polluted discharges to waters in the Region; and it is an outreach based program, based on resolving problems through involvement and education of all affected parties. The pilot program emphasizes recognition of good businesses versus "bad actors".

A major action area of municipal storm water management programs is the elimination and prevention of discharges other than storm water to storm drain systems. Washwaters are some of the more commonly observed "non-storm water discharges". Specifically, mobile cleaners (surface cleaners, janitorial services, auto detailers, carpet cleaners, window cleaners) have been identified as a significant source of discharges of material, wastes, and polluted waters to storm drain systems in the San Francisco Bay Area. However, these discharges are difficult to deal with because of the variable quantity and quality of the discharge, the intermittent nature of the discharge, and the mobility of the discharger. Consequently, we have worked with the Bay Area Stormwater Management Agencies Association (BASMAA) on the development of a pilot source control/recognition program for mobile cleaners to resolve these issues.

The pilot program focusses on surface cleaners as a target group of mobile cleaners. Surface cleaners include steam cleaners and pressure washers that clean sidewalks, plazas, parking areas, driveways, drive-throughs, and building exterior surfaces. The surface cleaner pilot program will be used as a prototype for developing materials and approaches for the remaining types of mobile cleaners.

To develop the surface cleaners pilot program, meetings were held with surface cleaners and their customers in which the participants were given a chance to express opinions on what would constitute a successful program. One finding was that customers need educating, as well as the surface cleaners, to ensure that the value of hiring a responsible surface cleaner is understood. As a result, a program consisting of education and recognition has been produced. Surface cleaners who demonstrate awareness of and implement the prescribed pollution prevention practices will be issued a "recognition letter". The list of recognized cleaners will be provided to businesses and agencies that hire surface cleaners.

To date, the pilot program has completed the development of outreach material (including identification of pollution prevention practices) and scheduled an outreach/recognition workshop for surface cleaners on August 13, 1996. The main premise behind the pollution prevention measures is that washwaters containing soaps or other cleaning agents are toxic and should not be discharged to storm drains. There are scenarios, however, in which discharges would not be considered polluted if the appropriate pollution prevention measures are implemented, and as such, discharge to storm drains would be allowed. The complete list the outreach materials and events scheduled are described in Appendix A.

We have also sent outreach letters to entities affected by the program to make them aware of the program and how it may affect them and to solicit their cooperation and participation. These include surface cleaners and cleaning equipment distributors, surface cleaner customers, wastewater treatment authorities, municipal storm water management programs, and municipal departments that hire or inspect mobile cleaners. Issues pertinent to these entities and recommended actions are described in Appendix A.

One of the outstanding issues that still needs to be resolved pertains to acceptance of these washwaters by wastewater treatment authorities. Currently, conditions for acceptance of these discharges do not exist or otherwise vary in terms of quantity and quality criteria and disposal costs. For example, some systems will readily accept these discharges, while others impose conditions and costs that may be prohibitive. We intend to work with the Bay Area Dischargers Association and the Bay Area Pollution Prevention Group to resolve this issue. Our intent is to promote acceptance of these discharges such that recognized cleaners are provided incentive and reward for their efforts, and wastewater treatment authorities are provided appropriate credit for acceptance of new discharges.

Another issue concerns the appropriate mechanism for Regional Board endorsement of the program and the proposed allowance of certain discharges to storm drains. Potential actions may include prohibition of discharges that are not in accordance with prescribed pollution prevention measures, NPDES permit(s) for certain discharges, or non-regulatory endorsement of "recognized mobile cleaners". These and other options will be evaluated during the pilot program, and we will provide the Board with regular updates on the progress of the program.

RECOMMENDATION: This is an information item. No action is necessary at this time.

Appendices:

A - Outreach Materials and Scheduled Events
Affected Entities, Issues, and Recommended Actions

APPENDIX A

PILOT SOURCE CONTROL AND RECOGNITION PROGRAM FOR MOBILE CLEANERS

Outreach Materials and Scheduled Events

"Pollution from Surface Cleaning" - This folder was prepared to educate surface cleaners about the effects of wash water discharges to the storm drain system and to prescribe effective, low-cost pollution prevention practices.

"We'll do the Job Right!" - This card will be distributed by "Recognized Mobile Cleaners" to potential customers. Surface cleaners will use this card to proclaim their qualifications and their intent to prevent water pollution while conducting the cleaning work.

"When You Contract for Surface Cleaning....." - This flyer is geared towards customers who regularly hire surface cleaners. It alerts the customers about the outreach/ recognition program and specifies the pollution prevention practices that should be used to prevent surface cleaning discharges to the storm drain system. The flyer is suitable for photocopying and will be made available for mass mailings by the municipalities.

Pollution Prevention Voucher - The voucher is to be filled out in duplicate by a Recognized Mobile Cleaner upon completion of a cleaning project. Retention of a copy by both the cleaner and the customer provides a record for municipal or State inspectors of the type of surface cleaned, the cleaning method used, and how the wash water was disposed.

Outreach/Recognition Workshop - Outreach workshops will be held to provide surface cleaners with the technical information required to protect the environment, comply with the law, and become a Recognized Mobile Cleaner. The first workshop is scheduled for August 13 and two additional workshops are in the planning stages. The workshops will be videotaped for viewing by surface cleaners who were unable to attend one of the scheduled dates.

Recognition Test and Letter - The true/false, multiple choice exam will take 15-20 minutes to complete. Surface cleaners that correctly answer a minimum percent of the questions will receive a "recognition letter" from BASMAA. This letter can be displayed to customers as proof that the cleaner is qualified to complete the job in an environmentally responsible manner.

Database of Recognized Cleaners - BASMAA will prepare and update a database of Recognized Mobile Cleaners. Municipalities can request a copy of the database to promote recognized cleaners in their area, while potential customers can request a copy of the database when soliciting bids for cleaning projects.

Workshop Training Kit - A workshop training kit will be assembled to allow municipalities and/or wastewater treatment authorities the opportunity to offer the Outreach/Recognition Workshop at their discretion. Included in the kit will be a videotape of one of the scheduled workshops, outreach materials to be distributed, the recognition test, a scoring key, and instructions on how to conduct the workshop and administer the test.

PILOT SOURCE CONTROL AND RECOGNITION PROGRAM FOR MOBILE CLEANERS

Affected Entities, Issues, and Recommended Actions

ENTITY	ISSUES	RECOMMENDED ACTIONS
Surface Cleaner	• Surface cleaners are liable for pollutant discharges to the storm drain system resulting from their cleaning activities. • Municipalities will soon be enforcing discharge prohibitions more reliably and possibly more severely. • An opportunity is available for surface cleaners to become educated on appropriate methods of wash water disposal and gain some good publicity for environmentally responsible cleaning.	• Participate in the program by attending a source control / recognition workshop and becoming a Recognized Mobile Cleaner. • Use pollution prevention practices when cleaning.
Surface Cleaner Customer	• Surface cleaner customers are liable for pollutant discharges to the storm drain system resulting from contracted cleaning activities. • Municipalities will soon be enforcing discharge prohibitions more reliably and possibly more severely. • Customers will be required to take responsibility for the method of disposal utilized by a contracted cleaner.	• Participate by becoming familiar with the prescribed pollution prevention practices. • Make use of mobile cleaners who participate in the program by only hiring "Recognized Mobile Cleaners". • Supervise contracted cleaners to ensure that appropriate pollution prevention practices are used to dispose of any wash water generated from their activities.
Wastewater Treatment Authority	• Wash water determined to be inappropriate for disposal in the storm drain system may be discharged to the sewer system. • Mobile cleaners are being directed to contact the local wastewater authority for discharge requirements prior to disposal in the sewer system.	• Participate by becoming familiar with the prescribed pollution prevention practices and incorporating them into pretreatment or pollution prevention programs if appropriate. • Assist mobile cleaners who call for advice in determining acceptability of their wash water for sewer disposal.
Municipality	• A key component of the municipal storm water permit program is the effective prohibition of non-storm water discharges to storm drain systems. • Municipalities and businesses that hire mobile cleaners are liable for discharges from these cleaning activities.	• Participate by becoming familiar with the prescribed pollution prevention practices and incorporating them into the municipality's own storm water management program. • Become aware of surface cleaners and customers in the municipality's jurisdiction. • Make use of mobile cleaners who participate in the program by only hiring "Recognized Mobile Cleaners".

Mobile Cleaner

BEST MANAGEMENT PRACTICES

for Waste Water Runoff

Presented by

CETA Cleaning Equipment Trade Association

2535 Pilot Knob Road • Suite 105
St. Paul, Minnesota 55120

Phone: 1-800-441-0111 or 612-686-7086 Fax: 612-686-7088

September 23, 1994

Cleaning Equipment Trade Association

2535 Pilot Knob Road • Suite 105
St. Paul, Minnesota 55120

SAN FRANCISCO BAY AREA CETA
(Cleaning Equipment Trade Association)

September 23, 1994

To: Members of the Cleaning Industry

Subject: Mobile Cleaner Best Management Practices for the San Francisco Bay Area (dated August 2, 1994)

Attached for your review and use are Best Management Practices (BMP's) for the more common mobile washing applications. These BMP's have evolved from many discussions among mobile users, distributors, and sewer and storm water officials over the past year and a half.

This document will continue to be refined and updated as testing results and other data become available. However, the current document has the endorsement of the County of Alameda and the San Francisco Bay Area Regional Water Quality Control Board. Our objective is to obtain similar endorsements from all applicable agencies in the Bay Area.

SF Bay Area CETA

Alameda County
Urban Runoff
Clean Water Program
A Consortium of Local Agencies

951 Turner Court, Hayward CA 94545
(510) 670-5543 FAX (510) 670-5262

September 12, 1994

Cleaning Equipment Trade Association (CETA)
c/o Mr. David Wyett
2535 Pilot Knob Road, Suite 105
St. Paul, Minnesota 55120

On behalf of the Industrial Subcommittee, I wish to acknowledge the cooperative effort in compiling the Mobile Cleaner Best Management Practices, version dated August 2, 1994. Our Alameda County Urban Runoff Clean Water Program appreciated the chance to work with your organization to update the document.

This document has been reviewed and approved by our Management Committee and Industrial Subcommittee. We believe that you have incorporated the best management practices (BMPs) known to date to eliminate pollutant discharges to storm water. As with most of the provisions associated with the Urban Runoff Program, this approval process is dynamic. I would like to request continued dialog to assist in further refining these BMPs. Our group would like to revisit these BMPs annually. I look forward to continuing to work together to exchange information and refine field techniques.

Paul Zoltarelli
Chair, Industrial Subcommittee

STATE OF CALIFORNIA PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
N FRANCISCO BAY REGION
1 WEBSTER STREET, SUITE 500
OAKLAND, CA 94612
(510) 286-1255

September 6, 1994

David Wyett, Chairman
San Francisco Bay Area
Cleaning Equipment Trade Association
1441 Terminal Avenue
San Jose, CA 95112

Subject: Mobile Cleaner Best Management Practices

Dear Mr. Wyett:

This letter serves as our endorsement of the Mobile Cleaner Best Management Practices (BMPs), dated August 2, 1994, developed by the San Francisco Bay Area Cleaning Equipment Trade Association (CETA). This endorsement is based on our recognition that the BMPs are intended to apply to the most common mobile washing applications and are based on best professional judgement. As such, we recognize that there will be situations where the recommended procedures will have to be tested to affirm their applicability and effectiveness. We also recognize that the BMPs are recommendations and that the most appropriate and environmentally and regulatory sound practices must be determined on a case-by-case basis, with consideration of the type and location of actual mobile washing applications. The recommended procedures provide a sound basis for making such case-by-case determinations.

Most importantly, we fully support and endorse the practice of *no discharge* of wash waters to storm drains in all circumstances where soaps or chemicals are used. Such discharges would violate discharge prohibitions established by municipalities. They would also be in violation of the California Water Code and the Federal Clean Water Act unless the discharge is specifically authorized by a NPDES permit issued by the State. The appropriate disposal option is discharge to the sanitary sewer. We will continue to work with sanitary sewer agencies (Publicly Owned Treatment Works) to secure their acceptance of these discharges.

We appreciate CETA's efforts to coordinate the development of the BMPs. We believe the best approach to resolving water quality and waste disposal issues is through the involvement and participation of affected parties. The work group that you have sponsored provides the best opportunity to identify the most economically and technically feasible management practices for mobile cleaning applications. This cooperative approach will enable streamlining any required permits at the local and state levels. If you have any questions, please call me at 510-286-0962.

Sincerely,

Thomas Mumley
Storm Water Program Coordinator

CETA

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612-686-7086
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Introduction

Storm drains and sanitary sewers are the two principal routes by which pollutants reach the South San Francisco Bay. Storm drains carry runoff from streets, urban centers, industrial sites and open spaces into local streams, creeks, marshes and Bay waters. Sanitary sewers carry wastes to wastewater treatment plants, but small amounts of some pollutants reach the Bay in the treated water.

Since the Clean Water Act was passed in 1972, a lot of effort has gone into cleaning our creeks, waterways and the Bay. One of the contributors to this pollution has been wash water runoff from pressure washing and steam cleaning.

These Best Management Practices (BMP's) for mobil cleaners describe the most common types of cleaning and the proper waste water disposal for each one.

Remember, this is a general purpose booklet and not an attempt to describe each and every washing application. If you have questions about a specific waste disposal problem, contact your city or county non-point source group, your local Public Owned Treatment Works (POTW), your equipment supplier, or the Cleaning Equipment Trade Association (CETA) office for a referral.

It is the responsibility of each contractor to operate his/her business in a manner that complies with local stormwater and wastewater discharge requirements. Understanding and using this manual will help you comply.

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SAN FRANCISCO BAY AREA CETA
(Cleaning Equipment Trade Association)

Working Group Non-Government Participants

Distributors:			
Jack Keeler	Bay Area Chemex	(415)952-9997	So San Fran
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Contract Cleaners:			
Rick Christi[redacted]	Power Washing Service	(510)449-6890	Livermore
Jesus Valerio	Rainbow Mobile Wash	(415)967-0367	Mt. View

Acknowledgment

Special recognition to the Santa Clara County Nonpoint Source Pollution Control Program group for their help and encouragement on this project from day one.

Appreciation and thanks to Alameda County for their recommendations and endorsement; to the Regional Water Quality Control Board representative Tom Mumley for his participation, encouragement and letter of endorsement; and to the many POTW representatives from Santa Clara County and Alameda County who contributed their ideas and support.

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CETA

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Mobile Cleaner BMPs

Recommendations for disposal of washwater are listed in the order of preference.

I. Transportation-Related Washing

A. Fleet Washing - Exterior Only - removing mainly dirt; with or without soap:

No storm drain disposal permitted; must discharge to sanitary sewer/dirt; some unavoidable evaporation off paved surfaces.

Washwater can not be discharged to the storm drain. For disposal:

Best: Use wash pads that capture the washwater and discharge it to the sanitary sewer. (Ideally, the customer has established a separate wash area that captures the washwater. Or, contract cleaner can use temporary wash pad and pump to sanitary sewer.)

2nd: Seal storm drains. Washwater runoff and excess soapy water must be collected and pumped or otherwise discharged as follows:

- Best: Sanitary sewer (Pump into sanitary system clean out/sink or into an on-site private sanitary sewer manhole; verify with the facility manager that it is not a storm drain manhole.)
- 2nd: Landscaped[1] or dirt area (Note: Be aware that soapy washwater may adversely affect landscaping. Should be directed onto dirt area sufficiently large enough to contain all the water. Discuss with the building owner.)

If a significant amount of washwater runoff evaporates at the site before it can be collected, and the site is routinely used for this purpose, the paved area itself must be cleaned either before **October 15th** (the formal beginning of the rainy season) or at the end of contract (whichever comes first). That washwater must be collected and discharged to sanitary.

[1] For minimal discharge flows only. Repetitive use of the same area or excessive waste volume to the same area may be illegal.

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B. Engine/Equipment Degreasing

Auto/truck drive train cleaning
Engine degreasing
Airplane cleaning, including landing gear

With or without soap, no storm drain disposal permitted; requires pre-treatment before discharge to sanitary; should be cleaned on a wash pad; requires discussion with customer's facility operator

Because it is likely that pollutants (esp. petroleum products and metals) are concentrated in these washwaters, the local POTW (Public Owned Treatment Works) will require some type of pre-treatment before discharge to sanitary sewer. Contact the POTW for requirements and additional information. Contact the facility operator regarding wash pad and pre-treatment equipment available on-site (i.e. oil/water separators, coalesors,...). A partial list of local distributors who may carry this equipment is on page 2. See the yellow pages for additional distributors.

C. Acid Cleaning of Unpainted Trucks/Containers

Trucks and metal containers (unpainted) using acid detergents

Acid runoff from cleaning unpainted trucks or containers with acid detergents must be neutralized to a pH between 6 and 10 before pumping to sanitary. Contact local POTW for additional information. *Never discharge to storm drain.*

D. Mobile Auto Detailing - infrequent, light cleaning, using soap

(rarely at same site; removing mainly dirt; with minimum water volume)

Run off:

Best: Minimized runoff may remain on paved surfaces to evaporate. If there is sufficient water volume to reach the storm drain, plug the storm drain and pump the water to the sanitary sewer.

2nd: Landscaped[1] or dirt area (Note: Be aware that soapy washwater may adversely affect landscaping. Should be directed onto dirt area sufficiently large enough to contain all the water. Discuss with the building owner.)

Remaining soapy water in bucket:

Best: Should be discharged to sanitary.

2nd: May be distributed over a dirt area.

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E. Car Lot Rinsing for Dust Removal - no soap

If rinsing dust from exterior surfaces using **water only**, and no soap/solvent, may discharge runoff to storm drain or to landscaped or dirt areas. Prevent contamination of the runoff by not allowing it to run through oil deposits on the pavement or in the gutter.

F. Semi Trailers and Boats

Truck trailer, interior cleaning (food-related)

Sweep, collect and dispose of debris. Use dry cleaning methods as much as possible. Food residue must be disposed of as garbage or sent to the sanitary sewer. Avoid hosing down the trailer. Washwater can not be discharged to storm drain; it should be pumped to sanitary sewer. Contact POTW for more information.

Truck trailer, interior cleaning (toxic substances) - may require special training

If toxic materials have been shipped in the trailer, and there has been a spill:

* Do not hose down the spill,
* Protect nearby storm drains, and
* Contact the local fire department for guidance.

Boat cleaning (if paint chips are being removed in preparation for painting)

Filtered washwater must be discharged to sanitary sewer. Contact POTW for further information. Dispose of paint particles appropriately according to paint type: dispose of as hazardous waste if paint is lead-based, copper-based, or contains tributyl tin or PCBs; otherwise, dispose of paint particles as garbage.

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II. Surface Cleaning

A. Sidewalks and Plazas - using soap

Washwater must go to sanitary sewer.

Sweep, collect and dispose of debris and absorbent. The BMPs in this section do not apply if there has been an oil or other hazardous material spill on the site. In the case of a spill, contact the local fire department for guidance.

B. Sidewalks and Plazas with no oil deposits - no soap

Sweep, collect and dispose of debris. Washwater may go to storm drain.

C. Sidewalks, Plazas, Driveways ,Drive-through Window Areas with light oil, *frequently cleaned* - no soap

Sweep, collect and dispose of debris. Dry clean oil spots with absorbent and dispose of absorbent as garbage. Place oil absorbent boom around storm drain. Washwater may go to storm drain through an oil-absorbent boom. No oil sheen should be visible on the water flowing into the storm drain.

D. Drive-throughs, Driveways, Parking Garages, Service Stations with excess oil deposits - with or without soap; *not frequently cleaned.*

Seal storm drains. Sweep, collect and dispose of debris. Dry clean oil spots with absorbent and dispose of absorbent in a legal manner. Vacuum/pump washwater to sanitary. Washwater disposal options should be discussed with the facilities operator/site manager. Best to discharge through an oil/water separator. One may be available at the site, however, do not use an oil/water separator intended to capture cooking oil. See attached (p. 2) partial list of oil/water separator distributors, or check your local yellow pages. Pre-treatment may not be required, but contact the local POTW for more information. If there has been an oil spill, contact the local fire department for guidance.

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E. Building Exteriors and Walls

Note: If soap is used, washwater must not go to storm drain. All debris must be kept out of storm drains.

Glass and Steel Buildings - no soap used

Best: Direct washwater runoff to dirt/landscaped areas.

2nd: Discharge directly to storm drain. We recommend that you seal the drain with a fabric filter to capture the dirt in the washwater.

Painted buildings, with paint job in good shape - no soap used

Painted after 1978, i.e. no lead

Best: Direct washwater runoff to dirt/landscaped areas.

2nd: Use filter fabric to prevent paint particles from entering storm drain. Washwater may go to storm drain through the filter fabric--never directly. Dispose of collected particles as garbage.

Painted buildings, with lead-based or mercury-additive paint - with or without soap)

Seal storm drains and vacuum/pump washwater to a tank. Water and sludge may need to be disposed of as hazardous waste. Consult POTW and local hazardous waste regulators (i.e. County Health or Fire Department)

Painted buildings, *to remove paint* and clean in preparation for painting - with or without soap

Consult POTW and local hazardous waste regulators (i.e. County Health or City Fire Department). These BMPs do not address the disposal of paint.

F. Graffiti Removal

Using wet sand blasting

Minimize quantity of water used. Any runoff should be:

Best: Directed to landscaped or dirt area.

2nd: Filtered through boom to keep sand out of drain.

Sweep debris and sand. Dispose of all waste to avoid future run off contamination.

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Using high pressure washing and cleaning compound

Best: Direct washwater run off to dirt/landscaped area. No run off can go to storm drain.

2nd: Seal storm drains and vacuum/pump washwater to sanitary. Contact POTW for guidance, as harsh cleaning compounds may require pre-treatment.

G. Masonry Efflorescence using acid wash to remove mineral deposits on masonry

Seal/block storm drain.

Best: Rinse treated area with alkaline soap and direct rinse water to a landscaped/dirt area.

2nd: Collect washwater. Neutralize washwater to a pH between 6 and 10. Pump to a sanitary cleanout at the site, into a sink or a toilet, or contact the POTW.

III. Food-Related Cleaning

A. Restaurant Alleys, Grocery Dumpster Areas (outdoors)

No discharge allowed to storm drain.

Best: Dry Clean only, if possible (e.g. using rags, absorbents, and sweeping debris)

2nd: Dry clean first. Seal storm drain. Wash area. Vacuum or pump washwater to sanitary sewer. Screen washwater for particles.

B. Restaurant Cleaning of Floor Mats, Exhaust Filters, etc.

Note: Washing mats outdoors and allowing the washwater to drain to a storm drain is prohibited.

Best: Clean mats, etc. inside building with discharge to sanitary sewer (sink or a floor drain).

2nd: Clean mats, etc. outside, in bermed area with a drain that is connected to the sanitary sewer system.

C. Kitchen Grease

Kitchen recyclable oil, grease, and meat fat

Save for recycling in tallow bin or other sealed containers. Never pour into a sink, floor drain, or storm drain. Do not contaminate recyclable fats with waste grease from an interceptor or trap. See "Tallow" in the yellow pages.

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Kitchen waste grease from interceptor or trap

Never dispose of waste grease in the storm drain or creek, or into the sanitary sewer system. For waste grease disposal, see "Grease Traps" or "Septic" in the yellow pages.

D. Grocery Carts

If soap is used, washwater must be captured, filtered for particles, and pumped to sanitary.

If no soap is used:

Best: Capture washwater, filter for particles, and pump to sanitary sewer. If hot water is used, hot/warm water discharge to a creek is prohibited.

2nd: Washwater may be discharged to storm drain through a filter barrier (e.g. using boom) to filter out debris.

E. Lunch Wagons/Food Carts

Washwater must be discharged at a commissary equipped to accept and discharge wastewater to the sanitary sewer system. Never discharge any wastewater (except melted ice) to gutters or storm drains. Trucks and carts and any equipment should be cleaned on a properly equipped wash pad at the commissary. For a list of licensed commissaries see your county Health Department.

IV. Misc. or other

A. Mobile Homes

Decks

Roofs/Shingles

Awnings

Residential/Commercial Pool Decks

1. Landscaped[1] or dirt area (Note: Be aware that soapy washwater may adversely affect landscaping. Should be directed onto dirt area sufficiently large enough to contain all the water. Discuss with the building owner.)
2. If washwater doesn't go to dirt/landscaping:
   a. If soap is used, washwater must go to sanitary sewer.
   b. If soap is not used, washwater can be discharged to storm drain through a filtering apparatus (i.e. boom) to capture debris and particles.

   Exception: Treated wood shingles are often treated with a toxic material. Treated shingles should be dry cleaned only. Runoff from cleaning may be toxic to plants in a landscaped area and should never be discharged to the storm drain or sanitary sewer.

4AA Sample Reporting Form

Alameda Countywide
Clean Water Program

Standard Stormwater Facility Inspection Report Form

Municipality: _____

Date: _____

Reason for Inspection: ☐ First Inspection ☐ Routine Inspection ☐ Response to Complaint ☐ Facility has closed or Facility Information has changed

NAME OF FACILITY	SITE ADDRESS

CONTACT NAME	PHONE	BUSINESS TYPE/ACTIVITY	SIC

Is the property owner different than the facility owner? ☐ yes ☐ no If yes, complete the following:

NAME PHONE

MAILING ADDRESS

Is the facility covered under any other programs or permits? (Check all that apply.) ☐ None ☐ Sanitary sewer

☐ Air quality ☐ Hazmat business plan ☐ Underground storage tanks ☐ Aboveground storage tanks

☐ Fire department(hazmat storage) ☐ Hazmat waste generator ☐ Other _____

Is the facility covered under a storm water permit? ☐ Does not need Coverage ☐ No, but may need to be (Refer to Regional Board)

☐ Individual ☐ General: Does the facility have a SWPPP? ☐ yes ☐ no

N/A = Not Applicable; PTNL = POTENTIAL for Pollutant Discharge: 1 = low potential, 2 = medium potential, 3 = high potential
ACTUAL Type of Discharge: BMP: 0 = BMPs are effective, 1 = BMPs are fairly/almost effective, 2 = BMPs are not effective, 3 = No BMPs are implemented
PEX = Pollutant Exposure, NSW = Non-Stormwater Discharge

AREAS OF ACTIVITY	N/A	PTNL	ACTUAL Type of Discharge			REMARKS: Describe recommendations, requirements, and time to implement. Check box if remark is a *requirement.*
			BMP	PEX	NSW	
A. Outdoor Process/Manufacturing Areas						☐
B. Outdoor Material Storage Areas						☐
C. Outdoor Waste Storage/Disposal Areas						☐
D. Outdoor Vehicle and Heavy Equipment Storage, Maintenance Areas						☐
E. Outdoor Parking Areas and Access Roads						☐
F. Outdoor Wash Areas						☐
G. Rooftop Equipment						☐
H. Outdoor Drainage from Indoor Areas						☐
I. Other (describe):						☐

ADDITIONAL COMMENTS/REMARKS

☐ See attached for more comments.

FIRST Follow-up Inspection (Date & Findings)	SECOND Follow-up Inspection (Date & Findings)

IORITY FOR RE-INSPECTION: ☐ 1; First ☐ 2; Second ☐ 3; Third

NFORCEMENT: ☐ None ☐ Verbal Notice ☐ Warning Notice ☐ Administrative Action ☐ Administrative Action w/ Penalty &/or Cost Recovery ☐ Legal Action

Facility Representative Signature: _____ Date: _____

Print Name of Facility Representative: _____ Inspector's Signature: _____

4BB APWA Guidance on Regulated Industries

APWA STORM WATER TASK FORCE

OVERVIEW OF THE NPDES GENERAL PERMIT FOR DISCHARGES OF STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITIES

The California NPDES GENERAL PERMIT FOR DISCHARGES OF STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITIES, EXCLUDING CONSTRUCTION ACTIVITIES (General Permit) was adopted by the State Water Resources Control Board (SWRCB) on November 19, 1991. Notices of Intent for coverage under the General Permit must be submitted to the SWRCB between the dates of January 15, 1992 and March 30, 1992. A California General Permit for Discharges of Storm Water Associated with Construction Activities is scheduled for adoption in Summer 1992.

The Federal storm water regulations identify the industry types, which are subject to storm water runoff, that require a permit. These industry types are described either by a specific description or by Standard Industrial Classifications (SIC) Code. The industry types identified include some facilities which may not typically be thought of as "industrial" and some facilities which are typically owned and operated by public agencies.

The General Permit covers storm water runoff from 10 of the following 11 categories listed in the Federal storm water regulations. The facilities included in each category are described in Attachment I and listed in the tables shown below in parentheses.

EPA Categories

i. Facilities subject to storm water effluent guidelines, new source performance standards or toxic pollutant effluent standards under 40CFR Subchapter N (Table 1)

ii. Certain manufacturing facilities (Table 2)

iii. Active and inactive oil and gas operations and mining facilities (Table 2)

iv. Hazardous waste treatment, storage, or disposal facilities (Table 4)

v. Landfills, land application sites, and open dumps that receive or have received any industrial wastes from facilities listed herein (Table 4)

vi. Recycling facilities, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards (Table 2)

vii. Steam electric power generating facilities (Table 4)

viii. Transportation facilities which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations (Table 2)

ix. Wastewater treatment plants with design flows greater than 1.0 mgd or plants required to have a pretreatment program (Table 4)

x. Construction (will be covered under the separate General Permit for Discharges of Storm Water Associated with Construction Activities)

xi. Other manufacturing facilities where materials, machinery, or products are exposed to storm water (Table 3)

General Information

A. Permit Fee

1. $250 in areas with a municipal NPDES permit
2. $500 in all other areas

B. To obtain a permit application form (NOI), call Stefanie Gordon at 916/657-0752

C. You will receive a letter 2 to 3 weeks after submitting your application confirming that you are covered by the General Permit

D. If you fail to submit an NOI by the March 30, 1992 deadline, submit an NOI anyway with an explanation why you were delayed

E. Certain determinations about this permitting process by the U.S. Environmental Protection Agency (EPA) may not apply in California. Procedures and applicability of the General Permit will be determined by the State Water Resources Board

F. The two major requirements of the General Permit are development and implementation of a Storm Water Monitoring and Reporting Program and a Storm Water Pollution Prevention Plan

G. Submit your completed NOI and permit fee to:

State Water Resources Control Board
Division of Water Quality
P.O. Box 1977
Sacramento, CA 95812-1977

Attention: Storm Water Permitting Section

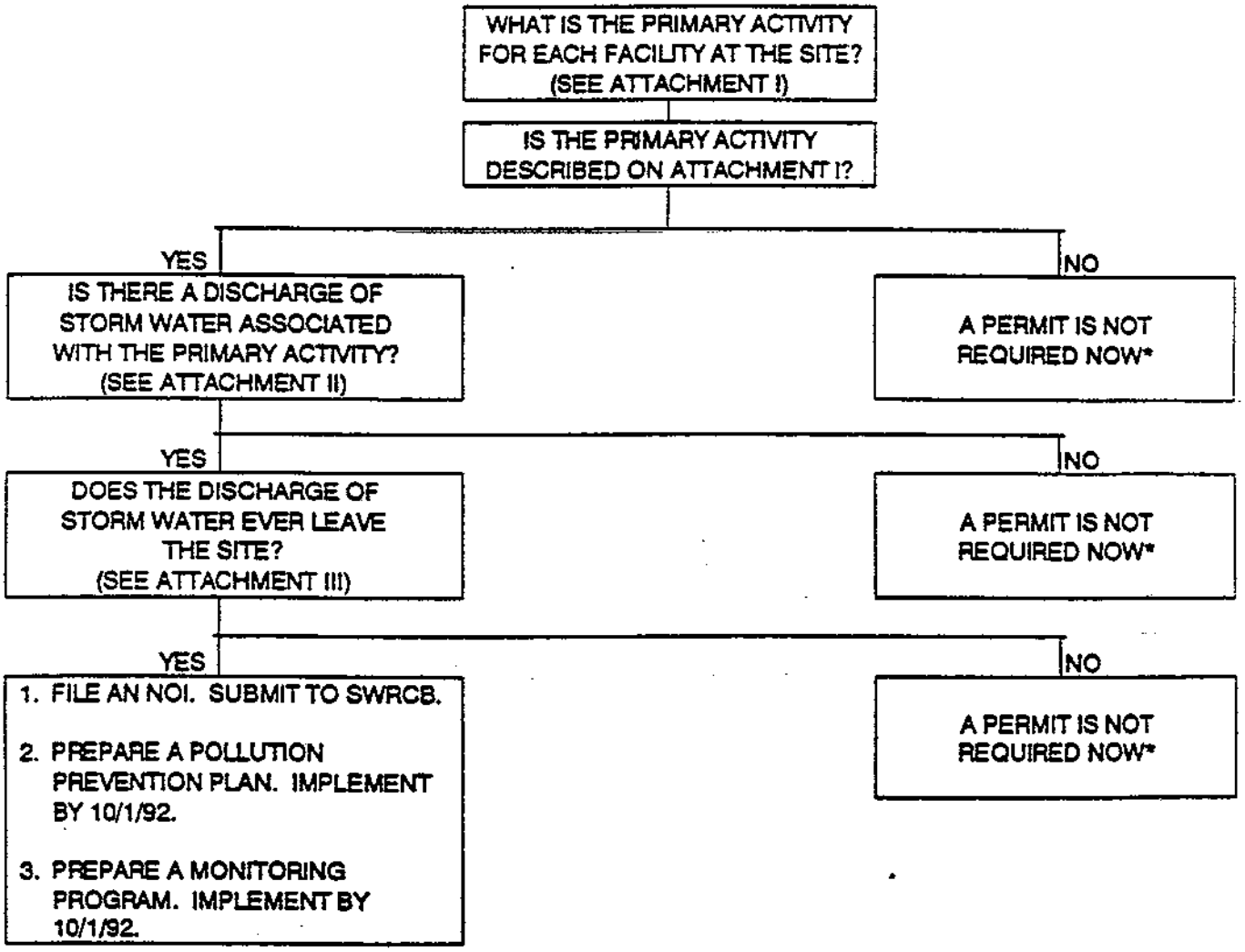
H. A Standard Industrial Classification (SIC) Manual can be found at most libraries. To order a manual call:

1-800-872-6386 or 1-800-562-0245
Specify Title Code #84161-9.

C6542/OVRVW
4/16/92

DECISION TREE

DOES THE GENERAL PERMIT FOR DISCHARGES OF STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITIES APPLY TO MY SITE?



* LOCAL AGENCIES MAY ADOPT OTHER PERMITS, CONDITIONS, RULES OR ORDINANCES THAT APPLY TO YOUR INDUSTRY.

ATTACHMENT I

INTRODUCTION

The State NPDES General Permit for Discharges of Storm Water Associated with Industrial Activities (General Permit) covers 10 of the 11 categories of industrial facilities described in the federal storm water regulations. All 11 categories are described below. Industrial facilities owned or operated by governmental entities (including federal, state, and municipal facilities) and included in any of the 10 designated categories (Categories i through ix, and xi) are subject to General Permit requirements. Category x facilities will be covered by a separate General Permit for Discharges of Storm Water Associated with Construction Activities (scheduled for adoption in Summer 1992).

Category i through ix facilities must file a Notice of Intent to be covered by the General Permit if they discharge industrial storm water (see Attachment II) to waters of the United States (see Attachment III). Category xi facilities must file a Notice of Intent to be covered by the General Permit only if they have equipment or material (outdoor activities) exposed to storm water (see Attachments II and III).

Five categories of facilities (ii, iii, vi, viii, and xi) are defined by Standard Industrial Classification (SIC) codes. Application of SIC codes is described below. Affected SIC codes are listed in Tables 2 and 3.

The remaining six categories of facilities (i, iv, v, vii, ix, and x) are defined by industrial activity descriptions.

APPLICATION OF SIC CODES

Identify Each Facility Contained at the Site

A facility is defined as "something that is built, installed, or established to serve a particular purpose" (Webster's Ninth New College Dictionary, 1986). Therefore, identifying the "purpose" is critical in defining a facility, i.e., each facility will achieve a particular end which can be described with a SIC code.

If more than one activity is occurring, the site may involve two separate, but contiguous facilities. Factors to consider include physical barriers and separate management. For example, a hotel complex could include a marina facility managed by a separate party or separated by a physical barrier from the hotel complex. In this case, the marina would be considered a separate facility associated with industrial activity subject to the Permit requirements (Transportation SIC 4493).

Identify Primary Activity

Once all facilities are identified, determine the primary purpose for each facility. The primary purpose is determined by the principal product or groups of products produced or distributed, or services rendered. The principal product or service should be determined by its relative share of value added (gross production, sales, receipts, or revenues) at the facility. Once the primary purpose of facility is identified, you will be able to determine if the primary purpose is described by one of the listed SIC codes.

In issuing the General Permit, the SWRCB indicated that a facility must be permitted if the primary activity (purpose) at the facility is described by one of the listed SIC codes (whether or not the activity is primary or auxiliary to the owner or operator of the facility). Thus, the primary activity at the facility should be considered when applying the SIC codes rather than the primary business of the owner or operator.

For example, a school bus maintenance facility is required to obtain a permit since establishments operating school buses (SIC 4151) are in one of the categories described in the storm water permit regulations, even though the facility is owned by an educational institution (e.g., a school district) which is not described by one of the listed SIC codes.

If a site contains two or more facilities each described by designated SIC codes, only one NPDES permit may be necessary if the owner of the site assumes responsibility for all facilities (see Attachment III - Who is Responsible for Obtaining the NPDES permit?). As an alternative, the operators for each facility could apply for separate permits.

GENERAL DESCRIPTION OF INDUSTRIAL FACILITY CATEGORIES

Category i

Facilities Listed Under 40 CFR Subchapter N

These consist of all facilities subject to promulgated: a) storm water effluent limitation guidelines, b) new source performance standards, or c) toxic pollutant effluent standards under 40 CFR Subchapter N. All affected industrial categories are identified in Table 1.

Industries listed with the new source performance standards group need only be permitted if they are a "new source"; meaning an industrial facility built after the performance standards were promulgated by EPA. Industries that believe that they may be included in Category i should review the Subchapter N guidelines and/or consult their local Regional Water Quality Control Board.

Excluded are facilities with toxic pollutant effluent standards which are exempted under Category xi (i.e. because materials, equipment, and products are not exposed to storm water).

Category ii

Manufacturing Facilities

These consist of facilities engaged in the mechanical or chemical transformation of materials or substances into new products, and are usually described as plants, factories, or mills and characteristically use power driven machines and materials handling equipment. Establishments engaged in assembling component parts of manufactured products or in the blending of materials such as lubricating oils, plastics, or liquors are included. Table 2 includes all four digit SIC codes within this category.

All facilities identified by this category are required to file to be covered by the General Permit, regardless of whether equipment and/or materials are exposed to storm water. These facilities should also note that the definition of "storm water discharge associated with industrial activity" (see Attachment II) includes, but is not limited to, discharges from the specified industrial activity areas. Included in the definition are manufacturing buildings and material and waste storage areas (whether totally enclosed or not) including tank farm areas. Activities of concern include emissions from stacks or air exhaust systems, use of unhoused manufacturing and heavy industrial equipment, and generation of dust or particulates.

Excluded are facilities engaged in services or wholesale or retail trade.

Category iii

Oil and Gas/Mining Facilities

These consist of active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water

contaminated by contact with or that has come into contact with any overburden, raw material, intermediate products, finished products, by-products, or waste products located on the site of such operations. Inactive mining operations are mined sites that are not being actively mined, but which have an identifiable owner/operator. Included are SIC Codes 10 (Metal Mining), 11 (Anthracite Mining), 12 (Coal Mining), 13 (Oil and Gas Extraction), and 14 (Mining and Quarrying of Nonmetallic Minerals, Except Fuels). Table 2 includes all four digit SIC codes within this category.

Excluded are inactive mining sites where mining claims are being maintained prior to disturbances associated with the extraction, benefaction, or processing of mined material, nor sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim. Also excluded are certain areas of coal mining meeting the definition of a reclamation area under 40 CFR 434.11(1) and certain areas of non-coal mining which have been released from state or federal reclamation requirements after December 17, 1990.

Category iv

Hazardous Waste Treatment, Storage, or Disposal Facilities

These consist of hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or permit under Subtitle C of the Resource Conservation and Recovery ACT (RCRA). These include only hazardous waste facilities under the federal definition of hazardous waste (RCRA hazardous waste as defined in Title 22, Section 66261.3, CA Health and Safety Code). The California definition of hazardous waste is broader and includes non-RCRA hazardous wastes. Only hazardous waste facilities based on the federal definition are required to obtain a NPDES storm water permit. However, non-RCRA hazardous waste facilities are still expected to effectively manage storm water discharges and may be required by a Regional Board to obtain a permit on a case-by-case basis. They must also comply with any conditions imposed by a permitted municipal storm water agency. See Table 4 for further detail.

Category v

Landfills, Land Application Sites, and Open Dumps

These consist of landfills, land application sites, and dumps that received any industrial wastes, including active and inactive sites that receive or have received industrial waste from any of the types of facilities described as industrial facilities in the storm water regulations (i.e., these eleven categories), sites subject to regulation under Subtitle D of RCRA, and sites that have accepted wastes from construction activities (construction activities include any clearing, grading, or excavation that results in disturbance of five acres or more). It is probable that most active and inactive landfills have received industrial waste. See Table 4 for further detail.

Excluded are properly closed landfills that now function as a different land use (e.g., park, golf course, etc.) and which do not pose a threat of discharging storm water exposed to landfill waste.

Category vi

Recycling Facilities

These consist of facilities involved in the recycling of materials, including facilities engaged in assembling, breaking up, sorting, and wholesale distribution of motor vehicle motors and parts, scrap, and other waste materials, and include metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards. Included are facilities which store and recycle paper, glass, metals, oil, rubber, plastics, and other synthetics. These include SIC Code 5015-Used Motor Vehicle Parts and SIC Code 5093-Scrap and Waste Materials.

Excluded are municipal waste collection sites where bottles, cans, and papers are collected for recycling purposes.

Category vii

Steam Electric Power Generating Facilities

These consist of steam electric power generating facilities, including coal handling sites. See Table 4 for further detail.

Excluded are onsite and offsite ancillary transformer facilities, as long as such facilities have regular inspections and management practices in place, including spill prevention, response, and clean up.

Category viii

Transportation Facilities

These consist of transportation facilities classified by the SIC indicated below which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or other operations identified under Categories i through vii or ix through xi must be permitted.

In determining whether a facility is covered by the transportation category, first determine whether the facility is involved in providing transportation to individual customers or for other companies or establishments, or provides long-distance trucking services to anyone. Maintenance facilities owned or operated by companies or public agencies which are involved in providing transportation services to the public or other businesses are covered, including the transportation of individuals (such as by buses, vans, or taxies) and goods (such as by trucks, rail, ships, or airplanes). All long-distance trucking facilities are covered.

Excluded are transportation facilities which only transport goods for the company or enterprise of which it is a part or only transport its own employees. Municipal corporation yards are excluded unless they perform the functions described in the SIC codes below, such as the service of an urban or suburban bus line (SIC 4111 - Local and Suburban Transit), or contain a warehousing and storage facility described by SIC codes 4225 or 4226. However, all municipal corporation yards are still expected to effectively manage storm water discharges and may be required by a Regional Board to obtain a Permit on a case-by-case basis. They must also comply with any conditions imposed by a permitted municipal storm water agency.

Also excluded are fuel stations, vehicle repair or service stations, and body shops which are not associated with the establishments described in the SIC codes below. However, these establishments are still expected to effectively manage storm water discharges and may be required by a Regional Board to obtain a permit on a case-by-case basis. They must also comply with any conditions imposed by a permitted municipal storm water agency.

Major transportation groups covered by the Permit are described below:

SIC 40 - Railroad Transportation

This major group includes establishments furnishing transportation by line-haul railroad, and switching and terminal establishments. Railways serving a single municipality, contiguous municipalities, or a municipality and its suburban areas are classified in Major Group 41.

SIC 41 - Local and Suburban Transit and Interurban Highway Passenger Transportation

This major group includes establishments primarily engaged in furnishing local and suburban passenger transportation, such as those providing passenger transportation within a single municipality, contiguous municipalities, or a municipality and its suburban areas by bus, rail, or subway, either separately or in combination, and establishments engaged in furnishing transportation to local scenic features. Also included are establishments primarily engaged in furnishing highway passenger transportation and establishments furnishing highway passenger terminal or maintenance facilities. Intercity bus lines are included in this major group, but interurban railways are classified in Major Group 40.

SIC 42 - Motor Freight Transportation and Warehousing (except SIC 4221-25 (Public Warehousing) which are included in Category xi)

This major group includes establishments furnishing local or long-distance trucking or transfer services or those engaged in the storage of special products (SIC 4226) such as automobiles (dead storage only), furs (for the trade), textiles, whiskey, and goods at foreign trade zones.

SIC 43 - United States Postal Service

SIC 44 - Water Transportation

This major group includes establishments engaged in freight and passenger transportation on the open seas or inland waters, and establishments furnishing such incidental service as lighterage, towing, and canal operation. This major group also includes excursion boats, sightseeing boats, and water taxis. Establishments engaged in the operation of charter or party fishing boats are not included.

SIC 45 - Transportation by Air

This major group includes establishments engaged in furnishing domestic and foreign transportation by air and also those operating airports and flying fields and furnishing terminal services. Establishments primarily engaged in performing services which may incidentally use airplanes (e.g. crop dusting and aerial photography) are not included.

SIC 5171 - Petroleum Bulk Stations and Terminals

These include establishments primarily engaged in the wholesale distribution of crude petroleum and petroleum products, including liquefied petroleum gas, from bulk liquid storage facilities.

Table 2 includes a complete list of all four digit SIC codes within this category. All facilities identified by this category are required to obtain NPDES permits for the discharge of industrial storm water regardless of material, equipment, or product exposure.

Category ix

Sewage or Wastewater Treatment Works

These consist of treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of one million gallons per day (MGD) or more, or required to have an approved pretreatment program under 40 CFR Part 403. Industrial activity areas at these facilities include, but are not limited to, onsite sludge composting;

storage of chemicals such as ferric chloride, alum polymers, and chlorine; and areas which experience spills and bubbleovers. See Table 4 for further detail.

Excluded are farm lands, domestic gardens, or lands used for sludge management or reclamation of municipal wastewater where the sludge or wastewater is beneficially reused and which are not physically located in the confines of the facility.

Category x

Construction Activities

These include, but are not limited to, clearing, grading, and excavation activities. The State intends to issue a separate General Permit for Discharges of Storm Water Associated with Construction Activities to cover storm water discharges from these activities. The General Permit for Construction Activities will further delineate the extent of affected construction activities.

Excluded from the General Permit for Construction Activities will be operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale. However, such operations are still expected to effectively manage storm water discharges and may be required by a Regional Board to obtain a permit on a case-by-case basis. They must also comply with any conditions imposed by local permitted municipal storm water agencies.

Category xi

Manufacturing Facilities

These consist of manufacturing facilities identified by SIC code which have storm water discharges "associated with industrial activities" from areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. Discharges of storm water "associated with industrial activity" and "exposure" to storm water are addressed in Attachment II.

Areas of industrial activity include manufacturing buildings and storage areas. Areas of industrial activity do not include access roads and rail lines.

Table 3 is a complete list of four digit SIC codes included in this category.

ATTACHMENT II

IS THERE A DISCHARGE OF STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITY?

The term "discharges of storm water associated with industrial activity" means discharges of storm water from areas at a facility where storm water may contact pollutants or activities may release pollutants to storm water. Such discharges include, but are not limited to, discharges from the following:

a. Industrial plan yards;
b. Immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility (except for category xi);
c. Material handling sites;
d. Refuse sites;
e. Sites used for the application or disposal of process waste waters; 40 CFR 401
f. Sites used for the storage and maintenance of material handling equipment;
g. Sites used for residual treatment, storage, or disposal;
h. Shipping and receiving areas;
i. Storage areas (including tank farms) for raw materials, and intermediate and finished products;
j. Manufacturing buildings; and
k. Areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water.

Significant materials include, but are not limited to, raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Access roads and rail lines include those used or traveled by carriers of raw materials, manufactured products, waste materials, or by-products used or created by the facility. Included are haul roads or rail lines dedicated to transportation of industrial products at facilities and roads and rail lines which are exclusively or primarily dedicated for use by the facility. They do not include public access roads or roads used to transport bulk samples of raw materials or products in small-scale prior to industrial production.

Note that the definition of industrial activity areas is not limited to the specified areas. Any area at a facility where storm water may contact pollutants or activities may release pollutants to storm water must be considered. Also note that the definition includes manufacturing buildings and material and waste storage areas (whether totally enclosed or not). Activities of concern in these areas include emissions from stacks or air exhaust systems, use of unhoused manufacturing and heavy industrial equipment, generation of dust or particulates, use of material handling equipment, and material handling activities.

Non-industrial Areas are areas located at facilities such as office buildings and accompanying parking lots are generally excluded, as long as the drainage from the excluded areas is discharged separately from storm water drained from areas with industrial activities. The intent of the regulations is to control industrial activity storm water discharges. Non-industrial areas are considered equivalent to residential or commercial land-use areas and should be managed as such. These areas may be subject to other requirements imposed by local agencies which have jurisdiction over or manage storm drain systems or waterways.

For the manufacturing facilities identified by Category xi, storm water discharge associated with industrial activity includes only storm water discharges from the areas (except access roads and rail lines) that are listed above where material handling equipment or activities, raw materials, intermediate products, final products, waste material, by-products, or industrial machinery are exposed to storm water.

Exposure means either direct contact with storm water or the possibility of release (e.g., spills) of pollutants to storm water. For example, roof drainage from manufacturing buildings must be considered when determining exposure. Exposure in this circumstance would include direct or potential contact or release of pollutants (associated with raw materials, products, or waste) from roof stacks to storm water. Manufacturing facilities may also be sources of dust or particulates associated with material handling equipment or activities, raw materials, products, or waste, or industrial machinery. Enclosed storage areas are also defined as areas of industrial activity where there may be exposure during loading/unloading of materials or exposure due to spills.

Category xi facilities are expected to use reasonable and professional judgment when making the determination of exposure from the listed areas and activities. In order to demonstrate that these areas are not exposed to storm water, the following conditions must be met:

1. All illicit (un-permitted) connections to the storm drainage system must be eliminated;

2. All materials must be completely contained at all times so, if spilled, they will not directly or indirectly contact storm water, and

3. All emissions from stacks or air exhaust systems, unhoused manufacturing and heavy industrial equipment, and emissions of dust or particulates must not be exposed to storm water.

If a facility demonstrates that there is no exposure, documentation of the rationale for the determination should be retained on site. Written approval by a Regional Board and a NPDES industrial storm water discharge permit is not required for such facilities. However, such facilities are expected to effectively manage storm water discharges and may be required by a Regional Board to obtain a permit on a case-by-case basis. They must also comply with any conditions imposed by a permitted municipal storm water agency.

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ATTACHMENT III

IS THERE A DISCHARGE OF STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITY TO WATERS OF THE UNITED STATES?

The answer is yes, and a General Permit is required, if either of the following applies:

a. The discharge of industrial storm water is directly to waters of the United States through any conveyance. The conveyance does not have to be a pipe or ditch. It includes "sheet flow" discharges resulting from any manipulation of land surface (e.g., pavement).

b. The discharge of industrial storm water is to a storm drain system which ultimate discharges to waters of the United States. In this case all "sheet flow" discharges are included.

The answer is no, and General Permit is not required, if either of the following applies:

a. The discharge of industrial storm water is to a municipal sanitary sewer system or combined sewer system (combined sanitary and storm sewer system).

b. The discharge of industrial storm water is to evaporation ponds, percolation ponds, or dry wells (groundwater injection wells), and there is no discharge to surface waters under any circumstances.

Even though these types of discharges are not required to obtain a General Permit, the discharges may be subject to separate waste discharge requirements issued by a Regional Water Quality Control Board (Regional Board) if they pose a threat to groundwater. If there is a question, call the local Regional Board to obtain guidance.

IS A SEPARATE STORM WATER PERMIT REQUIRED IF THE FACILITY ALREADY HAS A NPDES PERMIT?

A separate General Permit is not required if an existing NPDES permit identifies and addresses all industrial storm water discharges from the facility.

An existing NPDES permit may be modified to address all industrial storm water. Normally, this modification will occur when the existing permit is reissued or amended by a Regional Board. In the interim, the facility should obtain coverage under the General Permit.

WHO IS RESPONSIBLE FOR OBTAINING THE GENERAL PERMIT?

Either the owner or operator of the facility may obtain the Permit. Generally, the operator will be responsible for obtaining the permit. The operator is usually responsible for the industrial activity, and therefore, more appropriately, the best entity to manage the activity in compliance with the permit. However, owners may obtain coverage for a facility with the understanding that they will be directly responsible for the storm water discharge and consequently, responsible for compliance with permit conditions.

For example, a tenant which operates an industrial facility at an airport complex may be responsible for submitting a NOI for coverage under the General Permit and would be responsible for implementing a Storm Water Pollution Prevention Plan (SWPP Plan) for its facility. Alternatively, the airport owner may choose to assume responsibility for its tenants, in addition to its own industrial activities. In this case, the airport owner would submit a NOI and would be responsible for implementing a SWPP Plan that addresses all noted activities at the airport complex.

TABLE 1
SUBCHAPTER N - EFFLUENT GUIDELINES AND STANDARDS
(Category i)

Group 1	Group 2	Group 3	Part	Description
	X		405	Dairy products processing point source category
	X		406	Grain mills point source category
	X		407	Canned and preserved fruits and vegetables processing point source category
	X		408	Canned and preserved seafood processing point source category
	X		409	Sugar processing point source category
	X	X	410	Textile mills point source category
X	X		411	Cement manufacturing point source category
X	X		412	Feedlots point source category
	X	X	413	Electroplating point source category
	X	X	414	Organic chemicals, plastics, and synthetic fibers
	X	X	415	Inorganic chemicals manufacturing point source category
	X		417	Soap and detergent manufacturing point source category
X	X		418	Fertilizer manufacturing point source category
X	X	X	419	Petroleum refining point source category
	X	X	420	Iron and steel manufacturing point source category
	X	X	421	Nonferrous metals manufacturing point source category
X	X		422	Phosphate manufacturing point source category
X	X	X	423	Steam electric power generating point source category
	X	X	424	Ferroalloy manufacturing point source category
	X	X	425	Leather tanning and finishing point source category
	X	X	426	Glass manufacturing point source category
	X		427	Asbestos manufacturing point source category
	X	X	428	Rubber manufacturing point source category
	X	X	429	Timber products processing point source category
	X	X	430	Pulp, paper, and paperboard point source category
	X		431	The builders' paper and board mills point source category
	X		432	Meat products point source category
	X	X	433	Metal finishing point source category

TABLE 1 (Continued)
SUBCHAPTER N - EFFLUENT GUIDELINES AND STANDARDS
(Category i)

Group 1	Group 2	Group 3	Part	Description
X	X		434	Coal mining point source category; BPT, BAT, BCT limitations and new source performance standards
			435	Oil and gas extraction point source category
X			436	Mineral mining and processing point source category
	X	X	439	Pharmaceutical manufacturing point source category
X	X	X	440	Ore mining and dressing point source category
X	X		443	Effluent limitations guidelines for existing sources and standards of performance and pretreatment standards for new sources for the paving and roofing materials (tars and asphalt) point source category
	X		446	Paint formulating point source category
	X		447	Ink formulating point source category
			454	Gum and wood chemicals manufacturing point source category
		X	455	Pesticide chemicals
			457	Explosives manufacturing point source category
	X		458	Carbon black manufacturing point source category
		X	459	Photographic point source category
			460	Hospital point source category
	X	X	461	Battery manufacturing point source category
	X		463	Plastics molding and forming point source category
	X	X	464	Metal molding and casting point source category
	X	X	465	Coil coating point source category
	X	X	466	Porcelain enameling point source category
	X	X	467	Aluminum forming point source category
	X	X	468	Copper forming point source category
	X	X	469	Electrical and electronic components point source category
	X	X	471	Nonferrous metals forming and metal powders point source category

Group 1: Storm water effluent limitations guidelines - Permit Mandatory
Group 2: New source performance standards - Permit Mandatory
Group 3: Toxic pollutant effluent standards - Permit conditional on exposure to storm water (Category xi)

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TABLE 2

MANDATORY INDUSTRIES (Categories ii,iii, vi, and viii)
Permit Required in Any Case

Metal Mining

1011	Iron Ores
1021	Copper Ores
1031	Lead & Zinc Ores
1041	Gold Ores
1044	Silver Ores
1061	Ferroalloy Ores, Except Vanadium
1081	Metal Mining Services
1094	Uranium-Radium-Vanadium Ores
1099	Miscellaneous Metal Ores, N.E.C.

Coal Mining

1221	Bituminous Coal and Lignite Surface Mining
1222	Bituminous Coal Underground Mining
1231	Anthracite Mining
1241	Coal Mining Services

Oil & Gas Extraction

1311	Crude Petroleum & Natural Gas
1321	Natural Gas Liquids
1381	Drilling Oil & Gas Wells
1382	Oil & Gas Field Exploration Services
1389	Oil & Gas Field Services, N.E.C.

Mining & Quarrying of Nonmetallic Minerals, Except Fuels

1411	Dimension Stone
1422	Crushed & Broken Limestone
1423	Crushed & Broken Granite
1429	Crushed & Broken Stone, N.E.C
1442	Construction Sand & Gravel
1446	Industrial Sand
1455	Kaoline & Ball Clay
1459	Clay & Related Minerals, N.E.C.
1474	Potash, Soda, & Borate Minerals
1475	Phosphate Rock
1479	Chemical & Fertilizer Mineral Mining, N.E.C.
1481	Nonmetallic Minerals Services, Except Fuels
1499	Miscellaneous Nonmetallic Minerals, Except Fuels, N.E.C.

Lumber & Wood Products, Except Furniture

2421	Sawmills & Planing Mills, General
2426	Hardwood Dimension & Flooring Mills
2429	Special Product Sawmills, N.E.C.
2431	Millwork
2435	Hardwood Veneer & Plywood
2436	Softwood Veneer & Plywood
2439	Structural Wood Members, N.E.C.
2441	Nailed and Lock Corner Wood Boxes & Shook
2448	Wood Pallets & Skids
2449	Wood Containers, N.E.C.
2451	Mobile Homes

Lumber & Wood Products, Except Furniture (Cont.)

2452	Prefabricated Wood Buildings
2491	Wood Preserving
2493	Reconstituted Wood Products
2499	Wood Products, N.E.C.

Paper & Allied Products

2611	Pulp Mills
2621	Paper Mills
2631	Paperboard Mills

Chemicals & Allied Products

2812	Alkalies & Chlorine
2813	Industrial Gases
2816	Inorganic Pigments
2819	Industrial Inorganic Chemicals, N.E.C.
2821	Plastics Materials, Synthetic Resins, & Nonvolcanizable Elastomers
2822	Synthetic Rubber
2823	Cellulosic Manmade Fibers
2824	Manmade Organic Fibers, Except Cellulosic
2841	Soap & Other Detergents, Except Specialty Cleaners
2842	Specialty Cleaning, Polishing, & Sanitation Preparations
2843	Surface Active Agents, Finishing Agents, Sulforated Oils, and Assistants
2844	Perfumes, Cosmetics, & Other Toilet Preparations
2851	Paints, Varnishes, Lacquers, Enamels, and Allied Products
2861	Gum & Wood Chemicals
2865	Cyclic Organic Crudes & Intermediates, & Organic Dyes & Pigments
2869	Industrial Organic Chemicals, N.E.C.
2873	Nitrogenous Fertilizers
2874	Phosphatic Fertilizers
2875	Fertilizers, Mixing Only
2879	Pesticides & Agricultural Chemicals, N.E.C.
2891	Adhesives & Sealants
2892	Explosives
2893	Printing Ink
2895	Carbon Black
2899	Chemicals & Chemical Preparations, N.E.C.

Petroleum Refining & Related Industries

2911	Petroleum Refining
2951	Asphalt Paving Mixtures & Blocks
2952	Asphalt Felts & Coatings
2992	Lubricating Oils & Greases
2999	Products of Petroleum & Coal, N.E.C.

Leather Tanning & Finishing

3111	Leather Tanning & Finishing

Note: N.E.C. means Not Elsewhere Classified.

Stone, Clay, Glass, & Concrete Products

3211 Flat Glass
3221 Glass Containers
3229 Pressed & Blown Glass & Glassware, N.E.C.
3241 Cement, Hydraulic
3251 Brick & Structural Clay Tile
3253 Ceramic Wall & Floor Tile
3255 Clay Refractories
3259 Structural Clay Products, N.E.C.
3261 Vitreous China Plumbing Fixtures & China & Earthenware Fittings & Bathroom Accessories
3262 Vitreous China Table and Kitchen Articles
3263 Fine Earthenware (Whiteware) Table and Kitchen Articles
3264 Porcelain Electrical Supplies
3269 Pottery Products, N.E.C.
3271 Concrete Block & Brick
3272 Concrete Products, Except Block & Brick, N.E.C.
3273 Ready-Mixed Concrete
3274 Lime
3275 Gypsum Products
3281 Cut Stone & Stone Products
3291 Abrasive Products
3292 Asbestos Products
3295 Minerals & Earths, Ground or Otherwise Treated
3296 Mineral Wool
3297 Nonclay Refractories
3299 Nonmetallic Mineral Products, N.E.C.

Primary Metal Industries

3312 Steel Works, Blast Furnaces (Including Coke Ovens), & Rolling Mills
3313 Electrometallurgical Products, Except Steel
3315 Steel Wiredrawing & Steel Nails & Spikes
3316 Cold-Rolled Steel Sheet, Strip, & Bars
3317 Steel Pipe & Tubes
3321 Gray & Ductile Iron Foundries
3322 Malleable Iron Foundries
3324 Steel Investment Foundries
3325 Steel Foundries, N.E.C.
3331 Primary Smelting & Refining of Copper
3334 Primary Production of Aluminum
3339 Primary Smelting & Refining of Nonferrous Metals, Except Copper & Aluminum
3341 Secondary Smelting & Refining of Nonferrous Metals
3351 Rolling, Drawing, & Extruding of Copper
3353 Aluminum Sheet, Plate, & Foil
3354 Aluminum Extruded Products
3355 Aluminum Rolling & Drawing, N.E.C.
3356 Rolling & Drawing of Nonferrous Metals, Except Copper & Aluminum
3357 Drawing & Insulating of Nonferrous Wire
3363 Aluminum Die-Castings
3364 Nonferrous Die-Castings, Except Aluminum
3365 Aluminum Foundries
3366 Copper Foundries

Primary Metal Industries (Cont.)

3369 Nonferrous Foundries, Except Aluminum & Copper
3398 Metal Heat Treating
3399 Primary Metal Products, N.E.C.

Fabricated Structural Metal Products

3441 Fabricated Structural Metal

Electronic & Other Electrical Equipment & Components, Except Computer Equipment

3648 Lighting Equipment, N.E.C.
3652 Phonograph Records & Prerecorded Audio Tapes & Disks
3679 Electronic Components, N.E.C.

Ship & Boat Building & Repairing

3731 Ship Building & Repairing
3732 Boat Building & Repairing

Railroads

4011 Railroads, Line-Haul Operating
4013 Railroad Switching & Terminal Establishments

Local & Suburban Transit & Interurban Highway Passenger Transportation

4111 Local & Suburban Transit
4119 Local Passenger Transportation, N.E.C.
4121 Taxicabs
4131 Intercity & Rural Bus Transportation
4141 Local Bus Charter Service
4142 Bus Charter Service, Except Local
4151 School Buses
4173 Terminal & Service Facilities for Motor Vehicle Passenger Transportation

Motor Freight Transportation & Warehousing

4212 Trucking, Local Without Storage
4213 Trucking, Except Local
4214 Local Trucking & Storage
4215 Courier Services, Except By Air
4226 Special Warehousing & Storage, N.E.C.
4231 Terminal Facilities & Joint Terminal Maintenance Facilities for Motor Freight Transportation

United States Postal Service

4311 United States Postal Service

Water Transportation

4412 Deep Sea Foreign Transportation of Freight
4424 Deep Sea Domestic Transportation of Freight
4432 Freight Transportation on the Great Lakes - St. Lawrence Seaway
4449 Water Transportation of Freight, N.E.C.

Note: N.E.C. means Not Elsewhere Classified.

Water Transportation (Cont.)

4481 Deep Sea Transportation of Passengers, Except by Ferry
4482 Ferries
4489 Water Transportation of Passengers, N.E.C.
4491 Marine Cargo Handling
4492 Towing & Tugboat Services
4493 Marinas
4499 Water Transportation Services, N.E.C.

Transportation By Air

4512 Air Transportation, Scheduled
4513 Air Courier Services
4522 Air Transportation, Nonscheduled
4581 Airports, Flying Fields, & Airport Terminal Services

Wholesale Trade - Durable Goods

5015 Motor Vehicle Parts, Used
5093 Scrap & Waste Materials

Petroleum & Petroleum Products

5171 Petroleum & Petroleum Product Wholesalers, Except Bulk Stations & Terminals

Note: N.E.C. means Not Elsewhere Classified.

TABLE 3

CONDITIONAL INDUSTRIES (Category xi)
Permit required only if materials, machinery, or products are exposed to stormwater

Food & Kindred Products

2011	Meat Packing Plants
2013	Sausages & Other Prepared Meat Products
2015	Poultry Slaughtering & Processing
2021	Creamery Butter
2022	Natural, Processed, & Imitation Cheese
2023	Dry, Condensed, & Evaporated Dairy Products
2024	Ice Cream & Frozen Desserts
2026	Fluid Milk
2032	Canned Specialities
2033	Canned Fruits, Vegetables, Preserves, Jams, & Jellies
2034	Dried & Dehydrated Fruits, Vegetables, & Soups Mixes
2035	Pickled Fruits & Vegetables, Vegetable Sauces & Seasonings, & Salad Dessings
2037	Frozen Fruits, Fruit Juices, & Vegetables
2038	Frozen Specialities, N.E.C.
2041	Flour & Other Grain Mill Products
2043	Cereal Breakfast Foods
2044	Rice Milling
2045	Prepared Flour Mixes & Doughs
2046	Wet Corn Milling
2047	Dog & Cat Food
2048	Prepared Feeds & Feed Ingredients for Animals & Fowls, Except Dogs & Cats
2051	Bread & Other Bakery Products, Except Cookies & Crackers
2052	Cookies & Crackers
2053	Frozen Bakery Products, Except Bread
2061	Cane Sugar, Except Refining
2062	Sugar Cane Refining
2063	Beet Sugar
2064	Candy & Other Confectionery Products
2066	Chocolate & Cocoa Products
2067	Chewing Gum
2068	Salted & Roasted Nuts & Seeds
2074	Cononseed Oil Mills
2075	Soybean Oil Mills
2076	Vegetable Oil Mills, Except Corn, Cottonseed, & Soybean
2077	Animal & Marine Fats & Oils
2079	Shortening, Table Oils, Margerine, & Other Edible Fats & Oils, N.E.C.
2082	Malt Beverages
2083	Malt
2084	Wines, Brandy, & Brandy Spirits
2085	Distilled & Blended Liquors
2086	Bottled & Canned Soft Drinks & Carbonated Waters
2087	Flavoring Extracts & Syrups, N.E.C.
2091	Canned & Cured Fish & Seafoods
2092	Prepared Fresh or Frozen Fish & Seafoods
2095	Roasted Coffee
2096	Potatoe Chips, Corn Chips, & Similar Snacks
2097	Manufactured Ice
2098	Macaroni, Spaghetti, Vermicelli, & Noodles

Food & Kindred Products (Cont.)

2099	Food Preparations, N.E.C.

Tobacco Products

2111	Cigarettes
2121	Cigars
2131	Chewing & Smoking Tobacco & Snuff
2141	Tobacco Stemming & Redrying

Textile Mill Products

2211	Broadwoven Fabric Mills, Cotton
2221	Broadwoven Fabric Mills, Manmade Fiber & Silk
2231	Broadwoven Fabric Mills, Wool (Including Dyeing & Finishing)
2241	Narrow Fabric & Other Smallwares Mills: Cotton, Wool, Silk, & Manmade Fiber
2251	Women's Full-Length & Knee-Length Hosiery, Except Socks
2252	Hosiery, N.E.C.
2253	Knit Outerwear Mills
2254	Knit Underwear & Nightwear Mills
2257	Weft Knit Fabric Mills
2258	Lace & Warp Knit Fabric Mills
2259	Knitting Mills, N.E.C.
2261	Finishers of Broadwoven Fabrics of Cotton
2262	Finishers of Broadwoven Fabrics of Manmade Fiber & Silk
2269	Finishers of Textiles, N.E.C.
2273	Carpets & Rugs
2281	Yarn Spinning Mills
2282	Yarn Texturizing, Throwing, Twisting, & Winding Mills
2284	Thread Mills
2295	Coated Fabrics, Not Rubberized
2296	Tire Cord & Fabrics
2297	Nonwoven Fabrics
2298	Cordage & Twine
2299	Textile Goods, N.E.C.

Apparel & Other Finished Products Made From Fabrics & Similar Materials

2311	Men's & Boy's Suits, Coats, & Overcoats
2321	Men's & Boy's Shirts, Except Work Shirts
2322	Men's & Boy's Underwear & Nightwear
2325	Men's & Boy's Separate Trousers & Slacks
2326	Men's & Boy's Work Clothing
2329	Men's & Boy's Clothing, N.E.C.
2331	Women's, Misses' & Juniors' Blouses & Shirts
2335	Women's, Misses' & Juniors' Dresses
2337	Women's, Misses' & Juniors' Suits, Skirts, & Coats
2339	Women's, Misses'& Juniors' Outerwear, N.E.C.

Note: N.E.C. means Not Elsewhere Classified.

Apparel & Other Finished Products Made From Fabrics & Similar Materials (Cont.)

2341	Women's, Misses, Children's, & Infants' Underwear & Nightwear
2342	Brassieres, Girdles, & Allied Garments
2353	Hats, Caps, & Millinery
2361	Girls' Children's & Infants' Dresses, Blouses, & Shirts
2369	Girls', Childrens', & Infants' Outerwear, N.E.C.
2371	Fur Goods
2381	Dress & Work Gloves, Except Knit & All-Leather
2384	Robes & Dressing Gowns
2385	Waterproof Outerwear
2386	Leather & Sheep-Lined Clothing
2387	Apparel Belts
2389	Apparel & Accessories, N.E.C.
2391	Curtains & Draperies
2392	Housefurnishings, Except Curtains & Draperies
2393	Textile Bags
2394	Canvas & Related Products
2395	Pleating, Decorative & Novelty Stitching, & Tucking for the Trade
2396	Automotive Trimmings, Apparel Findings, & Related Products
2397	Schiffli Machine Embroideries
2399	Fabricated Textile Products, N.E.C.

Millwork, Veneer, Plywood, & Structural Wood Members

2434	Wood Kitchen Cabinets

Furniture & Fixtures

2511	Wood Household Furniture, Except Upholstered
2512	Wood Household Furniture, Upholstered
2514	Metal Household Furniture
2515	Mattresses, Foundations, & Convertible Beds
2517	Wood Television, Radio, Phonograph, & Sewing Machine Cabinets
2519	Household Furniture, N.E.C.
2521	Wood Office Furniture
2522	Office Furniture, Except Wood
2531	Public Building and Related Furniture
2541	Wood Office & Store Fixtures, Partitions, Shelving, & Lockers
2542	Office & Store Fixtures, Partitions, Shelving, & Lockers, Except Wood
2591	Drapery Hardware & Window Blinds & Shades
2599	Furniture & Fixtures, N.E.C.

Paper & Allied Products

2652	Setup Paperboard Boxes
2653	Corrugated & Solid Fiber Boxes
2655	Fiber Cans, Tubes, Drums & Similar Products
2656	Sanitary Food Containers, Except Folding

Paper & Allied Products (Cont.)

2657	Folding Paperboard Boxes, Including Sanitary
2671	Packaging Paper & Plastics Film, Coated & Laminated
2672	Coated & Laminated Paper, N.E.C.
2673	Plastics, Foil & Coated Paper Bags
2674	Uncoated Paper & Multiwall Bags
2675	Die-Cut Paper, Paperboard, & Cardboard
2676	Sanitary Paper Products
2677	Envelopes
2678	Stationery Tablets & Related Products
2679	Converted Paper & Paperboard Products, N.E.C.

Printing, Publishing, & Allied Industries

2711	Newspapers: Publishing, or Publishing & Printing
2721	Periodicals: Publishing, or Publishing & Printing
2731	Books: Publishing, or Publishing & Printing
2732	Book Printing
2741	Miscellaneous Publishing
2752	Commercial Printing, Lithographic
2754	Commercial Printing, Gravure
2759	Commercial Printing, N.E.C.
2761	Manifold Business Forms
2771	Greeting Cards
2782	Blankbooks, Looseleaf Binders & Devices
2789	Bookbinding & Related Work
2791	Typesetting
2796	Platemaking & Related Services

Drugs

2833	Medicinal Chemicals & Botanical Products
2834	Pharmaceutical Preparations
2835	In Vitro & In Vivo Diagnostic Substances
2836	Biological Products, Except Diagnostic Substances

Paints, Varnishes, Lacquers, Enamels, & Allied Products

2851	Paints, Varnishes, Lacquers, Enamels, & Allied Products

Rubber & Miscellaneous Plastics Products

3011	Tires & Inner Tubes
3021	Rubber & Plastics Footwear
3052	Rubber & Plastics Hose & Belting
3053	Gaskets, Packing & Sealing Devices
3061	Molded, Extruded, & Lathe-Cut Rubber Mechanical Goods
3069	Fabricated Rubber Products, N.E.C.
3081	Unsupported Plastics Film & Sheet
3082	Unsupported Plastics Profile Shapes
3083	Laminated Plastics Plate, Sheet, & Profile Shapes
3084	Plastics Pipe
3085	Plastics Bottles

Note: N.E.C. means Not Elsewhere Classified.

Rubber & Miscellaneous Plastics Products

3086	Plastics Foam Products
3087	Custom Compounding of Purchased Plastics Resins
3088	Plastics Plumbing Fixtures
3089	Plastics Products, N.E.C.

Leather & Leather Products

3131	Boot & Shoe Cut Stock & Findings
3142	House Slippers
3143	Men's Footwear, Except Athletic
3144	Women's Footwear, Except Athletic
3149	Footwear, Except Rubber, N.E.C.
3151	Leather Gloves & Mittens
3161	Luggage
3171	Women's Handbags & Purses
3172	Personal Leather Goods, Except Women's Handbags & Purses
3199	Leather Goods, N.E.C.

Glass Products, Made Of Purchased Glass

3231	Glass Products Made of Purchased Glass

Fabricated Metal Products, Except Machinery & Transportation Equipment

3411	Metal Cans
3412	Metal Shipping Barrels, Drums, Kegs, & Pails
3421	Cutlery
3423	Hand & Edge Tools, Except Machine Tools & Handsaws
3425	Saw Blades & Handsaws
3429	Hardware, N.E.C.
3431	Enameled Iron & Metal Sanitary Ware
3432	Plumbing Fixture Fittings & Trim
3433	Heating Equipment, Except Electric & Warm Air Furnaces
3442	Metal Doors, Sash, Frames, Molding, & Trim
3443	Fabricated Plate Work (Boiler Shops)
3444	Sheet Metal Work
3446	Architectural & Ornamental Metal Work
3448	Prefabricated Metal Buildings & Components
3449	Miscellaneous Structural Metal Work
3451	Screw Machine Products
3452	Bolts, Nuts, Screws, Rivets, & Washers
3462	Iron & Steel Forgings
3463	Nonferrous Forgings
3465	Automotive Stampings
3466	Crowns & Closures
3469	Metal Stampings, N.E.C.
3471	Electroplating, Plating, Polishing, Anodizing, & Coloring
3479	Coating, Engraving, & Allied Services, N.E.C.
3482	Small Arms Ammunition
3483	Ammunition, Except for Small Arms
3484	Small Arms
3489	Ordinance & Accessories, N.E.C.
3491	Industrial Valves
3492	Fluid Power Valves & Hose Fittings

Fabricated Metal Products, Except Machinery & Transportation Equipment (Cont.)

3493	Springs, Steel, Except Wire
3494	Valves & Pipe Fittings, N.E.C.
3495	Wire Springs
3496	Miscellaneous Fabricated Wire Products
3497	Metal Foil & Leaf
3498	Fabricated Pipe & Pipe Fittings
3499	Fabricated Metal Products, N.E.C.

Industrial & Commercial Machinery & Computer Equipment

3511	Steam, Gas, & Hydraulic Turbines, & Turbine Generator Set Units
3519	Internal Combustion Engines, N.E.C.
3523	Farm Machinery & Equipment
3524	Lawn & Garden Tractors & Home Lawn & Garden Equipment
3531	Construction Machinery & Equipment
3532	Mining Machinery & Equipment, Except Oil & Gas Field Machinery & Equipment
3533	Oil & Gas Field Machinery & Equipment
3534	Elevators & Moving Stairways
3535	Conveyors & Conveying Equipment
3536	Overhead Traveling Cranes, Hoists, & Monorail Systems
3537	Industrial Trucks, Tractors, Trailers, & Stackers
3541	Machine Tools, Metal Cutting Types
3542	Machine Tools, Metal Forming Types
3543	Industrial Patterns
3544	Special Dies & Tools, Die Sets, Jigs, & Fixtures, & Industrial Molds
3545	Cutting Tools, Machine Tool Accessories, & Machinists' Precision Measuring Devices
3546	Power Driven Handtools
3547	Rolling Mill Machinery & Equipment
3548	Electric & Gas Welding & Soldering Equipment
3549	Metalworking Machinery, N.E.C.
3552	Textile Machinery
3553	Woodworking Machinery
3554	Paper Industries Machinery
3555	Printing Trades Machinery & Equipment
3556	Food Products Machinery
3559	Special Industry Machinery, N.E.C.
3561	Pumps & Pumping Equipment
3562	Ball & Roller Bearings
3563	Air & Gas Compressors
3564	Industrial & Commercial Fans & Blowers, & Air Purification Equipment
3565	Packaging Machinery
3566	Speed Changers, Industrial High-Speed Drives, & Gears
3567	Industrial Process Furnaces & Ovens
3568	Mechanical Power Transmission Equipment, N.E.C.
3569	General Industrial Machinery & Equipment, N.E.C.
3571	Electronic Computers
3572	Computer Storage Devices
3575	Computer Terminals
3577	Computer Peripheral Equipment, N.E.C.

Note: N.E.C. means Not Elsewhere Classified.

Industrial & Commercial Machinery & Computer Equipment

3578 Calculating & Accounting Machines, Except Electronic Computers
3579 Office Machines, N.E.C.
3581 Automatic Vending Machines
3582 Commercial Laundry, Drycleaning, & Pressing Machines
3585 Air Conditioning & Warm Air Heating Equipment & Commercial & Industrial Refrigeration Equipment
3586 Measuring & Dispensing Pumps
3589 Service Industry Machinery, N.E.C.
3592 Carburetors, Pistons, Piston Rings, & Valves
3593 Fluid Power Cylinders & Actuators
3594 Fluid Power Pumps & Motors
3596 Scales & Balances, Except Laboratory
3599 Industrial & Commercial Machinery & Equipment, N.E.C.

Electronic & Other Electrical Equipment & Components, Except Computer Equipment

3612 Power, Distribution, & Specialty Transformers
3613 Switchgear & Switchboard Apparatus
3621 Motors & Generators
3624 Carbon & Graphite Products
3625 Relays & Industrial Controls
3629 Electrical Industrial Apparatus, N.E.C.
3631 Household Cooking Equipment
3632 Household Refrigerators, & Home & Farm Freezers
3633 Household Laundry Equipment
3634 Electrical Housewares & Fans
3635 Household Vacuum Cleaners
3639 Household Appliances, N.E.C.
3641 Electric Lamps Bulbs & Tubes
3643 Current-Carrying Wiring Devices
3644 Noncurrent-Carrying Wiring Devices
3645 Residential Electric Lighting Fixtures
3646 Commercial, Industrial, & Institutional Electric Lighting Fixtures
3647 Vehicular Lighting Equipment
3648 Lighting Equipment, N.E.C.
3651 Household Audio & Video Equipment
3652 Phonograph Records & Prerecorded Audio Tapes & Disks
3661 Telephone & Telegraph Apparatus
3663 Radio & Television Broadcasting & Communications Equipment
3669 Communications Equipment, N.E.C.
3671 Electron Tubes
3672 Printed Circuit Boards
3674 Semiconductors & Related Devices
3675 Electronic Capacitors
3676 Electronic Resistors
3677 Electronic Coils, Transformers, & Other Inductors
3678 Electronic Connectors
3679 Electronic Components, N.E.C.
3691 Storage Batteries
3692 Primary Batteries, Dry & Wet

Electronic & Other Electrical Equipment & Components, Except Computer Equipment (Cont.)

3694 Electrical Equipment for Internal Combustion Engines
3695 Magnetic & Optical Recording Media
3699 Electrical Machinery, Equipment, & Supplies, N.E.C.

Transportation Equipment

3711 Motor Vehicles & Passenger Car Bodies
3713 Truck & Bus Bodies
3714 Motor Vehicle Parts & Accessories
3715 Truck Trailers
3716 Motor Homes
3721 Aircraft
3724 Aircraft Engines & Engine Parts
3728 Aircraft Parts & Auxiliary Equipment, N.E.C.
3743 Railroad Equipment
3751 Motorcycles, Bicycles, & Parts
3761 Guided Missiles & Space Vehicles
3764 Guided Missile & Space Vehicle Propulsion Units & Propulsion Unit Parts
3769 Guided Missile & Space Vehicle Parts & Auxiliary Equipment, N.E.C.
3792 Travel Trailers & Campers
3795 Tanks & Tank Components
3799 Transportation Equipment, N.E.C.

Measuring, Analyzing & Controlling Instruments; Photographic, Medical, & Optical Goods; Watches & Clocks

3812 Search, Detection, Navigation, Guidance, Aeronautical, & Nautical Systems & Instruments
3821 Laboratory Apparatus & Furniture
3822 Automatic Controls for Regulating Residential & Commercial Environments & Appliances
3823 Industrial Instruments for Measurement, Display, & Control of Process Variables, & Related Products
3824 Totalizing Fluid Meters & Counting Devices
3825 Instruments for Measuring & Testing of Electricity & Electrical Signals
3826 Laboratory Analytical Instruments
3827 Optical Instruments & Lenses
3829 Measuring & Controlling Devices, N.E.C.
3841 Surgical & Medical Instruments & Apparatus
3842 Orthopedic, Prosthetic, & Surgical Appliances & Supplies
3843 Dental Equipment & Supplies
3844 X-Ray Apparatus & Tubes & Related Irradiation Apparatus
3845 Electromedical & Electrotherapeutic Apparatus
3851 Ophthalmic Goods
3861 Photographic Equipment & Supplies
3873 Watches, Clocks, Clockwork Operated Devices, & Parts

Note: N.E.C. means Not Elsewhere Classified.

Miscellaneous Manufacturing Industries

3911	Jewelry, Precious Metal
3914	Silverware, Plated Ware, & Stainless Steel Ware
3915	Jewelers' Findings & Materials, & Lapidary Work
3931	Musical Instruments
3942	Dolls & Stuffed Toys
3944	Games, Toys, & Children's Vehicles, Except Dolls & Bicycles
3949	Sporting & Athletic Goods, N.E.C.
3951	Pens, Mechanical Pencils, & Parts
3952	Lead Pencils, Crayons, & Artists' Materials
3953	Marking Devices
3955	Carbon Paper & Inked Ribbons
3961	Costume Jewelry & Costume Novelties, Except Precious Metal
3965	Fasteners, Buttons, Needles, & Pins
3991	Brooms & Brushes
3993	Signs & Advertising Specialties
3995	Burial Caskets
3996	Linoleum, Asphalted-Felt-Base, & Other Hard Surface Floor Coverings, N.E.C.
3999	Manufacturing Industries, N.E.C.

Public Warehousing & Storage

4221	Farm Product Warehousing & Storage
4222	Refrigerated Warehousing & Storage
4225	Warehousing & Storage, General

Note: N.E.C. means Not Elsewhere Classified.

TABLE 4
MANDATORY INDUSTRIES (Categories iv, v, vii, and ix)
Permit Required in Any Case
April 1992

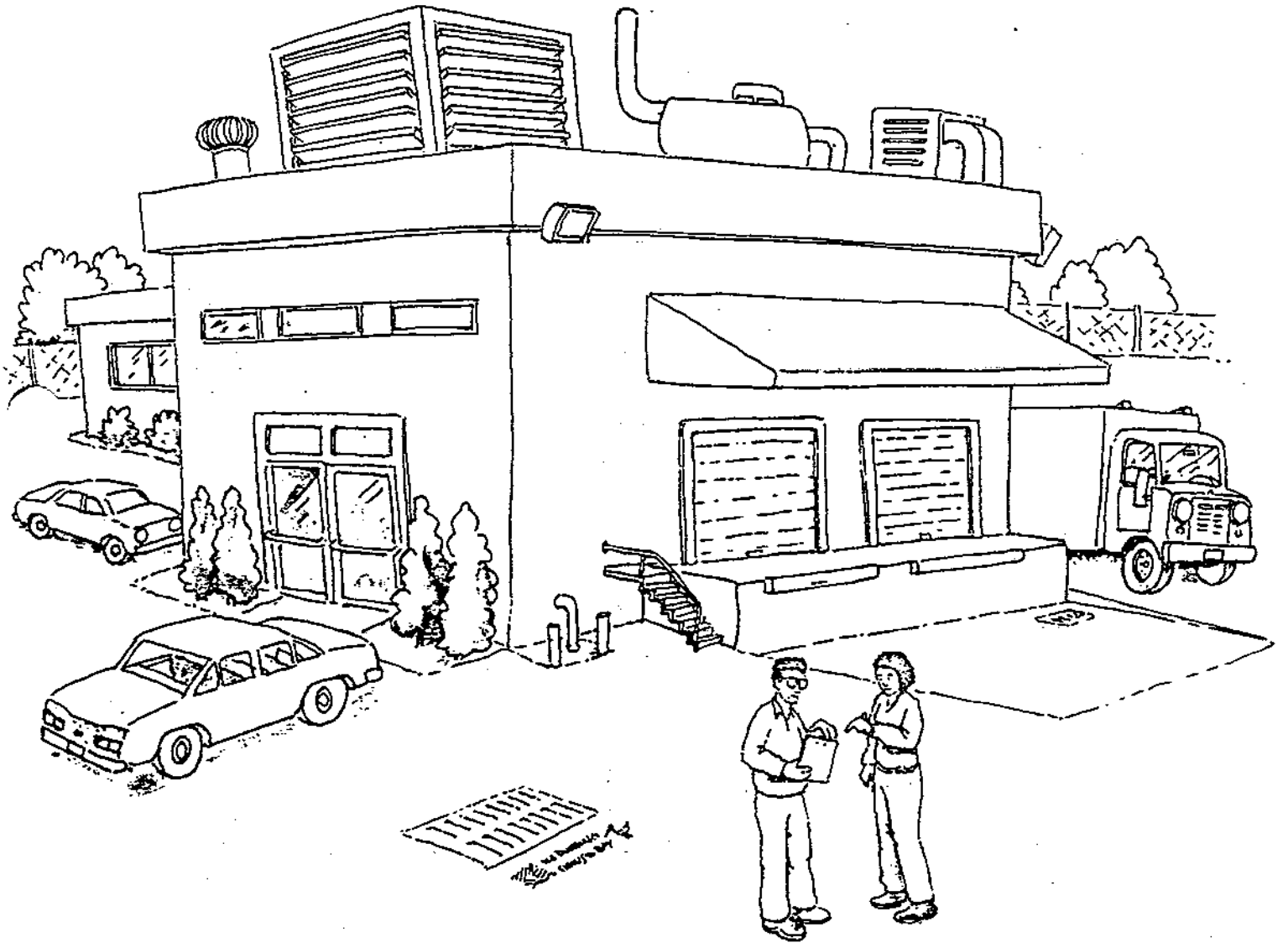
TYPE OF FACILITY	FACILITIES INCLUDED	FACILITIES EXCLUDED	COMMENTS
Hazardous Waste Treatment Facilities	Facilities regulated by the State Department of Toxic Substances Control, which: a) operate under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA), and b) use any method, technique, or process, to change the physical, chemical, or biological character or composition of RCRA hazardous wastes for the purpose of neutralization; energy or material resource recovery; rendering such waste nonhazardous, less hazardous, or safer to transport, store, or dispose; reducing waste volume; or making such waste more amenable for recovery or storage.		RCRA hazardous wastes are defined in Section 66261.3 of Title 22 of the California Code of Regulations.
Hazardous Waste Storage Facilities	Facilities regulated by the State Department of Toxic Substances Control, which: a) operate under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA), and b) hold RCRA hazardous wastes from onsite or offsite locations for a temporary period until the waste is treated, disposed of, or stored elsewhere.	Temporary hazardous wastes storage facilities operated for less than 90 days are not covered by RCRA.	RCRA hazardous wastes are defined in Section 66261.3 of Title 22 of the California Code of Regulations.
Hazardous Waste Disposal Facilities	Facilities regulated by the State Department of Toxic Substances Control, which: a) operate under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA), and b) discharge, deposit, inject, or place RCRA hazardous wastes on or into any land or water.		RCRA hazardous wastes are defined in Section 66261.3 of Title 22 of the California Code of Regulations.
Landfills	Active, inactive, and closed sites that: a) receive or have received wastes from other facilities covered by the General Industrial Stormwater NPDES Permit, b) are subject to regulation under Subtitle D of RCRA, or c) have accepted wastes from construction activities involving clearing, grading, or excavation of five acres or more.		A Landfill is defined as an area of land or excavation in which wastes are placed for permanent disposal, excluding land application sites, surface impoundments, injection wells, and waste piles (40 CFR Part 257.2).

TABLE 4
MANDATORY INDUSTRIES (Categories iv, v, vii, and ix)
Permit Required in Any Case
April 1992

TYPE OF FACILITY	FACILITIES INCLUDED	FACILITIES EXCLUDED	COMMENTS
Land Application Sites	Active, inactive, and closed sites that: a) receive or have received wastes from other facilities covered by the General Industrial Stormwater NPDES Permit, b) are subject to regulation under Subtitle D of RCRA, or c) have accepted wastes from construction activities involving clearing, grading, or excavation of five acres or more.	Manure spreading operations.	A Land Application Site is defined as an area where wastes are applied onto or incorporated into the soil surface for agricultural purposes or for treatment and disposal (40 CFR Part 257.2).
Open Dumps	Active, inactive, and closed sites that: a) receive or have received wastes from other facilities covered by the General Industrial Stormwater NPDES Permit, b) are subject to regulation under Subtitle D of RCRA, or c) have accepted wastes from construction activities involving clearing, grading, or excavation of five acres or more.		An Open Dump is a municipal landfill failing to satisfy the Criteria for Municipal Solid Waste Landfills specified in 40 CFR Part 258. Open dumps are prohibited under Section 4005 of RCRA.
Steam Electric Power Generating Facilities	Facilities that generate electricity utilizing fossil type fuel (coal, oil, or gas) ~~or nuclear fuel and thermal cycle~~ using a steam water system, and raw material storage areas, including coal handling sites.	Facilities with NPDES permits which regulate stormwater discharges.	
Wastewater Treatment, Storage, Recycling, or Reclamation Facilities	Facilities that treat, store, recycle, or reclaim municipal wastewater, including adjoining land dedicated to sewage sludge disposal.	1. Facilities with NPDES permits which regulate stormwater discharges. 2. Facilities with design capacities of less than 1 MGD which are not required to have a pretreatment program under 40 CFR Part 403. 3. Farm lands and domestic gardens where sludge is beneficially reused, or sludge management facilities which are not located on land adjoining the treatment, storage, recycling, or reclamation facilities site. 4. Facilities that are in compliance with Section 405 of the Clean Water Act (federal regulations governing sewage sludge disposal). 5. Facilities that collect all stormwater runoff and discharge the runoff back to the headworks of the treatment facility.	

4CC BMPs for Industrial Storm Water Pollution Control

Best Management Practices for Industrial Storm Water Pollution Control



Santa Clara Valley
Nonpoint Source
Pollution Control Program

CONTENTS

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Introduction: Storm Water Pollution Control for Industrial Facilities

Storm water is a source of pollutants in San Francisco Bay. Storm drains carry runoff from streets, urban centers, industrial sites, and open spaces into streams, creeks, marshes, and Bay waters. Industrial operations are only one contributor to this problem, but they are known to be a source of heavy metals, oily wastes, and other substances. Manufacturing, shipping, and storage operations that are exposed to storm water can be sources of pollutants in storm water.

Federal and state storm water regulations now require many kinds of industrial facilities to take steps to prevent storm water pollution. Your facility may need to be covered under the Regional Board's January 1992 Industrial Storm Water General Permit for the Santa Clara Valley. If so, you need to prepare a *Storm Water Pollution Prevention Plan*, or SWPP Plan, that is in part a collection of BMPs like the ones described in this manual. If your facility is *not* covered under the General Permit, you may still need to implement BMPs to comply with local pollution prevention requirements.

Storm water pollution, unlike some pollution problems, cannot be covered by one set of rules that applies to all industrial facilities. Regulated industrial facilities in the Santa Clara Valley range from manufacturing facilities that cover several square miles to storefront distributors. Different plants can have very different storm water quantities, flow patterns, and potential pollutants. Even different facilities of the same general industry may need different approaches to preventing storm water pollution.

The BMPs in this manual are recommended by the Santa Clara Valley Nonpoint Source Pollution Control Program to help you prevent storm water pollution; protect water quality in streams, the groundwater basin, and the Bay; and comply with storm water regulations. This manual is intended to help you identify and implement the best practices that are necessary and economically feasible for your facility to prevent storm water pollution.

The BMPs include both operating practices and structural controls that can reduce the amounts of pollutants in storm water. You need to determine which of these may apply to your facility, and implement them as necessary. Specific regulations may vary from one municipality to another, so you should become familiar with local storm water ordinances in your community.

This manual consists of two parts. The recommended BMPs in Part 1 are basic, everyday operational practices and relatively small structural or equipment requirements that can be effective in *preventing* pollution, reducing potential pollutants *at the source.*

In many industrial facilities, storm water pollution can be prevented with common-sense precautions and modest changes in routine operations or maintenance practices. The numbered sections are keyed to some industrial operations that are common to many kinds of facilities. The sections describe BMPs that typically can be applied to the operations. These practices alone might be sufficient to control storm water pollution for some industrial facilities.

In other cases, to prevent storm water pollution it will be necessary to establish new practices or build physical controls. Part 2 of this manual consists of "advanced management practices." The advanced BMPs require more costly or more intensive efforts to address pollutants that are not adequately controlled by the simpler operational BMPs. The advanced BMPs describe possible approaches if you need to go beyond the Part 1 BMPs.

Recommended BMPs for Storm Water Pollution Prevention

Part 1 of this manual contains BMPs that are recommended to control storm water pollution from particular industrial activities. Part 1 is divided into numbered sections. Each section describes industrial activities common to many kinds of industrial facilities, and contains a collection of BMPs tailored to that kind of industrial activity or operation.

As a rule the recommended BMPs in this part of the manual are intended to describe "state of the practice." These are the preferred operational techniques that pertain to each of the industrial activities, recommended to control potential storm water pollution that could result from that activity. Many of these practices are straightforward housekeeping activities, and many may already be in place at your facility. In general, the recommended BMPs are *pollution prevention* measures: they are geared toward reducing pollutants at the source, preventing the release of potential pollutants to storm water.

The recommended BMPs are to be implemented on an ongoing basis for the indefinite future. Operators of industrial facilities in the Santa Clara Valley should expect to implement these BMPs or similar controls, wherever they would be effective at preventing pollutants from flowing with storm water from the site.

Review your current operating practices and, where they differ from the Part 1 preferred BMPs, modify your practices and train your employees in the new procedures. You need to evaluate your own facility and decide what works best, because storm water pollution control practices take a number of forms, and may include a wide range of solutions that are not included in this manual. Storm water pollution control may be guided by three general principles:

Prevent water from contacting working areas.

Shipping areas, outdoor equipment, material storage areas, vehicle maintenance spaces, and working areas of all sorts are subject to contamination with raw materials, process liquids, grease, oily wastes, heavy metals, and miscellaneous potential pollutants. If you prevent storm water, wash water, or water from other sources from contacting areas exposed to pollutants, you won't discharge pollutants into your storm drains.

- Keep rainfall from directly contacting working areas, by installing roofs, placing structures, or moving industrial operations indoors.
- Prevent *run-on* storm water from contacting industrial areas, indoors or out by using properly designed berms or grading. Run-on is water that flows across the industrial area. It picks up pollutants as it flows.
- Avoid practices where you use water that later enters the storm drains—for instance, washing in outdoor areas. Most of these practices, including many that were acceptable in the past, are now considered to be "illegal dumping" of non-storm water to the storm drain.

Keep pollutants off surfaces that come into contact with water.

Evaluate your site carefully to identify all areas that are contacted by storm water, wash water, cooling water that is otherwise unpolluted, or other water that is allowed to be discharged to the storm drain. Then take special care to keep pollutants off these surfaces. That means controlling minor leaks and spills that you might otherwise overlook, and taking a close look at your operating routines and equipment to determine whether any substances are exposed to storm water that do not need to be.

Manage storm water before it is discharged to the storm drain.

If you can't avoid adding pollutants to storm water, you may need to remove pollutants to meet water quality requirements before discharge. Storm water control regulations, and this manual, consider treatment as a last resort and emphasize source control options because they are usually less costly and more effective in the long run. In this manual, treatment measures appear only under Advanced Management Practices.

1. Training and Education for Employees and Customers

Successful storm water pollution control relies in large part on proper training and education of employees. Many of the recommended BMPs in this part of the manual identify specific training needs for employees who conduct the activities. Train your employees in best management practices for storm water pollution control.

Train employees in these BMPs because a single employee's mistake or misunderstanding at the wrong time, in the wrong place, can lead to a costly pollution incident. When you have selected the BMPs that apply to your facility, add training in the BMPs to your regular employee training procedures.

Train employees to routinely inspect industrial activities and equipment that may be exposed to storm water. A once-a-week walk-through can help identify potential difficulties before they become major problems. Inspect structural BMPs to be sure that they continue to function properly.

Continue your training procedures in the future. Assign experienced workers to train new employees. Review procedures as a group at least once a year. You can coordinate this with worker safety training programs or "worker right-to-know" training for hazardous materials.

Periodically check employees' work practices to be sure the BMPs are implemented properly. Post informational and reminder signs, such as: proper equipment wash procedures at designated washing areas; "Close the cover" signs at dumpsters and other storage areas; and others. Stencil "No dumping! — flows to Bay" messages at storm drains. (Stencils are available from the NPS Program.)

Provide general information as well, because employees often respond best if they understand *why* they are being asked to conduct a new procedure. Employees' suggestions in return can help identify cost-effective storm water controls for your facility. Provide positive feedback so employees understand the difference they each make in protecting the Bay.

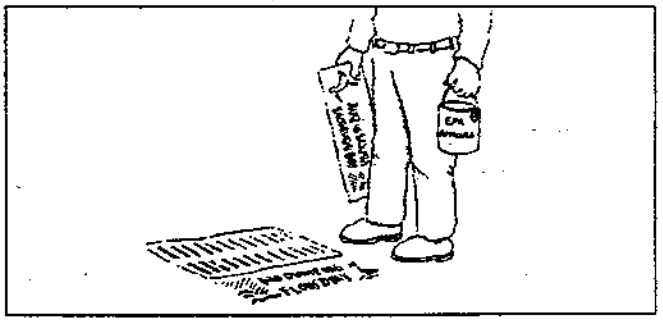
Emphasize the importance of keeping pollutants out of the storm drain, because the drains flow directly to streams and the Bay without benefit of the wastewater treatment that the sanitary sewers receive. Educate plant personnel about the harmful environmental effects of improper disposal of materials into the storm drain, so they understand the importance of preventing storm water pollution. Also, educate employees on what they can do at home to reduce storm water pollution in the Bay. Public information pamphlets are available from your municipality or the NPS Program — see the back cover.

If you subcontract for small construction jobs or other work on your premises, write contracts with your BMPs as conditions. Provide contractors with proper disposal options for wastes. Monitor contractors to be sure they comply with your BMPs.

To keep abreast of new developments, participate in workshops, trade association meetings, and seminars. Trade association publications can be valuable sources of information. Modify your practices whenever you find a new idea that serves your shop better.

If you serve customers at your facility, be aware of customer activities onsite. If they dispose of materials improperly, *you* will be responsible for the violation. Ask your customers not to discard liquids into your trash cans or storm drains. If you have persistent problems, you may need to monitor your customers more carefully at trash cans, storm drains, and other potential disposal areas on your property.

Let your customers know how you are minimizing wastes and recycling fluids to show that you are a "good neighbor," and encourage your customers to be the same. Showing clients what you are doing to protect the Bay is good public relations. Some businesses make the customer aware of their environmental requirements by including a modest environmental compliance fee, itemized on customers' billing statements, to cover handling and disposal costs for hazardous materials.



Label storm drain inlets so employees do not dispose waste there.

2. Eliminating Improper Discharges to Storm Drains

The Industrial Storm Water General Permit generally prohibits discharges of *anything but storm water* to the storm drains. There are many ways in which non-storm water from industrial plants can enter the storm drainage system. In most cases, the discharges result from practices that are now illegal, even though they may be inadvertent or may have been permissible in the past. Industrial process water, building wastewater, and water from other sources are prohibited, with a few exceptions described in Table 1. Inspect your facility and yard to be sure no unauthorized discharges enter your storm drains.

Unauthorized discharges take two forms. **Illicit connections** are improper permanent connections that allow wastewaters to enter storm drains, including some that may have been allowed in the past. Connections that allow sanitary or process wastewater to enter the storm drain are prohibited, including all storm drain connections from indoor drains or sinks. More information on identifying and removing illicit connections is available in the Santa Clara Valley NPS Program's Guide to Compliance with the General Permit.

Illegal dumping is water that has been exposed to industrial activities, and then released to the properly-connected storm drainage system. Pollutants may be introduced to storm drains inadvertently, by routine practices that discharge water outdoors; or by routinely discharging wastes, wash water, and other materials to storm drains, catch basins, and other conveyance facilities either on your property or in the street. A large part of this improper discharge results from employees' lack of understanding, coupled with a lack of readily-available proper routes for the discharge.

You need to make a long-term ongoing effort to assure that no illegal discharges will occur. This requires continuing observation to identify potential sources of intentional or inadvertent improper discharges. Discontinue or re-route the water from those activities. Continuing employee training will be needed. Measures to help prevent illegal discharges include:

- Provide well-marked proper disposal or collection methods for waste water wherever you frequently use wash water, discharge cooling water, or produce a liquid waste that might otherwise reach the storm drain.
- Employee training should especially emphasize proper disposal of non-storm water (see Section 1). Educate employees to understand that storm drains connect directly to streams and the Bay without treatment.
- Label all storm drain inlets and catch basins "No dumping—flows to Bay" so employees will know which inlets are part of the storm drain system.
- Periodically inspect and maintain storm drain inlets. Clean out catch basins so that accumulated pollutants do not wash down the storm drains.

Table 1 is a summary of a 3-page table included in the Storm Water Industrial General Permit for the Santa Clara Valley. The table identifies some common sources of water in industrial plants that can enter storm drains. For each source, the table lists the preferred disposal option for facilities in the Santa Clara Valley. For water that is allowable for discharge to the storm drain, Table 1 lists conditions or restrictions on discharge.

A few discharge categories of special interest are:

- **Cooling tower condensate** for industrial process water must be discharged to the sanitary sewer, with the appropriate permits.
- **Internal coolant** for refrigeration or building air conditioning is prohibited from the storm drains.
- **Building air conditioner condensate** may be discharged to the storm drain *only* if it is not treated with algae inhibitors, corrosion control chemicals, or other additives. Do not allow it to run across parking lots or other paved surfaces that may be contact pollutants on its way to the storm drain; use a pipe or trough to direct the flow. In most Santa Clara Valley cities, the preferred course is to discharge to the sanitary sewer. (Some cities have made this a legal requirement.)

Table 1. Preferred disposal options for water discharges

Water source	Preferred disposal option	Restrictions or permit needed	Possible options for reuse or recycle
Industrial process wastewater	Sanitary sewer	POTW permit	Reuse in-plant whenever possible.
Non-contact cooling water	Onsite reuse		Reuse in closed-loop cooling system (cooling tower).
• Uncontaminated*	Storm drain if reuse is impossible	Storm water NPDES permit	
• Contaminated	Sanitary sewer	POTW permit	Treat and reuse
Industrial cooling equipment condensation		Storm water NPDES permit	Hold and apply to landscape
• Uncontaminated*	Storm drain	Must be tested and shown to be uncontaminated.	
• Contaminated	Sanitary sewer	POTW permit	
Building air conditioner condensation	Storm drain (if city allows)	Some localities require discharge to POTW with permit	
Building air conditioner coolant			Reuse in-plant whenever possible.
• Uncontaminated*	Storm drain	Storm water NPDES permit	
• Contaminated	Sanitary sewer	POTW permit	
Storm water in outdoor secondary containment			
• Uncontaminated*	Storm drain	Test to determine contamination.	Pump and apply to landscaping. (See Section 5)
• Contaminated	Sanitary sewer	POTW permit	
Storm water from outdoor material storage			
• Covered	No discharge	Zero contact with storm water.	
• Open	Storm drain	Water quality inlet or similar treatment. (See Section 20) Storm water NPDES permit	
Roof drain water	Storm drain if no pollutants	Roof vents may be source of pollutants. See BAAQMD air emissions regulations and Section 4.	
Industrial equipment wash water	Sanitary sewer	POTW permit	Reuse in-plant whenever possible
Vehicle maintenance wash water	Sanitary sewer	POTW permit	Capture and reuse for washing
One-time vehicle wash water	Storm drain (See Section 7)	Water only (no soap or solvents)	Minimize water; prevent flow across paved area.
Wash water from paved walkways in commercial and business districts	Storm drain	Sweep sidewalks before washing. No cleaning chemicals may be used.	Minimize water use and direct to landscape.**
Commercial exterior building wash water	Storm drain	Filter prior to entering catch basin.	Minimize water use and direct to landscape.**
Landscape irrigation	Storm drain		Minimize water so none runs off.**
Potable water and potable line flushing	Storm drain	Must be dechlorinated***	
Fire fighting flows	Storm drain	Block downstream channels to detain for testing as hazardous waste.	

Source: Storm Water Industrial General Permit for the Santa Clara Valley, Regional Water Quality Control Board /S. F. Bay Region, January 1992.
POTW permit: Permit to pretreat and discharge is required from your wastewater authority (Publicly Owned Treatment Works)
BAAQMD: Bay Area Air Quality Management District
* Biocides, corrosion inhibitors, or other additives are contaminants from a storm water point of view.
** Must comply with local water use restrictions during drought conditions.
*** Potable water, swimming pool water and other chlorinated sources must be dechlorinated by aeration, retention, or chemical additives to a "no measurable chlorine" standard before reaching receiving water. If the water is not dechlorinated it must be discharged to the sanitary sewer under a POTW permit.

3. Spill Prevention, Control, and Cleanup

Small spills can have cumulative effects that add up to a significant source of potential pollutants in your storm water discharge. The best approach by far is to prevent spills and leaks: maintain a regular inspection and repair schedule, and correct potential spill situations before a spill can occur. Some prevention techniques are described in Sections 4, 5, and 6.

When a spill does occur, quick and effective response is the best way to prevent pollutants from reaching storm water. Prepare a set of well-defined procedures for responding to a spill of any liquids in an area that might be exposed to storm water. The procedures can be specific for your facility, and should consider all circumstances from small, minor releases that can be easily handled to a large emergency spill — including who to call to respond to the situation before it gets out of hand. Train employees in the procedures (Section 1).

The basic procedures should emphasize that spills be cleaned up promptly, not allowed to evaporate. Otherwise, pollutants remain on the pavement and may be washed to the storm drains with the next rain, or will remain in the soil to become a possible groundwater pollutant. If the spill is on an unpaved surface, determine whether you need to remove the contaminated soil to prevent it from being a source of future storm water pollutants.

Also, the standard procedures should specify cleaning up leaks, drips, and other spills without water whenever possible. Do not use a hose or wet mop to clean up a spill area. Hosing may remove the spill from the immediate area, but does not keep the pollutant out of the environment. On the contrary, it adds to the volume of the spill and spreads the spilled material around a larger area.

If you handle hazardous materials, spill prevention and response procedures are described in your hazardous materials management plan, filed with your fire department or other hazardous materials ("HazMat") authority (see Section 6). If a spill occurs, notify the authorities as required in your emergency response plan. Contain and collect the spilled substance, then dispose of the substances and any contaminated soil in compliance with hazardous materials regulations.

Small spills are those which can be wiped up with a shop rag. Don't put wet rags in the dumpster with the shop trash: store them in a covered rag bin, of the kind used at auto service stations. Avoid paper towels. You can avoid making this a waste stream by sending used rags to a professional cleaning service. (You need to inform your cleaning service of what the shop rags have been used for.) Do not saturate rags with gasoline, solvents, or other volatile liquids.

Medium-sized spills are too large to wipe up with a rag and require more attention. Contain and soak up the liquid using dry absorbent material such as vermiculite, specially-prepared sawdust, or "cat litter." Absorbent "snakes" may be used as temporary booms to contain and soak up the liquid. Sweep up the used absorbent and snakes and dispose of them appropriately: with the shop trash if non-hazardous, with the hazardous wastes if necessary. Another convenient option is to use a wet/dry shop vacuum cleaner to collect spills, and dispose of the liquid with your liquid or hazardous wastes. *Do not* use vacuums for gasoline, solvents or other volatile fluids, because the enclosed vacuum may become an explosion hazard.

Larger spills must be contained, then cleaned up. For spills of food waste or other non-hazardous liquid, take steps to contain and clean up the liquid, and minimize the wash water used in cleanup. Shut off or plug storm drain inlets or sewer inlets where the spill may enter. If necessary, keep temporary plugs on hand to fit your inlets and train employees in when and how to use them. For hazardous materials spills, implement your emergency procedures and alert your HazMat authority.

Wipe up small spills immediately with shop rags.

4. Outdoor Process Equipment Operations and Maintenance

Storm water from your site can accumulate pollutants by exposure to numerous small leaks, spills, and other discharges of outdoor equipment. Large equipment may require specially-designed structural or advanced BMPs to reduce the potential for storm water to contact pollutants. Ordinary precautions, such as those below, may suffice for smaller equipment.

As a first step, identify all equipment at your site that may be exposed to storm water, or may discharge potential pollutants that may be exposed to storm water. Identify the kinds of pollutants each piece of equipment may generate — lubricants, coolants, and other possible sources of leaks or discharges.

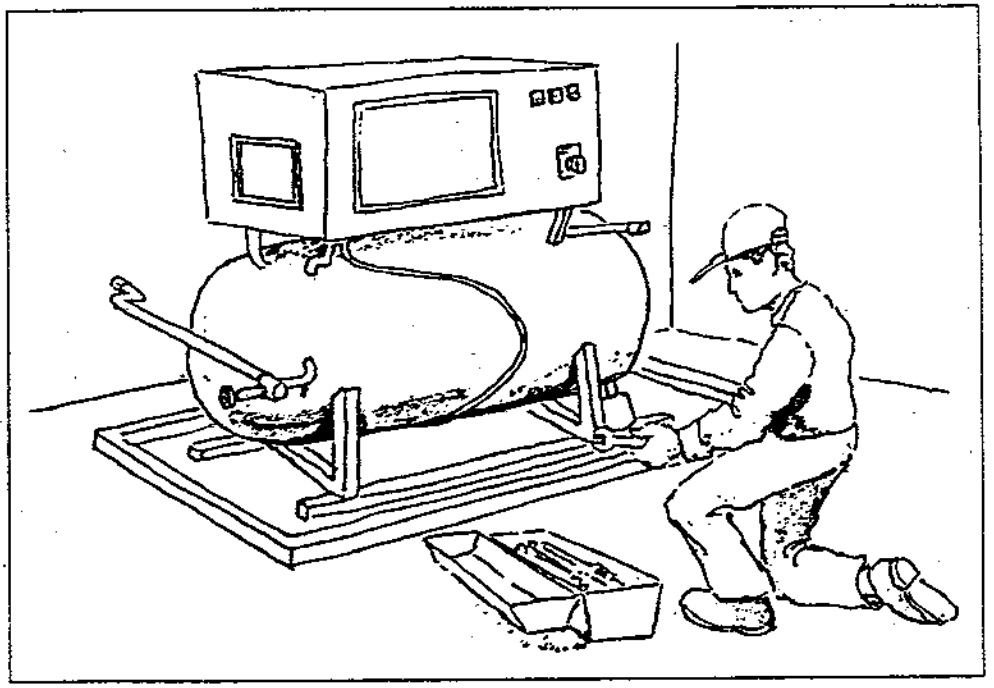
Be creative and thorough in developing your list. The inventory should include rooftop cooling towers or air conditioners; rooftop air vents for industrial equipment; outdoor air compressors and other service equipment; indoor wet processes where leaks or discharges may discharge to outdoor areas; and material transfer areas, such as loading areas where forklifts or trucks may carry pollutants outdoors on their tires.

Using the equipment inventory, assign an employee to inspect each piece of equipment on a regular basis to see that it is functioning properly. This could be the employee responsible for operating the equipment if it is used regularly, or may be a maintenance staff member for equipment on the roof or in seldom-seen places. Inspect for leaks, malfunctions, and staining on and around the equipment, and other evidence of leaks and discharges. Assign the inspecting person to be responsible for reporting a spill. Develop a routine for taking actions on the report: cleaning up the spill, and repairing the leak to prevent future spills.

Where possible, take the next step toward full pollution prevention and make modifications to prevent storm water from contacting the equipment or its discharges. Place equipment on an impermeable surface, or install a drip pan beneath potential leak points. To minimize the amount of rainwater that contacts the equipment, you may construct a simple roof and install a berm to prevent run-on and runoff. If the equipment requires a "wet" process — that is, operations inevitably releases wash water or process liquids — place it on a paved surface and install a connection to the sanitary sewer. Check with your municipality or wastewater authority to identify appropriate permits.

Air compressors and other equipment sometimes produce small quantities of automatic blowdown water, which commonly contains lubricating oil or other potential pollutants. This may not be discharged to the storm drain. Connect the blowdown to the sanitary sewer. Or, if the compressor has a frequent small bleed, place a drip pan or catchment to collect the water — do not let it soak into unpaved surfaces or run off paved surfaces.

Condensate on exterior surfaces of compressors, building cooling equipment, and other machinery need not be collected for discharge to the sanitary sewer, but may be directed to the storm drain. Prevent buildup of puddles or pools of condensate under the equipment; route it to a storm drain so it does not pick up pollutants while it flows across your site.



Keep drip pans under outdoor equipment to contain drips and leaks, especially during maintenance.

5. Outdoor Materials Storage and Handling

If you handle **bulk solid materials** outdoors, keep them covered, in appropriate containments, and protected from storm water. Apply this policy for raw materials, products, by-products, and construction materials or supplies. Materials of concern include gravel, sand, lumber, topsoil, compost, concrete, packing materials, metal products, and others.

Store the material in one of these ways:

- The preferred method is storage on a paved surface with a roof or covering so that no direct rainfall contacts them, and with appropriate berms or mounding to prevent run-on of storm water. Roofs are required by most municipalities for new facilities.
- Where a roof is not feasible, store on a specially constructed paved area with a drainage system. Pave the area with a slope of about 1.5% to minimize water pooling. Prevent runoff and run-on with berms or curbing along the perimeter. For many materials, the preferred alternative will be the installation of *no drain* and the testing and pumping of ponded water to the sanitary sewer, a treatment sytem, or offsite disposal as appropriate. Discharge to the storm drain is not allowed for many materials.
- Where a drain is allowed, install longitudinal drains that lead to treatment facilities or water quality catch basins along the lower edge of the pad. You may need a permit from your wastewater authority to discharge to the sanitary sewer, or may need the Regional Board to allow special provisions in your storm water NPDES permit (the General Permit).
- As a temporary arrangement, place the material on a paved surface and cover it with plastic sheeting, secured with weighted tires or sand bags. If possible, choose a mounded or bermed area that will prevent run-on of storm water through the material. Move the materials to a permanent storage place as soon as possible.

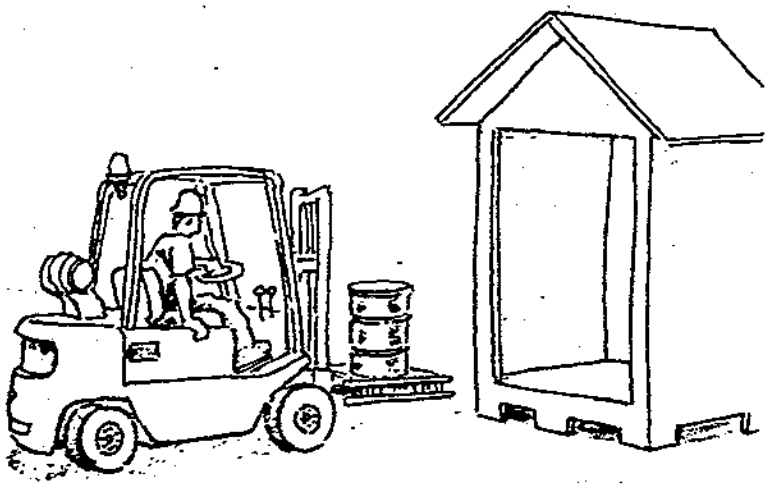
Parking lots or other surfaces near bulk materials storage facilities should be swept periodically to remove fines that may wash out of the materials, which will otherwise wash away with storm water. Larger bulk material storage facilities will need more extensive structural controls designed for the specific facility and material.

Hazardous materials need to be stored in accordance with federal, state, and local HazMat requirements. The requirements are generally more than adequate to prevent storm water pollution — for instance, HazMat secondary containment may have *no drain*.

If you store **liquid containers**, implement a plan and a design to control unexpected leaks and spills so the liquid does not reach storm drains or surfaces that will be exposed to storm water. If you store hazardous materials, the spill prevention plans required by your HazMat authority are adequate to ensure storm water protection. Non-hazardous materials storage should also incorporate spill control designs and procedures.

Select a storage method appropriate for the type of material. Keep liquid tanks in a designated area on a paved impermeable surface and within a berm or other secondary containment. Keep outdoor storage containers especially in good condition. Inspect containers regularly for damage or leaks, as described

"Doghouse" sheds are one way to keep storm water away from barrels and materials kept outdoors, and provide spill control at the same time.

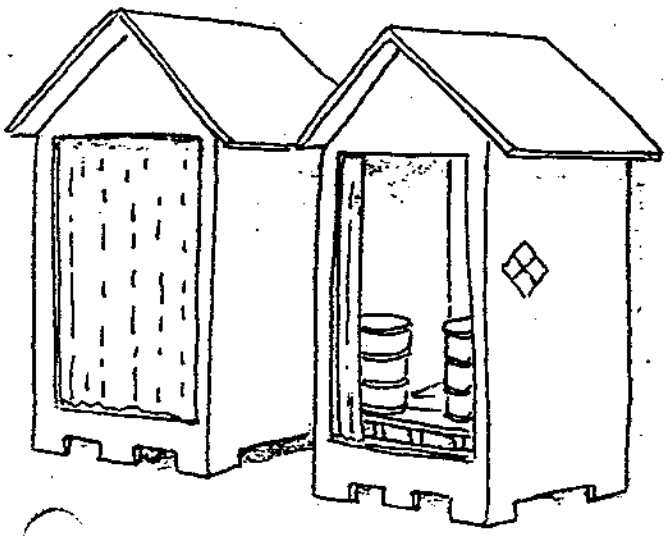


in Section 4. Clean up any leaks or spills immediately (using dry methods, described in Section 3), and repair the leaks promptly.

If the materials frequently leak during transfer, or the materials generally cause a wet environment when using or storing them, the area may need to be connected to the sanitary sewer (permitted by your wastewater authority), and should be covered and bermed to minimize contact with storm water.

Some localities *require* that secondary containments be connected to sanitary sewers, and prohibit any hard-plumbed storm drain connections within the secondary containment. On the other hand, large storage facilities and tank farms that have high-capacity bermed areas may receive rainfall over a wide area, and much of it may not contact the tanks or equipment; these might be better-served by a storm drain. As a rule, large facilities like this need site-specific storm water pollution prevention designs.

For smaller storage tanks, storage in roofed areas can prevent all contact with storm water (in combination with well-designed spill control procedures). Store liquids in a shed where one is available. New sheds, even if temporary, can be costly because of building permits and fire-code requirements. A possible option is the "doghouse" design used by some firms (illustrated). The roof and flooring prevent contact with direct rain or run-on storm water. Since it has only two walls, most fire departments do not require sprinklers. The flooring is wire mesh above secondary containment, so most HazMat authorities accept the structure for storing hazardous materials. (A permit may be required by local building or planning departments.)



Storm water in secondary containments often accumulates from direct rainfall into open containments. Water that has contacted storage vessels, or the pumping and transfer equipment associated with storage and handling, is considered to have contacted industrial activities and may not be discharged to the storm drains.

You may wish to roof the containment to avoid this problem. If that is not possible, or you wish to avoid the cost, you need to identify an acceptable disposal for water from the containment. One common solution is a portable pumping system that can be moved to accommodate separate containment structures on your site. The equipment can pump water into a truck or portable temporary holding tank. The water then can be tested and disposed according to whether any pollutants are present. Some disposal options are:

- If it meets criteria to be defined as hazardous waste, employ a certified hazardous waste hauler for disposal at a permitted hazardous waste facility.
- If it contains constituents similar to process wastewater for which your onsite wastewater pretreatment facilities are designed, pretreat the water and discharge to the sanitary sewer.
- If it meets standards for your industrial discharge permit, discharge it to the sanitary sewer without pretreatment (if your wastewater authority permits).
- Reuse it on your site in an appropriate manner: industrial process water, equipment wash water, steam cleaning makeup, or another use where the water will eventually be discharged as industrial or sanitary wastewater. You may need to invest in a truck or plumbing to convey the water to its reuse location.
- If it is free of hazardous constituents, use it on your facility grounds for landscape watering. Don't apply the water to landscaping if hazardous pollutants are present — even if not concentrated enough to be hazardous waste — because the pollutants may accumulate in the soil or vegetation, and create a health hazard over the long term.

6. Waste Handling and Disposal

Table 2 summarizes the preferred storage and disposal practices for some common industrial facility wastes. For many wastes, reusing or recycling is the most cost-effective means to prevent potential pollution. Fluids that you hold for recycling are special categories of hazardous waste. You may store them on your site only for short periods, in accordance with hazardous waste requirements, but they can be transported under somewhat less stringent requirements than other hazardous wastes. Many recycling services have special variances or permits that reduce your paperwork requirements and allow shipping at reduced cost.

Keep general shop trash in a dumpster with the lid closed. Put the dumpster in a paved area, not on unpaved soil or your lawn. Keep the area clean by picking up dropped trash and sweeping the area regularly (perhaps once a week), but don't use a hose to clean up — keep water off the area. Nearly all dumpsters and trash compactors leak; keep liquid wastes out of them, and keep them closed to keep storm water out.

If you can't prevent leakage from trash containers, install a roof or lean-to that keeps direct rainfall off, and place asphalt curbing or berms around the dumpster to contain the leaks. (Check with your local agencies and comply with fire codes and building permits.)

If you store **scrap metal** or other materials outdoors, keep them under a roof, cover, or tarpaulin. Keep scrap parts or other used metals indoors. Oils and other potential pollutants can wash off long after you think the parts have been washed clean. Collect waste metal, such as used parts and metal lathe filings, for delivery to a scrap metal dealer.

If you store **empty drums** outdoors, do not hold them longer than necessary. Ship them to a drum reconditioner or another facility.

- Drain them completely to avoid spills.
- Seal them properly watertight, to keep storm water from entering; otherwise, the water would become a process wastewater, and can't be dumped to the storm drain.

Store and handle **hazardous wastes** properly. Hazardous materials or wastes are not a storm water problem if they are handled in accord with state and federal regulations, and the requirements of your local HazMat control authority.

Keep hazardous waste and materials indoors or under cover in a locked area, to keep nighttime trespassers away. Store them before disposal in special hazardous waste containers, or closed drums within a secondary containment that is approved by your HazMat authority.

Table 2. Preferred waste handling & disposal methods

		Recommended storage	Preferred disposal	Hazardous waste?
General plant wastes	Used parts: clean metal scrap	Bin (covered or indoors)	Scrap collector	No
	Used oily parts, contaminated	Drum	Hazardous waste hauler	Yes
	Metal shavings	Bin (covered or indoors)	Scrap collector	No
	Used rags	Rag bin with lid	Rag laundry	Possibly
	Soiled cleanup absorbent	Drum	Hazardous waste hauler	Yes
	Coolant from air conditioner or refrigeration equipment	Recycling machine	Reuse in-house (HVAC service company)	No
Liquid wastes	Paints*	Original container, with lid	Hazardous waste hauler	Yes
	Waste lubricating oil	Drum (segregate)	Oil recycler	Special**
	Solvents, thinners, and miscellaneous fluids*	Tank ("hot" waste) (Segregate different fluids to make recycling possible)	Solvent recycler (where possible) or waste hauler	Possibly
Liquid containers	Empty drums	Indoors or under cover	Drum reconditioner	
	Empty cans, bottles, aerosol cans, etc.	Drum	Municipal trash or hazardous waste hauler	Possibly
Vehicle wastes	Waste motor oil	Drum (segregate)	Oil recycler	Special**
	Brake fluid, gear oil, hydraulic fluids, etc.*	Bottle or tank ("hot" waste)	Hazardous waste hauler	Yes
	Antifreeze	Tank (segregate)	Recycler	Special**
	Batteries	Open rack	Battery supplier	Special**
	Tires	Covered or indoors	Tire hauler	No
	Oil filters	Drum (drain first)	Oil recycler	Special*

* *Unused pure product may sometimes be returned to the vendor rather than disposed as waste.* ** *Recyclable under special hazardous materials restrictions.*

In most cities of Santa Clara County, the municipal fire department is the HazMat authority that controls hazardous materials storage, handling, and response. Some locales contract with the Central Fire District or the County Health Department. For information about handling solid wastes that might be controlled under hazardous waste regulations, contact the County's Environmental Health Department or Cal-EPA's Toxic Substances Control Division. (See the rear cover for a list of regulatory agencies.)

Empty containers such as storage barrels, oil cans, paint buckets, aerosol cans, and similar containers are hazardous wastes if they once held hazardous materials. You may not discard these with the regular trash. They must be stored properly so they do not leak outdoors. Some drum suppliers accept empty drums for reuse, under less-stringent hazardous material recycling regulations.

Vehicle maintenance waste materials often deserve special attention. Waste oil, antifreeze, spent solvents, and some other liquids can be recycled. Spent batteries may not be discarded with trash, but must either be disposed as hazardous waste, or returned to the dealer from whom you purchased them, for reclamation and reuse. Guidance on handling vehicle wastes may be found in the Automotive Industries BMP manual, available from the NPS Program and listed on the rear cover.

7. Equipment Washing and Steam Cleaning

Wash water for industrial equipment in most cases must be discharged as process wastewater to the sanitary sewer, and is not allowed in storm drains. To clean dirty, greasy field equipment or trucks you must install equipment to capture, pretreat, and discharge the wash water to the sanitary sewer as industrial process waste. It may be less costly in the long run to locate a commercial car wash which has all the appropriate equipment and municipal permits, and to contract with them for washing services offsite.

If you wash vehicles or equipment on your site, you may do so only in a designated area, designed and equipped as follows:

- Pave the area.
- Mark the area clearly as a wash area, and be sure all employees know they must wash in this area only. Post instructional signs that prohibit changing vehicle oil, washing with solvents, and other activities.
- Install sumps or drain lines to collect wash water for treatment and discharge to the sanitary sewer; reuse (for repeated washings); or recycle (used elsewhere onsite).
- If the equipment is a continuing source of grease or heavy dirt, cover the area to prevent contact with rain water when not in use.
- Grade or berm the area to prevent storm water from running on.
- If possible, wash inside a building designed for maintenance or equipment storage. Ensure that all drains connect to the sanitary sewers.

Steam cleaning should be done on your site *only* if you are equipped to capture all the water and other wastes. All the washing requirements above apply to steam cleaning as well. Steam cleaning wash water is prohibited from storm drains; requires a permit from your wastewater authority — including pretreatment requirements, such as an oil/water separator; and may require you to determine whether it is a hazardous waste treatment unit. If you steam clean, do it indoors or in a specially-prepared outdoor working area where you collect the wash water and treat it for discharge.

8. Trucking and Shipping/Receiving

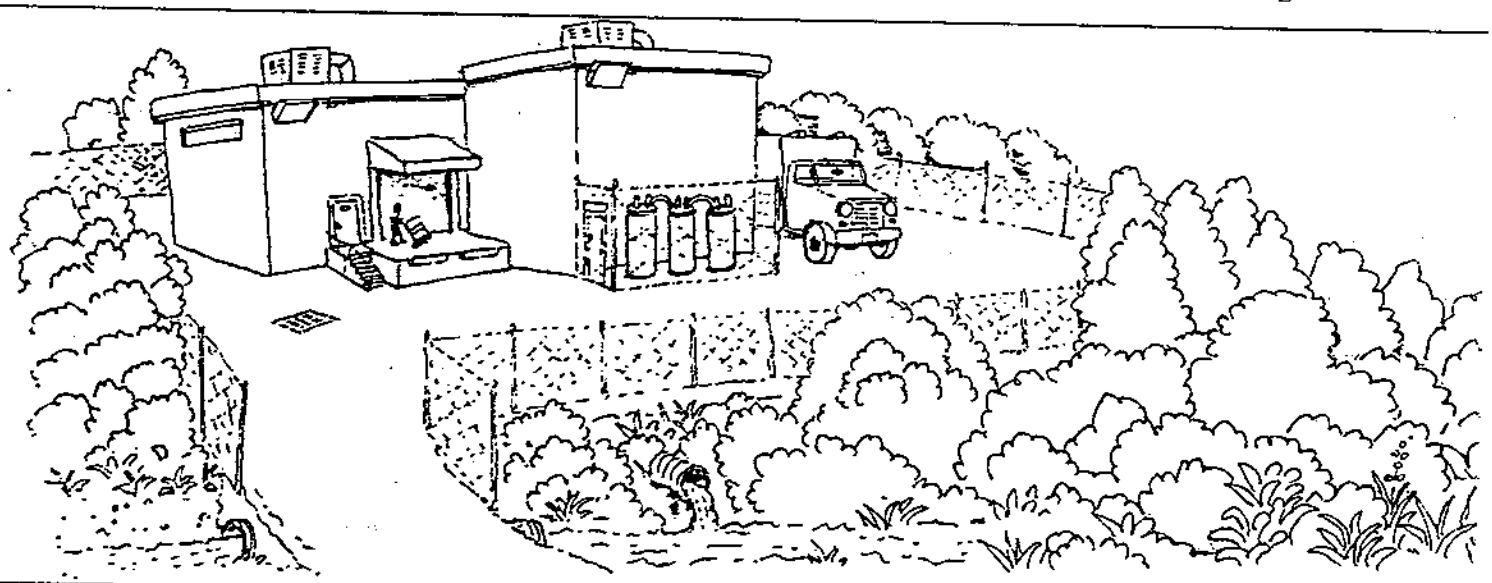
Truck loading and unloading are potential sources of pollutants when rainfall and run-on contact spilled raw materials, dust, and motor fluids that accumulate in this heavy-traffic area.

Load and unload raw materials, products, and other materials only at designated loading areas. In that way, you can isolate the potential source to areas that you can control, rather than unspecified areas throughout your site. The best areas from a storm water point of view are indoor bays. For facilities that must use an outdoor loading dock, some operational BMPs and simple design features can control storm water pollution.

- Cover the loading dock area with a roof overhang, or use a door skirt that fits snugly to both the building door and the truck door.
- Install curbs or berms around the loading area to prevent storm water from running on and any spilled material from running off. Accumulated liquids should be pumped out with a portable pump to the sanitary sewer unless concentrations exceed allowable limits. In those cases the material must be treated or shipped offsite.
- Designate the person who accepts the shipment, the truck driver, or someone else to check under the truck for leaked motor fluids, spilled materials, debris, and other foreign materials.
- If you own and operate the truck, make the driver responsible for identifying and reporting the spill — large or small.
- If you receive shipments from trucks operated by others (a trucking company or suppliers' trucks), i.e., the drivers are not your employees, have the person who signs for delivery responsible for inspecting for spills, leaks, and debris before the trucks leave.
- Detail a procedure so that a maintenance crew cleans up spilled materials promptly.
- If you have a small company that cannot spare a crew, make the driver responsible for cleaning up after unloading or before departing with a full load.
- If you identify the loading dock as a significant source of potential pollutants in your SWPP Plan, implement further control measures such as those described in Section 13.

If you load or unload liquids, you need further operational precautions and the loading dock needs further design features. If you handle hazardous materials, all the features you need are probably in place as part of a spill control and response plan. If they are not, you should select structural BMPs such as those described in Section 13.

Parking lots and access roads are sources of potential pollutants from the trucks themselves and from possible spills or leaks of the materials being transported. If you are re-grading roads and parking lots, or if you transport materials that you expect to be signifi-



Storm water runoff from industrial roofs, trucks, parking lots, and yards flows into storm drains and directly into streams and the Bay. It never receives treatment that would remove pollutants.

cant sources of potential storm water pollutants, follow the structural BMPs recommended in Section 16. For existing facilities, especially smaller parking lots and short driveways where no hazardous materials are transported, you can effectively prevent storm water pollution by implementing routine maintenance activities, such as:

- Visually inspect your access roads and parking lots regularly to identify and clean up spills.
- Remove solid debris as soon as operations permit.
- Clean up liquid spills promptly, as if they were on your shop floor.

Conduct street sweeping-style cleanups periodically to remove loose debris, small amounts of spilled raw materials, road dust, and other potential pollutants.

- Smaller spaces can easily be swept by hand.
- Do not hose off paved surfaces.
- For larger spaces, use a vacuum truck or mechanical sweeper (that collects solids, not just brushes them aside). Whenever possible, do not use a wet-washing street sweeper unless you can collect the polluted wash water.
- Private corporations or your municipality might perform the work on a contract basis so you need not purchase the truck.

During the dry weather season, the appropriate frequency of sweeping for your facility depends on how heavily the road is used and the kinds of materials you transport. Some signs that you need to sweep more frequently:

- If your trucks commonly spill or drip bulk materials.
- If you notice debris or other materials accumulating on the access roads. The correct frequency is the one that prevents unwanted materials from accumulating.

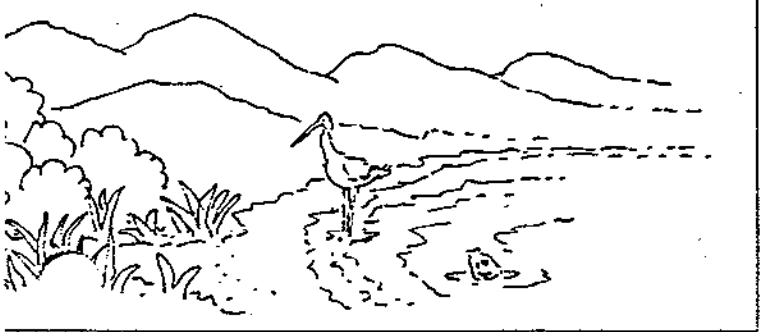
During the wet weather season, emphasize sweeping at times that will best prevent storm water from contacting potential pollutants:

- Clean the area once thoroughly in the fall, before the wet weather season begins.
- After that, you may stay close to your dry-season needs for debris removal, but add an additional thorough cleaning before a major rainfall (half an inch or more of rainfall forecast).

Dispose of the cleaned-up material with your regular facility trash if there are no hazardous materials. If you suspect it may be hazardous — if you handle hazardous materials, or if you know of a significant motor oil leak, for example — you should test the material or dispose of it with your facility's hazardous waste. You could face substantial penalties if you improperly dispose of hazardous waste.

If you **park trucks or heavy equipment** onsite, inspect the parking area for leaks of oil and motor fluids and design a procedure to report them, clean them up, and repair the leaking vehicle. Some practical techniques include:

- Designate consistent parking spots for each vehicle so that if a leak is indicated on the ground, the truck can be identified and repaired.
- Designate a responsible person to check under a vehicle for leaks or spills. If you employ drivers, the driver could be responsible as part of a vehicle check before driving.
- Clean up spills promptly, using dry cleanup procedures described in Section 3. Conduct the preferred cleanup procedures for unpaved as well as paved areas.
- Develop a reasonable procedure for identifying, reporting, repairing, and cleaning up leaking motor fluids and spilled materials. Make sure employees are fully trained in the procedures: who is responsible for checking each truck, who should be notified, and who should respond.



9. Fleet Vehicle Maintenance

The Automotive BMP manual prepared by the Santa Clara Valley NPS Program addresses automotive and vehicle repair facilities. You should implement the BMPs in that manual if vehicle maintenance is a potentially significant source of pollutants on your site. Sections 9 and 10 of this manual merely summarize some of the appropriate BMPs for fleet maintenance at an industrial facility.

Whenever possible, perform vehicle maintenance in an indoor garage, not in outdoor parking areas. If you change oil and do other routine engine work outdoors, you need to create a designated area for vehicle maintenance. Keep the area clean as if it were part of your shop floor and use dry cleanup practices. The area should incorporate some specific design features, as described in Sections 14 and 15. Some operational methods also can be successful at preventing storm water pollution at vehicle maintenance areas. A few suggestions:

- Keep equipment clean; don't allow buildup of grease and oil, which will wash away when the equipment is exposed to rain.
- If you work on vehicles outdoors, keep drip pans or containers under the vehicles at all times while you work on them — leaks and spills occur unexpectedly. Place drip pans under vehicles as soon as you detect a leak.
- Drain fluids from any retired vehicles kept onsite for scrap or parts. Out-of-service vehicles you intend to restore and vehicles being held for resale should be checked periodically for leakage.
- Don't change motor oil or perform vehicle or equipment maintenance in the parking lot or storage yard; use the vehicle maintenance area. Don't allow customers or employees to change their personal vehicles' oil in your vehicle service areas.

Vehicle **parking or storage yards** need to be operated with some similar precautions:

- Inspect equipment in the yard for fluid leaks regularly — perhaps with a walk-by inspection for ground staining every day, and a closer visual inspection once a week.
- Keep the equipment yard clean and clear of debris, using dry sweeping methods as in Section 8. Do not hose off the area or wash with water, because any runoff becomes an illegal discharge to the storm drain.
- Maintain the yard's storm drain inlet(s) with special care. Clean them on a regular schedule and also after large storms. Pay attention to the kinds of potential pollutants that accumulate, so you can identify the sources and take measures to control the sources.

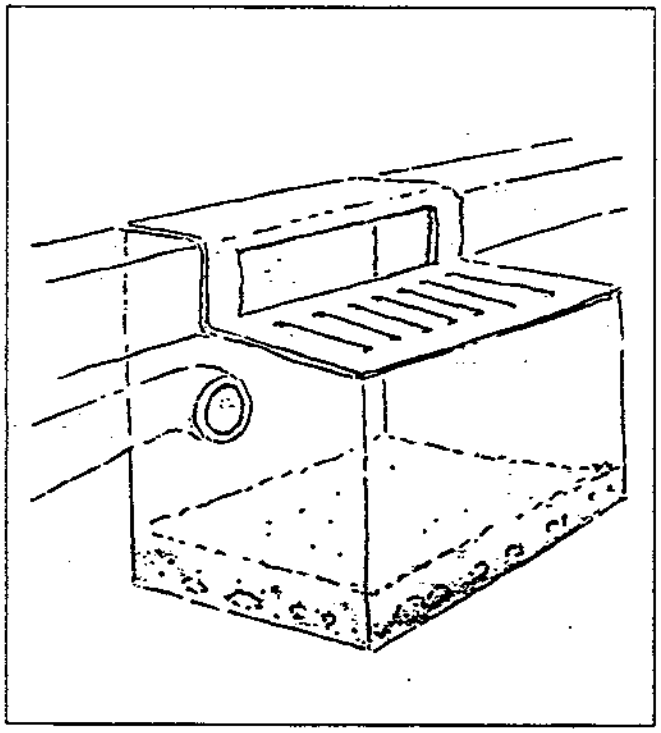
10. Fleet Vehicle and Equipment Fueling

If you have a vehicle fueling area it should be designed and operated to minimize spilled fuel and leaked fluids coming into contact with rain water. This section describes general principles, but simple operational controls may not be adequate for an industrial fueling facility. You may need to re-design your fueling area or install structural controls. Section 14 describes some general design approaches that may be useful in your eventual complete Storm Water Pollution Prevention Plan. In the near term, steps you can take for proper operation of a fueling area include:

- Use a paved area or provide a concrete slab for the fueling area — never place it on open ground. Concrete is preferred because fuel and oils cause asphalt to deteriorate.
- Clean up gasoline overflows and spills using dry methods as in Section 3. Do not allow spills to run off or evaporate, and do not flush the spill away with a hose. Spread absorbent material, sweep it up with a broom, and dispose of it as a hazardous waste.
- Post signs that instruct pump operators not to "top off" or overfill gas tanks. Keep dry cleanup materials in the fueling area, and instruct employees in the dry clean up methods described in Section 3. Assign someone responsibility to check the area every day for gasoline, motor oil, or other fluids that may have leaked.
- When you do routine cleaning, use a damp cloth on the pumps and a damp mop on the pavement rather than spraying with a hose to minimize clean water to the sump.

The main concept is to respond properly to fluid leaks in this spill-prone area. Even very small spills, when they happen every day, add up to a lot of fuel in the drainage system. This is an improper discharge that is illegal under the General Permit. Small spills do not present a problem if the fueling area is designed to handle spills — that is, if no storm water contacts it, and if it drains to a sump. But if the area drains to a valved-off storm drain or sewer connection, it must be pumped out before the valve may be opened during a rainfall.

Fuel tanks, including temporary tanks, need to be permitted by your HazMat authority. They will specify design features such as size of containments. Keep temporary fuel tanks in a bermed area that has an impervious lining, such as concrete or a heavy-gauge plastic liner.



A catch basin helps keep debris and sediments out of the storm drain, but needs to be cleaned out periodically.

11. Building Maintenance and Grounds Upkeep

Building maintenance and general outdoor cleanup should use the same principles as parking lot cleanup and spill prevention: clean up without water whenever possible, by sweeping or wiping; wash with as little water as possible; prevent and clean up spills; and clean up debris and solids so they do not reach the storm drains.

Arrange **rooftop** drains or downspouts so they don't drain directly onto paved surfaces. Connect them directly to a storm drain instead. Alternately, allow water to flow onto a grassy surface, if the grassy area is large enough that it can accept the roof's entire runoff from a medium-sized storm — that is, no water runs across the grassy area into a paved area except in the largest of storms.

Maintain the **storm water conveyance system** on your property. The "conveyance system" may be as simple as roof downspouts and a gutter in your driveway, or may be an extensive system of inlets, ditches, drainage channels, and underground lines. Keep all parts of the system clear of debris to avoid blockage that may cause storm water to back up. Remove from the system any spilled or leaked materials that can be transported by storm water.

Clean the storm drain inlets to remove sediment and debris at least twice a year — late in the dry weather season before the first storm, and after the first major storm of the wet weather season. After each large storm, inspect the inlet; remove debris; and determine whether you need to remove sediments or do other maintenance.

The storm drain inlet may have a **catch basin:** a below-grade chamber where the storm drain pipe connects. Catch basins are intended to collect debris and sediments to prevent clogging the lines. Therefore, the catch basins themselves must be cleaned out periodically to prevent flooding. If you clean catch basins annually, shortly before the wet weather season, you can keep them flowing freely and remove leaves, sediments, and other materials that would otherwise be washed down the storm drain. Don't flush the catch basin with water: use a shovel or vacuum device to remove the materials.

Other useful design features, such as vegetated ditches and water quality improvement inlets, are described in Sections 19, 20, and 21 as advanced BMPs.

12. Building Repair, Remodeling, and Construction

This section describes some relatively simple BMPs that apply to minor building repairs, remodelling, and minor construction projects at an industrial facility that involve "industrial activity exposed to storm water."

Larger-scale projects, such as construction of new facilities, are covered under a separate General Permit for construction. These require more extensive storm water pollution prevention measures than described here. A separate BMP manual for construction activities is available from the Santa Clara Valley NPS Program. (See rear cover.)

The same practices are *recommended* for construction activities on industrial sites. Before you begin a construction or repair project, review the Construction BMP Manual to identify and implement the appropriate practices. If those BMPs do not apply, or are unduly elaborate for a simple construction activity that will be completed in a short time, consider the BMPs described in this section.

Store building materials under cover or in contained areas, using BMPs discussed above, in Section 5. For outdoor storage at a construction site, select a pollution prevention method such as:

- Put an impermeable tarp over piles of wood, gravel, or other materials. Don't wait for forecasts of rain — do this every day, to avoid being caught unaware. Also, it will keep materials from blowing off the pile and contributing pollutants to runoff later.
- Keep the working area clean every day for the same reason. Sweep up wood splinters, paint chips, and other residues every day, as well as a thorough cleanup at the end of the project.

Painting requires some basic procedures.

- Before painting, while you scrape to remove old paint, spread a ground cloth or tarpaulin to collect dust and paint chips. If the paint contains lead or tributyl tin, dispose of the paint chips as hazardous waste.
- Mix paints indoors before starting work.
- Use impermeable ground cloths, such as plastic sheeting, while you paint. Place in-use paint buckets in a pan or on plastic sheeting.
- At the end of the work day, store paint buckets and barrels of materials away from contact with storm water.
- Use a tarp or portable, inflatable berm to prevent spills.
- Treat a paint spill as a chemical spill: capture it before it flows to the storm drain, and clean it up promptly using dry methods.

During **painting cleanup**, proper procedures are:

- If you use water-based paint, clean brushes and equipment in a sink connected to the sanitary sewer.
- Clean up oil-based paint where you can collect the waste paint and solvents to be handled as small quantity hazardous waste — do not pour it to the sink or to a storm drain.
- Keep leftover paint, solvents, and other supplies for a later use, or deliver them to a solvent recycler with other plant wastes when you ship a batch.
- Handle empty paint cans and other containers as described in Section 6. Containers may be small-quantity hazardous waste. Latex paint cans are not hazardous waste if the paint is dry.

Do not fall back on old cleanup practices from days when storm water pollution was not known as a problem. Do not pour leftover paint down the storm drain or onto the ground. Do not clean brushes into the storm drain or pour buckets of cleanup water to the drain, or wash spilled paint down the storm drain with a hose. These practices are now categorized as "illegal dumping." Do not wipe brushes onto old newspapers, or pour leftover paint supplies into newspapers and discard the paper in the trash.

Spray painting requires a few extra precautions.

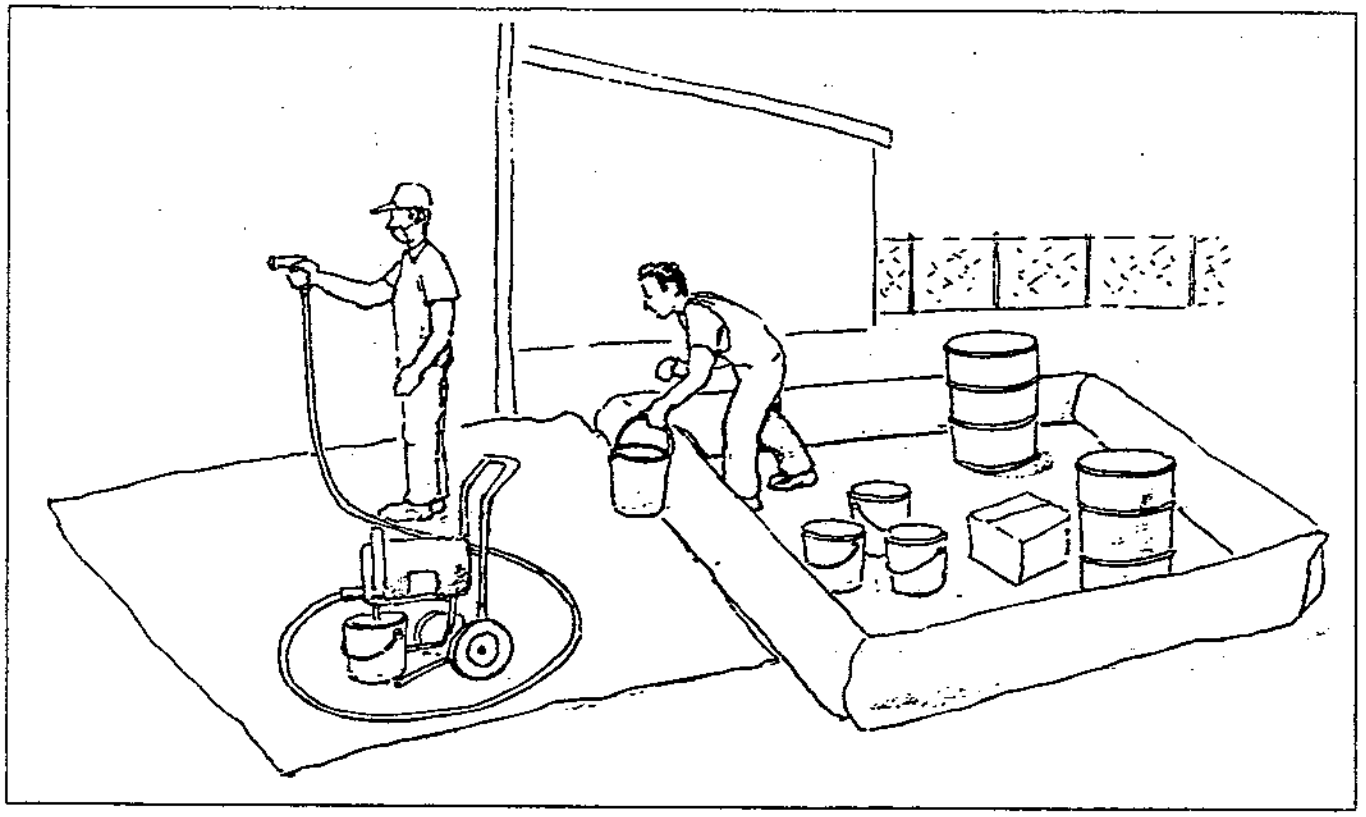
- Use temporary scaffolding to hang drop cloths or draperies to shield you from the wind and to collect overspray.
- Arrange the draperies to minimize the spreading of windblown materials.
- Be aware of air quality restrictions on spray paints that use volatile chemicals. Consider a water-based spray paint for better air quality compliance.

Sand blasting can be controlled to keep particles off of paved surfaces and out of storm drains. Ask your municipality whether building and construction codes place requirements on the size and type of blasting medium that is allowed. More complete instructions are available in the Construction BMP manual for full-sized jobs, but some basics should be applied for smaller projects, as well:

- Place a tarpaulin or ground cloth beneath your work to capture the blasting medium and particles from the surface being cleaned.
- Hang tarps or drop cloths to enclose the area, using temporary scaffolding if necessary. Arrange the drop cloths to protect the work area from wind, and to capture airborne particles.
- Curtail operations on a windy day.
- Clean up frequently: collect dust and particles from the drop cloths before you produce too large a pile to handle easily.

Wood preservatives, pavement seal coating, and other outdoor surface treatments commonly contain metals, pesticides, solvents, or polymers that are hazardous materials. Handle and dispose of them properly, as follows:

- Apply only as much of the chemical as the wood can absorb or as needed to cover the paved area.
- Soak up excess chemicals with absorbent material or rags rather than allowing them to flow to the storm drains or soak into the soil.
- If the chemicals spill, clean up promptly using dry techniques; see Section 3.
- When sealing a sidewalk, prevent the sealant from reaching the gutters or drains. Use absorbent booms, or stuff rags into storm drain openings.
- When treating a roof with wood preservative or sealant, line the gutters with rags. Dispose of the rags properly: with your hazardous waste if the substances you are using are hazardous.
- If you clean a roof or sidewalk before applying preservative, sweep thoroughly to remove loose particles first, then wash with water if necessary.
- Collect wash water from downspouts or drains where possible and remove particles.
- Avoid applying surface treatment chemicals during the wet weather season.



Outdoor painting requires practices to prevent paint and dust from becoming storm water pollutants.

Advanced BMPS and Structural Controls

Some industrial operations and plant situations require more extensive measures to control storm water pollution. All but the smallest and least complex industrial facilities are likely to require some structural modifications. Depending on your facility, and your success at eliminating potential sources of storm water pollution, your long-term implementation plan may need to include more or fewer of these advanced BMPs.

The BMPs in this section are more extensive and, in general, more costly than the recommended BMPs in Part 1. These BMPs include structural controls — storm water management measures that require constructing new facilities or installing new equipment. Not all of the advanced practices are necessary for every facility, and some will not be of use in some facilities.

You will need to evaluate your own plant to determine which BMPs are applicable to your operations, and which combination will best succeed at controlling the storm water pollutants that may run off from your site. You may find you have a choice in selecting structural BMPs, unlike in implementing basic recommended practices. Evaluate and select controls that are adequate and most cost-effective for your site.

The BMP descriptions in Part 2 are not complete design standards, but describe the central principles you need to consider in identifying and controlling storm water pollution from various sources in your plant. Design standards, performance specifications, and detailed discussion of the design and application of structural and treatment BMPs are available in a BMP manual from the state of California, scheduled for publication in late 1992.

Advanced pollution control practices take a number of forms, and may include a wide range of solutions that are not listed here. You may develop other approaches that are more effective for your facility.

Or, you may need to develop and implement further BMPs than the ones described in this manual. If you conduct more complex activities, especially activities that are unavoidably exposed to storm water, you will need to develop more intensive source control and storm water management BMPs.

If you are renovating your shop or building a new facility, you should evaluate installing some of these structural controls even if the shop does not currently have a pollution problem with that specific area. Some of the structural measures in this section are much less costly to install during new construction than to retrofit afterwards.

For example, if you re-grade an equipment parking area, you should consider storm water design criteria even if the yard has not been in violation of standards in the past. If you put off implementing the measures, future more-stringent requirements may require these same measures to be retrofitted, which can be much more costly than if you do it while constructing a new facility or renovating for other reasons.

If your principal sources of pollutants do not originate with industrial activities, you may need to control sources that are not specifically named in the General Permit, such as: pesticides and fertilizers from landscape maintenance; oil and antifreeze from autos in large employee parking lots; and cooling water or equipment lubricants from large building ventilation and cooling equipment. Your municipality and the NPS Program hold their own permit that requires they reduce pollutants in storm water from *all* sources, and they may request your cooperation in developing controls for your pollutant sources that go beyond the BMPs in this manual.

13. Loading Dock Design Features

Loading docks may require more intensive pollution controls than the operational BMPs described in Section 8. This is especially true of areas where you load or unload liquids in containers. Bulk liquid transfers are a more intensive industrial operation that requires specific control designs, and are not addressed in this manual.

Additional features of a properly-designed loading dock include:

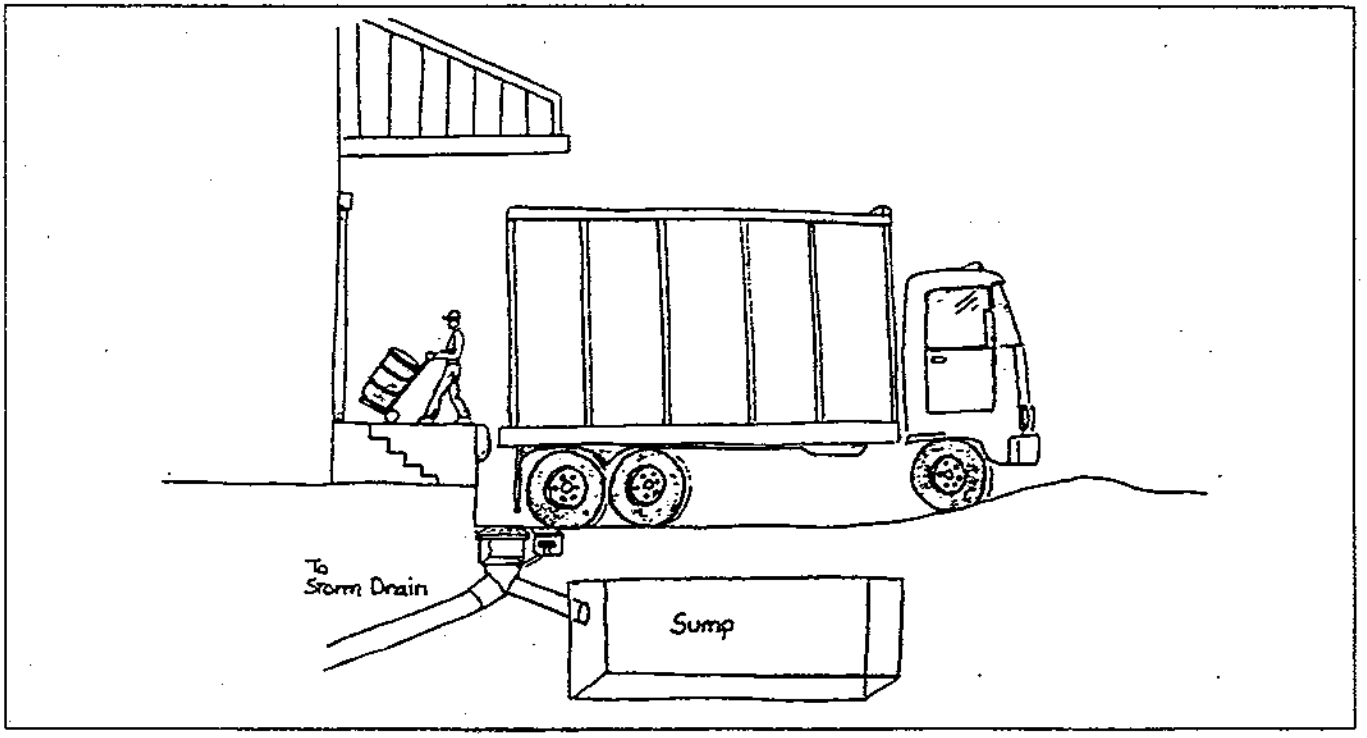
- Grade the loading area to be sloped or recessed to direct flow toward an inlet with a shutoff valve, or toward a dead-end sump.
- Make sure the inlet includes a sump with enough capacity to hold a spill while the valve is closed.
- Keep the valve closed at all times except when you need to release storm water or other liquids that are acceptable for discharge.
- Preferably, this inlet should connect to a sanitary sewer rather than a storm drain. Check with your wastewater treatment authority for permitting requirements.
- Consider completely preventing contact with storm water using a roof and berms, as described in Section 8. This will both avoid washing potential pollutants into the drain and avoid discharging clean storm water to the sanitary sewer.

If the inlet connects to a *storm drain:*

- Accumulated liquid must be tested and found to contain *no pollutants* before opening the valve for discharge.
- If the liquid does contain pollutants, you need to pump it from the sump and discharge to your sanitary sewer if the wastewater treatment authority agrees to accept it. (See the recommendation below.)

If the inlet connects to a *sanitary sewer:*

- Accumulated liquid must be tested and found to be within the parameters specified in your wastewater discharge permit before opening the valve for discharge.
- If you cannot discharge to the sanitary sewer, you need to convey the liquid to a hazardous waste disposal facility.



A dead-end sump provides secure spill control, but any accumulated liquids need to be pumped out, tested, and properly disposed. Use berms or slopes to prevent run-on so storm water is not added to waste in the sump.

14. Equipment Yard Design Features

Parking and storage yards for large vehicles and heavy equipment generally require site-specific structural and operational controls. Follow the operational BMPs for vehicles recommended in Sections 7, 8, 9, and 10. Also assess your equipment yard to determine possible sources of pollutants, and install appropriate controls to keep potential pollutants out of the storm water. Design approaches may include:

- Grade the area to slope to a longitudinal drain, or install curbs to direct all storm water to a storm drain in the yard. If your yard is not too large and is properly designed, it should drain to a single storm drain. Even a small yard should include a storm drain on your property, and not rely on a city-operated drain in the street.
- If you determine that the equipment yard is a large source of oily materials in your storm water, consider fitting the inlet(s) with a sand filter (see Section 20) or removing oily pollutants (see Section 21).

Segregate the area where you service vehicles, and install special structural controls.

- If possible, perform all work indoors, or construct a roof over the specified area. This will require a building permit and compliance with appropriate fire codes.
- Pave the surface with concrete, not asphalt. Vehicle fluids may dissolve asphalt, or may be absorbed into the blacktop and released later.
- Drain the surface to a single drain, preferably connected to a sanitary sewer. The drain may require an oil/water separator or oil/grease trap, and must be approved by your wastewater treatment authority.
- Grade the working area to be higher than the parking lot, or surround it with a berm, to prevent storm water run-on.
- Construct a special area in which to segregate your "dirtiest" equipment (roof tar equipment, asphalt paving equipment, etc.) Handle its discharges, leaks, and runoff separately. This approach could save you from the need to treat *all* the runoff from the equipment yard.

15. Fleet or Equipment Fueling Area Design Features

If your facility's vehicle fueling area is one of the significant sources you identify in your SWPP Plan, you may need more intensive BMPs than the operational efforts described in Section 10. Some design features to consider are:

- Cover the fueling area to prevent rain from falling directly on the area. Install a roof over the fueling island, the area where vehicles park while fueling, and as much of the approach area as practical. Leaked engine fluids and spilled fuel inevitably accumulate on the pavement in these heavily-trafficked areas.
- Storm drain and sewer inlets that drain the fueling area must be equipped with a shutoff valve to keep fuel out of the drain in the event of a spill from the pumps. The valve should be kept closed at all times except during a rainfall.
- Curtail fueling activities when the valve must be open, or use extra precautions to capture any spilled fuel, such as a large drip pan under the vehicle.

A number of different approaches may serve as effective **drainage design.** The fueling area needs to be separated from the rest of the yard, both to contain any fuel spill and to prevent storm water from running on. Select or adapt a scheme such as one of these:

- Grade the fueling area to be "mounded" or elevated. The Automotive Industries BMP manual includes a suggested mounded grading scheme.
- Install berms around the area that are high enough to redirect water from a large storm.
- Grade the entire fueling area to drain to a single inlet. You can accomplish this with longitudinal drains at the perimeter along the "downhill" side of the fueling area, or with a depression in the middle of the fueling area. Either way, be sure to design the grading to avoid run-on.
- At the inlet, either install a sump, from which you will pump any accumulated liquids; or connect to a sanitary sewer, after checking to get all the permits the wastewater authority may require. The sump or connection should be operated as suggested for a loading dock area in Section 13.

16. Access Roads and Rail Corridors

Access roads and rail corridors can be significant sources of pollutants for some industrial facilities. In the General Permit, access roads and rail corridors are defined as "industrial activities exposed to storm water" that you must include in identifying potential sources and selecting BMPs for your SWPP Plan.

Maintenance and operational BMPs for access roads are the same as those described for vehicle access and parking areas under Section 9. Some structural BMPs are described below.

Proper drainage design is a good place to start. Generally, this means the roads should be crowned and sloped outward; and that storm water should not be allowed to drain across the road, but be carried in ditches or culverts alongside the road. Grass-lining the roadside ditches can be an effective way to remove storm water pollutants — see Section 20. Maintain the ditch to be sure it does not clog or fill with sediments, allowing storm water to overflow. Plant vegetation by the roadside to control erosion and to promote rainwater infiltration.

If your site includes railroad access, an important source of pollutants is the preservatives on wooden railroad ties. Use a less-toxic preservative; avoid organic toxics such as creosote and pentachlorophenol. Or use concrete ties or other non-wooden ties.

Control spills and dust from railroad unloading. If your rail line delivers or picks up liquids, in bulk or in containers, you may need to add spill-control loading docks with shutoff valves. (See Section 3 for spill controls, and Section 13 for loading dock design features). If parked railroad cars drip, install a drip pan at the loading dock between the rails.

17. Onsite Storm Water Management

Some industrial facilities may still find potential pollutants exposed to storm water even after implementing source control measures like the operational BMPs in the first part of the manual and the structural source controls above. Further structural controls can be used to manage the storm water itself, either to control the flow of the runoff (described in Section 19), to remove some of the pollutants in passive devices (Section 20), or to remove pollutants using specially-designed equipment (Section 21).

The best way to avoid the need for storm water management or treatment is to use source controls, most likely in combination. The right combination for your facility will probably include conscientious implementation of BMPs such as those recommended in Sections 1 through 12 of this manual, attention to the sources of waste at your facility, and careful reduction of process wastes.

If you need to manage storm water onsite, the most important consideration is to minimize the quantity of storm water that contacts potential pollutants. For example, keep the area of industrial activities as small as possible; separate the area from parking lots, to prevent run-on; and roof or enclose the area if possible.

Design your storm water conveyance system to *isolate* the areas where storm water contacts potential pollutants, and convey water from those areas separately from water that runs off of "clean" and non-industrial parts of the site. This will allow you to control storm water with smaller and less-costly hydraulic or water quality controls. Or, if you plan to discharge to your wastewater treatment authority (Section 18), reducing the volume will reduce the discharge cost and increase the willingness of your wastewater authority to accept the discharge.

18. Redirect Storm Water Discharge from Storm Drain to Sanitary Sewer

If source control BMPs are not adequate to prevent discharging pollutants in storm water from your facility, you may need to cease discharging storm water that contacts those pollutants. One way to avoid discharging potential pollutants with storm water is to isolate runoff from that part of your facility where the pollutants are contacted and discharge the storm water to the sanitary sewer rather than a storm drain.

Installing new connections and new piping can be quite costly, and the required permits may be a barrier, so this could be a costly BMP. Also, it will require a permit from your local wastewater authority. The permit will specify the volume of water you may discharge, the kind of pretreatment equipment you may need to install and operate, and requirements for monitoring your discharge.

Redirecting discharge to the sanitary sewer may not be allowable in all localities — some wastewater authorities have sections in their local ordinances that prohibit the discharge of storm water to the sanitary sewer. Requirements might differ from one municipality to another, so contact the authority that serves your area for information. (See the list on the rear cover.)

Your wastewater treatment authority, as a rule, would prefer to minimize the volume of storm water that passes through the treatment system. You should reduce the quantity of storm water you redirect, using techniques like those described in Section 17.

The wastewater authority may require temporary storage of your storm water onsite, to avoid overloading their facilities during a storm. Your authority is more likely to accept discharge of storm water that has contacted pollutants if you can store it temporarily and deliver it *after* the high flows from a storm event.

19. Storm Water Management: Hydraulic Controls

Hydraulic controls are intended to control *quantity* of storm water discharge, but can be useful for water *quality* as well by removing potential pollutants from storm water. BMPs of this type are widely used to control erosion of hillsides and to remove sediments from storm water runoff. Also, hydraulic-control BMPs can help to remove oils and heavy metals that adsorb to sediment particles in storm water.

Design standards and operating information for hydraulic controls are available in a number of references. The NPS Program is preparing a manual of "new development" BMPs recommended for newly-constructed buildings, which includes discussion of hydraulic BMPs for storm water pollution control and conditions under which hydraulic BMPs should be implemented. Design specifications for hydraulic controls will also be addressed in detail in a BMP manual being prepared by the state of California for storm water pollution control. Many local and regional regulations that target erosion control give specifications for hydraulic BMPs.

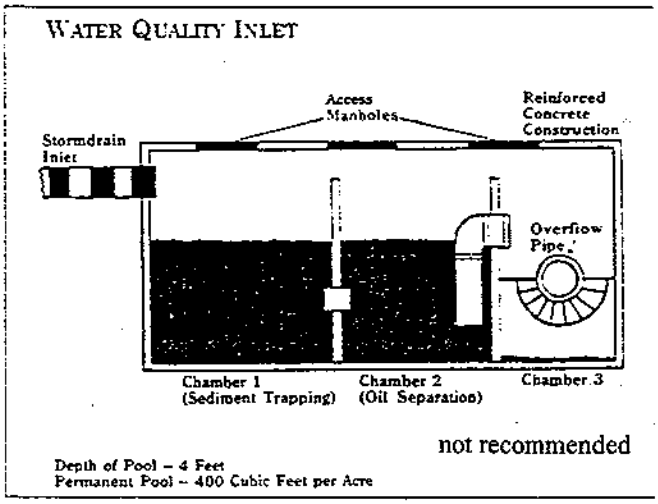
Hydraulic controls are designed for one of two purposes. One category serves to control the **rate of peak flow**, slowing the flow of water at the height of the storm to reduce its potential to carry away soils and other contaminants. The other type reduces **volume** of runoff, generally by causing some storm water to *infiltrate* (or soak into the soil) rather than running off into storm drains, streets, or streams. Some approaches control both peak rate and volume.

Hydraulic controls for a site are most effective if the overall site design is considered. The first step generally is to modify the site layout to increase the water-permeable surface, to increase infiltration and reduce runoff volume. If greater flow control is needed, the second step may be to strategically place *infiltration trenches* to intercept runoff and promote infiltration. (Infiltration may not be permitted in some areas — see Section 20.) For large quantities of flow, onsite ponds can be designed either to slow the peak flow of storm water or to hold water onsite until it infiltrates or evaporates. These are known as *detention ponds* or *retention ponds*. A variation is the *storm water wetland*, which similarly controls flow while wetland vegetation helps remove pollutants.

20. Storm Water Management: Water Quality Controls

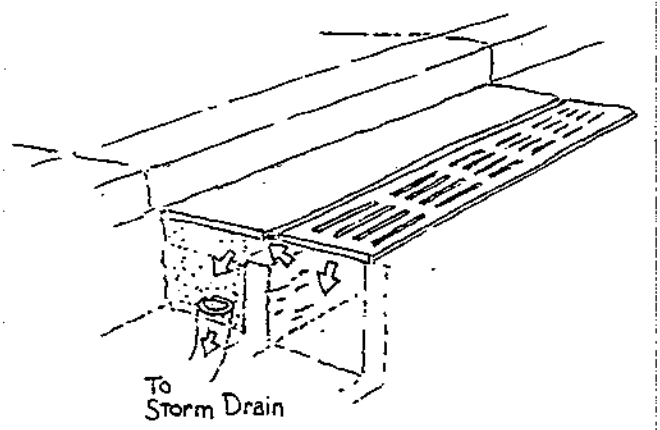
A number of specific storm water management controls are better suited to water quality control than hydraulic control. These features may be added to various parts of the storm water conveyance system on an industrial site to help control potential pollutants in the storm water before it leaves the site. They are for the most part passive design features rather than treatment devices in the usual sense. Information in existing references gives design parameters for these water quality controls, so this section merely summarizes a few types of controls.

A simple technique is a **vegetated swale** or **channel,** a ditch that carries storm water in which plants are permitted to grow. The plants provide some peak flow control by slowing the water. They also remove some pollutants by encouraging the deposition of sediments and minor oily wastes. This control can be retrofitted to some existing storm water conveyance ditches simply by allowing grasses to grow, if it does not interfere with storm water drainage and cause water to back up onto the site.



An API separator is only partly effective at removing oily wastes, but is more effective at removing sediments than an ordinary catch basin.

A **water quality inlet** is a simple multi-purpose device, shown in the diagram above. A storm drain inlet is fitted with an enlarged catch basin or grit chamber where solids and sediments settle out of the water. A baffle restricts the flow of surface-floating oil, which can be removed by hand later. Floatable debris also collects at the baffle. This type of inlet has in the past been used to help remove oily wastes, but is of limited effectiveness. Section 21 describes the inlet further, including its maintenance requirements.



A sand filter inlet can remove some pollutants before they enter the storm drain.

A **sand filter inlet** is a storm drain inlet that contains sand or another filter medium. The sand removes particulates and oily wastes from storm water as it enters the storm drain. An extension of the same concept is a **sand filter,** where storm water quality can be improved before discharge. Sand filters appear to be particularly effective if used in combination with detention or retention ponds, by diverting the first-flush of runoff (often carrying the most pollutants) to the filter and routing the remainder of the water to the pond.

Many of these water quality controls can be designed either of two ways: to control potential pollutants before discharging water to a storm drain; or to remove unwanted constituents and then direct the storm water into the ground as an *infiltration* device. Any of these controls that use infiltration techniques, or others designed specifically to promote infiltration, (porous pavement, infiltration trenches, and others), may be restricted or prohibited in some municipalities in the Santa Clara Valley as potential sources of ground water contamination. Dry wells for disposal of storm water are illegal under State and Federal Law.The Regional Board's newly-amended Basin Plan for the San Francisco Bay Region adopts some new policies that address infiltration devices. The NPS Program does not recommend them in areas where shallow ground water may be impacted. Check with your municipality before installing an infiltration device.

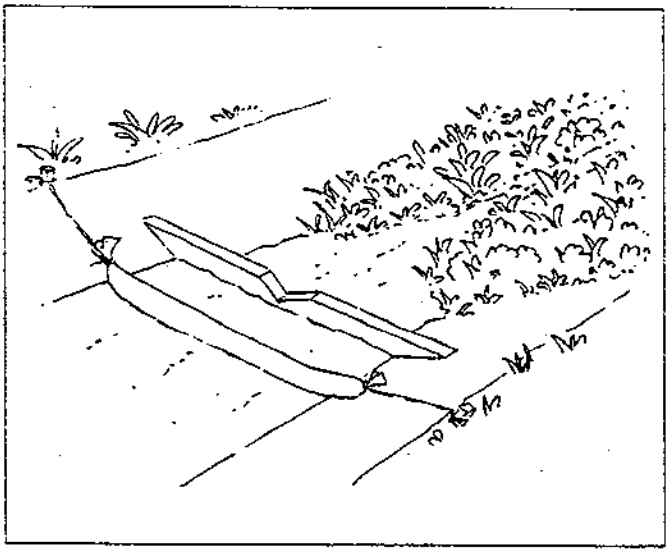
21. Storm Water Management: Removing Oily Pollutants

A simple technique to remove oils and grease from storm water uses **oil-absorbent materials** (or *oleophilic* materials), such as the booms used to contain oil spills. The absorbent material preferentially absorbs oil, and does not fill with water, so it can be used on storm water with small concentrations of oily materials.

Some facilities that have a storm water conveyance ditch where water flows season-long have found it convenient to install a permanent floating boom to control an occasional light surface sheen. When the boom is spent, it is full of oil and is visibly heavier, floating lower in the water. The booms are inexpensive enough that they may easily be replaced whenever the absorbent is saturated. Disposal is more costly, since they may be hazardous waste unless an oil recycler can accept the material.

Oil/water separators are a broad category of devices that are intended to remove oily constituents. There are many varieties of oil/water separators, and the term is not used in the same way by all equipment vendors or design specifications.

For most applications, oil/water separators are *not recommended* as a storm water management strategy. Source control BMPs are strongly preferred. Oil/water separators are fairly costly, and most designs do not operate best at the low concentrations commonly present in storm water. A sand filter inlet is typically more effective, and less costly, for the small quantities and low concentrations of oils in routine storm water runoff — that is, runoff that has not directly contacted oily industrial activities.



Oil-absorbent berms can remove oily sheen from storm water. Vegetation in an open ditch can slow the flow, helping sediments settle.

Separators may be useful in limited applications. They are sometimes useful as a retrofit measure, to temporarily help a facility comply while it installs more effective source control BMPs. Another use is in spill control sumps, upstream of a treatment process. The advanced designs are sometimes used as a treatment device (that will discharge to a sanitary sewer) for storm water that contacts industrial activities in isolated areas where contact cannot be avoided.

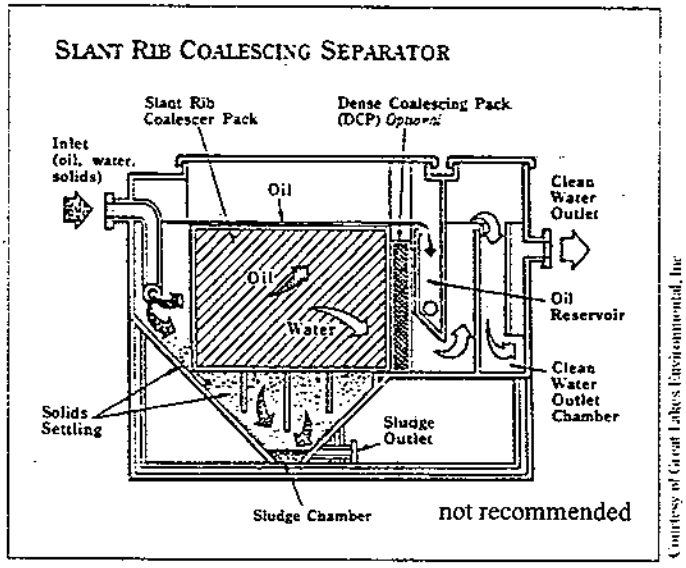
The API oil/water separator is a simple design, named for the American Petroleum Institute. The API separator is sometimes called an "oil and grease trap," to distinguish it from a true oil/water separator used for industrial wastewater. An API separator usually is a long basin with multiple chambers or vaults, typically installed below grade. It can be fitted to storm drains or storm water inlets in a variety of configurations — the water quality inlet described in Section 20 is one form. The intent is to slow water and stratify the flow so that oil rises. The floating oil is then retained by one or more baffles in the chambers.

An API separator removes the bulk of floating oily wastes, especially if the oil is not well-mixed but floats on top of the water. However, it is not highly efficient, so storm water can still be polluted unacceptably even after it flows through the inlet. The separator works by concentrating oily wastes within the chamber, so inevitably some of the collected wastes are carried away during heavier storms. It can be made somewhat more effective at oil removal if it includes pads or pillows of oleophilic material at the water surface level.

If you install an API separator, it *must be maintained* regularly. It requires a standing pool of water, which should be pumped out periodically and replaced with clean water. To clean, remove oil floating on the standing pool and greasy matter collected at the baffle. Some commercial oil recyclers accept this material for recycling; otherwise, it must be handled as hazardous waste. If you install oil-absorbent pillows, the pillows must be closely monitored and replaced when they are saturated, also disposed either as hazardous waste or to a recycler. If the inlet includes a sediment trap, as in the water quality inlet shown in Section 20, remove solids with a shovel between storms.

Develop a regular cleaning schedule appropriate for your facility. For inlets that don't carry much flow, three cleanings per year are sufficient: once before the rainy season (mid-September) to remove materials that have accumulated; once after the first major storm; and once at the end of the rainy season to prevent slow loss or evaporation of the collected oily wastes. If storm water flow is greater, the API separator may need to be cleaned monthly, or periodically between storms. As another guideline, clean the separator before three inches of oil accumulate in the entry chamber.

The **CPI, or coalescing plate interceptor** oil/water separator, is a more advanced design. These are common for treatment of oil-bearing industrial wastewater, but are less often cost-effective for storm water. The CPI separator generally achieves greater removal efficiency than an API type, but is more costly to purchase and operate. A CPI separator can attain a high removal efficiency, and accommodate a fairly high flow rate, but at ever-increasing capital costs for the equipment (by adding more separator plates). The best economics generally apply for relatively high concentrations of oil at low and constant flow rates.



Courtesy of Great Lakes Environmental, Inc

A CPI separator can be very effective at removing oil but requires upstream sediment control and can be costly to maintain.

A few design features can improve the effectiveness of an oil-water separator. Pollution removal effectiveness is highest if the concentration is high when the storm water enters the unit. Avoid diluting the water to be treated with water from other parts of the site, where it does not contact the potential pollutants, both to save on the capital investment and to increase treatment effectiveness. For industrial process applications, an evaporator can be used reduce the volume of water treated.

An oil-water separator works best if sediment is not present in the water — limit your water to be treated to isolated areas, free of mud and soils if possible. Efficiency is highest with a fairly steady flow, so you may require upstream detention. Also, don't site the separator downstream of a pump, because the pump mixes the oil and water and partially emulsifies the oil, so separators are less effective.

Storm water treatment generally is *not recommended* as a BMP. Some of the devices described in Section 21 may be considered to be treatment by the state or by your local wastewater treatment authority, which can open the door to some burdensome regulatory restrictions and permitting requirements.

For most industrial facilities, the best advice about onsite storm water treatment is to avoid it, for a number of reasons. Most of the available treatment equipment is costly to purchase and to receive permitting approval for. Operational costs can also be significant — you must monitor the equipment to assure continued effectiveness, and may need to prepare and submit chemical analyses to demonstrate continued compliance.

Further, in most places in the Santa Clara Valley, treatment of storm water means you must discharge it to the sanitary sewer rather than the storm drain (as described in Section 17). In effect, water on which you perform treatment is no longer considered to be storm water, but industrial wastewater instead. You will need to obtain or modify a discharge permit from your local wastewater authority or your municipality.

The most troublesome permitting procedures are for hazardous materials. Before installing any treatment equipment, determine whether your waste water is a hazardous waste. Cal-EPA/Toxics or the County Environmental Health Department can describe the necessary testing and approval procedures. If the wastewater that would enter the pretreatment equipment is considered to be hazardous you must obtain a permit from Cal-EPA/Toxics to operate a hazardous waste treatment facility. At present this may be true even for a simple water quality inlet. If you determine that the waste stream is not hazardous, and do not apply for a hazardous waste treatment permit, keep your testing documentation on hand to show regulators.

Pollution Control Agencies and Sources of Information

Santa Clara Valley Nonpoint Source Pollution Control Program

For information about storm water pollution control requirements, contact the Program or your local municipality.

Santa Clara Valley NPS Program
5750 Almaden Expressway
San Jose CA 95118 (800) 794-2482

City of Campbell	(408) 866-2150
City of Cupertino	(408) 252-4505
City of Los Altos	(415) 948-1491
Town of Los Altos Hills	(415) 941-7222
Town of Los Gatos	(408) 354-6864
City of Milpitas	(408) 942-2360
City of Monte Sereno	(408) 354-7635
City of Mountain View	(415) 903-6329
City of Palo Alto	(415) 329-2129
City of San Jose	(408) 277-5533
City of Santa Clara	(408) 984-3151
City of Saratoga	(408) 867-3438
City of Sunnyvale	(408) 730-7270
Santa Clara County	(408) 411-1195
Santa Clara Valley Water District	(800) 794-2482

Documents available from the Program:
- BMP Manual for Automotive Repair Facilities
- BMP Manual for Construction Activities
- Industrial Storm Water Compliance Guidance Handbook (guidance for the Regional Board's Industrial Storm Water General Permit)
- Industrial Storm Water Compliance Binder
- Integrated Pest Management Brochure

Wastewater Treatment Authorities

For information on wastewater permitting and on allowable discharges to the sanitary sewer, contact your wastewater treatment authority

San Jose/Santa Clara Wastewater Treatment Plant
Department of Industrial Waste (408) 945-5300

Sunnyvale Wastewater Treatment Plant
Industrial Pretreatment Program (408) 730-7270

Palo Alto Regional Water Quality Control Plant
Environmental Compliance Division (415) 329-2117

Documents available fromPalo Alto:
- Storm Drain Pollution Prevention Guidelines

Emergency Response: Dial 911

County of Santa Clara

For information about compliance with hazardous waste regulations, contact:

Environmental Health Department—Toxics Enforcement Program (408) 299-6930

For information on waste minimization and guidance on contacting other agencies, contact:

Hazardous Waste Management Program (408) 441-1195

Document available:
- Hazardous Waste Management and Reduction—A Guide for Small and Medium-Sized Businesses (City of San Jose and Santa Clara County)

California Environmental Protection Agency

Regional Water Quality Control Board: San Francisco Bay Region, Region 2
2101 Webster Street, Suite 500, Oakland, CA 94612

For information on permitting of transportation, treatment, recycling, and disposal of hazardous wastes, contact:

Department of Toxic Substances Control Division (Cal-EPA/Toxics), Region 2 (510) 540-3739
700 Heinz Avenue, Bldg. S, Berkeley, CA 94710

For information on waste minimization and hazardous waste management technologies, contact:

Alternative Technology Division (916) 324-1807
744 P Street P.O. Box 942732, Sacramento, CA 94234-7320

Documents available from Alternative Technology:
- California Waste Exchange: A Newsletter/Catalog
- Fact Sheet: Waste Reduction for Automotive Repair Shops
- Hazardous Waste Reduction for Automotive Repair Shops:
  - Part 1: Checklist
  - Part 2: Assessment Manual
- List of CA Licensed Hazardous Waste Haulers

Association of Bay Area Governments

P.O. Box 2050, Oakland, CA 94604-2050 (510) 464-7900

Documents available from ABAG:
- Manual of Standards for Erosion & Sediment Control Measures

These agencies are concerned with environmental requirements for industrial facilities. It may be necessary to contact other agencies to verify compliance. These contact points are current at time of publication.

4DD Sample Checklist

NOTICE OF NONPOINT SOURCE INSPECTION

City of Palo Alto
Environmental Compliance Division
2501 Embarcadero Way, Palo Alto, CA 94303
Telephone: 415-329-2598 Fax: 415-494-3531

Facility Name:	**Inspection Date/Time:**
Site Address:	**SIC Code:**
Contact Person/Title:	**Primary Activity:** Industrial/Commercial/Construction
Telephone:	

Item	Section	Storm Water Problem	Recommended Control Measures	Compliance Date	Results*

OI has been submitted: Yes No N/A **SWPPP & SWMP are available:** Yes No N/A

Comments/Referrals

No Storm Water Problems Observed for this Inspection

You are hereby notified to implement all recommended control measures noted above on or before the compliance date(s). Time granted for the implementation of control measures does not preclude any enforcement actions by the City or other agencies.

Inspector: **Received by:**

***Reinspections:** __/__/__(____) __/__/__(____) __/__/__(____)
Date & Initial Date & Initial Date & Initial

Distribution: Original to Contact Person. Copy to File
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SECTIONS & DESCRIPTIONS

Section 2

Indoor Activities

2-1. Floor cleaning water improperly disposed.
2-2. Equipment cleaning wastewater improperly disposed.
2-3. Mfg. residues, spills, leaks properly cleaned.

Section 3

Outdoor Activities

3-1. Vehicle and equipment fueling (tank farm).
3-2. Vehicle and equipment washing: mats, filters, screens.
3-3. Vehicle and equipment maintenance and repair.
3-4. Storage and handling of raw materials, products and by-products.
3-5. Waste storage, handling and disposal (i.e., Hazardous Materials).
3-6. General construction activities/erosion.
3-7. Pavement cleaning or power washing (steam).
3-8. Scrap yards/Equipment/Vehicle storage.
3-9. Process residues.
3-10. General housekeeping.
3-11. Irrigation and landscape maintenance.

Section 4

Equipment

4-1. Air Compressors.
4-2. Air conditioning, chillers, refrigeration.
4-3. Air scrubbers.
4-4. Basement parking lots (sumps).
4-5. Boilers.
4-6. Catch basin/Drop inlet condition.
4-7. Compactors/Dumpsters.
4-8. Cooling tower blow down.
4-9. Emergency shower drains.
4-10. Filter back flushing.
4-11. Floor sinks/drains.
4-12. Grease interceptors/Tallow bin.
4-13. Groundwater treatment discharge.
4-14. Groundwater dewatering devices.
4-15. Loading/Unloading.
4-16. Parking lot.
4-17. Ponds/Fountains
4-18. Roof (vent)/Other roof equipment.
4-19. R.O./D.I. units.

Abbreviations/Definitions

NOI -Notice of Intent for the coverage under the States NPDES General Permit for dischargers of storm water associated with industrial activity in the Santa Clara County to the South San Francisco Bay(Order No. 92-011, NPDES No. CAG612001) which is submitted to the Cali fornia Regional Water Quality Control Board S.F. Bay Region.
SWMP - Storm Water Monitoring Plan
SWPPP - Storm Water Pollution Prevention Plan
NPDES - National Pollutant Discharge Elimination System
BMP - Best Management Practices
SIC - Standard Industrial Classifications Code

Mandatory Industries - A permit is required in any case
Conditional Industries - A permit is required only if materials, Machinery, or Products are exposed to stormwater.
Non-regulated - Those industries which were not identified by the Federal Storm Water Regulations/EPA Categories which are subject to storm water runoff.

Agency Phone Numbers

RWQCB (510) 286-1255
SCVWD (408) 265-2600
Fish & Game (408) 649-2370