CITY OF PORTLAND
ENVIRONMENTAL SERVICES

1211 SW Fifth Avenue, Room 800, Portland, Oregon 97204-3713 (503) 823-7740, FAX (503) 823-6995 Dean Marriott, Director

September 29, 1998

Elliot Zais
Portland MS4 Project Manager
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

Dear Mr. Zais:

On behalf of the City of Portland and its co-permittees, I am pleased to submit the enclosed *Annual Compliance Report No. 3*. This report fulfills reporting requirements for the City of Portland's NPDES Municipal Separate Storm Sewer Discharge Permit. It covers the work accomplished during the third fiscal year of the permit program (July 1, 1997 through June 30, 1998).

We believe we have made good progress toward meeting our permit requirements and stormwater program goals this past year. Each co-permittee's section of the report details the activities implemented, program status, and any initiated or proposed program changes. An overview of each co-permittee's section is provided in the Executive Summary.

As we move into permit year 4, we will continue many of our current program activities, as well as initiate some new elements. An added challenge will be to integrate our activities with the requirements and goals of the Endangered Species Act (ESA) in response to the listing of steelhead trout as a threatened species. We will also begin preparing for permit re-application by evaluating the program to date and identifying possible modifications. We look forward to working with DEQ in these important efforts.

Please call me at 823-7096 if you have any questions concerning this report.

Sincerely,

Dave Kliewer
Regulatory Planning and Evaluation, Division Manager

cc: Patrice Mango, Portland Stormwater Program Manager
Co-permittees
Enclosure

City of Portland

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System Discharge Permit

Permit Number: 101314

ANNUAL COMPLIANCE REPORT NO. 3

Fiscal Year 1997-98
(July 1, 1997 - June 30, 1998)

Prepared for:

Oregon Department of Environmental Quality

September 29, 1998

Submitted by:

City of Portland, Oregon
Multnomah County
Port of Portland
Oregon Department of Transportation
Multnomah County Drainage District No. 1
Peninsula Drainage District No. 1
Peninsula Drainage District No. 2

City of Portland
National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer System Discharge Permit
Permit Number: 101314

ANNUAL COMPLIANCE REPORT
Fiscal Year 1997-98
(July 1, 1997 - June 30, 1998)

We, the undersigned, hereby submit this annual compliance report for the Municipal Separate Storm Water System Discharge Permit No. 101314, in accordance with Schedule B, Section 7 (System-Wide Report) of that permit. We certify, as required by 40 CFR Section 122.22, under penalty of law, that this document was prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on our 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 our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Dean Marriott
Director, Bureau of Environmental Services
City of Portland

Larry F. Nicholas, P.E.
Director, Department of Environmental Services
Multnomah County

Mike Thorne
Executive Director
Port of Portland

Tim J. Hayford
Manager, Multnomah County Drainage District No. 1
Peninsula Drainage District No. 1

Rich Halsten
Chairman, Peninsula Drainage District No. 2

OREGON DEPARTMENT OF TRANSPORTATION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL STORMWATER SYSTEM ANNUAL REPORT
AUGUST 1998

We the undersigned hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater System Annual Report in accordance with the NPDES Permit Numbers:

- Portland NPDES Permit #108015
- Clackamas County NPDES Permit #108016
- Unified Sewerage Agency NPDES Permit #101309
- City of Gresham NPDES Permit #101315
- City of Eugene NPDES Permit #101244
- City of Salem NPDES #108919

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on our inquiry of the person or persons who manage the system, or those who are directly responsible for the gathering of information, the information submitted is, to the best of our knowledge and belief, true accurate and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

24 Aug 98

Doug Tindall
State Maintenance Engineer

Sue Chase
Oregon Plan for Salmon and Watersheds Manager

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REPORT CONTENTS

EXECUTIVE SUMMARY

I. GENERAL INTRODUCTION

Permit Background
Program Components
Program Coordination
Report Preparation and Organization

II. CITY OF PORTLAND

III. MULTNOMAH COUNTY

IV. PORT OF PORTLAND

V. OREGON DEPARTMENT OF TRANSPORTATION

VI. MULTNOMAH COUNTY DRAINAGE DISTRICT NO. 1
PENINSULA DRAINAGE DISTRICT NO. 1
PENINSULA DRAINAGE DISTRICT NO. 2

VII. PORTLAND NPDES THIRD ANNUAL STORMWATER MONITORING COMPLIANCE REPORT

APPENDICES

A: City of Portland NPDES Stormwater Permit
B: Compliance Reporting Requirements
C: Permit Schedule Requirements (City of Portland)

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

INTRODUCTION

This third Annual Compliance Report is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the City of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Discharge Permit (hereinafter referred to as the stormwater permit or permit). It covers the work accomplished during the third fiscal year (July 1, 1997 through June 30, 1998) of the permit program.

The report is submitted by the City of Portland and its six co-permittees: the Oregon Department of Transportation (ODOT), Multnomah County, Multnomah County Drainage District No. 1, Peninsula Drainage District No. 1, Peninsula Drainage District No. 2, and the Port of Portland.

The management and implementation of the permit program is a cooperative effort among the City of Portland's Bureau of Environmental Services (BES), other City bureaus, the co-permittees, DEQ, Metro, the Oregon Association of Clean Water Agencies (ACWA), other agencies, and the public.

The major components of the Stormwater Program include the following management practices:

Best Management Practices (BMPs) for new stormwater techniques:

- PI: Public Involvement
- ED: Public Education
- OM: Operations and Maintenance
- IND: Industrial/Commercial Controls
- ILL: Illicit Discharges Controls
- ND: New Development Standards
- STR: Structural Controls
- PS: Planning/System Preservation and Development

Existing Management Practices (EMPs), such as:

- Street sweeping
- Household hazardous waste collection
- Right-of-way revegetation programs, such as the "wildflower program"
- Erosion control inspection
- Watershed programs

- Environmental zones surrounding water resources as buffers to urban impacts

Required Management Practices (RMPs), which include:

- Program management
- Monitoring
- Annual compliance reporting

The Annual Compliance Report includes individual reports prepared by each co-permittee. Each report describes the activities implemented, program status, and any initiated or proposed program changes. An overview of each co-permittee's report is provided below.

CITY OF PORTLAND

The City of Portland continued to make good progress toward meeting its permit requirements and stormwater program goals in fiscal year 1997-98. Key activities and accomplishments are summarized below.

- During the latter part of permit year 3, BES implemented Integrated Watershed Planning to stress comprehensive, multi-objective watershed management along geographical boundaries, coordinating with the various jurisdictional and public interests within those areas. Water quality improvement and protection are critical objectives in establishing watershed priorities. Integrated Watershed Plans for the major watersheds (Columbia Slough, Johnson Creek, Willamette, and Tryon) will be completed during Spring of permit year 4, and Stormwater Program activities in permit year 4 will be implemented on a watershed-by-watershed basis.

- During permit year 3, the National Marine Fisheries Service (NMFS) listed steelhead trout as a threatened species under the Endangered Species Act (ESA) in March 1998. Stormwater Program activities integrate closely with ESA goals by implementing BMPs that will improve and protect water quality and mitigate stormwater quantity impacts. Permit year 3 also saw the passage of Metro's Stream and Floodplain Protection Plan (Title 3). The performance standards for water quality closely related to existing Stormwater Program BMPs. During permit year 4, the Stormwater Program will identify and implement opportunities to address Title 3 requirements in coordination with development of the Integrated Watershed Plans.

- Development of the Stormwater Management Manual, with input from the Stormwater Policy Advisory Committee (SPAC) and a Technical Advisory

Team, began in permit year 3. The manual identifies requirements for stormwater management for new development and redevelopment within the City of Portland. Several drafts have been circulated for stakeholder review and comment. Refinement of the manual and SPAC involvement are continuing into permit year 4.

- A number of projects within the Parkrose Area Pilot Project continued and/or were completed during permit year 3. BES's increasing focus on Integrated Watershed Plans has decreased the need for testing/pilot projects. With increased knowledge of watershed-specific issues, concepts can be tested throughout the City rather than be confined to one location. Close-out and evaluation of the Parkrose Area Pilot Project will therefore occur during permit year 4.

- DEQ approved modification of the Stormwater Monitoring Program from a land use-based approach to an approach based on best management practices. The new monitoring program builds upon the information produced from previous monitoring efforts and more effectively directs resources toward acquiring new information to support the development and refinement of stormwater management activities.

- Public involvement/education activities continued to be a significant element of the Stormwater Program. Key activities included the Naturescaping for Clean Rivers program; continued distribution of the *Clean Rivers: Why Should I Care?* video and initiation of a second video project; outreach to nontraditional audiences, a variety of stormwater education activities, stewardship grant projects, continued participation in the Regional Coalition for Clean Rivers and Streams, and distribution of educational publications and materials.

MULTNOMAH COUNTY

Multnomah County implemented the permit year 3 activities on schedule as expected in the Stormwater Management Plan (SWMP), and continued ongoing best management practices as outlined in the SWMP. Key accomplishments, as reported in Section III of this annual report, include several major program-level achievements. Training sessions at the national, state, local, and internal level have been well attended this year for Stormwater Implementation Team members to learn more about how to apply water quality improvements to their everyday activities. Other County departments and divisions are now actively cooperating with the inspection and enforcement aspect of water quality management through a new system of immediate referrals in the event of major or minor pollution in the right-of-way. This year, the Multnomah County Land

Use Planning Division wrote new County Code for more stringent erosion and sediment control during new development and other construction, as well as wider buffer zones for waterways in the SEC (Significant Environmental Concern) zones. County permit requirements for road-building projects continue to utilize ODOT's new 00280 specifications for strict erosion control measures, and have added requirements to include vegetation management during and post-construction. The County and the City of Portland completed an intergovernmental agreement to better define the roles and responsibilities of the co-permittees under the Municipal NPDES Program and to financially support the City's public education efforts through the Regional Coalition for Clean Rivers and Streams.

PORT OF PORTLAND

The Port of Portland owns or manages approximately 9,700 acres within the city of Portland Urban Services Boundary. The Port implemented numerous new programs this year related to stormwater quality improvement, as summarized below and discussed in more detail in Section IV of this annual report.

The de-icing studies slated for the 1998-99 season are being developed by the Port de-icing team and the Port's consultant. The 1998-99 Portland International Airport (PDX) de-icing program will be documented in a winter operations plan. Many projects initiated last winter will be continued, including aeration of the detention ponds, trench drain closure and glycol collection, and deployment of two Glycol Recovery Vehicles (GRV). A new "No Urea Policy" has been formally adopted at PDX. Other de-icing efforts include testing a new pavement chemical (potassium formate) using a two-step chemical application process, switching the type of chemicals applied, adjusting chemical mixers based on application temperatures (to be done by airlines), and researching new de-icing technologies.

The Marine Division, PDX, and the Portland Ship Repair Yard (PSY) have developed stormwater inlet stenciling programs. PDX is also developing an airport-specific environmental training video that will be shown to Port employees as well as tenant employees. Terminal 6 (T-6) equipment operators were given spill and stormwater information and procedures. PSY now conducts environmental awareness courses for supervisors and managers.

The Port continues to coordinate with other government agencies on water quality protection activities relevant to Port properties and activities. The Port has participated in coordinated efforts in a number of pollution control projects, including the Leadbetter water quality facility and the Rivergate wetlands. The Port has participated in Regional Spill Response Task Force meetings, municipal

stormwater compliance co-permittee meetings, and Public Participation Action Plan meetings. The Port is also in the process of developing a Port-wide program to address Endangered Species Act compliance issues. Potential changes to stormwater quality programs are being evaluated in order to improve water quality for endangered species and increase protection and restoration of fish and wildlife habitat.

The Port Tenant Program is under continuing development. Initial training and awareness classes were conducted in 1997. PDX provided additional information to tenants in a BMP meeting in May 1998.

The following additional practices have been implemented in the past permit year:

PDX

- New toluene recovery system to be installed
- New wash bay to be constructed for maintenance equipment and vehicles
- New "No Wash Policy" established and implemented
- Tenants installing wash pads for containment and disposal of vehicle and equipment washing

Industrial Parks

- Added two catch basins to yearly cleaning and inspection schedule
- Revegetated large areas in the Rivergate district

PSY

- Enlarged dry dock storm/wash water collection treatment system to increase holding capacity
- Established new environmental training courses for managers and supervisors
- Installed approximately 60 new catch basin inserts
- Increased frequency of yard sweeping and cleanup

Marine Terminals

- Constructed a new fuel island at T-6; all stormwater drainage goes through the oil/water separator
- Downsized current equipment wash area at T-6 and diverted wash water to the sanitary sewer system
- Installed spill procedure labels into heavy equipment at T-6

- Developed catch basin inspection policy; increased number of catch basins inspected at all terminals
- Reduced mowing and chemical applications by planting native species in landscaped areas at all terminals

Tenant Properties

The chief goal of the Port's Stormwater Tenant Program is to address stormwater BMP implementation with all Port tenants that have the potential to impact Port stormwater quality. A tenant survey and tenant meetings have been conducted and are the first vital steps in the program.

Monitoring

The Port has implemented a program to test three typical stormwater BMPs, including catch basin filters, an oil/water separator, and a Stormceptor unit. The data will be submitted each year in the annual report and will also be shared with the co-permittees, ACWA, and other state agencies.

OREGON DEPARTMENT OF TRANSPORTATION (ODOT)

As of September 1998, ODOT holds six Municipal Separated Storm Sewer System (MS4) permits issued by DEQ. These permits are held in conjunction with local municipalities and county agencies located in the urban areas of Portland, Eugene, and Salem.

ODOT is committed to meeting the clean water requirements of these specific urban MS4 permits. ODOT is also committed to responsible conservation and protection of Oregon's natural resources. In 1998, ODOT worked to strengthen this commitment by continuing to expand its Clean Water Program beyond the urban MS4 permit boundaries and integrate this program into all statewide ODOT activities that affect and promote clean water runoff.

ODOT's Clean Water Program, Salmon Recovery Program, and Integrated Pest Management Program are all integral to ODOT's component of the Oregon Plan for Salmon and Watersheds. The Oregon Plan for Salmon and Watersheds for ODOT involves implementing clean water best management practices (BMPs) across the state (as well as within the boundaries of ODOT's MS4 permit areas). Some highlights of the efforts in 1998 include the following activities.

Continued evaluation and development of maintenance practices that reduce negative impacts to water quality and promote watershed health.

- Achieved use of maintenance BMPs to improve water quality by 90 percent of ODOT maintenance crews.

- Reduced use of chemicals (herbicides and fertilizers) through planting projects and changed herbicide spray practices.

- Reduced use of winter sanding material through chemical de-icers.

- Continued roadwaste research project to identify roadwaste management BMPs for water quality.

Participation with other state agencies in the Oregon Plan for Salmon and Watersheds

- Continued culvert modification project for salmon passage.

- Continued with a Natural Resource Inventory Mapping Project to identify environmentally sensitive areas along ODOT highways.

- Worked with local watershed groups and agencies to implement watershed betterment projects.

Continued efforts to improve water quality impacts from ODOT highway construction projects

- Developed new monitoring program for erosion control on ODOT construction projects. (Monitoring now shows 90 compliance with ODOT's NPDES construction permits.)

- Developed water quality facility plans for new construction projects planned for the City of Portland.

- Began work on developing a plan for water quality mitigation on ODOT construction projects statewide.

Continued partnering efforts with other agencies throughout the state to promote watershed health and habitat for salmon.

- Partnered with U. S. Geological Survey, Federal Highway Administration, and Multnomah County on research projects investigating watershed issues.

- Worked with Oregon Department of Fish and Wildlife and Oregon State University in ODOT's effort to retrofit highway culverts for fish passage.

- Worked with DEQ to initiate the development of a new ODOT NPDES permit that will be more efficient and effective for implementing ODOT's watershed health efforts.

For the upcoming permit year, ODOT plans to continue its efforts to meet the requirements of its MS4 NPDES permits. As part of this effort, ODOT will continue to integrate its Clean Water Program into all ODOT programs that impact water quality.

MULTNOMAH DRAINAGE DISTRICT NO. 1 (MCDD#1)
PENINSULA DRAINAGE DISTRICT NO. 1 (PENN1)
PENINSULA DRAINAGE DISTRICT NO. 2 (PENN2)

As noted in last year's Annual Compliance Report, Multnomah County Drainage District No. 1 (MCDD#1) is now under contract for the management and administration of both Peninsula Drainage District No. 1 (PENN1) and Peninsula Drainage District No. 2 (PENN2). Each District retains its individual board, but the overall day-to-day management and operations are conducted by MCDD#1 staff. As a result, this report covers the activities of all of the Districts during permit year 3.

Following two years of abnormal weather patterns and events, the main focus for the Districts during the past year has been to upgrade and update their flood control facilities. MCDD#1 is upgrading its two primary pumping facilities, PS#1 & PS#4, as well as completing levee section improvements. PENN1 is upgrading its levee sections and relocating the discharge pipes for its pumping station. PENN2 is rehabilitating approximately 1 mile of Columbia Slough levee between N. Vancouver and N. Denver Ave., as well as updating the pump station at Schmeer Rd. Each of these projects has incorporated the best management practices adopted in the NPDES Program.

As in past years, District management placed substantial effort on enforcement and coordination for erosion control. Monitoring and inspection of both new and existing development occurred over this last year. All new building permit applications for areas within the Districts were reviewed for general compliance with relevant BMPs, including site drainage, pretreatment of stormwater, outfall detail, setbacks from the resources/waterways, and adequate erosion control measures.

Once building permits were issued, the District inspected the installation and maintenance of the erosion control measures. If the controls were not adequate or not installed at all, the District contacted the contractor and owner to notify

them of the inefficiencies. If the inefficiencies were not corrected immediately, the owner/contractor was told the violation would be turned over to the City of Portland or DEQ for enforcement. In most cases, the owner/contractor did comply with the District's requests. If not, enforcement was turned over to the City or DEQ. Enforcement of erosion control standards by the agencies as a whole needs to be looked at and revised at the administrative level. In most cases, the permitting agencies have little or no enforcement authority. By the time DEQ exercises its authority, substantial damage has already occurred to the waterways.

Water-based maintenance was again expanded and performed in all of the Districts, instead of maintenance performed from the top of bank. Mapping of the drainage conveyance systems and associated outfalls was completed for all Districts, and illicit discharge investigations were performed. Efforts were also made to work with the City of Portland and property owners to revegetate slough banks in areas where water-based maintenance is now being implemented.

For capital improvements for each District, all efforts are being made to minimize impacts to the environment, from design through construction.

For the PENN2 levee improvements, an attempt was made to incorporate the rebuilding of the levee section with efforts by the City of Portland and the Corps of Engineers to build in larger cross-sections and benches to provide for vegetative plantings along the slough bank. These plantings would be in overbuild sections of the levee and thus not in the levee sections. Because of the extreme costs, the Corps and City abandoned the project, and the District and Corps are rebuilding the minimum section with clean riprap rock.

The projects for MCDD#1 have incorporated concerns about reducing velocities discharging to the outfalls as a result of increased pumping capacities at the rebuilt stations. Coordination between the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Department of State Lands, and the Corps occurred early in the design of the facilities. All in-water work periods were selected to have the least amount of impact to the associated waterways.

Section I

GENERAL INTRODUCTION

GENERAL INTRODUCTION

This third Annual Compliance Report is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the City of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Discharge Permit (hereinafter referred to as the stormwater permit or permit). (See Appendix A.) It covers the work accomplished during the third fiscal year (July 1, 1997 through June 30, 1998) of the permit program.

The report is submitted by the City of Portland and its six co-permittees: the Oregon Department of Transportation (ODOT), Multnomah County, Multnomah County Drainage District No. 1, Peninsula Drainage District No. 1, Peninsula Drainage District No. 2, and the Port of Portland.

PERMIT BACKGROUND

The stormwater permit application process started in 1990. In compliance with the NPDES timeline for stormwater permitting, the co-applicants submitted Parts 1 and 2 of the application to DEQ in November 1991 and May 1993, respectively. In accordance with Section 402(p) of the Clean Water Act, DEQ issued the permit on September 7, 1995.

Specific Authorities and Requirements

The permit incorporates by reference the Stormwater Management Plan submitted as part of the Part 2 permit application. Schedule B of the permit contains specific requirements regarding compliance reporting (referenced in Appendix B of this report). This Annual Compliance Report is in response to those requirements.

PROGRAM COMPONENTS

The major components of the Stormwater Program include the following management practices:

Best Management Practices (BMPs) for new stormwater techniques:

- PI: Public Involvement
- ED: Public Education
- OM: Operations and Maintenance

- IND: Industrial/Commercial Controls
- ILL: Illicit Discharges Controls
- ND: New Development Standards
- STR: Structural Controls
- PS: Planning/System Preservation and Development

Existing Management Practices (EMPs), such as:

- Street sweeping
- Household hazardous waste collection
- Right-of-way revegetation programs, such as the "wildflower program"
- Erosion control inspection
- Watershed programs
- Environmental zones surrounding water resources as buffers to urban impacts

Required Management Practices (RMPs), which include:

- Program management
- Monitoring
- Annual compliance reporting

PROGRAM COORDINATION

The management and implementation of the permit program is a cooperative effort among the City of Portland's Bureau of Environmental Services (BES), other City bureaus, the co-permittees, DEQ, Metro, the Oregon Association of Clean Water Agencies (ACWA), other agencies, and the public.

Co-Permittee Coordination

The City of Portland (as lead co-permittee) and the other co-permittees actively participated in the 3-year planning process to develop the NPDES permit application and individual Stormwater Management Plans, which became the basis for the current permit conditions. The co-permittees began meeting monthly (or more often as needed) in May 1993 to provide detailed comments to DEQ's permit process and negotiate intergovernmental agreements. They have continued meeting monthly to share information about program implementation, BMP effectiveness, monitoring, and maintenance program activities. These regular meetings have helped the co-permittees implement their Stormwater Management Programs and coordinate projects such as the City's Industrial Discharge and Illicit Connection BMP efforts and participation in the Regional Coalition for Clean Rivers and Streams public awareness and education activities.

Coordination with Others

The co-permittees coordinated closely with other local agencies to develop the NPDES permit application and individual Stormwater Management Plans, and continue to rely on regional cooperative efforts to successfully fulfill some of the permit requirements. The co-permittees work closely with the regional government, Metro, to support programs that have a positive water quality benefit. Examples include the household hazardous waste disposal program (BMP ILL1), the "Alternatives to Pesticides" education program (BMP PI1), and development of the 2040 Plan, a plan related to regional growth that will have significant effects on the Stormwater Program as a whole.

Representatives from the City, Multnomah County, and the Oregon Department of Transportation continue to actively participate in the Oregon ACWA Stormwater Committee to provide statewide coordination of stormwater permit implementation issues. Most Oregon agencies with NPDES stormwater permits are represented on this committee.

REPORT PREPARATION AND ORGANIZATION

The BES stormwater management team has coordinated preparation of this Annual Compliance Report on behalf of the City and its co-permittees. In addition to the co-permittees, all affected City bureaus participated in the report preparation, most notably Water, Transportation/Maintenance, Parks, Buildings, Planning, and Fire. The individual reports prepared by these other City bureaus have been compiled into a single City of Portland report. For submittal to DEQ,

the co-permittee reports have been combined into a single package with the City of Portland report.

This third annual report covers the period from July 1, 1997 through June 30, 1998. It includes activities that are a continuation of second-year activities. It does not repeat activities that were completed in year 2 (i.e., it is not cumulative).

The report is organized as follows:

- **Executive Summary**--A summary of significant program activities and program status for all of the co-permittees.

- **Section I: General Introduction**--An overview of the overall permit background and regulatory information, program components, program coordination, and report organization, relevant to all of the co-permittees.

- **Sections II through VI**--The individual compliance reports of the co-permittees, describing implementation actions taken, program status, and any initiated or proposed program changes.

- **Section VII: Portland NPDES Third Annual Stormwater Monitoring Compliance Report**

- **Appendices**

The report's goal is to convey clear, succinct program information that complies with the annual reporting requirements of the NPDES permit. The report will also provide Portland City Council and other interested parties with a Stormwater Program status overview. Detailed supporting information, such as inspection reports, logs, and individual correspondence, are archived at each permitted agency and are available to DEQ upon request.

Section II

CITY OF PORTLAND

CITY OF PORTLAND CONTENTS

	Page
INTRODUCTION	1
PROGRAM ORGANIZATION AND COORDINATION	1
RELATIONSHIP TO OTHER WATER QUALITY PROGRAMS	2
CITY BUDGET AND FUNDING	5
COST-EFFECTIVENESS	7
PROGRAM ASSESSMENT	8
ACTIVITY REPORTS	9
BMP PI1/ED1	11
BMP OM1	18
BMP OM2	22
BMP IND1	26
BMP ILL1	31
BMP ILL2	34
BMP ND2	40
BMP ND3	42
BMP ND4	44
BMP ND5	48
BMP STR1	53
BMP STR2	57
BMP STR3	60
BMP STR4	65
BMP PSI	69
BMP PS2	74
EARLY ACTION PROJECTS	77

CITY OF PORTLAND

INTRODUCTION

This third Annual Compliance Report for the City of Portland documents activities that occurred during the third fiscal year (July 1, 1997 through June 30, 1998) of the permit program and evaluates the status of the Stormwater Program. Key accomplishments for FY 97-98 include:

- Drafting of the *Stormwater Management Manual*, as directed by the Stormwater Policy Advisory Committee, to implement stormwater management standards for new development and redevelopment

- DEQ's approval of modification of the Stormwater Monitoring Program from a land use-based approach to an approach based on best management practices (BMPs).

- Completion of the Parkrose Pilot Project, with project close-out and evaluation to occur in permit year 4.

This section provides background information about the City's program organization and coordination, the relationship of the Stormwater Program to other water quality programs, relevant City budget and funding considerations, and program cost-effectiveness. Individual activity reports for each BMP (and related EMPs) and early action projects then follow.

PROGRAM ORGANIZATION AND COORDINATION

Program Authorization

The Portland City Council passed a resolution supporting the final National Pollutant Discharge elimination system (NPDES) stormwater permit application in June 1995. In that resolution, the Council designated the Bureau of Environmental Services (BES) as the lead for the City's implementation of the Stormwater Program.

Organization/Coordination within the City

As stated in last year's report, BES undertook a bureau-wide, function-based reorganization during year 2 of the NPDES permit period. All bureau project planning was centralized within the Systems Development Group and organized by watershed to enhance project coordination. At the end of year 3, BES implemented

an Integrated Watershed Planning (IWP) approach within the Systems Development Group to coordinate all water quality programs.

During FY 97-98, budgetary impacts from property tax limitation measures, passed by general election in November 1996, became more apparent. Consultant program assistance was reduced by approximately 40 percent from FY 96-97 funding levels. Stormwater program staff, reduced to fewer than three full-time equivalent staff during permit year 2, was further affected by implementation of the IWP effort. Stormwater Program staff are now participating on watershed teams to integrate Stormwater Program elements into watershed plans. Although the IWP effort will ultimately provide a means of implementing Stormwater Program activities, the initial planning stage (early in permit year 4) may affect ongoing BMP implementation.

To coordinate Stormwater Program activities within the City, the Bureau Representatives Group (formerly the technical advisory committee, or TAC) meets on an as-needed basis. The Bureau Representatives Group meetings provide a forum for regular communication among bureaus to plan and ensure NPDES permit compliance.

Program Approach

BES's Stormwater Program Manager is responsible for overall project management, compliance reporting, policy development, and coordination within the City of Portland. During year 3, Program Area Project Teams implemented the Stormwater Program, using an outcome-based approach. The teams were led by BES Stormwater Program staff and included members from various City bureaus. However, due to BES's shift to Integrated Watershed Planning, program activities in permit year 4 will be implemented on a watershed-by-watershed basis. Integrated watershed plans for the major watersheds (Columbia Slough, Johnson Creek, Willamette, and Fanno/Tryon) will be completed during Spring of permit year 4.

RELATIONSHIP TO OTHER WATER QUALITY PROGRAMS

Although not all the following activities are specifically required as part of the NPDES permit, they are closely associated with the Stormwater Program and related to stormwater quality.

CSO Program

The City is actively implementing a Combined Sewer Overflow (CSO) Program designed to eliminate sanitary sewage overflows to the Willamette River and Columbia Slough. The CSO Facilities Plan, completed in 1994, recommends

implementing a combination of roof drain disconnects, sump installation, hard-piped structural control solutions, and wet-weather treatment plant facility construction. Part of the CSO abatement strategy includes separation of combined flows in some areas and evaluation of water quality treatment alternatives for the resultant separated stormwater flows. In permit year 4, CSO implementation will be incorporated into the IWP approach.

Willamette River Pre-Design Project

The Willamette River Pre-Design Project was initiated during permit year 2 to re-assess long-term community values and ensure that broad water quality issues are addressed in the Willamette River portion of the CSO Facilities Plan. The Pre-Design Project includes evaluating innovative "green" technologies, such as infiltration ponds, roof-top stormwater detention, bio-infiltration swales, and vegetated buffer strips to reduce stormwater runoff and improve water quality. The planning and cost-effective analyses for the green solution and in-flow control and the development, calibration, and execution of hydraulic and pollutant models for existing conditions were completed during permit year 3. In permit year 4, implementation of green solutions will begin and the Willamette River Pre-Design will be incorporated into Integrated Watershed Planning.

Public Facilities Plan

During permit year 3, BES continued preparation of the Public Facilities Plan (PFP). Last updated in 1987, the PFP historically focused on infrastructure issues such as pipe conveyance and wastewater treatment system capacity. To incorporate broad water quality and stormwater issues, the current PFP includes evaluating retrofits to existing facilities to reduce stormwater pollutants and assessing channel and riparian zone resources. During FY 97-98, resource assessments were completed for the Fanno and Tryon Creek watersheds. The assessment reports evaluate stream and riparian conditions and prioritize enhancement sites. These assessments will be of critical importance in determining and proactively mitigating the stormwater-related impacts of increased urban density, as part of the City's current planning efforts to meet the requirements of Metro's Stream and Floodplain Protection Plan (Title 3), as well as BES's Integrated Watershed Planning. In addition, the *Stormwater Management Manual,* begun in permit year 3, will use the resource assessments to evaluate stormwater management requirements relative to stormwater impacts on receiving waterbodies. The Public Facilities Plan will also integrate and institutionalize elements of the IWP effort.

Watershed Programs

During FY 97-98, the City of Portland continued implementing watershed programs in the Columbia Slough, Johnson Creek, Fanno Creek, Balch Creek, Tryon Creek, and the Willamette River . The Willamette River watershed focuses on Balch Creek, streams draining to the Willamette that are not currently addressed under a separate program (i.e., Stephens Creek), and areas affected by the Willamette River Pre-Design Project. As discussed previously, during the latter part of permit year 3, BES implemented Integrated Watershed Planning to stress comprehensive, multi-objective watershed management along geographical boundaries, coordinating the various jurisdictional and public interests within those areas.

Water quality improvement and protection are critical objectives in establishing watershed priorities. These objectives were heightened during this permit year by the National Marine Fisheries Service's (NMFS) listing of steelhead trout as a threatened species under the Endangered Species Act (ESA) on March 13, 1998, and by the passage of Metro's Stream and Floodplain Protection Plan (Title 3).

The ESA listing applies to the Lower Columbia River evolutionary significant unit. The affected area includes the Willamette River and its tributaries, upstream to Willamette Falls. Within the permit area, the main problems include water quality and habitat degradation, habitat loss, and fish passage blockage by structures such as culverts. Altered streambank flows, loss of spawning gravels, and sedimentation all negatively affect spawning habitat. Decreased water oxygen, increased temperatures, bacteria, nutrients, pH, and toxic contaminants are all water quality parameters that can also negatively impact fish. In 1996, DEQ listed the Willamette River, Johnson Creek, and Tryon Creek as "water quality limited" for these parameters. Many of these parameters can be linked to increased stormwater runoff from urbanization and related decrease in water quality. This, in turn, results in increased sediments and associated contaminants of concern (bacteria, toxics, nutrients, and biochemical oxygen demand). The Stormwater Program activities integrate closely with ESA goals by implementing BMPs that will mitigate stormwater quantity impacts and improve water quality.

In Spring 1998, the Metro Council adopted the model ordinance and maps that will be used to carry out the performance standards of the Stream and Floodplain Protection Plan (Title 3). The Plan is a part of the Urban Growth Management Functional Plan that applies to all 24 cities and counties within the Metro boundary and includes both recommendations and requirements for local governments to meet. Title 3 describes specific performance standards and practices for floodplain and water quality protection. The requirements for floodplain protection include balanced cut and fill for any new development in the floodplain and removal of temporary construction fill. The performance standards for water quality closely

relate to existing Stormwater Program BMPs. These requirements include preservation of vegetated buffers along rivers, streams, and wetlands for all new development; minimum widths for vegetated corridors (50 feet from the top of bank on both sides of streams for slopes less than 25 percent and 200 feet for slopes greater than 25 percent); erosion prevention and sediment control for all new development within the Metro boundary, regardless of the size of development; and prohibition of the uncontained uses of hazardous materials along rivers and streams. During permit year 4, the Stormwater Program will identify and implement opportunities to address Title 3 requirements in coordination with development of the Integrated Watershed Plans.

Because of high public interest in the health of Portland's watersheds, public participation is an important element of watershed planning and implementation. During FY 97-98 , the City actively participated on watershed councils for the Columbia Slough, Johnson Creek, and Tryon Creek. In addition, the City fosters citizen stewardship through its Community Stewardship Program. That program provided $30,000 in grants to citizen groups to conduct water resource enhancement projects in their watersheds.

Pretreatment Programs and the Publicly Owned Treatment Works (POTWs)

Many of the City's more traditional operations and infrastructure support water quality goals. Sanitary sewage is collected for treatment at the Columbia Boulevard and Tryon Creek publicly owned treatment works (POTWs). The Columbia Boulevard Headworks was completed last fiscal year to improve wastewater treatment and accommodate increased flows resulting from capture of combined sewage previously discharged as overflows. The new headworks handles an average daily flow of 80 million gallons and in wet weather can process 300 million gallons a day. Existing pretreatment programs protect the sanitary system infrastructure, reduce pollutant releases to surface waters during combined sewer overflows, and prevent discharges that could cause treatment upsets or result in pollutant pass-through to surface waters. During permit year 3, modeling support for the Columbia Boulevard Wastewater Treatment Plant outfall improvements was completed.

CITY BUDGET AND FUNDING

The annual City of Portland costs for program administration, planning, development, program monitoring, public education and outreach, and demonstration project implementation (Parkrose Pilot Project) have averaged approximately $550,000 during each of the first 3 years of the permit period. For the same time period, related Stormwater Program activities have averaged

$1 million per year for watershed planning and $3 million per year for capital project implementation (e.g., Brookside wetland).

Because of the integral nature of the Stormwater Program with the City's normal operating functions, other costs related to implementation of the program are very difficult to quantify.

These programs are primarily financed by City stormwater drainage fees. In some cases, these are directly provided by monthly rates and stormwater development charges; in other cases, such as capital projects, they are bond-financed, to be paid back later through monthly fees. City Council approved revised stormwater monthly fees and stormwater system development charges during permit year 3. Monthly fees were adjusted to reflect operating, maintenance, and capital costs of the City's sanitary sewer and drainage system. The rate adjustments were based upon cost of service principles, ensuring equity by charging ratepayers according to the amount of sewer and drainage service they use. Monthly rates increased from $2.92 to $3.26 per 1,000 square feet of impervious surface, which translates to an increase from $6.07 to $7.82 per single family residence per month.

Formerly based on impervious area, the methodology for assessing system development charges for new development and significant redevelopment was revised to include two components. One represents the charge for stormwater facilities that handle runoff from individual properties. This portion will continue to be assessed based on impervious area. Credits will be granted against this part of the charge for onsite facilities constructed as part of new development. The other portion represents the cost of stormwater facilities that handle runoff from public rights-of-way. This portion will be assessed based on the use of the transportation system, using road frontage and vehicle trips to allocate the costs. The new monthly rates and system development charges will become effective at the start of permit year 4.

Some Stormwater Program projects are funded by federal programs. The Columbia Slough watershed program implemented a number of stormwater-related measures using funds from year 3 of the EPA Slough revitalization grant of $10 million. Permit year 4 is the last year of this EPA grant. The Johnson Creek watershed program received over $2.25 million from the Federal Emergency Management Agency (FEMA) and Community Development Block Grant flood mitigation programs. Combined with BES and Parks Open Space funds, 35 acres of land in frequently flooded areas were purchased.

COST-EFFECTIVENESS

The numerous groups participating in program implementation, integration of stormwater activities throughout the City, and coordination with the Integrated Watershed Planning effort result in cost-effective benefits. Indicators of success include:

- To address flood-related damage from the fall and winter of 1996/97, the City applied for and received matching funds from the Natural Resources Conservation Service (NRCS) to mitigate flood-related resource impacts in the riparian zone. The NRCS provided $175,000 for two restoration projects in Fanno Creek and Tryon Creek. These projects mitigated stream channel flood impacts from the February 1996 storm event. These remediation measures, implemented in permit year 3, will protect and improve water quality by stabilizing slope failures and mitigating erosion.

- BES and the Bureau of Parks and Recreation created an effective partnership to implement streambank restoration, riparian enhancement, community involvement, and water quality benefits at Marshall Park. Partnering of the two bureaus allowed for cost-sharing of resources, and locating the project on Parks property provides educational access and benefits.

- Stormwater Program staff researched innovative national and international stormwater management technologies, such as eco-roofs, and compiled a resource compendium of projects, designs, and vendors. Based on this research, an educational eco-roof display was constructed and exhibited at Portland's Annual Fall Home and Garden Show.

- With little investment of public resources, the *Naturescaping for Clean Rivers* program continues to successfully help homeowners integrate stormwater management into their yards. This program was expanded to include commercial and industrial applications in permit year 3.

- The Watershed Stewardship Program has granted at least $30,000 per year, leveraging an average of seven times that amount in volunteer and in-kind services from organizations, schools, and citizens for water quality projects.

- The integration of stormwater permit requirements into BES's Integrated Watershed Planning activities and capital projects criteria has incorporated permit requirements into all bureau projects.

- BMPs are tested and monitored before their citywide implementation through pilot projects such as Parkrose, the BES Water Quality Laboratory

(swales), and watershed projects (Balch Creek, Johnson Creek--Brookside) to help ensure facility efficiency and cost-effectiveness.

- Increased coordination with watershed activities, such as monitoring, has provided the Stormwater Program with additional data at no extra program cost.

- Continued collaboration with the Oregon Association of Clean Water Agencies (ACWA) has provided shared resources and information and prevented duplication of efforts (e.g., monitoring, permitting) among the state's permitted municipalities.

- The City has formed collaborative partnerships with many nonprofit, government, and academic institutions to investigate and implement innovative, cost-effective stormwater management strategies. These institutions include the University of Oregon, Oregon State University, Portland State University, Oregon Graduate Institute, and Metro.

- The Willamette River Pre-Design Project created a "green solutions" sub-task to integrate innovative stormwater treatment and management approaches into stormwater separation for part of the combined sewer system. These approaches use passive pollutant removal systems prior to discharge or infiltration. These methods are being reviewed for their cost-effectiveness compared with more traditional stormwater treatment or with remediating pollutant load impacts to receiving waters.

PROGRAM ASSESSMENT
(How Well Has the Program Worked?)

As in permit year 2, budgets and available resources continue to affect program implementation. This constraint became more pronounced because of the FY 96-97 budget reductions caused by property tax limitation measures and resultant City and Stormwater Program staff reductions. As a result, Stormwater Program implementation must encompass existing program priorities, permit renewal in year 4, and new stormwater quality requirements with reduced budgets and staff.

A Stormwater Policy Advisory Committee (SPAC) was formed in April 1996 to coordinate complex Stormwater Program issues that affect a wide range of stakeholders. The SPAC provides a forum for a broad base of stakeholders to develop policy guidance on balancing the goal of increased urban density with stormwater management. Representatives from City bureaus, business, home builders, developers, citizen groups, environmental groups, and other agencies

are included on the committee. During permit year 2, the SPAC developed stormwater policy guidance for new and significant redevelopment (BMP ND5). In June 1997, the SPAC recommended new stormwater management standards for new and redevelopment to be implemented through a *Stormwater Management Manual.* Development of the *Stormwater Management Manual,* with input from the SPAC and a Technical Advisory Team, began in permit year 3. Refinement of the manual and SPAC involvement continues into permit year 4.

The SPAC has also identified additional policy issues that it or a similar committee will address. These issues include stormwater management from existing development and redevelopment.

As noted above under "Cost-Effectiveness," the Portland Stormwater Program has been very cost-effective in terms of the benefits received. The exact long-term costs of the program, both to public and private sources, have yet to be determined.

ACTIVITY REPORTS

The following pages summarize the status of the various program activities, including BMPs, EMPs, and early action projects.

For each BMP, the following information is provided:

- The BMP identifier (e.g., PI1/ED1) and title.
- The BMP description from the Stormwater Management Plan.
- The desired outcome
- Key accomplishments for permit year 3. This section describes the year's activities and notes any significant changes/improvements from year 2. It also compares how actual year 3 activities compare with projected year 3 activities, as predicted in the last annual compliance report. Finally, this section notes the compliance status of this BMP in relation to permit schedule requirements. (See Appendix C for a summary of schedule requirements.)
- The status of related EMPs (in their form from the Stormwater Management Plan). This section focuses on noteworthy accomplishments or changes in existing practices. Where no specific text is included, no changes from the approach or practices shown in the original Stormwater Management Plan have occurred.*

- Challenges and solutions

- Potential modifications needed to the NPDES permit

- Projected major accomplishments for next fiscal year (1998-99)

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* EMP(iv) applies generally to all of the activity areas. As it is shown in the Stormwater Management Plan, it includes the following description and major headings:

Proposed Management Program shall include a comprehensive planning process which involves public participation...to reduce pollutants,...control techniques and systems,...and such other provisions which are appropriate.

- Clean Rivers Program
  - Drainage and Stormwater Quality
  - Combined Sewer Overflow (CSO) Program
  - Public Education and Involvement
- Mid-County Sewer Project
- Industrial Control Programs
- Solid Waste and Recycling Programs
- Public Facilities Management
- Smith and Bybee Lakes Management Plan
- Development Controls
- Light Rail Project
- Bi-State Lower Columbia Water Quality Program
- Carbon Dioxide Reduction Strategy
- SOLV
- State Toxic Material Reduction Act
- Land Use Plan District Planning
- Urban Forestry
- Livable Cities Planning Project
- Reclaiming Our Streets
- Skinny Streets Program
- State Transportation Planning Rule

Many of these program areas are addressed individually in the activity reports that follow.

PI1/ED1	Develop a comprehensive public involvement and education program

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Develop a comprehensive stormwater/watershed public participation program.

Develop a comprehensive stormwater/watershed education program.

DESIRED OUTCOME(S)

Actively engage Portland's citizens in improving water quality by reducing stormwater pollution.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

Education Video Series (See Nontraditional Activities)

Naturescaping for Clean Rivers

Continued *Naturescaping for Clean Rivers* residential program, in partnership with the East Multnomah Soil and Water Conservation District (EMSWCD). Activities included:

- Thirteen 4-hour workshops were conducted, with 271 participants. The workshops encompassed all Portland watersheds: Columbia Slough, Johnson Creek, Fanno Creek, Tryon Creek, Balch Creek, and Willamette River. In addition, 121 participants attended 14 follow-up mini workshops and tours.

- Information and messages were disseminated through a wide variety of venues, reaching thousands of citizens. Sixteen presentations were made. These included: 1) Presentations at community meetings (neighborhood associations, watershed councils, friends groups, garden clubs), 2) Presentations at regional conferences, including one sponsored presentation in Florida, and 3) Display booths at fairs and community events.

- Brochures and program information were also disseminated to 5,000 households through the City's Downspout Disconnection program. In addition, 20,000 households were verbally informed about Naturescaping concepts through the door-to-door effort of the Downspout Disconnection

program. A neighborhood event through the Friends of Trees organization distributed 150 trees. Approximately 10,000 households were reached through dissemination of brochures, flyers, and e-mail messages. Many more thousands were reached through local radio announcements, news stories, and a bill stuffer.

Home and Garden Show

- The organizers of this huge event offered the city a four-space area to exhibit an eco-roof pavilion, Naturescaping, and Downspout Disconnection. The City partnered with local businesses for their expertise and labor for this very large, 3-day event. Thousands (70,000 attended the show) were reached through the 38 volunteers who staffed the booth. In addition, a downtown roof-top garden tour was conducted and attended by 21 participants.

Nontraditional Activities

- Conducted three *Engaging Nontraditional Audiences* workshops: one for the annual International Association of Public Participation (IAP2) conference in Toronto, Ontario, Canada; one for the Arizona IAP2 chapter, and one in Portland in partnership with the local IAP2 chapter and the Portland Office of Neighborhood Involvement. A Portland area waiting list is being maintained for a future workshop as the workshops continue to generate interest with individuals and agencies.

- Completed the Parkrose Area Pilot Project *Nontraditional Audience Outreach* report. The report concluded with a "Guide to Ethnic Cultural Resources" in the Parkrose area.

- Distributed the *Clean Rivers: Why Should I Care?* (Volume I) video to 105 schools, agencies, and individuals. Also distributed 92 education activity packets.

- Conducted an outreach activity in partnership with the Columbia River Girl Scouts Council, Inc. Four troops in the inner city Portland area viewed the *Clean Rivers: Why Should I Care?* Volume I video as background information, then distributed an alternative cleaning product and informational brochure to 215 households in the area.

- Translated the *Clean Rivers: Why Should I Care?* Volume I video into Spanish. This version was distributed and viewed by 620 persons in the following organizations: Hispanic Access, La Raza, Oregon Council on Hispanic

Advancement (OCHA), Oregon Leadership Institute (OLI), Proyecto Adelante, Proyecto Conexion, LISTOS, and 4-H clubs within the state.

- Selected the production company and student talent for the *Clean Rivers: Why Should I Care?* Volume II educational video. This volume will include animation to deliver the messages. Fifty-three students of various ethnic and socio-economic backgrounds auditioned for the second video project. Eleven were chosen to participate in the project during the summer of 1998.

Stormwater Education Activities

- Reached approximately 20,519 students (grades K-12) with the "Clean Rivers Education Program," providing hands-on, interactive science education focusing on stormwater issues. Program options include:

  Classroom presentations : *Watershed Awareness, Stormwater Storytelling, Riparian Eco-Invaders*

  Field trips: *Willamette River Boat Tours, Investigating Urban Streams/Wetlands*

  Assembly Programs: *Raindrops to Rivers, Clean River Quest*

  Festivals: *Stormwater Obstacle Course*

- Provided a Riparian Eco-Invader check-out exhibit at Tryon Creek State Park for summer viewing.

- Used two Americorps staff members to promote storm drain stenciling of 114 BES facilities and 247 storm drains; this includes all BES properties. Stewardship stenciling activities and education programs were tied together in an effort to involve new citizens in stenciling. Tryon Creek State Park staff were given a permanent box of stencils for local use.

- Provided a much sought-after second Stormwater Obstacle Course kit for check-out to groups.

- Added jet boat tours, partnering with the Willamette River Keepers.

Stewardship Grant Projects

- Provided stewardship grants to:

Stephenson Elementary and Markham Adventure schools for their Naturescaping gardens

Parkrose High School to raise native plants for sale to the community

Madison High School to work with a golf course to develop and plant an upland Naturescape

- Developed a new Project Wet Teacher activity, Sum of the Parts, for elementary and junior high teachers. This activity shows the cumulative impact of stormwater pollution.

Education Advisory Committee

- Continued monthly Education Advisory Committee meetings to review and advise on public participation approaches and activities.

Regional Coalition for Clean Rivers and Streams

- Continued participation in the Regional Coalition for Clean Rivers and Streams, made up of four agencies (which also represent all of their participating co-permittees): City of Portland, Unified Sewerage Agency, Clackamas County, and City of Gresham. Developed and implemented a public awareness campaign in April and May 1998. This included printed ads in regional newspapers, a Spanish translated version for a regional Hispanic News newspaper, and local radio spots. Packets of brochures were available to those who called a "hot line" for more information.

Publications

- Published one issue of the quarterly newsletter, *The Mainstream*.

- Published two *Clean River Tips* postcards that were mailed to the Parkrose Area Pilot Project mailing list of 600. In addition, several hundred more were printed and distributed through all Portland watersheds.

- Distributed educational materials at community meetings and events.

Note: Public education and involvement activities are also cited under other BMPs where appropriate and under the Parkrose Pilot Project early action project.

Significant Changes/Improvements from Year 2

Funding for the temporary part-time staff person to augment the *Naturescaping for Clean Rivers* program was discontinued.

Comparison with Projected Accomplishments

The projected accomplishments for fiscal year 1997-98 identified in the second annual compliance report (September 1, 1997) were achieved, with the following exceptions:

- Formation of a program-wide public advisory committee: Deferred, pending availability of staff resources and funding.
- Comprehensive media/public information plan: Deferred to FY 98-99.
- Stormwater Runoff: Deferred, pending availability of funding and staff resources.
- *Taking Care of Your Watershed* guidebooks (finalize and distribute for Fanno, Balch, and Tryon Creek): . Deferred to FY 98-99.
- "Adopt A Storm Drain" program: Deferred to FY 99-00.

Compliance Status

On schedule.

RELATED EMP STATUS

EMP (B)(5)

"... a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts..."

Illicit Discharge and Public Response
(Also see ILL1 and ILL2)

Oregon Adopt-a-River Program (SOLV)

SOLV has two programs that provide watershed clean-up. "Down by the Riverside," a one-day event held in many locations, provided 57 volunteers to

pick up 16,620 pounds of debris. The ongoing "Adopt-a-River" program provided 120 people to pick up 3,415 pounds of debris.

Neighborhood Clean-up Program

This program included about the same level of effort as reported last year, with the exception of the ice storm clean-ups.

EMP (A)(6)

"... reduce to maximum extent practicable (MEP) discharges from MS4s of pesticides/herbicides/fertilizers (p/h/fs)..."

Education

Alternatives to Pesticides Program (managed by Metro)

The City and Metro have changed their approach for this partnership. The focus is on partnerships with two golf courses to reduce the use of chemicals and increase the use of native plants.

Alternatives to chemical use is also an integrated message in the *Naturescaping for Clean Rivers* Program.

CHALLENGES AND SOLUTIONS

No unusual challenges.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

None requested.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Pursue formation of a program-wide public advisory committee.
- Develop a *Clean Rivers: Why Should I Care?* Volume II education video.
- Develop a comprehensive media/public information plan.
- Work with the Office of Neighborhood Involvement (ONI) to identify opportunities for joint materials and activities.

- Conduct the "Stormwater Runoff," a walk/run fun event in and around downtown Portland/the Willamette River (if funding and staff resources are available).

- Develop and implement public participation materials/activities as needed for other BMPs.

- Finalize the Balch Creek, Fanno Creek, and Tryon Creek *Taking Care of Your Watershed* guidebooks.

- Work with the Regional Arts and Culture Council (RACC) to plan and implement a visual arts stormwater activity/event.

- Continue ongoing activities such as the Regional Coalition for Clean Rivers and Streams, the *MainStream*, educational activities, the Clean River Works public awareness campaign, the Educational Advisory Committee, and *Naturescaping for Clean Rivers*.

- Update the 2-year Public Participation Action Plan.

- Conduct the following activities for the *Naturescaping for Clean Rivers* program:

  Develop and implement an evaluation plan to determine the program's effectiveness for pollution prevention.

  Develop a plan for "Big Yards" (business/industry/public) and the related "trade" organizations. Implement a pilot of this program element.

OM1	Develop an operations and maintenance plan for public stormwater controls and evaluate existing practices

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Develop an operations and maintenance (O&M) plan for public stormwater quality structural controls and evaluate existing stormwater maintenance practices that affect water quality.

DESIRED OUTCOME(S)

Evaluate and revise, if appropriate, operations and maintenance practices for public structural stormwater controls to reduce pollutant discharges.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- The BES Sewer Maintenance Group has completed the inventory of structural facilities and condition assessment of these facilities.

- Continued revision of the Wastewater Collection Management System database to the MAXIMO database to track maintenance efforts and conditions of facilities.

- Began construction of a new dewatering facility for vactor wastes. The new facility will have double the capacity to dewater solids from sumps, inlets, and catch basins.

- Completed an operations and maintenance plan requirements list for all new water quality facilities, both public and private (see ND5).

- Developed a draft survey for watershed managers to assess watershed-specific operations and maintenance plan needs.

Significant Changes/Improvements from Year 2

The BES Sewer Maintenance Group initiated and completed a sediment measurement project on 90 percent of inventoried sumps and sediment manholes that are over 2 years old. Measurements will be used to generate needed cleaning work orders and will establish a maintenance baseline and provide data to develop area-specific sediment accumulation rates.

Comparison with Projected Accomplishments

- Work to evaluate the level of O&M needed for water quality is continuing. Over the past year, efforts were confined to condition assessment rather than activity evaluation. No direct pilot testing of individual maintenance practices occurred this permit year.

- Work is still continuing on watershed-specific O&M plans and needs assessments to incorporate into the Maintenance Manual. A draft survey has been developed and will be completed after Integrated Watershed Plan efforts finish their first phase of work.

Compliance Status

The final O&M plan for water quality facilities is in progress, and implementation of improved practices will occur as evaluations are completed and the additional work is budgeted.

RELATED EMP STATUS

EMP (A)(1)

"*... maintenance activities and schedule for structural controls...*"

EMP (B)(7)

"*Description of controls to limit infiltration of seepage of sanitary sewers to MS4...*"

The following categories of activities addressed the above EMP elements: stormwater passive treatment facilities, swales (bio-filtration), ditches, detention ponds and road-crossing culverts, trash racks, sumps, catch basins, subsurface sanitary disposal control, standard design specifications, inflow and infiltration, and animal waste control. Ongoing maintenance activity for the following types of facilities is based on emergency need only, with a small amount of routine maintenance. The noteworthy accomplishments and/or changes within those EMPs are:

- Repaired or constructed 187 inlets, 1,496 feet of inlet lead, 224 sumps, 212 culverts, and 13 trash racks.

- Cleaned approximately 300 sumps, 15,700 catch basins, 18 detention ponds, one swale, 33,000 feet of culverts, 50,000 feet of ditch, and spent 3,500 labor hours cleaning trash racks.

- Permitted and inspected 1,202 subsurface sanitary disposal facilities.

- Multnomah County Health permitted 44 exotic animal permits and responded to over 500 animal waste/odor control calls.

CHALLENGES AND SOLUTIONS

As budgets shrink and new facilities are added to the maintenance roles, individual facility maintenance is beginning to occur less frequently. New funding mechanisms and/or reprioritizing existing funding sources will be needed to adequately maintain all existing and new water quality and quantity control facilities and other parts of the sewer collection system. One solution the city is using is condition assessment to identify region- or facility-specific maintenance schedules.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

A full evaluation of maintenance practices for water quality facilities has not yet taken place, so a modification of the permit is requested. The City instead has concentrated on moving to a more accurate system for identifying and implementing needed maintenance at all stormwater pollution reduction and conveyance facilities. The City requests a modification to the permit to shift to a program stressing appropriate and adequate maintenance efforts for the life system of the facility, with subtler efforts aimed at activity evaluations of practices for water quality.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Complete a secondary sediment measurement pass on sediment manholes and sump facilities.

- Complete facility maintenance workplan to request further funding and staffing on condition assessment and water quality efforts.

- Complete construction of the second sump dewatering pad.

- Develop a workplan to evaluate at least one O&M practice for water quality facilities a year, as budget allows.

- Complete survey of watershed-specific maintenance activity needs and maintenance frequency, and develop into watershed-specific sections of the Stormwater Maintenance Management Manual.

- Continue research on new and improved practices for inclusion in the Stormwater Maintenance Management Manual.

OM2	Evaluate operations and maintenance activities for public rights-of-way

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Evaluate operations and maintenance (O&M) activities for public rights-of-way to determine water quality impacts. Recommend improved procedures or practices that reduce the discharge of pollutants to the stormwater system.

DESIRED OUTCOME(S)

Evaluate and, where appropriate, revise operations and maintenance practices for public rights-of-way in order to reduce pollutant discharges to the storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Task 3 and 4 of the permit were completed with the preparation and TAC review of the OM2 Workplan for implementation. A copy of the Workplan (May 12, 1998 Revision) is available upon request.

- Implementation of the work plan has begun with pilot projects prior to full-scale implementation of revisions to practices. The following pilot projects are underway:

  1. Administrative Management Team: To build institutional support for stormwater quality improvements, regular meetings of the Bureau of Maintenance's administrative managers has begun. The administrative team is working to track program implementation and applicability of pilot projects to individual operations, and will review and recommend application of successful practices to other maintenance operations.

  2. Basic Awareness Training: Training started with senior staff and progressed to the administrative management group and division staff, with training scheduled to start in July 1998 for field crews.

  3. Runoff Management Kits: Runoff management turned out to be a greater concern than erosion control in Bureau operations. Products have been evaluated and ordered for testing.

- Outside of the pilot program, the Maintenance Bureau is testing alternatives to diesel oil as an asphalt releasing agent. Initial results have been promising on truck beds, but effectiveness in machinery needs additional testing to determine if costs and benefits justify transition to new releasing agents.

- The Stormwater Management Team in the Office of Transportation and Bureau of Maintenance is also working to help endangered salmon and steelhead in local receiving waters. The team is represented on the citywide committee to develop a coordinated response to the listing of species under the Endangered Species Act. The OM2 Workplan has already been a valuable tool to help identify areas of potential benefits to species and habitat.

Significant Changes/Improvements from Year 2

The focus has shifted from preliminary evaluation of activities to testing pilot improvements to practices.

Comparison with Projected Accomplishments

The final OM2 Workplan was presented to the TAC on schedule in early 1998 for review and comment. It includes improvements to practices, an implementation plan, and a proposed implementation schedule.

Actual implementation of the Workplan started with a presentation to senior managers and division staff in mid to late 1997. An administrative management team (discussed above) was created in November to begin implementation of clean water practices.

Compliance Status

In compliance with all permit dates.

RELATED EMP STATUS

<u>EMP (A)(1)</u>

"*... maintenance activities and schedule for structural controls...*"

<u>EMP (A)(3)</u>

"*...a description of practices for operating and maintaining public streets, roads, and highways and procedures for reducing the impact on receiving waters ...including deicing...*"

The following categories of activities addressed the above EMP elements: street cleaning and roadside maintenance, street repair and paving, sewer cleaning and repair, traffic maintenance, structures maintenance and repair, and sidewalk repair. The noteworthy accomplishments and/or changes within those activities are:

- The City of Portland continues to work with ODOT and the FHWA to develop a snow and ice program that meets both transportation and environmental needs. Rock washing continues, which reduces TSS loading, while the City continues to work to balance TSS and BOD issues in managing the snow and ice control program.

- Evaluation of the "potential environmental improvements to practices," listed in section 3 of the OM2 Workplan, is continuing to determine realistic approaches.

- The team of administrative managers is tracking pilot projects to determine applicability to specialized needs of individual operations.

- The Bureau continues to take an integrated approach to landscape management:

    1. Experimental planting and horticultural practices are still being developed and tested to stabilize drainage and transportation facilities, control erosion and other pollutants, and minimize requirements for irrigation and chemical application.

    2. Certification is required for Bureau of Maintenance chemical applicators and selected staff specializing in managing vegetation.

CHALLENGES AND SOLUTIONS

Like other programs, operation and maintenance of public rights-of-way is faced with the challenge of providing basic urban services in an era of decreasing revenues, increasing costs, and additional responsibilities to reduce negative impacts to local waterways. The City will pursue an integrated approach among its many bureaus to create a sustainable plan that addresses City goals. Partnering with other bureaus within the City and other local jurisdictions should help meet the goals of adequate urban services, protecting local waterways, and supporting regional environmental quality.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

No modification to the permit is anticipated.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

A strong base for expanding basic projects and testing improvements for individual programs is anticipated by the end of permit year 4.

IND1 Control discharges from industries and solid waste facilities

The Industrial Source Control Division (ISCD) in BES is conducting most of the activities related to this BMP.

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Develop a comprehensive program to control the discharge of pollutants to the stormwater system from existing and developing industries and municipal solid waste facilities, including procedures to develop and enforce requirements, conduct inspections, and implement a monitoring program.

DESIRED OUTCOME(S)

Implement consistent approaches and enforcement to control industrial and commercial discharges.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Inspected, sampled, and administered the permits for 98 industries with discharge of stormwater to the MS4. Continued to perform annual compliance inspections and additional inspections, if warranted, to provide technical assistance or assess BMP implementation.

- Continued to perform inspections and evaluate the need for stormwater permits for non-permitted industries in the MS4. Identified 12 industries required to obtain stormwater permits.

- Continued to implement an industrial data base to track inspections, permits, stormwater drainage issues, monitoring results, and industrial information. Continue to modify the data base to include pertinent information and improve reporting capabilities.

- Performed inspections, collected stormwater samples, and presented findings to DEQ for classes of industries with pollution potential prevalent in the Columbia Slough Basin for inclusion into the permitting program.

- Evaluated SARA Title III listings versus the State Fire Marshall's list to determine discrepancy in listing. Determined that State Fire Marshall's list is

more expansive. However, only SARA Title III industries are required to obtain stormwater permits. The Stormwater Program Permitting which identifies industries based on SIC Codes is inclusive of SARA Title III Industries.

- Identified and evaluated all four treatment , storage, and disposal facilities for the requirement to obtain a stormwater permit.

- The regional Pollution Prevention Outreach (P2O) Team continued its technical assistance partnerships with local automotive and dental associations. In addition, a sticker recognition program was started for automotive services, with the guidance of a technical assistance team that includes members from AAA, OSPRIG, two local trade groups (PATA and ASA) and a member from each of the seven P2O jurisdictions.

- The City's BEST Program assisted industries with "green practices," saving water and energy and dealing with stormwater and solid waste. In FY 1997-98, six additional businesses were recognized for their efforts in these areas. Since the program started (1992), 42 area businesses have won awards for projects/practices that are saving them over $8 million a year.

- In 1997, BES's Pollution Prevention Program's Third Annual Pollution Prevention Recognition Awards were presented to six individual, teams, and public/private partnerships that have demonstrated environmental enhancement, economic viability, and information sharing. These award recipients voluntarily prevented discharges of solid waste, wastewater, and stormwater through innovative management and technological changes.

- The BES Pollution Prevention Program's voluntary on-site assistance with the business community was enhanced in 1997. Accomplishments included:

  - Reduced air emissions by 70 tons/year.
  - Reduced hazardous wastes by 7,200 kg/year.
  - Reduced materials moving to landfills by 1,925 tons/year.
  - Reduced pollutants in wastewater (up to 900 mg/l BOD; and 13,000 pounds/year of phosphates).
  - Conserved over 64,000 ccf/year of water.

- Finalized and implemented a partnership program with Multnomah County Health Department sanitarians to address stormwater issues and control non-stormwater discharges to the storm sewer identified during restaurant inspections. Developed an informational packet, including a flyer and poster, to be used during inspections.

Significant Changes/Improvements from Year 2

- Finalized work and began implementation of a batch discharge process for non-stormwater discharges to the storm sewer allowed under the MS4 permit. Developed policy on acceptance of pumped groundwater discharges to the storm sewer system. Worked in conjunction with DEQ to define which groundwater discharges require a permit from DEQ and which can be allowed under municipal controls. Developed control mechanism for discharges allowed to MS4 under municipal controls.

- Performed a comprehensive basin search for pollution sources related to contaminated sediments in Whitaker Slough of the Columbia Slough.

Comparison with Projected Accomplishments

Projected activities were completed, with the following exception:

- The integrated Watershed Planning effort is integrating stormwater permitting issues and opportunities into work plans for each of the City's watershed programs. This effort should work to incorporate industrial stormwater control citywide, including the CSO Program Area.

Compliance Status

In compliance with all permit dates, except for final completion of a signed intergovernmental agreement with the various co-permittees.

RELATED EMP STATUS

EMP (B)

"A description of a program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer system to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm system."

The following categories of industrial controls activities addressed the above EMP elements: wastewater discharge permits, accidental spill prevention plans, Pollution Complaint Program, Buildings Plan Review Section, and Fire Bureau's SARA Title III facility review. The noteworthy accomplishments and/or changes within those EMPs are as follows:

- Reviewed SARA Title III facility plans.

- Remediation is underway in East Multnomah County Project, including hydraulic controls in TGA, TSA, and SGA. Plume movement controls are in place for east wellfield. Characterization and remedial efforts in west wellfield continue.

CHALLENGES AND SOLUTIONS

The Integrated Watershed Plan effort will help provide citywide consistency and coverage by the Industrial Stormwater Program. Staffing and other resource concerns are the primary remaining challenge of expanding the program to provide more in-depth citywide effort.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

The automotive brochure listed as an EMP in the 1993 permit application has been revised into a multi-media Ecological Business, Automotive Pilot Project.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Continue to inspect all permitted industries discharging to the MS4 once per year, and conduct sampling as needed. (There are currently approximately 100 permitted industries).

- Continue to inspect non-permitted industries discharging to the MS4 to evaluate the need for permits (approximately 100-200 per year).

- Review and track all permitted discharges to the MS4--for example, cooling water, boiler blowdown, and groundwater remediation.

- Continue to implement a batch discharge process for non-stormwater discharges that do not require an NPDES permit, using controls developed by the municipality.

- Strengthen Pollution Prevention Program and Prevention Activities, including the expansion of the Environmental Assistance Program partnership between Portland businesses, BES, and DEQ.

- Implement the Eco-Logical Business Program Pilot with the P2O Team and the Automotive Advisory Group.

- Identify and evaluate landfills for the requirement to obtain a stormwater permit.

- Develop a BMP for certain classes of washwater generated by mobile cleaners. Develop/participate with DEQ in an outreach program for mobile washers. Develop an informational exchange with the Interagency Regulatory Analysis Committee (IRAC) in Washington state and others on programs addressing mobile cleaners.

- Update the Implementation Manual for the Industrial Stormwater Program.

- Initiate review of 17.39 for revisions and inclusion of Administrative Rules.

- Complete development of industrial and commercial BMPs for structural requirements for certain activities at new development to help minimize the exposure of industrial activity to rainfall and stormwater runoff. These will be part of the new Stormwater Management Manual (ND5).

- Meet with Multnomah County Health sanitarians to assess the effectiveness of BMPs developed for minimizing pollutant discharges to the MS4.

- Implement a program to stencil storm sewer catch basins on inspected industrial sites, using the Bureau's Public Education staff.

- Intensify work on the Automotive Partnership Program, a multi-media effort to work with automotive trade groups to reduce pollutants from automotive service and repair shops. Formal implementation will occur in FY 98-99.

ILL1	Improve the spill prevention and response program

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Improve the Spill Prevention and Response program to reduce the frequency and impact of spills to the stormwater system.

DESIRED OUTCOME(S)

Reduce the impact of spills on surface and groundwater.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Continued to meet quarterly and update the workbook of the Regional Spill Committee.
- Added a member from the U. S. Coast Guard to the Regional Spill Committee.
- Began a GIS database and mapping project in the Water Bureau to log sites related to hazardous materials use, documented chemical releases, etc. This system will eventually also include groundwater monitoring data.
- Continued oversight of remediation at contaminated industrial sites within the Columbia South Shore area.

Significant changes/improvements from year 2

- Developed a Draft Stormwater Management Manual that provides stormwater quality and quantity management requirements for new development and significant redevelopment (redevelopment activities on sites larger than 38,000 square feet). BMPs were developed to address specific site activities or characteristics. These BMPs incorporate aspects of the Groundwater Issues White Paper to protect both surface water and groundwater resources.
- Revised and incorporated major portions of the Columbia South Shore Hazardous Containment Handbook into the Stormwater Management Manual.

Comparison with Projected Accomplishments

- Completed an outline for a spill training program; continuing to work on the details. Awaiting availability of training coordinator to complete this task.

- Still waiting for Fire Bureau approval of training facility plans.

- Conducted ongoing updates of contact phone numbers and membership listing.

Compliance Status

In compliance with all permit dates. The full groundwater workplan is being developed by each individual agency. All regional agencies' workplans are due for discussion at the Regional Spill Committee. The City of Portland is already working on implementing some elements listed in the white paper within the Stormwater Management Manual (see ND5). Remaining work items will be developed into a spill prevention workplan by the end of fiscal year 1998/99.

RELATED EMP STATUS

EMP (B)(4)

"*A description of procedures to prevent, contain and respond to spills that may discharge into the municipal separate storm sewer system.*"

The following categories of activities addressed the above EMP elements: Spill Response Program, Accidental Spill Prevention Program, tank farm policy, Hazardous Materials Response Team, Columbia South Shore, hazardous substances, and Buildings Plan Review Section. The noteworthy accomplishments and/or changes within those EMPs are as follows:

- New structures proposed in the Columbia South Shore Plan District (COSS) that require building permits must receive Water Bureau approval prior to permit issuance if chemicals will be used on the site. Approximately 100 permit applications were reviewed. All new buildings in the COSS have sealed floors and secondary containment, where necessary. Storm drains and discharge lines in loading and storage areas have valves to contain spills onsite.

- The Fire Bureau Hazardous Materials response team responded to approximately 200 calls in FY 1997-98.

CHALLENGES AND SOLUTIONS

The balance of priorities between groundwater, stormwater, and drainage continues to be a significant city-wide concern. Protection of groundwater is universally supported, however. The strategies to implement that protection are in discussion. The items listed in the Groundwater Issues white paper are being considered to inclusion in each jurisdiction's work plan.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

None

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Complete the Groundwater Protection from Spills workplan for the City of Portland, and encourage other jurisdictions to partner in some implementation efforts.

- Establish the spill training facility at the Fire Bureau Training Center on NE 122nd Avenue.

- Continue to work with and expand Bureau involvement to develop and implement a workplan that addresses groundwater and surface water protection from spills. Encourage other jurisdictions to implement similar spill protection and response.

- Complete spill training curriculum.

ILL2	Prevent, search for, detect, and control illicit (non-stormwater) discharges

The Illicit Discharges Elimination Program (IDEP) is being conducted by the Spill Protection and Citizen Response Section within BES's Environmental Compliance Division (ECD) and the Source Control Division (ISCD).

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Develop and implement a program to prevent, search for, detect, and control illicit discharges to the stormwater system.

DESIRED OUTCOME(S)

Reduce/eliminate unauthorized discharges to the stormwater system and surface waters.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Continued revising priority outfall list; currently tracking 99 outfalls.
- Verified connections at 99 outfalls (5.6 outfalls per month), including onsite inspections of commercial and industrial facilities.
- Continued dry weather monitoring at all major outfalls during the summer sampling period of 1997 and sampled all priority outfalls at least twice. Average of 40 outfalls sampled during dry weather months. Implemented plans for flow monitoring equipment to be used at outfalls where slug loads and periodic dumping incidents may occur, especially during evenings and weekends.
- Identified and removed illicit discharges, primarily washwaters, from 12 industrial facilities that were inspected. Continued to develop a BMP to control washwater discharges identified during stormwater inspection as part of the Industrial Stormwater Program.
- Completed a sampling program of two buildings' cooling tower discharges. High levels of zinc and molydbenum have encouraged the City to develop a policy requiring such discharges to go to the sanitary sewer.

- The Spill Response and Citizen Response Section is coordinating efforts with the Industrial Source Control Division (ISCD) to develop a closed loop tracking system for the identification and resolution of reported illicit discharges/illegal dumpings:

  - Cases identified: Approximately 50 by sampling, and 175 by complaints.

  - Cases resolved: 90 percent of sampling and 60 percent of complaints.

- Continued to implement measures to limit impacts from non-stormwater discharges related to City operations:

  Fire Bureau: Prior to environmental upgrades, interim measures are being finalized for cleaning and minor maintenance procedures.

  Water Bureau: Started program development for zonal flushing and is accepting technical assistance from Industrial Source Control.

- Commercial and industrial building plan review will continue and be enhanced by system improvements and manual development:

  Approximately 200 commercial and industrial building plans were reviewed.

  The new Development Bureau (BluePrint 2000) is in the process of developing the TRACS system, a new software system for tracking and permitting building plans.

- Ten BMP's will be implemented as discharge control mechanisms under Chapter 7 of the BES Stormwater Management Manual (under development):

  1. Fuel Dispensing
  2. Bulk Petroleum Storage in Multiple Tanks
  3. Exterior Solid Waste Storage
  4. Exterior Materials Storage
  5. Loading and Unloading Docks
  6. Roadways and Parking Areas
  7. Covered Vehicle Parking
  8. Equipment and/or Vehicle Washing
  9. Interior Floor Drains
  10. Recycled Industrial Land

Significant Changes/Improvements from Year 2

Amended the illegal dumping code provisions to allow solid waste program employees to help resolve illegal dump sites. Worked on cleanup of 184 investigated illegal dump sites. Developed an internal system within BES and the Bureau of Buildings to respond to and resolve illegal dumping calls. Issued 27 notices of civil infractions and collected 15 fines totaling $1,585. Other 12 ($2,050) were sent to collection agency. BES currently investigates the theft of service complaints, while the Metro solid waste enforcement investigates offensive littering complaints.

Comparison with Projected Accomplishments

- Working to integrate IDEP activities into the Integrated Watershed Planning effort.

- The Water Bureau has continued to use reporting and dechlorinating BMPs for all water line and tank cleaning activities.

- Incorporated a number of commercial and industrial use-related requirements into the Stormwater Management Manual (see ND5).

- Had initial discussions with Parks Bureau regarding its master planning effort for its facilities. More follow-up is needed.

- Evaluated one element of building-related discharges: cooling tower water. Still need evaluation of other building discharges and groundwater-related discharges in FY 98-99.

- Had initial discussion to integrate IDEP programs into mapping, with more follow-up needed.

Compliance Status

In compliance with all permit dates, except for final completion of a signed IGA with the various co-permittees.

RELATED EMP STATUS

EMP (B)

"A description of a program, including a schedule, to detect and remove (or require the discharge to the municipal separate storm sewer system to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm system."

EMP (B)(1)

"A description of a program, including inspections, to implement and enforce an ordinance, order or similar means to prevent illicit discharges to municipal separate storm sewer systems."

EMP (B)(5)

"... a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts..."

EMP (B)(6)

"... educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

The following categories of industrial controls activities addressed the above EMP elements: wastewater discharge permits; accidental spill prevention plans; Pollution Complaint Program; Buildings Plan Review Section; Fire Bureau's SARA Title III facility review; Spill Response Program; Tank Farm Policy and Hazardous Materials Response Team; SOLV events; Metro's Recycling Information Center line; BES Solid Waste and Recycling Programs; and development controls, including plans review. The noteworthy accomplishments and/or changes within those EMPs are as follows:

- The Pollution Prevention Program trains city staff on prevention methods in their daily activities. The P2 program also offers workshops for businesses to learn self-applied environmental assistance techniques.

- The BES hotline number (823-7180) receives about 1,500 calls per year regarding pollution complaints, industry information, spills, seepage discharges, and agency referrals. This hotline is staffed 24 hours a day.

- The City continues to comply with the intent of the State Toxic Materials Reduction Act through evaluation of all new chemicals used in various City facilities.

- The City's solid waste/recycling programs achieved the following waste reduction measures:

  - Obtained an 80.4 percent curbside recycling rate (approximately 628 pounds annually per household)

  - Recycled 19,979 tons of yard debris (approximately 307 pounds annually per household)

  - Obtained 88 percent of complexes recycling four or more items.

  - Retrieved an average of 240 gallons of used oil per month for 3 years from four targeted collection areas in Parkrose and Brentwood/Darlington.

  - Sponsored 80 neighborhood cleanups and cleanup of 36 illegal dump sites, collecting 324 tons of solid waste and 17 tons of hazardous waste.

  - Retrieved an additional 13.34 tons of bulky waste in 4 days.

  - Recovered 2,140 tons of flood-damaged material and 7,000 tons of ice-storm debris (mostly tree debris).

  All of this material was prevented from entering local water bodies.

- The City's Green Team of concerned employees instigated programs for better paper recycling and more environmentally friendly product purchasing, hosted a Green Fair to showcase environmentally friendly local businesses, sponsored "clean your files" days, and sponsored a coffee mug promotion. They continued in 97-98 with a focus on recycling. A battery recycling system was established to keep flashlight, radio, calculator, and other batteries form being landfilled.

- Stop Oregon Litter and Vandalism (SOLV), a statewide non-profit group, retrieved approximately 2,700 pounds of material through the Oregon Adopt-a-River Program and 14,360 pounds of man-made litter and 2,200 of natural (ivy) debris during its Down by the Riverside event on May 16, 1998.

CHALLENGES AND SOLUTIONS

Consistent citywide program coverage to control stormwater discharges continues to be a challenge, but the effort will be moving forward with the Integrated Watershed Approach planning effort.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

None

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Continue to implement the IDEP and develop a workplan and schedule; integrate results into the BES mapping system.

- Continue discussions with the Parks Bureau regarding pollutants generated at its facilities and integrating pollution prevention efforts into its facilities master planning effort.

- Continue evaluation of building-related and groundwater-related non-stormwater discharges. Develop work scope and schedule for other non-stormwater discharges.

- Continue to remove illicit discharges to the storm sewer system as they are identified.

- Work with the Fire Bureau to develop BMPs to control potential pollutant discharges associated with fire flows

ND2	Work with landowners and public agency staff to control pollutants from unregulated sites

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Work with landowners, tenants, and public agencies to apply practical erosion/sediment control and other practices to reduce pollutant discharges associated with undeveloped and developed properties and park lands.

Note: This BMP requires the City to develop and implement a program to train and educate City staff about stormwater pollution problems and how to report problems, and to then use City staff "trainers" to provide this education/training to the public.

DESIRED OUTCOME(S)

Implement coordinated citywide training to reduce stormwater pollution on developed/undeveloped property and park lands.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments:

- Designed and produced stand-alone displays and handouts. This is considered to be cost-effective and requires fewer staff resources than training sessions.

Significant changes/improvements from year 2:

Entirely new approach that allows for use of a display rather than training sessions.

Comparison with Projected Accomplishments:

Activities have been greatly reduced because of limited staff resources. The displays were designed to meet bureaus' needs and would be appropriate for display at all city bureaus, as well as for public display.

Compliance Status:

Due to lack of staff resources, the display boards have not been utilized this fiscal year.

RELATED EMP STATUS

EMP (iv)

CHALLENGES AND SOLUTIONS

Limited staff resources to implement this BMP has been a challenge this fiscal year. A request for assistance will be made.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

None

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Identify and provide staff support to continue the work of the BMP.
- Secure space with interested bureaus to set up displays.

ND3 Improve the NEPA project review process to address water quality

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Improve involvement in the National Environmental Policy Act (NEPA) project review process to better address water quality issues.

DESIRED OUTCOME(S)

Promote and facilitate, through a combination of administrative, regulatory, technical and incentive approaches, sustainable urban development that improves and maintains water quality and is consistent with "Sustainable City Principles."

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

Significant attention has and continues to be given to BMP ND5, which will cover all potential NEPA projects.

Significant Changes/Improvements from Year 2

Based on above accomplishments, this BMP is no longer needed.

Comparison with Projected Accomplishments

Not applicable.

Compliance Status

Covered by BMP ND5.

RELATED EMP STATUS

EMP A(2)

"*A description of planning procedures to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separated storm sewer systems discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutant discharges after construction is complete.*"

The following City Code requirements would affect a NEPA project:

- Chapter 17.38, Drainage and Water Quality (See BMP ND5)
- Chapter 33.430, Environmental Zones (See BMP ND5)
- Chapter 33.515, Columbia South Shore Plan District (See BMP ND5)
- Chapter 33.840, Hazardous Substances Review (See BMP ILL1)

CHALLENGES AND SOLUTIONS

None.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

Request this BMP be deleted from the permit and considered to be covered under BMP ND5.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

Not applicable.

ND4	Develop and implement a comprehensive pollution control program for construction sites

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Develop a comprehensive pollutant discharge control program for all construction sites.

DESIRED OUTCOME(S)

Create and implement a comprehensive program to minimize/eliminate pollutant loads (erosion and other pollutants) from construction sites citywide.

Conduct activities in three areas: 1) code authority, 2) program administration, and 3) education/training.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Participated in and commented on the draft recommendations of the State Technical Advisory Committee for control of erosion from small (under 5 acres) construction sites. Two City members sit on this TAC, one representing the Oregon Association of Clean Water Agencies (ACWA) and the other as a transportation development expert.

- Began internal discussions on code authority and comprehensive program elements with representatives from the Bureaus of Buildings, Environmental Services, Transportation, Water, Planning, and Parks. This group will recommend change to the existing ordinance to extend requirements citywide and to provide an adequate level of funding for inspection, enforcement, and assistance efforts.

- Began updating an Erosion Control Technical Guidance Manual. Also developing a homebuilders guide for construction.

- Created an Interproject Soil Trading Network to provide a resource for agency and construction company employees working on projects that need soil or gravel or have soil or gravel available as a result of excavation.

Significant Changes/Improvements from Year 2

Several multi-bureau groups are now working on various elements of the comprehensive construction site pollutant control program. With work nearing completion on the Stormwater Management Manual for new and redevelopment (ND5), these construction site efforts now have a high priority.

Comparison with Projected Accomplishments

- Two City staff members have provided comments on the draft recommendations of the DEQ State Technical Advisory Committee for control of erosion from small (under 5 acres) construction sites and on the Metro Title 3 planning efforts.

- Work has begun on revisions to the Erosion Control Technical Guidance Handbook. Work is continuing on format redesign, performance requirements for BMPs, and inclusion of new BMPs.

  The Bureau of Buildings has formed a committee to look at all current erosion control codes and policies and make recommendations to City policy makers and the SPAC for changes. This effort will involve all City bureaus and will include citizen and contractor participation in order to adopt a citywide erosion control ordinance and provide an adequate level of inspection, enforcement, and funding.

Compliance Status

All four task elements of this BMP are well beyond the permit schedule. The City is now aggressively moving forward with program development and handbook revision efforts.

RELATED EMP STATUS

<u>EMP (D)</u>

"*... a program to implement and maintain structural and non-structural best management practices to reduce pollutants... from construction sites....*"

<u>EMP (D)(1)</u>

"*...description of procedures for site planning which incorporate consideration of potential water quality impacts...*"

EMP(D)(2)

"...description of requirements for nonstructural and structural best management practices..."

EMP (D)(3)

"...description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and characteristics of soils and receiving water quality...."

The following categories of activities to reduce construction site pollutants addressed the above EMP elements: Development controls and construction inspection activities in City Code Title 14 (Vehicle Leaks and Waste Controls), Title 17.38 (Drainage and Water Quality), Title 17.40 (Pavement), Title 18 (City Engineer Control of Wastes and Dumping), Title 24 (Clearing, Grading and Erosion Control), and Title 33 (Planning and Zoning). The noteworthy accomplishments and/or changes within these EMPs are as follows:

- A construction site recycling program continues to operate, with a new amendment raising the applicable project size to $50,000 rather than $25,000 in cost. All sites within the City appear to be complying.

CHALLENGES AND SOLUTIONS

New development issues continue to be controversial, making construction site management a difficult issue to move forward on. A further challenge is determining which bureau(s) within the city have the ability, authority, and resources to provide the various elements of an effective and comprehensive construction site pollutant control program. Because erosion prevention and sediment control are of such high concern and impact, control of other construction site pollutants continues to be a secondary issue.

Policy development is also slightly hampered by the statewide TAC effort, which has been stalled due to concerns raised by ACWA and the League of Oregon Cities and Counties.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

The City requests a modification to the NPDES permit schedule to allow adequate time to address program development and handbook revision issues. An internal stakeholder group is already at work and hopes to have program recommendations by the end of calendar 1998 year. Handbook revisions are on

approximately the same schedule. Outside stakeholder involvement is expected during Winter 1998 and Spring 1999. Full implementation of the program will likely be delayed until November 1999, when code changes and approvals have been completed.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Complete revisions necessary to the City's Erosion Control Handbook and implement as many provisions as possible by the 1999 construction season. Develop other pollutant control BMPs and set a schedule for their inclusion.

- Complete draft programmatic recommendations by the end of calendar year 1998. Conduct public involvement and have an implementation plan in place by the end of FY 1998/99.

- Create educational and training guidance to support the decisions made by the policy group.

ND5 Establish water quality requirements for new and redevelopment

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Develop stormwater quality treatment facility requirements for all new and redevelopment projects.

DESIRED OUTCOME(S)

Promote and facilitate, through a combination of administrative, regulatory, technical and incentive approaches, sustainable urban development that improves and maintains water quality and is consistent with "Sustainable City Principles."

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- The Stormwater Policy Advisory Committee (SPAC) and Technical Advisory Team provided oversight and comment on manual drafts. The SPAC membership includes developers/builders, designers, environmental groups, citizen activists, and City and DEQ staff.

- BES drafted the Stormwater Management Manual that will implement SPAC's recommended policies and provide technical criteria for designers.

- Provided technical assistance on numerous new and redevelopment projects. As a result, the developers applied stormwater quality controls on a voluntary basis.

- Completed the second annual Metro stormwater design awards program, in conjunction with Metro, DEQ, the Unified Sewerage Agency, Clackamas County, the City of Gresham, and Clark County, Washington. The program is intended to identify design approaches that support good stormwater management and urban density goals and preserve or enhance natural resources. Preparation of a 1997 handbook of award winners was begun for distribution to designers.

- Assisted students at Portland State University and the University of Oregon working on masters programs in urban planning and landscape architecture.

- Implemented a citywide interim water quality design requirement to reduce TSS discharges by 50 percent.

See BMP STR4 regarding eco-roof and other stormwater management techniques for new development-related research.

Significant Changes/Improvements from Year 2

None

Comparison with Projected Accomplishments

- Continue to work on development of design criteria for new and significant redevelopment.

- Continue to review and potentially modify City Code chapters 17.38, 24.10, 24.50, 24.70 and possibly other chapters.

- Continue to work on improving the development review process. Have not developed the education curriculum, but have prepared and given several presentations to design and planning professionals.

Compliance Status

Not in compliance with permit schedule.

RELATED EMP STATUS

EMP (iv)

"Program shall include a comprehensive planning process..., control techniques and systems,...and such other provisions which are appropriate."

Land Use Plan Districts

The City continues to update its Comprehensive Plan to achieve compliance with the Metro 2040 Growth Plan. The City is focusing efforts on the 2040 Town Centers and Title 3 requirements to develop solutions which integrate stormwater, stream quality, and livability issues in areas targeted for increased density.

Extensive effort was expended on development and adoption of the Southwest Community Plan. Adoption of the Plan was postponed in favor of focused

efforts on citywide planning components such as the Stormwater Management Manual and urban reserve planning. In general, it was felt that implementation of some of the citywide planning efforts would provide a stronger framework for development and implementation of the Southwest Community Plan.

Smith and Bybee Lakes Natural Resources Management Plan

All development plans within the management area were in conformance with the NRMP requirements, including stormwater quality controls.

Natural Resources Management Plan for Peninsula Drainage District No. 1

This plan was completed in June 1997 and went into effect July 12, 1997.

State Transportation Planning

The City adopted a zoning code in October 1996 that contributes to reductions in vehicle miles traveled and includes pedestrian and transit-friendly development.

Public Facilities Management

BES and the Parks Bureau have collaborated on numerous projects to help develop park improvements site plans that reduce pollutants in stormwater discharges.

EMP A(2)

"A description of planning procedures to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separated storm sewer systems discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutant discharges after construction is complete."

City Code Chapter 17.38, Drainage and Water Quality, and Stormwater Discharge

Stormwater quality and quantity design requirements and associated resource protection issues specified in the Stormwater Management Manual will be implemented through Title 17 of Portland City Code. Design issues resulting from TMDL(s) or 303(d) listings are addressed in the manual and will be addressed in future code modifications. The Manual has adopted a TSS removal requirement of 70 percent, greater than the previous interim requirement.

City Code Title 34, Subdivisions

The City is in the process of rewriting Title 34 the Subdivision Regulations. In response to SPAC recommendations, the draft code will be modified to require that land be identified and set aside for stormwater management prior to lot subdivision. It is anticipated that work will be completed in FY 1998-99.

City Code Chapter 33.430, Environmental Zones

Title 33 is currently being modified to provide resource protection and design requirements for new stormwater discharges entering an Environmental Zone. The intent of the modifications is to protect the Environmental Zones from damage resulting from stormwater discharges. Potential code modifications may include flow control, velocity reduction, outfall placement, and creative/innovative outfall armourment techniques.

Johnson Creek Plan District code changes adopted in April 1998 provide for balanced cut and fill within the 100-year floodplain. Other Plan District requirements for flow and quality are still in place.

Johnson Creek Plan District code changes provide for balanced cut and fill within the 100-year floodplain and a 50 percent impervious surface limitation in all zones of the Johnson Creek Floodplain Subdistrict.

Work is continuing on revisions to add a standard for water quality in the E-zone. (See BMP PS1 for information about the City's new environmental zone handbook.)

Environmental zoning was substantially updated for the Boring Lava Domes area in November, 1997.

City Code Chapter 33.515, Columbia South Shore Plan District

Plan district requirements for land use are still in place.

The Stormwater Management Manual will require all new development and significant redevelopment to perform a hazardous substances review and implement stormwater management measures previously required by the Columbia South Shore Hazardous Materials Containment Handbook. The review and management measures will be required citywide, rather than only in the Columbia South Shore. Code language to address this is currently being developed. Placement of this requirement within the code may change following code revision, expected to occur in 1998 and 1999.

NEPA Plan Review

See BMP ND3

Stormwater Discount Program

BES is currently developing an in-lieu fee structure to provide incentives for onsite stormwater management in conjunction with the Stormwater Management Manual.

CHALLENGES AND SOLUTIONS

New and redevelopment issues continue to be the most controversial and difficult to implement of all the NPDES tasks. Because of the complex issues associated with this BMP, progress has been slow.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

The final Stormwater Management Manual is scheduled for implementation in permit year 4.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Modify City Code Titles 17, 18, 24, 25, 33, and 34 as needed to implement Stormwater Management Manual requirements, and support/facilitate innovation and resource protection in stormwater planning, design, and management.

- Implement the Stormwater Management Manual.

STR1 Evaluate the need for new stormwater treatment facilities. Design and construct if appropriate.

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Evaluate the need for construction of stormwater quality treatment facilities. If appropriate, develop plans for construction, maintenance and monitoring of the facilities. Construct and monitor appropriate facilities.

DESIRED OUTCOME(S)

Evaluate, and if appropriate, design and construct stormwater treatment facilities within selected areas.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- In conjunction with the Public Facilities Plan, completed a hydrologic evaluation of basins over 160 acres, including Mocks Bottom and three major outfalls in the Columbia Slough (122nd, 148th, and 162nd).
- Updated the major outfalls list. With additions and removals of outfalls, there are currently 99 City major outfalls.
- Developed an internal schedule for delineating the catchment and estimating the seasonal pollutant loading for each new major outfall.
- Continued estimating the seasonal pollutant loads from each of the major outfalls.
- Completed Integrated Watershed Plans for Willamette, Columbia Slough, Johnson Creek, and Tyron Creek, and incorporated BMP tasks.

Significant Changes/Improvements from Year 2

None

Comparison with Projected Accomplishments

Proposed facilities are in the design phase and have not been constructed as planned in 1997/98 at the outfalls in the Columbia Slough and Fanno Creek.

Various constraints have delayed progress, but the facility construction is planned for FY 98/99.

Compliance Status

The integration of this BMP into the Integrated Watershed Plan (IWP) approach will provide a comprehensive, citywide BMP implementation strategy. However, the scheduled IWP implementation (Spring 1998) may result in some delay in the BMP schedule.

RELATED EMP STATUS

EMP (A)

"...A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas...to be implemented during the life of the permit."

Structural and Source Controls

The City continues to implement structural water quality facilities as it separates segments of the Combined Sewer Overflow (CSO) area and incorporates facilities into new public building sites to manage stormwater discharge. Specific examples are the completed construction of a water garden at the Water Quality Laboratory and completed construction of the Ramsey Lake stormwater ponds.

As part of the EPA grant for the Columbia Slough, stormwater treatment facilities are currently being designed for the 158th Avenue, 148th Avenue, and 138th Avenue outfalls.

The Parkrose Pilot Project (NE 122nd Avenue Subbasin) in the Columbia Slough watershed has one facility ready for construction that will cover part of the drainage area for the major outfall at 122nd Avenue. (See Parkrose Pilot Project under Early Action Projects.)

Task Management, Modeling, and Analysis for the CSO Elements of the Public Facilities Plan

Tasks begun or completed in permit year 3 include :

- CSO model calibration

- CSO basin flooding characterization and CSO basin flood control alternatives analyses

- Development of sump maps, including locations for new sumps

- Development of revised westside stream separation areas and preliminary design of stream separation conduits

- Analysis of hydraulic benefits of proposed Green Solutions for basement flooding

Task Management, Modeling, and Analysis for the Willamette River CSO Predesign Project

- Development, calibration and execution of hydraulic and pollutant models for existing conditions

- Tools development for Task T7--Alternatives Development

- Developed complete system-wide models for existing conditions and future Integrated Watershed Plan, including the PFP-Joint Basin Plan.

- Development and analysis for the report "Portland CSO Characteristics for the Years 1990-2000," written to satisfy the Consent Decree between the City of Portland and the Northwest Environmental Advocates.

Lead Modeling Support for Large Basin Predesign Projects

- Insley/Taggart-A Basin Relief and Reconstruction Project

- Taggart B/C/D Basin Relief and Reconstruction Project

- Sellwood Basin Relief and Reconstruction Project

Lead Modeling Support for Small Predesign Projects

- Alder Basin ongoing support

- Riverside Basin ongoing support

- Fiske B Basin

- Northwest Portland stormwater design projects

- Northeast Portland stormwater pollution reduction facilities

Modeling Support for Columbia Slough CSO Projects

- Modeling support for Columbia Slough Consolidation Conduit 90 percent to final design issues

- Modeling support for CBWTP outfall improvement issues

CHALLENGES AND SOLUTIONS

An ongoing challenge is coordination between the watershed and CSO programs to ensure that structural water quality facilities are evaluated and selected in a consistent manner citywide. The integration of this BMP into the IWP will assist in this effort.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

A schedule change may be requested following completion of the IWP effort in permit year 4.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Identify the top three priority outfalls that will require water quality facilities and begin predesign alternatives analyses.

- Continue to implement watershed facilities/resource plans that address major outfalls.

- Initiate surface water/ stormwater management plans for the five major watersheds.

STR2 Retrofit flood control facilities to address water quality

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Determine the practicability of retrofitting existing drainage and flood control facilities (e.g., retention basins, infiltration basins and drainage channels) to improve water quality. If practicable, develop plan(s) and implement.

DESIRED OUTCOME(S)

Evaluate, and, if appropriate, design and construct stormwater treatment facilities within selected areas.

Retrofit existing flood control infrastructure to maximize pollutant reduction without impairing flood control performance.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Completed construction of the Brookside flood management and wetland/water quality project (14-acre site) on Johnson Creek.
- Implemented several actions in the Johnson Creek Resource Management Plan.
- Worked with facilities planners, watershed managers, and O&M staff to identify opportunities to retrofit flood control facilities when there is a potential benefit to water quality.
- Completed Oak Creek and Spring Garden NRCS Projects and secured reimbursement from the NRCS (about $175,000). Design, permitting and coordination completed for other NRCS projects.

Significant Changes/Improvements from Year 2

- The fact sheets identified in Task 1 of this BMP are s now under the Stormwater Management Manual (see BMP ND5).
- Many tasks under this BMP are covered by BES's facilities planning process.

Comparison with Projected Accomplishments

Actual accomplishments are close to the projections.

Compliance Status

It is anticipated that the schedule for Task 3 may not be met.

RELATED EMP STATUS

EMP (A)

"... A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas... to be implemented during the life of the permit."

Structural and Source Controls

Public facilities planning is now a part of this BMP's tasks.

EMP (A)(4)

"...procedures to assure that flood management projects assess the impacts on water quality... structural flood control devices have been evaluated... provide additional pollutant removal..."

Drainage and Stormwater Quality

The facilities planning process, in collaboration with the watersheds and stormwater groups, will prepare resource management plans that cover drainage and water quality. The upper Tryon Creek corridor assessment was completed during permit year 3, as well as the Fanno Creek Resource Management Plan (1997/98).

CHALLENGES AND SOLUTIONS

Similar to BMP STR1, an ongoing challenge is the coordination among watershed, CSO, facilities planning, and other City programs to ensure that managers are addressing water quality impacts in the design/construction of new and retrofitted flood control facilities.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

A schedule change may be needed for Task 3.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Johnson Creek projects CIP predesign work.
- Brookside plans, second phase of plantings to be installed. Maintenance and monitoring, including monitoring of swales and Stormceptors for water quality.
- Completion of the citywide Facilities Plan.
- Completion of Integrated Watershed Plans for the Willamette River, Columbia Slough, Johnson Creek and Tryon Creek.

STR3 Support community and government tree planting programs

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Support government and community tree planting programs.

DESIRED OUTCOME(S)

Promote and facilitate, through a combination of administrative, regulatory, technical and incentive approaches, sustainable urban development that improves and maintains water quality and is consistent with "Sustainable City Principles."

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Implementation of the Urban Forest Master Plan is underway.
- The City's urban forestry activities have remained much the same as they were in 1993, which includes planting, care, preservation, and education.
- Implementation of a neighborhood Tree Liaison Program is underway.
- The Urban Forestry Division continues to promote planting trees that provide more shade to address water quality.
- The Friends of Trees organization uses City donations to fund a portion of its community tree planting program, natural area restoration projects, and Youth Tree Corps program.
- A new restoration approach was designed and developed to help the City meet TMDLs and the sediment Consent Order for the Columbia Slough. Stakeholders were involved in the development of this approach.
- The Planning Bureau is developing a more comprehensive tree protection and planting ordinance.
- Under BES's Watershed Revegetation Program, volunteers and contract crews removed non-native vegetation on 80 acres in watersheds throughout Portland and planted over 60,000 native trees, 20,000 shrubs, and 100,000 wetland plants in FY 1997/98. The program also provided 100,000 native

trees and shrubs to other local agencies and non-profit groups for watershed revegetation work.

- Completed design for Balch Creek/Lower Macleay Park streambank restoration project.
- Initiated bank restoration for three Willamette River demonstration projects.
- Planted over 700 trees on Portland Public Schools properties.
- Held four planting days in the Fanno Creek and Tryon Creek watersheds.

Significant Changes/Improvements from Year 2

None

Comparison with Projected Accomplishments

- Did not conduct research on water quality benefits of trees.
- Did not review BES and other bureau specifications to find ways of adding more trees to projects.
- Applied for tree inventory grant with Portland State University; some inventory work has been done by PSU students and neighbors.

Compliance Status

On schedule

RELATED EMP STATUS

EMP (iv)

"Program shall include a comprehensive planning process,...control techniques and systems,...and such other provisions which are appropriate."

Watershed Program Tree and Vegetation Planting

- **Columbia Slough:** 63,925 trees, 25,000 shrubs, 100,000 wetland plants, and 8 miles of stream restored to date. Established a wetland plant nursery.

- **Johnson Creek:** Planted 630 trees, 2,275 shrubs and other herbaceous plants at Brookside site, 50 trees at Johnson Creek Park, and 800 trees at Tideman Johnson Park. All were streambank plantings.

- **Tryon Creek:** Planted 500-600 trees at Marshal Park on Metro property, along Terwilliger Blvd.

- **Fanno Creek:** Fans of Fanno planted 1,000-1,500 trees at Taylor Woods along the Fanno main stem.

- **Balch Creek:** Restored 400 linear feet of stream, in accordance with the Forest Park Natural Resource Management Plan. Conducted activities to remove invasive English ivy.

- **Willamette River:** Provided a stewardship grant to a citizens group in Stephens Creek for a 3/4-acre site cleanup and vegetative enhancement.

- **Columbia River:** No known plantings.

- **Downspout Disconnect Area:** The CSO downspout disconnection program is providing some plant material to homes that disconnect. Hundreds of homes have been disconnected to date.

- **Forest Park Natural Resource Management Plan:** The plan is being implemented to restore old growth forest and remove invasive species. Conducted activities to remove invasive English ivy.

Carbon Dioxide Reduction Strategy

BES and others continue to sponsor the "Seed the Future" tree planting campaign to plant over 145,000 trees. To date, the City CO_2 strategy is showing signs of reducing per capita emissions. However, with population increases and an increase in power generation from fossil fuels due to the Trojan plant shutdown, total emissions are still increasing.

<u>EMP (A)</u>

"...A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas... to be implemented during the life of the permit."

Structural and Source Controls

Although not traditionally considered a structural control, trees are known to intercept rainwater and prevent it from becoming stormwater runoff. They shade impervious areas, reducing heat gain in stormwater runoff. Trees also hold soil in place, thus structurally stabilizing land and creek banks. (See watershed planting activities, above.)

EMP A(2)

"A description of planning procedures to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separated storm sewer systems discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutant discharges after construction is complete."

City Code Chapter 17.38, Drainage and Water Quality (Public Works Code)

Trees are often planted as a component of BES projects.

City Code Chapter 33.430, Environmental Zones (Zoning Code)

The Planning Bureau reviews new development plans to ensure preservation of native vegetation.

City Code Title 33, Environmental Zones

Application of specific landscape standards is required for development.

NEPA Plan Review

See BMP ND3

CHALLENGES AND SOLUTIONS

Financing is always a challenge. One of the responsibilities of the Urban Forestry Coordinator is to secure grants and other funding. Funding for research may prove difficult, but potential agency partners are being identified.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

None anticipated.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Research and document water quality benefits of trees and provide information to others.

- Review BES and other bureau specifications and standards to identify how bureaus can provide more tree planting on various types of city projects. This is especially important in light of the many temperature issues in most of Portland's waterways.

- Participate with other bureaus in implementing the multiple facets of the Urban Forestry Master Plan.

- Conduct the City tree inventory and identify tree-deficient areas.

- Determine, prioritize, and fund projects to correct deficient areas.

- City Council will consider new tree protection and replacement regulations for all residential zones. A minimum number and size of trees must be preserved or planted as part of new development. An applicant also has the option of paying into a city tree planting fund.

STR4 Establish design standards for flood control and water quality facilities

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Review and modify existing design standards for drainage/flood control and water quality facilities to improve water quality.

DESIRED OUTCOME(S)

Improve existing design standards to address water quality and other City imperatives. Identify, investigate and test innovative and economical techniques for water quality improvement.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- The City completed installation of the swales at the Water Quality Laboratory and developed water quality monitoring alternatives for sampling of the swales. Several tests of the swale system were performed, including test pumping, data retrieval, and sensor calibration. A summary of the swale design and system operation was prepared for future guidance. Swale test literature was reviewed to investigate other monitoring techniques that could be employed in the swale project.

- Worked with a developer to construct water quality landscape planters and numerous other landscape techniques that BES will monitor.

- Continued to research benefits of eco-roofs (roofs covered with a thin layer of soil and vegetation), in cooperation with PGE and others.

- Participated in a regional stormwater consortium being formed by the Oregon Graduate Institute to address stormwater/landscape demonstration project opportunities.

- Continued to investigate activities of others conducting research in the Northwest.

See ND5 accomplishments for BMPs included in the Stormwater Management Manual that protect both surface water and groundwater resources.

See ND5 regarding development of interim water quality guidelines.

Significant Changes/Improvements from Year 2

Task 2 is not being addressed under BMP ND5.

Comparison with Projected Accomplishments

- Update of the Sewer Design Manual is being addressed through development of the Stormwater Management Manual (see ND5).

- The Development Review Manual to reference water quality standards is not yet completed.

- Tests on the Water Quality Laboratory swales and other projects are discussed under other BMPs and under the new monitoring plan. (See BMP STR3, BMP ND5, and Section VII: Portland NPDES Second Annual Stormwater Monitoring Compliance Report.)

Compliance Status

Additional time needed to complete Task 2. Proposed new completion date is June 30, 2000.

RELATED EMP STATUS

EMP (A)

"*...A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas...to be implemented during the life of the permit.*"

Structural and Source Controls

EMP (A)(1)

"*... maintenance activities and schedule for structural controls...*"

See description under BMP OM1 and OM2.

EMP A(2)

"*A description of planning procedures to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separated storm sewer systems*

discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutant discharges after construction is complete."

- ***City Code Chapter 17.38, Drainage and Water Quality (Public Works Code)***
- ***City Code Chapter 33.430, Environmental Zones (Zoning Code)***
- ***City Code Chapter 33.515, Columbia South Shore Plan District (Zoning Code)***
- ***City Code Chapter 33.840, Hazardous Substances Review***
- ***NEPA Plan Review***
- **Stormwater Discount Program**

EMP (A)(4)

"...procedures to assure that flood management projects assess the impacts on water quality...structural flood control devices have been evaluated...provide additional pollutant removal..."

Drainage and Stormwater Quality

- **Balch Creek:** Water quality and channel restoration pilot project completed and monitored for 2 years.
- **Johnson Creek:** Two swales at the Brookside Project and the monitoring of two Stormceptors have been planned for FY 98/99.
- **Tryon Creek:** Corridor assessment of upper Tryon Creek completed.
- **Fanno Creek:** Fanno Creek Resource Management Plan completed.
- **Willamette River:** Predesign activities underway. Many projects will result in the creation of new stormwater-only areas and some new outfalls.
- Although BES tries to address water quality on all public works projects, other bureaus will not always allow this approach unless it is specifically required by code.

CHALLENGES AND SOLUTIONS

See BMP ND5 for a discussion of challenges related to establishing new water quality requirements for new and redevelopment.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

None

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Complete update of the Sewer Design Manual.
- Complete the Development Review Manual to reference water quality standards.

PS1	Modify landscape requirements to encourage use of self-sustaining vegetation

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Modify landscape requirements for various land uses to encourage use of self-sustaining vegetation which reduces the need for pesticides, herbicides, fertilizers, and water.

DESIRED OUTCOME(S)

Promote and facilitate, through a combination of administrative, regulatory, technical and incentive approaches, sustainable urban development that improves and maintains water quality and is consistent with "Sustainable City Principles."

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- The Planning Bureau completed a review of existing City landscape design standards and practices for new and redevelopment. BES has incorporated these into the Stormwater Management Manual (see BMP ND5).

- Continued research on "building green," including the benefits of eco-roofs to retain, detain, and mitigate stormwater runoff. This work is being coordinated with other interests such as the Portland Energy Office and PGE.

- Developing new landscape and O&M requirements for new development under BMP ND5.

- Under BES's Watershed Revegetation Program, 40 businesses and other private landowners participated in and helped fund revegetation projects on their properties and neighboring properties.

- Developed, in coordination with design and construction services, a new process for planning, predesign, design, permitting and construction of Operating Stream Enhancement Projects.

See STR3 for Stream and Riparian Enhancement Projects

See STR3 regarding the Balch Creek/Lower Macleay Park Streambank Restoration Project.

Significant Changes/Improvements from Year 2

None

Comparison with Projected Accomplishments

The technical review tasks are almost completed. However, submittal to the Planning Commission and City Council has not yet occurred.

Compliance Status

Additional time is needed to complete.

RELATED EMP STATUS

EMP (A)(1)

"*...maintenance activities and schedule for structural controls...*"

See BMP OM1 and OM2 for the following activities:

Stormwater Passive Treatment Facilities (e.g., Airport Way)

Swales (biofiltration)

Ditches

Detention Ponds and Road Crossing Culverts

Trash Racks, Catch Basins, Sumps, etc.

EMP A(2)

"*A description of planning procedures to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separated storm sewer systems discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutant discharges after construction is complete.*"

City Code Chapter 17.38, Drainage and Water Quality (Public Works Code)

See BMPs OM1 and OM2

City Code Chapter 33.430, Environmental Zones (Zoning Code)

The Planning Bureau, with support from BES, has completed an Environmental Handbook. The handbook provides information to help project designers and property owners with properties within the E-zone. It includes extensive information on site design and native plants and some information about stormwater management.

City Code Chapter 33.515, Columbia South Shore Plan District (Zoning Code)

Landscape and site design standards exist for Plan Districts. These and other Plan District standards have not yet been reviewed for stormwater impacts.

City Code Chapter 33.840, Hazardous Substances Review

See BMP ILL 1

NEPA Plan Review

See BMP ND3

Stormwater Discount Program

See BMP ND5

EMP (A)(6)

"*....reduce to maximum extent practicable (MEP) discharges from MS4s of pesticides/herbicides/fertilizers (p/h/fs)....*"

State Certification

The State of Oregon still requires commercial and public facility applicators to be certified. The Parks Bureau has a certification program for its staff that meets the state requirements. Other City staff can take the Parks Bureau certification course.

City Activities

The Parks Bureau continues to improve its Integrated Pest Management Program and has reduced its use of pesticides. It appears the Bureau of Maintenance continues to increase its use of herbicides in order to plant more wildflower areas. (See BMPs OM1 and OM2.) BES has developed a *Naturescaping for Clean Rivers Program* that at this time primarily addresses existing development. (See BMP PI1/ED1.)

Education

Metro has an Alternatives to Pesticides Program that BES partially supports financially. (See BMP PI1/ED1.)

Private Groups

The City has not tracked the activities of previously known private groups or any new groups.

CHALLENGES AND SOLUTIONS

The Planning Bureau has suggested certain changes to the landscape code and omitted others. BES believes some additional changes are practicable and will discuss these with the Planning Bureau. This BMP may face challenges similar to those of BMP ND5.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

Need more time or staff to complete.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Complete the technical work regarding landscape requirements. Provide recommendations in a draft report for review, revision, and eventual adoption.

- Prepare materials for Planning Commission action. Following Planning Commission action, prepare approved policy and code changes for City Council approval.

- Initiate technical review of other code requirements that have identified water quality impacts. Provide recommendations in a draft report for review, revision, and adoption.

- Prepare materials for Planning Commission action. Following Planning Commission action, prepare approved policy and code changes for City Council approval.

- Review landscape requirements of all Plan Districts not covered by the Planning Bureau's landscape standards review of 1996-97.

PS2	Evaluate use of financial incentives for protection of natural areas

STORMWATER MANAGEMENT PLAN DESCRIPTION(S)

Evaluate practicability of providing financial incentives for property owners who protect natural areas considered to have valuable water quality characteristics.

Research what other agencies are doing relative to providing financial/other incentives for the protection of natural areas, and consider developing a similar program for Portland.

DESIRED OUTCOME(S)

Promote and facilitate, through a combination of administrative, regulatory, technical and incentive approaches, sustainable urban development that improves and maintains water quality and is consistent with "Sustainable City Principles."

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Developing a stormwater management mitigation credit system under BMP ND5.

- Completed report to BES director regarding new fee structure for stormwater (relates to this BMP).

- Completed the developable lands maps, evaluated the maps, and coordinated with watersheds and other bureaus.

- Took the following actions under watershed programs:

  Columbia Slough: The City purchased 35.08 acres (17.08 through the Parks Bureau and 18 through the Open Spaces Fund).

  Johnson Creek: The City purchased approximately 15 acres at Brookside and NE 112th Avenue for a wetland/flood reduction/water quality facility, and six other parcels totaling 6 acres. The City also completed a long-term land acquisition plan and has designated funding for future acquisitions.

Willamette River: Metro purchased approximately 14 acres as part of the Greenspaces program.

Tryon Creek: Metro purchased 11 acres along the creek.

Fanno Creek: Metro purchased 7 acres, while BES acquired some tax foreclosed properties.

Metro Open Spaces and the City have purchased a total of 1,702.24 acres as of June 30, 1998.

- Based on a Public Utility Rate Board recommendation, City Council in 1995 directed BES to develop a more comprehensive rate structure. In May 1997, BES formed a Stormwater Rate Advisory Committee, which is in the process of developing a rate structure that includes attention to stormwater quality.

Significant Changes/Improvements from Year 2

None

Comparison with Projected Accomplishments

Actual accomplishments correspond with the projections.

Compliance Status

Behind schedule.

RELATED EMP STATUS

EMP A(2)

"A description of planning procedures to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separated storm sewer systems discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutant discharges after construction is complete."

City Code Chapter 17.38, Drainage and Water Quality (Public Works Code)

City Code Chapter 33.430, Environmental Zones (Zoning Code)

See BMP PS1

City Code Chapter 33.515, Columbia South Shore Plan District (Zoning Code)

City Code Chapter 33.840, Hazardous Substance Review

NEPA Plan Review

Stormwater Discount Program

See also BMP ND5

CHALLENGES AND SOLUTIONS

Land use issues are highly charged in Portland at this time. There is a perceived conflict of this BMP with development density goals.

POTENTIAL MODIFICATIONS TO THE NPDES PERMIT

Additional time is needed.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Develop a program to accomplish the desired outcomes stated above.

EARLY ACTION PROJECTS

In 1994, prior to issuance of the NPDES permit, the City elected to conduct a number of early action projects. These are projects that were not specifically named in the Part 2 NPDES permit application, but are considered essential for pilot testing and demonstrating certain program elements before valuable resources are used to apply the controls citywide. Accomplishments of the early action projects undertaken to date are described below.

Parkrose Area Pilot Project (NE 122nd Avenue)

DESIRED OUTCOME(S)

To identify, through testing and evaluation, cost-effective and sustainable methods for citywide implementation of the stormwater management program.

The pilot project is designed to test BMPs and EMPs in a well-defined study area located in NE Portland. Results of activities in the study area will be used to recommend when, where, if, and at what level those activities should be conducted elsewhere in the City. The study area includes a hydrologic catchment area draining to the M-1 stormwater monitoring station, where the City has collected 5 years of baseline data.

KEY ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

Work began on the Parkrose Pilot Project in 1994, with the project now moving into a close-out phase. Accomplishments over the last fiscal year are as follows:

General

- Evaluated the Parkrose Community Traffic Circle site using City Green software to determine volume and pollutant loading avoided by project plantings.

Public Education/Involvement

- Distributed 600 copies of the second and third quarterly Parkrose Pilot Project newsletter.

- Distributed 600 copies of Stormwater Program postcard tips with "recipes" for clean rivers (winter 1997 and spring 1998).

- Installed two interpretive signs for the Parkrose Middle School and Community Traffic Circle Planting Projects.

- Worked with ODOT to find a community group to adopt the Parkrose Community Traffic Circle planting site.

- Created a draft site adoption handbook for community groups for the Parkrose Community Traffic Circle site.

Illicit Discharges Elimination

- Completed three dry weather sampling events at the M-1 outfall.

- Began work with the sediment remediation program to identify possible responsible parties for a sediment hot spot within the project area, possible attributed to local farming activities.

New Development Controls

- Completed an onsite verification of sites prone to erosion problems. Construction sites were forwarded to the Columbia Slough grant program construction inspector and other sites will be forwarded to the Columbia Slough program public involvement staff.

Structural BMPs

- Moved forward with design review and completion of designs for the right-of-way swale and sand filter facilities on NE 121st and Sandy.

- Completed installation of the Parkrose Middle School bioswale project and monitored three storms.

- Completed two plantings (500 plants) and drywater installation at the Community Traffic Circle Project.

Comparison with Projected Accomplishments

- Initiation of catchment cleaning O&M plan incorporated into the full city O&M effort.

- Street strip and herbicide use plan for Traffic Circle site will not be done by City, but has some changes through site adoption handbook and ODOT efforts.

- Completed Parkrose Middle School Bioswale project.

- Design work for the right-of-way projects is moving forward.

- Implementation of farm solutions has been turned over to sediment remediation program.

- The public survey of residents has been delayed and is now planned for fall 1998.

- The Erosion Control Program evaluation is complete, with some follow-up work needed.

CHALLENGES AND SOLUTIONS

With the increasing work on Integrated Watershed Plans, the need for testing/pilot projects has decreased. With increased knowledge of watershed-specific issues, testing of concepts can occur throughout the City and need not be confined to one location. The Parkrose Area Pilot Project will therefore be closing out during fiscal year 98/99.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Complete design and possibly construction for the right-of-way projects at NE 121st and Sandy.

- Conduct a close-out public survey of study area residents, similar to the first project survey.

- Send out a closure newsletter that announces final information on Pilot Project activities.

- Support the first year of the community groups adoption of the Parkrose Community Traffic Circle Project.

Russell Pond/Wetland

DESIRED OUTCOME(S)

To improve water quality benefits of the existing pond/wetland system by retrofitting flood control and site landscape components. To involve interested nearby neighbors and high school students in site research and possible retrofit projects at the existing pond site.

KEY ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

Accomplishments

- Developed and completed a drainage system research project that documents yearly changes in the drainage system.
- Continuing on predesign report efforts to highlight options for the site.
- Continued work with the local Middle School, providing support and access for a detailed mapping project.

Comparison with Projected Accomplishments

- Completed flow modeling as part of the flow research project.
- Have not yet selected a design alternative and met with the public. Anticipate this will occur in fiscal year 98/99.
- New operations plan is awaiting new design effort.
- Initiated a school involvement effort with Gregory Heights Middle School.

CHALLENGES AND SOLUTIONS

Delays with City staffing to support the design effort have been the biggest challenge. Using outside contractor help to complete the design may be a solution to completing project implementation.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Select one design alternative, meet with the public, and complete design.

- Create a new operations and maintenance plan for the facility and for the time period before construction begins.

Oregon Museum of Science and Industry (OMSI)

DESIRED OUTCOME(S)

To evaluate the performance of the vegetated bioswales in the OMSI parking lots and implement improvements to enhance the pollutant removal capability of the system.

KEY ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

This project was put on hold because of a major right-of-way project (the extension of Water Avenue) proposed to bisect the site. The project outcome identified above will be implemented in FY 98/99 if possible.

CHALLENGES AND SOLUTIONS

Impacts from the Water Avenue project have significantly change the OMSI site.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Upgrade features disturbed by Water Avenue construction and begin site testing in FY 99/00.

Water Quality Laboratory

DESIRED OUTCOME(S)

Participate in the design of the new City Water Quality Laboratory to ensure that water quality approaches are integrated into the project design.

KEY ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

This project is completed. See BMP STR4 and Section VII: Portland NPDES Third Annual Stormwater Monitoring Compliance Report, for ongoing activities related to this early action project.

CHALLENGES AND SOLUTIONS

None

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

Not applicable; project is completed.

GOBI Park Projects

DESIRED OUTCOME(S)

Work with the Parks Bureau to address stormwater quality issues related to GOBI park improvement projects.

KEY ACCOMPLISHMENTS, PERMIT YEAR 3 (FY 97-98)

- BES provided technical assistance for water quality improvements, which the Parks Bureau has incorporated into its designs. In many cases, this has resulted in the improvement of the design beyond existing requirements.

- Identified and evaluated another park project at April Hill Park and found that the neighborhood storm system was already daylighted in the park.

CHALLENGES AND SOLUTIONS

Coordination is a challenge because of the Parks Bureau's very tight project timeframes. Another challenge is the restrictions in surface water features resulting from safety concerns on joint Parks Bureau/school district properties.

PROJECTED MAJOR ACCOMPLISHMENTS FOR FY 98-99

- Continue collaboration with the Parks Bureau.

- An additional GOBI measure will be on the November 1998 ballot.

Section III

MULTNOMAH COUNTY

Multnomah County
Municipal NPDES Annual Report for Permit Year 3
City of Portland and Co-Permittees
Permit #101314
September 1, 1998

MULTNOMAH COUNTY STORMWATER MANAGEMENT PROGRAM

Multnomah County is a Co-Permittee to the Municipal NPDES Permit issued by Oregon's Department of Environmental Quality (DEQ) September 7, 1995 because it owns and operates a small portion of the MS4 within the Portland Urban Services Boundary which is the permit boundary. This Compliance Report for Permit Year Three (PY3) (Annual Report) of the Five-Year Municipal National Pollutant Discharge Elimination System (NPDES) Permit documents the implementation activities of Multnomah County's Stormwater Management Program (Program) in the Portland NPDES permit area as well as some activities outside this permit area. The Program consists of management tasks submitted by the County and approved by the DEQ. Multnomah County began the stormwater management program in 1991 when it actively participated in the three-year planning process with the City of Portland and Co-Applicants to develop the Parts 1 and 2 co-applications, which became the basis of the NPDES permit conditions. Most of the County's roles and responsibilities for complying with the permit terms fall under implementation of the Stormwater Management Plan (SWMP) as Best Management Practices (BMPs) rather than duties toward monitoring, education, or industrial discharges, although financial support to the City for those activities is satisfied through an intergovernmental agreement (IGA). The third permit year covers SWMP activities from July 1, 1997 through June 30, 1998.

Background

The Portland Stormwater Program was initiated to comply with federal municipal NPDES regulations for municipal stormwater discharges (40 CFR 122.26(d)), issued by U.S. EPA in November 1990. These regulations required submittal by May 1993 of a two-part application for a NPDES municipal stormwater permit for discharges to waters of the U.S. from the Municipal Separate Storm Sewer System (MS4). Following acceptance of the permit application, the Oregon DEQ issued a municipal NPDES permit to all co-permittees on September 7, 1995. The initial term of the permit is five years, with expected renewal every five years thereafter.

Prior to issuance of the municipal NPDES permit, the County recognized the importance of educating County personnel who would collectively be responsible for ensuring permit compliance. In the Fall of 1993, the County's Stormwater Implementation Team was formed, consisting of technical and policy consultants and lead County staff. County Implementation Team members represent necessary 'functional groups' (See Functional Groups section, below) responsible for specific BMP implementation tasks, and are almost entirely from the County Department of Environmental Services (DES), Transportation/Land Use Planning Division.

This Team produced a Five-Year NPDES Stormwater Management Implementation Plan (1995) to provide guidance for program implementation. The plan describes the BMPs and activities, defines roles and responsibilities for the County and other co-permittees, presents the schedule and budget, describes reporting requirements, and suggests measures for evaluating the BMPs. An important component of the implementation plan is a series of reporting forms created for use by County field staff and supervisors to track program compliance and to measure success.

Following completion of the Implementation Plan, a series of work sessions were held with the entire Implementation Team to introduce and describe the use of the plan, as well as to complete quarterly reports where feasible. These reports, now semi-annual, along with the compilation of data from 14 other reporting forms/logs are organized into individual BMP files and are primarily used to prepare the accomplishments section of this Annual Report.

Co-Permittee Role of Multnomah County

The County joined the City of Portland (lead applicant) and five other co-applicants in 1991 to begin the 3-year process to prepare and submit the two-part NPDES permit application. This permit application was accepted by Oregon DEQ and a permit to discharge municipal stormwater was issued September 7, 1995. The five other co-permittees are the Port of Portland, Oregon Department of Transportation (ODOT), Multnomah Drainage District No. 1 (MDD #1), Peninsula Drainage District no. 1 (PEN 1), and Peninsula Drainage District No. 2 (PEN 2). Each of the participating agencies owns and/or operates a portion of the MS4 within the Portland Urban Services Boundary. Additionally each of the agencies discharges stormwater into another agency's system, and/or receives discharges from another agency's system into its own. Multnomah County is a co-permittee to the Portland Municipal NPDES Permit No. 101314 due to a small percentage (about 1-2% of total permit area) of unincorporated land within the Portland Urban Services Boundary, and the fact that it owns or operates minor

portions of the MS4. When the Part 2 co-application was submitted in May 1993, unincorporated County lands within the Portland NPDES permit boundary were much larger, and covered several thousand residents, mostly in SE Portland. Since then, most of these lands have been annexed to the City of Portland (December 1994). This compliance report incorporates those changes and diminished area of responsibility. Since 1997, Multnomah County and the City of Portland's Department of Transportation (PDOT) operate under an intergovernmental agreement known as the Westside Maintenance Agreement. This contractual arrangement provides for road maintenance activities by PDOT in unincorporated Multnomah County, primarily the area known as "Dunthorpe." The City agrees to maintain the County-owned road system to the same level of NPDES implementation as that used by PDOT throughout the rest of the Portland permit area.

These changes have not affected the overall intent of each Best Management Practice although several BMPs are no longer applicable due to the annexation. The County continues to implement an active Stormwater Management Program which has resulted in new stormwater maintenance practices, improved communication between Maintenance, Planning and Design staff on stormwater facility and drainage issues, new levels in field staff awareness of the importance of source control, and improved considerations in contract requirements for activities in road building and design which may impact the MS4. The PY3 Annual Report documents, in summary form, the high level of effort in meeting the Program requirements.

Program Activities: Best Management Practices (BMPs)

The Multnomah County municipal NPDES stormwater permit program within the Portland NPDES permit area encompasses two main elements: Best Management Practices (BMPs) and Other Activities (OAs) necessary to meet regulations and run the program, as described below.

BMPs are source or treatment controls designed to reduce pollution in stormwater. *Source* controls are practices or devices which keep pollutants out of stormwater runoff in the first place, such as routine inspection and maintenance practices or covers for outdoor storage areas. *Treatment* controls are typically structural devices designed to temporarily store or treat stormwater runoff to remove pollutants that have already entered the stormwater. Examples include detention basins and grassed biofiltration swales. EPA requires that the County's stormwater program include both source and treatment controls, as well as structural and non-structural controls. However, the EPA recognized that municipalities would focus on source controls for the first 5-year permit period

until the stormwater pollution problems can be better defined. The County Program outlined in this implementation program therefore emphasizes cost-effective source controls, most of which are non-structural in nature.

Implementation of the 20 County BMPs and OAs described in the Portland permit began in 1994. The County's Stormwater Management Plan in the Part 2 NPDES permit application describes each of these BMPs in detail. Key accomplishments for each BMP activity are listed in this compliance report in table/matrix form. The County/Portland BMPs are grouped into seven implementation categories:

- **(1) Public Involvement and Education (PI and ED)**
- **(2) Operations and Maintenance (OM)**
- **(3) Industrial/Commercial Controls (IND)**
- **(4) Illicit Discharges Control (ILL)**
- **(5) New Development Standards (ND)**
- **(6) Structural Controls (STR), and**
- **(7) Planning/System Preservation and Development (PS).**

The following provides an overview description of the County BMPs in each category. The BMPs apply to the unincorporated land (Dunthorpe) and the County-owned roadways and associated storm drainage system within the Portland permit area.

- **Public Involvement and Education (PI and ED)**

  The County's participation in public involvement and education activities is limited due to the small amount of unincorporated land and associated residents within the Portland NPDES permit area. During Permit Year Three (PY3), the County joined the "Regional Coalition for Clean Rivers and Streams". For the most part, the residents in these areas will be informed through the Coalition's educational efforts via mass media (radio, billboards, newspaper) and direct mailing. County staff are encouraged to attend and participate in stormwater workshops and meetings sponsored by the City and other local agencies.

  County representatives attend Watershed Council meetings and actively participate on several regional committees as part of the public involvement element. Although outside the Portland permit area per se, the M.C.TRANS newsletter is sent to 45,000 residents of unincorporated County and Cities east of Portland. This newsletter informs the public of transportation activities and includes educational elements of water quality issues.

- **Operations and Maintenance (OM)**

  Best Management Practices (BMPs) have been conducted by the County to address stormwater quality impacts from routine operations and maintenance activities. The County's Stormwater Maintenance Manual describes the various maintenance activities performed by the County related to roadways and associated storm drainage facilities. The manual includes procedures for routine inspection and maintenance of facilities with the dual purpose of providing flood control and protecting water quality. A series of field logs are used in tracking progress of the maintenance program and evaluating effectiveness over time. The County staff are continuing daily recordkeeping and are meeting reporting requirements.

  The County contracts with the City of Portland for operation and maintenance of storm drainage facilities associated with roadways in the unincorporated pockets of land within the westside Portland Urban Services Boundary (USB). Computerized inventories of drainage and road appurtenances are maintained by both organizations.

  The County participates in the City of Portland's O & M Inter-Agency Advisory Committee. This committee is headed by the Portland Department of Transportation (PDOT) and will be developing recommendations for improving right-of-way maintenance. A draft was completed by PDOT in June 1997 and April 1998.

  County staff assess the effectiveness of road maintenance activities and adjust methods and/or frequencies as needed to improve stormwater quality. The Road Maintenance field logs are entered into the NPDES database system to document events, routine maintenance activities, and potential pollution problems.

  The County implemented a separate computerized NPDES database to collect information recorded daily on field logs. All events are recorded by County road number, date, and type of work activity or findings of the field crew. Special database fields alert staff for follow-up investigation, such as when heavy litter or oil is sighted in ditches. The database has a wide range of custom querying and report generation. This includes annual totals, such as number of street miles swept or the total cubic yards of catch basin debris collected. The database has been used to prove date and time activity in

enforcement action against a discharger, and what kind of activity was noted. Over time, performance trending and maps can be generated to identify specific areas for improvement.

- **Industrial/Commercial Controls (IND)**
  The County BMPs for industrial and commercial facilities in the Portland NPDES permit area are no longer applicable to Multnomah County due to large annexations of County land by the City of Portland in 1994-95.

- **Illicit Discharges Control (ILL)**
  County representatives participate in the Interagency Spill Response Committee, lead by the City of Portland. Through this committee, the County reviews and comments on the coordination procedures intended to improve communications and response time in the event of a discharge which could adversely impact stormwater runoff.

- **New Development Standards (ND)**
  The County reviews plans for new private development/redevelopment in the unincorporated portions of the Portland permit area, which are largely residential (e.g., Dunthorpe area in Southwest Portland). The County utilizes the same stormwater design guidance used area-wide by design professionals. Water quality standards are incorporated into the process, as appropriate, as they are adopted by the City of Portland. The County continues to implement its construction bond program, which ensures financial recovery for damage to County right of way or associated drainage facilities, including erosion damage.

  The County is involved with review of public improvement plans for right-of-way in the Portland NPDES permit area when it involves a County road. For these public improvements, standards established by the Oregon Department of Transportation are generally referenced in all plans and contract specifications. The new 00280 ODOT specifications include stringent requirements for erosion control and on-site inspection.

- **Structural Controls (STR)**
  The County will review the City of Portland's report regarding proposed new or retrofitted public structural stormwater quality facilities within the Portland NPDES permit area. If any of the proposed new or retrofit facilities are within the County's jurisdiction, they will be considered for construction as part of the 5-year Capital Improvement Program (CIP). If favorable, a project detail sheet

will be developed to describe the schedule and funding for each project. Stormwater impacts and activities related to the projects currently included in the Multnomah County 5-year Capital Improvement Program will be described and evaluated for compliance with the permit.

The County will review the City of Portland's stormwater quality design storm standards proposed by the City Technical Advisory Committee. Trees and landscaping requirements will continue to be a part of all County improvement projects to the maximum extent practicable.

- **Planning/System Preservation and Development (PS)**
  The County continues to update inventories and maps of the County's storm drain system. In 1997-98 old maps were replaced with new updated versions. Working with these new maps, a field verification program is planned for 1998-99. For areas within the Portland USB, the County relies on the City of Portland to evaluate and revise existing landscape standards to encourage landscaping which reduces the need for pesticides and herbicides. Information developed by the other local agencies (e.g., City, Metro) regarding safe alternatives to yard care products will be distributed as available.

Program Activities: Other Activities (OAs)

The County implemented several other activities (OAs) required by the NPDES regulations to ensure the proper management and success of the program. Those activities are described in detail in the Five-Year Implementation Plan. In general, they include:

- Program Development and Management
- Program Assessment and Evaluation
- Monitoring Program and Annual Water Quality Report
- Seasonal Pollutant Loadings for Major Outfalls.

- **Program Development and Management (OA1)**
  These are various administrative and management tasks needed to ensure successful implementation of the program. Tasks include:

  - Participating in the development and negotiation of the NPDES Permit conditions;

- Developing and executing intergovernmental agreements (IGAs) with the other permittees;
- Overseeing modifications to the stormwater management plan and NPDES permit conditions on behalf of the County;
- Compiling and reviewing internal reports;
- Writing and submitting the annual compliance report;
- Coordinating and communicating with the other permittees and the City;
- Attending and facilitating meetings;
- Liaison with DEQ;
- Overall budget and schedule tracking; and
- Conducting Stormwater Implementation Team workshops at the County at least three times per year.

- **Program Assessment and Evaluation (OA2)**

  The NPDES regulations require each of the co-permittees to annually evaluate the success of their program and the effectiveness of the various activities being implemented. In addition to satisfying the regulations, this process provides information to key County staff and decision makers which enables them to reallocate resources and staff as appropriate.

  The County Stormwater Implementation Team met 3 times at 3-5 hour work sessions in PY3 to refine and review program implementation progress. This team also completes semi-annual assessment forms for each BMP.

- **Monitoring Program and Annual Water Quality Report (OA3)**

  The NPDES regulations require that the co-permittees continue to collect stormwater data during the permit compliance period as a means of augmenting existing data and providing data that will help measure the effectiveness of BMPs and/or identify sources of pollutants to the MS4. The County negotiates IGAs with the lead permittee to conduct most of this work. As modifications to the monitoring program occur, the County reviews changes and incorporates these into agreements. Additional monitoring may be conducted specifically for the County by consultants as the need arises.

- **Seasonal Pollutant Loadings for Major Outfalls (OA4)**

  The County is required to estimate the seasonal pollutant loadings for the major outfalls it owns within the NPDES permit areas. Since the Part 2

application was submitted, it has been determined that the County no longer owns major outfalls in the Portland USB subject to this permit.

Functional Groups

Managers and staff in the Multnomah County Department of Environmental Services, Transportation/Land Use Division implement the Stormwater Management Program (SWMP). Additionally, the County hired policy and technical consultants to assist in the management and implementation of the plan. The County Implementation Team meets regularly over the permit year to ensure compliance tasks are on schedule and are conducted according to plan. The Team includes Transportation Division Managers, Road Maintenance District Supervisors, the County Engineer, the County Emergency Management Administrator, the Planning Director, other County staff, and the technical and policy consultants. To ensure efficient implementation, each team member belongs to a 'functional group' responsible for specific BMPs, as described below.

Functional Group assignments were given to the Implementation Team to ensure active participation by the necessary staff and consultants. Assignments were made by matching appropriate staff and consultants to the BMPs directly relating to their duties. For example, the staff Engineer responsible for reviewing stormwater facility design is in the DESIGN functional group, while the staff Engineer responsible for overseeing road building contracts is in the CONSTRUCTION functional group. The nine functional groups are:

- Compliance
- Construction
- Design
- Education
- Emergency Response
- Land Use Planning
- Permits
- Road Maintenance, and
- Transportation Planning.

Functional group leaders and other Implementation Team members worked together throughout Permit Year 3 in a series of meetings, work sessions, and interviews. The purpose of these meetings was to update tasks and to track progress in satisfying the requirements of the Best Management Practices of the NPDES Stormwater Implementation Program.

The importance of the functional group structure is reflected best by an explanation of the PY3 compliance accomplishments for each group.

Functional Group Accomplishments: Permit Year 3

Compliance

General NPDES Roles and Responsibilities for Permit Year 3:

The Consultant/ Compliance Group is responsible for overall Program Development and Management, Program Assessment and Evaluation, and Program Compliance Reporting.

Key Accomplishments for Permit Year 3

- Completed intergovernmental agreement with City of Portland for County support and to define MS4 NPDES permit roles and responsibilities.
- Conducted Stormwater Program management, including program implementation coordination with County staff.
- Attended all Co-Permittee Management Committee meetings (approximately monthly) and DEQ meetings relating to the Portland NPDES Co-Permit.
- Conducted training sessions with new Stormwater Implementation Team members.
- Negotiated and adopted new Intergovernmental Agreement between the City and County for Program Activities and BMPs which are interdependent.
- Updated and revised the Five-Year Implementation Plan for the Multnomah County NPDES Stormwater Permit Program (pub. September 1995).
- Organized and facilitated three Workshop Sessions with Stormwater Implementation Team to track progress, update reporting information, and train staff in erosion control BMPs.
- Coordinated reporting activities with City of Portland, as lead permittee.
- Evaluated BMP effectiveness and conducted program assessment throughout the year, resulting in Annual Report to DEQ.

Construction

General NPDES Roles and Responsibilities for Permit Year 3:

County Engineering/ Construction Group ensures through plan checking, education of contractors, specification interpretation, pre-construction meetings, and rigorous inspection and monitoring, that stormwater controls are properly considered, installed, and maintained as part of all public Capital Improvement Projects. Stormwater controls include structural and non-structural techniques and practices which will result in reduced pollution.

Key Accomplishments for Permit Year 3

- Implemented on-site requirements to include more extensive erosion control measures and continuous on-site monitoring.
- Implemented ODOT's 00280 contract specifications for road-building projects. These measures require a formal pollution prevention plan, a rain gauge on site, weekly site monitoring and more frequent inspection in the event of a 1/2-inch 24-hour storm event.
- Monitored road-building projects (which include stormwater facilities) for proper construction techniques to allow benefits to stormwater quality. Includes vegetated ditches, drainage swales, new inlets per County standards.
- Utilized construction inspection checklist including water quality BMPs for pre-construction meetings.
- Inspected erosion control measures (such as silt fences, straw bales, inlet protection) used by Contractors to assure proper installation and maintenance to prevent sedimentation in stormwater system to the maximum extent practicable.
- Educated consultants and designers in stormwater Best Management Practices requirements for County road design projects.
- Attended quarterly Johnson Creek Watershed Council and monthly Inter-Agency Technical Standards Committee meetings (learned/ compared what other agencies are doing for construction BMPs).

Design

General NPDES Roles and Responsibilities for Permit Year 3:

County Engineering/ Design Group ensures through design of new projects and review of contractor's plans that stormwater and Best Management Practice (BMP) structural controls are considered and properly designed for Capital Improvement Program. They will promote a balance of stormwater quality and quantity (flood control) to the Maximum Extent Practicable in considering stormwater facility design.

Key Accomplishments for Permit Year 3

- Inventoried and updated MS4 map. Planned and budgeted field verification program for PY4.
- Incorporated water quality considerations in all design projects.
- Required developers to install pollution plates on new inlets.
- Required landscaping materials in design of contractor's road projects which will utilize not only low impact landscaping materials, but those which require less use of pesticides and/or herbicides.
- Applied engineering criteria to private development plans under the Planning Division's Hillside Development (HD) and Grading/Erosion Control (GEC) permitting process, including considerations of stormwater quality facilities.
- Attended 'Standards' subcommittee meetings (monthly) to compare/discuss stormwater design standards with other jurisdictions in Johnson Creek Watershed.

Education

General NPDES Roles and Responsibilities for Permit Year 3:

Multnomah County's responsibility for stormwater quality education is two-fold. Public education roles are important but are primarily the City of Portland's NPDES

Key Accomplishments for Permit Year 3

- Attended Columbia Slough Watershed Council meetings (monthly) and actively participated with public on council committees.
- County representative participated in meetings of the "Regional Coalition for Clean Rivers and Streams" and helped plan educational activities for the year.
- Begin public process for West of Sandy River

responsibilities for incorporated areas. This change occurred due to the accelerated annexation of SE Portland in 1995. Personnel training within the County Transportation/Land Use Division is still important, and is more extensive. Training includes initiating activities to educate and inform County staff about the sources and solutions to stormwater program issues.

Rural Area Plan which will include several measures for water quality improvements.

- Published articles to promote general water and stormwater quality issues, and public awareness of stormwater pollution through the M.C.TRANS Newsletter, a quarterly publication sent to 45,000 residents of the eastern portion of Multnomah County.

- Continued training workshops for County personnel and Transportation Division District Supervisors regarding latest water quality requirements and structural controls.

- Organized and presented a Water Quality Education activity center at Columbia Slough Watershed Council Open House all-day event for the Columbia Slough Watershed.

- Ensured residents are informed about Capital Improvement Program projects, and associated stormwater facilities, through attendance at public meetings, publication of the CIP document, and hearings with County Commissioners.

- County staff attended Continuing Education Workshop presented by The Wetlands Conservancy on "Nuisance Plant Management in Urban Natural Areas". Training included alternatives to pesticide use in water sensitive areas.

- Attended Johnson Creek Watershed Council meetings.

- Continued training of County personnel for Herbicide Application to minimize impact on stormwater system (licensed applicators only).

- Distributed Multnomah County Stormwater Maintenance Manual for Road Maintenance personnel as a training and documentation tool.

- Held special "Erosion and Sediment Control" Workshop as guidance for County staff in Best

Management Practices for source control. Attended by 32 County personnel.

- Offered Clean Water brochure series to public at both Permits office and County Survey office.

Emergency Response

General NPDES Roles and Responsibilities for Permit Year 3:

County Emergency response personnel will ensure water quality concerns are addressed during emergency procedures. In particular, consider how to prevent materials from reaching the Municipal Separate Storm Sewer System (MS4). Continue to raise awareness of emergency response personnel (in road maintenance group) to ensure general water quality concerns are addressed. Participate in regional Committees addressing these concerns to assure necessary coordination between agencies.

Key Accomplishments for Permit Year 3

- Prohibited use of salt as de-icing material on roadway.
- Continued training of County road maintenance staff and administrative staff in quick response to emergency calls regarding spills in right-of-way and recorded individual response activities.
- County Emergency manager established close working relationship with key agency people, including DEQ spill response manager.
- Participated in regional Emergency Response Committee and HAZMAT teams which meet regularly to coordinate response.
- Emergency management teams responded with appropriate equipment (containment booms and absorbent materials) involving minor spills, prevented oil from reaching MS4.
- County road maintenance role and procedures in the event of a large scale diesel spill were reviewed in training sessions.

Land Use Planning and Transportation Planning

General NPDES Roles and Responsibilities for Permit Year 3.

County Planning staff will ensure stormwater quality management and maintenance practices are considered in land use zoning and permit requirements and applications. In particular, they will enforce land use zoning and permit requirements which may impact stormwater quality. Determine whether land use planning procedures are in place to encourage sound environmental principles relating to water quality (SEC zones, etc.).

Key Accomplishments for Permit Year 3

- Improved inspection activity by addition of 1/2 time inspector/enforcement planner.
- Implemented procedures for design standards review of drainage facilities to coordinate permit review between Planning and the Design Section of the Transportation and Land Use Planning Division.
- Enforced Grading and Erosion Control (GEC) and Hillside Develop (HD) permit requirements to ensure appropriate water quality controls were used for proposed new construction projects.
- Enforced GEC and HD permit requirements by issuance of 15 grading violation citations in this permit area.
- Improved inspection and enforcement activity to ensure compliance with permit conditions including erosion control, buffer zones around riparian areas, and connections to the right-of-way.
- County Planning required landscaping in right-of-way to be able to flourish without the use of herbicides, irrigation or other artificial methods. Bonds are required for 2-year establishment period.
- Required 300 foot setback from designated significant streams in West Hills Rural Area Plan as part of Significant Environmental Concern (SEC) zoning program.
- Continued to apply 100 foot buffer zone in Tualatin Watershed.
- Denied permits to dump fill to applicants who could not demonstrate compliance with erosion

control standards.

Permits

General NPDES Roles and Responsibilities for Permit Year 3:

County Permits and Right-of-Way section will ensure stormwater pollution controls are considered and incorporated into permits for private and public construction projects which attach to and are in the County right-of-way. Specify erosion control requirements through contractor bonding for public right-of-way projects. Ensure maintenance will be conducted for life of project and immediate future.

Key Accomplishments for Permit Year 3

- Ensured specifications for contractors include measures for erosion/sediment control during paving operations.
- Monitored utility company permitted activities (for example pavement cuts) in right-of-way to ensure pollutant control measures are utilized such as silt socks, bio-bag filters and immediate pavement restoration.
- Required cash deposits as well as performance payment bonds for development permits (right-of-way permit) to ensure compliance with erosion control requirements.
- Utilized catchbasin 'sock design' to collect debris and reduce sediment runoff during land-disturbing activities.
- Continued to monitor and evaluate effects of erosion control on permits and field checked them for compliance. Some of these included wash racks, wash stations, graveled entrances, additional street sweeping, hay bales, etc.
- Inspected HDP (Hillside Development) and GEC (Grading and Erosion Control) permit holders for compliance with permit conditions involving erosion control.

Road Maintenance

General NPDES Roles and Responsibilities for Permit Year 3:

The Road Maintenance section of the County

Key Accomplishments for Permit Year 3

- Transportation Division personnel, as well as Inmate Work Crews, documented specific

Transportation Division will utilize established road maintenance procedures specifically relating to stormwater quality management. Document maintenance procedures through the Stormwater Maintenance Manual and field logs. Ensure that problems found in the field relating to stormwater quality and stormwater facilities are addressed as quickly as possible, in the appropriate manner.

observations relating to potential pollutants in the MS4 during routine inspection and cleaning operations. The observations were followed up by supervisors for resolution.

- Utilized new chemical application truck which minimizes dispersal of herbicides, minimizes amounts used, and automatically calculates rates of application.

- County Road District supervisor adjusted ditch maintenance schedule to late summer to prevent sediment from reaching stream. (Major schedule change.)

- Continued implementation of Operation and Maintenance Program for public stormwater facilities with goal of reducing pollutant discharges.

- Participated in ACWA publication Municipal Stormwater Toolbox for Maintenance Practices through Multnomah County model NPDES reporting system (June 1998).

- Attended Wilbur-Ellis Technical Seminar on Vegetation Management and Review of Herbicides. Resulted in removal of Pendulum as a pre-emergent.

- Began modification of anti-icing program to reduce amount of sanding material to the MS4. Designing CMA storage tank and retrieval system.

- Distributed Multnomah County Stormwater Maintenance Manual documenting procedures for management of the MS4 to appropriate new County personnel.

- Utilized daily and weekly recordkeeping procedures for Road Maintenance District Supervisors and field staff.

- Reported specific activities in field logs, e.g. street sweeping log, catchbasin cleaning record, etc. and recorded information in computer

database.

- Implemented a system for tracking and correcting water quality problems observed during routine maintenance operations.

- Road Maintenance staff attended internal training workshops (4 during PY3) to demonstrate use and follow-up of monitoring maintenance procedures and to discuss what improvements can be made to reduce pollutants to the MS4.

- Utilized an automated database for compiling field log information, to assist with annual reporting process.

- County crew is designing new truck box to prevent spillage from truck hauling by County maintenance crews. This will be constructed and tested PY4.

Best Management Practices (BMPs) and Other Activities (OAs): Accomplishments

Annual Compliance Reports for the Municipal NPDES Stormwater Permit are required to include information relating to each BMP task and schedule. The following matrices provide this information, in summary form, for each BMP. More detail is available upon request through documentation in the Multnomah County Transportation Division of the Department of Environmental Services. In general, all BMP tasks are on schedule without modification. Modifications occurring due to annexations and/or road transfers are noted and explained.
The matrices provide the following information:

- √ A short description of the Best Management Practice, with BMP Number. For more detail, see BMP Fact Sheets submitted to DEQ with the Part 2 Permit Co-Application.
- √ The overall intent, goals and objectives of the Best Management Practice.
- √ The Multnomah County 'Functional Group(s)' designated as responsible for BMP Implementation.
- √ Key accomplishments for Permit Year 3.
- √ Assessment of Controls. Indirect Measures of Effectiveness are available as a means of determining success of Best Management Practice. Direct measures of control will be Pollutant Load Reductions - a long term measurement not usually available the first few years of implementation.
- √ Any proposed modifications or changes to the schedule or activities.

Multnomah County NPDES Annual Report for Portland Permit Area - Permit Year 3 - July 1, 1997 through June 30, 1998

Best Management Practice	Overall Intent, Goals and Objectives	Functional Group(s) Responsible for BMP Implementation[1]	Key Accomplishments for Permit Year 3	Assessment of Controls	Proposed Modifications to Schedule or Activities/Status of Cooperative Arrangements with Co-Permittees
Public Education and Involvement (PI & ED)					
PI1. Develop a comprehensive stormwater/watershed public participation program potentially consisting of: • A program promoting continued involvement in "keep watershed clean" campaigns and "adopt-a-creek" efforts. • A program to coordinate and improve efforts to label storm drain inlets. • Continuation of education regarding impacts of oil, antifreeze, pesticides, herbicides, paints, solvents, and other wastes which are dumped into the storm sewer system.	Participate with the City and other agencies in coordinating new and existing efforts to involve the public in addressing the stormwater pollution prevention problem. Inform residents in unincorporated County area of potential impacts to the storm sewer system of their everyday activities. Participate to maximum extent practicable in local Watershed Councils and their activities.	Education	• Published "Water Quality: Our Shared Responsibility" article in M.C.TRANS Newsletter including ways the public daily activities can help protect water quality through source control (Summer 1998). • Board of County Commissioners approved "Adopt a Road" program. • County representative participates monthly in Regional Coalition for Clean Rivers and Streams in developing comprehensive stormwater/watershed public involvement campaign. • Prepared articles for M.C.TRANS Newsletter (distributed to employees and the public) to promote greater public involvement in various stormwater pollution prevention efforts. • Regularly attended the Johnson Creek Watershed Council meetings to represent County interests. • Actively participated in Tualatin Basin Public Awareness Committee (TBPAC). • Signed intergovernmental agreement for financial support to Regional Coalition for Clean Rivers and Streams. • Attended monthly meetings of Columbia Slough Watershed Council and actively participated in Council Committees. Presented information for public regarding new TMDL water quality requirements. • Attended public Fairview Creek Committee meetings. • Committed to $2,000 contribution to Regional Coalition for Clean Rivers and Streams for PY4.	• Tracked participation (#/type meetings attended) regarding public involvement.	Due to extensive annexation of some County lands and its residents by the City of Portland in December 1994, the County no longer has jurisdiction over those SE property owners. The County's NPDES roles and responsibilities within the permit area are only for unincorporated areas. For this reason, the County focuses its efforts on County employees and residents in unincorporated areas. In 1998, the County signed an IGA with the City of Portland to financially support the region's comprehensive public involvement campaign: The Regional Coalition for Clean Rivers and Streams. ***See Portland section of Annual Report.***

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ED1. Develop comprehensive stormwater/watershed education program potentially consisting of: • A program to educate engineers and others of new structural techniques that reduce negative water quality impacts to streams and the storm system, and design practices which reduce the need for pesticides, herbicides and fertilizer. • A program to educate regarding the relationship between vehicle use and stormwater quality problems. • A program to educate the public regarding the need to clean up and properly dispose of pet wastes. • Continuation of education programs regarding the impacts of oil, antifreeze, pesticides, herbicides, paints, solvents, and other wastes being dumped into the storm sewer.	Participate with the City and other agencies in coordinating new and existing efforts to educate and inform the public about impacts to the stormwater system. Educate appropriate County personnel regarding impacts of their on-the-job activities on the MS4, with the goal of minimizing negative impacts to receiving streams.	Education Road Maintenance	• Special "Erosion and Sediment Control" workshop held as guidance for County staff in Best Management Practices for source control. 5-hour session attended by 32 County personnel from Department of Environmental Services. • Presented status of Road Waste Management Program to Oregon Association of County Engineers and Surveyors. • Published articles in "M.C.TRANS" newsletter, (sent to 45,000 households), to educate public and employees about stormwater pollution impacts. • Training sessions with County Road Maintenance group included review of Stormwater Maintenance Manual, videos re: WQ impacts of road-building activity, meetings re: erosion control practices. • Worked with public to develop Transportation System Plan for West Hills including natural resource considerations. • Presented County public education materials at booth for "Columbia Slough Watershed Council Open House." • Trained County's herbicide applicators for current certification procedures to minimize water quality impacts to MS4. • Clean Water brochure series offered to public at both Permits office and at Survey office. • Work session held to review the goals and accomplishments of PY3 Stormwater Program attended by Road Maintenance Managers & Supervisors, Transp. Division personnel, & Land Use Planning Division. • County road maintenance lead men attended APWA Training session re: catchbasin cleaning methods. • County road maintenance district supervisors attended "Road and Street Maintenance Supervisors School" (Dec. 97 - Bellevue, WA) including sessions on road waste management and anti-icing agents.	• Kept notes of Erosion Control workshop attended. • Tracked phone calls resulting from M.C.TRANS article. • Training sessions were tracked for attendance.	Due to extensive annexation of some County lands and its residents by the City of Portland in December 1994, the County no longer has jurisdiction over those SE property owners. The County's NPDES roles and responsibilities within the permit area are only for unincorporated areas. For this reason, the County focuses its efforts on County employees, and residents in unincorporated areas. The County, as co-permittee, will track Portland's progress and stay involved in joint training sessions for staff as appropriate.

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Operations and Maintenance (OM)					
OM1. Develop O&M plans (or review and revise as appropriate, existing O&M plans) for all public storm facilities (new and existing) with the goal of reducing pollutant discharges.	Determine if current practices are effective in ensuring that sumps and inlets are operated and maintained in a manner that reduces pollutants to the maximum extent practicable (MEP). If not, make improvements. Develop new O&M procedures for facilities not currently addressed.	Road Maintenance Compliance	• Participated in ODOT Technical Advisory Committee to review and improve road waste management. • Generated summary reports from computer database utilizing daily/weekly inspection forms from field personnel. • Worked with ODOT to investigate best methods of collection and disposal of road waste through study to be conducted PY4. • Continued research process to determine feasibility of building new waste containment and dewatering facility. • Participated in and contributed to ACWA document Municipal Stormwater Toolbox for Maintenance Practices published June 1998. • Presented County Road Maintenance stormwater implementation program reporting system at Toolbox workshop • Distributed the "Multnomah County Stormwater Maintenance Manual" to describe procedures and inspections re: operating and maintaining County roads and associated drainage facilities. The procedures help to reduce water quality impacts/pollution problems. • Improved NPDES field logs were used to track maintenance activities. • Utilized the maintenance manual and recordkeeping system to conduct inspections of the system and correct problems as needed. • Assigned a staff person to track/compile records. • New road index system was developed for all County roads to provide more accurate reporting by inspectors and road maintenance staff.	• Assigned a staff person to compile records and calculate total amount of debris collected, problems addressed, etc. • Reviewed reports to determine effectiveness of recordkeeping system. • County Road Maintenance Supervisors and field staff are surveyed to determine if O&M practices are effective.	Due to annexations of County lands on the east side (i.e. sumped areas) by the City of Portland in December 1994, the County is now only responsible for maintaining stormwater facilities associated with County-owned roadways in small pockets of the west side. The county currently has a contract with the City of Portland for the City to maintain stormwater facilities associated with County roads within the permit area.

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OM2. Evaluate operations and maintenance activities for public rights-of-way to determine water quality impacts. Recommend improved procedures or practices that reduce the discharge of pollutants to the stormwater system.	Determine if current maintenance practices for roads/ditches are effective at reducing stormwater pollution; if not, make the necessary improvements. Ensure all appropriate County personnel continue BMP activity through regular workshops and training sessions. Promote requirements in road contracts to demonstrate compliance with erosion control plans.	Road Maintenance Compliance Permits	• Conducted training for new right-of-way inspectors to monitor roadways for improper discharge. • Research project proposed by Multnomah County and ODOT to study disposal and reuse of waste materials generated through highway maintenance activities was accepted for funding by Oregon's State Planning and Research Program. • Required approach roads to be rocked and paved to reduce tracking of soils onto roadway during road construction projects. • Inspection staff coordinated with Road Maintenance staff for complete system inspection of streets and ditches. • Reviewed draft Portland report Operation and Maintenance section of Portland's Stormwater Manual. • Increased use of bio-bag filters at catchbasins and ensured proper continuous use. Incorporated these methods into permit conditions and inspected for compliance. • Reviewed truck hauling practices with field crews after watching video "Luck is not enough." • Transportation Division managers attended Northwest Transportation Conference (Feb. 98) and presented discussion "New Issues for Environmental Protection." • Assigned a County representative to attend PDOT meetings regarding operations and maintenance practices - Technical Advisory Committee. • Based on trial tests, continued use of "silt socks" in inlets/catchbasins to further reduce sediment. • Continued to pick up and recycle sanding gravels in curbed areas of the County. • Continued to practice safe and environmentally sound vegetation management practices to the maximum extent practicable. Developed permit requirements to include vegetation management. • Held meetings to review & discuss truck hauling practices & impacts to water quality. Improved procedures were recommended. • Recommended improved practices and demonstrated new products for truck bed rinsing BMPs. • Implemented new program and standards for disposal of sump and catchbasin material.	• Assigned a staff person to compile records and calculate total amount of debris collected, problems addressed, miles swept, etc.	On schedule. No modifications. Westside Maintenance Agreement with City of Portland (PDOT) and Multnomah County (DES) provides for road maintenance in unincorporated areas (primarily "Dunthorpe") to be conducted by PDOT at the same level of service as PDOT provides to City roadways.

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OM3. Review current certification procedures/requirements for high-volume users of pesticides, herbicides, fertilizers (e.g., commercial applicators, public agency personnel) to assure that water quality impacts are addressed. As appropriate, make recommendations for changing the requirements.	Determine if current training/certification practices address water quality issues. If not, recommend changes. Improve application practices and train personnel to reduce pollutants to the maximum extent practicable.	Road Maintenance Education	• Assigned full-time staff person to address herbicide, pesticide application, with water quality impacts in mind. • Testing use of plant regulators (i.e., plant hormones) instead of herbicides which could maintain vegetation in roadside ditches. • Used new herbicide spray truck which computerizes application rates, calculates rates per mile, mixtures and concentration rates to reduce amount of spray and reduce impact to environment. • Attended State Vegetation Management Association Conference for R-O-W herbicide applicators. Included session on meeting NPDES goals. • Received annual education and renewal certification from ODA for licensed applicators. • Utilized field logs to record use of herbicides, pesticides, by amount of area covered, with result of reducing amounts used. • Established informational brochure for landowners managing "no-spray zones." • County staff attended ODOT training on CMA (anti-icing) application to improve practices which may reduce pollutants. • Participated in Herbicide Container Recycling Program, which keeps containers out of landfills. • Attended Wilbur-Ellis Technical Seminar on vegetation management and review of herbicides. Resulted in removal of Pendulum as a pre-emergent. • County staff attended continuing education workshop presented by The Wetlands Conservancy on "Nuisance Plant Management in Urban Natural Areas." Training included alternatives to pesticide use in water sensitive areas.	• Kept records of number of applicators attending the annual certification training. • Used results of several trial tests with various chemicals (i.e., "Pro-roundup," "Transline," "Finale," and "Pendulum") to determine which products tend to have less health and environmental effects (e.g. no/fewer residuals). • "Herbicide spray" logs were completed by field staff and filed. Information includes location sprayed, product type used and rates applied.	On schedule. No modifications.

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OM4. Review existing truck hauling practices and make recommendations, if necessary, to limit occurrence of leaks, spills, or other releases.	Control discharges from truck hauling activities to the extent that they are impacting County ROW. Respond to spills according to established emergency procedures. Follow-up with enforcement action and accountability.	Emergency Response Permits Compliance Road Maintenance Education	• Erosion control inspection requirements included conditions for spillage, haul routes, and mud tracking. • Increased compliance monitoring by coordinating enforcement with Multnomah County Sheriff's office. • Utilized established requirements for wash racks, grating, gravel/paved roads, bio-bags and a silt-sock device for catchbasins. Incorporated into permit requirements on a case-by-case review. • Contractors were required to pay $2,000 cash deposit as part of permit conditions for projects with heavy traffic to ensure no tracking of mud onto roadways and for spillage control. • County field inspectors continued to monitor grading permit activities. • Continued to inspect County fleet trucks daily to determine if defects/leaks require repairs. • Continued to respond to 911 referrals and complaints to monitor and clean up spills on County roads. • All field staff of Road Maintenance District #1 (Westside/Skyline) met to review and discuss correct and safe truck hauling practices. Determined changes for improvements including limiting and eliminating leakage. Sampled anti-stick for asphalt dump trucks.	• Utilized the "Report of Event" form for recording County's efforts to respond to and clean up any spills on County roadways. • Recorded inspection and monitoring results.	On schedule. No modifications.

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Industrial/Commercial Controls (IND)					
IND1. Develop a comprehensive program to control the discharge of pollutants to the stormwater system from existing and developing industries and municipal solid waste facilities, including procedures to develop and enforce requirements, conduct inspections and implement a monitoring program. (City of Portland Lead)	Support efforts by the City of Portland to eliminate illicit discharges from industries to the MS4 and to educate facility operators about ways to prevent stormwater pollution. Coordinate with DEQ's general permitting program.	Education Land Use Planning Road Maintenance Compliance	• Reviewed City of Portland draft Stormwater Manual, Chapter 6: BMPs for Commercial, Industrial, and Multi-Unit Dwellings. • Attended meetings including reports of Portland's progress in implementing industrial BMPs.	***See City of Portland Annual Report.***	Due to annexations by the City of Portland of County lands in 1995, the County has no jurisdiction over industrial property owners/operators in the Portland NPDES permit area. IGA was signed, but this BMP section will not be required due to City annexations/lack of County jurisdiction over industrial dischargers.
Illicit Discharge Controls (ILL)					
ILL1. Manage the Spill Prevention and Response program that reduces the frequency and impact of spills to the stormwater system.	Improve coordination efforts by all co-permittees to reduce the impacts of spills on surface and groundwater. Incorporate existing groundwater protection into stormwater program for spill prevention and response.	Emergency Response	• County Emergency Response staff attended meetings with Portland BES and DEQ to discuss spill response program especially relating to prevention of impacts to storm drains. • Continued to work with regional HAZMAT teams on policy matters concerning water quality impacts. • Continued full time Emergency Management Administrator position. • Used mini-booms and absorbent materials for quick response of minor spills of oil or fluid. • County inspection offices enforced action against several cases of mud tracking onto right-of-way. • Continued training of road maintenance staff and administrative staff in procedures regarding spills and discharges requiring emergency response. • Kept resource phone list for HAZMAT team. • Reviewed Road Maintenance role and procedures in the event of a large scale diesel spill.	• Kept records and notes of committee meetings. • Used NPDES "Event Form" to record response to spills.	On schedule. No modifications. The City is the lead co-permittee on this BMP. The County is a participant in the regional Interagency Committee on Spill Control.

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ILL2. Develop and implement a program to prevent, search for, detect, and control illicit connections and discharges to the stormwater system.	Detect and eliminate all illicit discharges (illicit connections and illegal dumping) to the MS4.	Emergency Response Permits Road Maintenance Compliance	• Road Maintenance crews continued to refer reported/suspected problem septic systems to appropriate agency. • Road Maintenance crews continued to refer illegal dumping incidents to vector patrol and "garbage police." • Worked with County Nuisance Control Division for enforcement and follow-up to potential illicit connections. • Corrections officer and inmate work crews continued to respond to litter/dumping complaints (funding provided by County). • Illicit discharge discovered; stop work order was issued; property owner required to remove fill. • Inspectors continued to aggressively monitor development and other roadway activity to correct and ensure erosion control measures were being conducted. For example, immediately stopped and instructed Skyline Blvd. nursery operator to clean mud from road system and prevent continued discharge. • County crews removed illegal dumping material and referred matter to DEQ. • County is collecting inventory on all culverts. Cleaned, repaired, replaced as needed and field inspected for illicit connections. • Began culvert system prioritization process in District 1 (Westside Skyline).	• Compiled information from road maintenance field logs and "Inmate work crew" logs to track and respond to pollution problems.	Due to annexations by the City of Portland of County lands in December 1994, the County no longer owns any major stormwater outfalls in the permit area. For this BMP, the County is focusing its efforts at controlling illegal dumping. IGA has been signed with City of Portland, but this BMP section may no longer be required due to annexation.

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New Development Standards (ND)					
ND1. Require Operation and Maintenance Plans for stormwater facilities related to new private development.	Address post-development pollutants discharged from private sites.	Permits Land Use Planning Compliance	• County funded and added one inspector for code enforcement to investigate complaints and/or violations of permit conditions. • Engineering staff in the Transportation and Land Use Planning Division continued to support the planning staff by reviewing technical data submitted by permit applicants for stormwater facilities. • Permits section of Transportation Division required long term commitments to maintenance of swales and other bio-filtration mitigation measures for stormwater that potentially impacts or is directly discharged in the right-of-way. • Reviewed City of Portland's Draft Stormwater Manual re: Water Quality Criteria for New Development. • Multnomah County continued negotiations with City of Portland for agreement where Portland would implement 2040 plan in westside urban areas. • Internal routing procedures ensure engineering staff are checking design for compliance with stormwater quality controls, including erosion control, connection to right-of-way, onsite detention, etc. • Stormwater engineering staff reviewed new development applications for compliance to Multnomah County standards for surface water management. • Continued to require detention systems for proper connection to right-of-way. • Reviewed new development permit applications for sedimentation manholes.	• Tracked level of effort expended in meetings related to this BMP. • Compiled information on "Report of Event" form re: review of permit applications.	Due to annexations by City of Portland of County lands in 1995, the County now has only small pockets of private property within the Portland NPDES permit area. On schedule. For Multnomah County's portion of the permit area, the County issues land use and right-of-way permits, and the City of Portland issues building, plumbing, and electrical permits.

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ND2. Work with landowners, tenants, and/or public agencies to apply practical erosion control, sediment control, and other controls to reduce pollutant discharges associated with undeveloped and developed properties, and park lands.	Assist property owners to eliminate erosion and sedimentation problems on their properties.	Permits Construction Education Land Use Planning	• County Planning issued 32 citations for grading violations. Each required site inspection, notification, and follow-up resulting in appropriate GEC permit or other action. • Transportation section personnel continued to report apparent violations caused by fill or excavation activities to Planning Section when outside R-O-W. (When inside R-O-W transportation group does follow-up) • Responded to complaints related to stormwater runoff and associated sediment loads. Required property owner to prevent extraneous runoff from commercial nursery. • Improved procedures for working with other County departments, state agencies and affected jurisdictional authorities to report pollutant discharges. • County is distributing educational brochures to landowners re: practical erosion control. • County Planning began 300 foot setback requirement in West Hills Rural Area Plan for designated significant streams.	• Kept records of the County staff's involvement in local educational workshops/ seminars. • See other BMP (ND1, ND2) accomplishments herein for extensive County erosion control program. • Kept records of County code violations, inspections, and status.	On schedule. No modifications. This BMP relates to private landowners. In the Portland permit area, County involvement is very limited because of the annexation of lands to the City, and the transfer of park lands to METRO.

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ND4. Develop a comprehensive pollutant discharge control program for all construction sites.	Eliminate/reduce discharge of all pollutants from construction sites which adversely impact stormwater and receiving water quality.	Land Use Planning Construction	• County denied permits to 2 large fill proposals because applicants could not demonstrate compliance with erosion control standards. • County enforced code requirements for maintaining grading and erosion control. • Multnomah County Planning Division applied the Grading and Erosion Control Standards (GEC) for "land-disturbing" activities on private lands. • Continued to use and require silt socks to further reduce sediment in runoff. • Hillside Development (HD) or GEC permits are required for grading, clearing, or fill on sites within the permit area. 48 GEC and HD permits were reviewed for compliance with County standards. • Continued to implement stringent erosion control measures for road construction projects utilizing ODOT's 00280 contract specifications. These measures require a formal pollution prevention plan, a rain gauge on-site, weekly site monitoring or more frequent inspection in the event of a 1/2-inch 24-hour storm event. • Required cash deposits as well as performance bonds for development permits (right-of-way permit) to ensure compliance with erosion control requirements. • County Department of Environmental Services began coordination process for ensuring transportation projects apply same standards required in GEC permits for private development. Standards are more stringent in Tualatin Basin (two slide repair projects on Cornelius Pass Road). Monitored effectiveness of erosion control measures and modified as necessary to reduce discharges. • Began computerized communication system to track new development permits where Multnomah County and City of Portland Building Bureau are involved. • County Road Maintenance often used bio-bag filters as temporary sedimentation control during storm events.	• HD and GEC permits standards require temporary erosion control and water quality protection during construction as well as permanent erosion control and stormwater facilities for final approval. Inspectors are trained to constantly evaluate and assess these controls. • Tracked number and status of permits issued.	On schedule. Task of participation in City's efforts has been modified to coordinate with City of Portland's new development standards team; schedule revised by City of Portland. County Planning will continue to coordinate with Portland City Building Bureau, and enforce construction site standards.

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ND6. Establish incentives and/or requirements for contractors/developers to ensure that damages from erosion and/or sediment deposition are addressed and paid for.	Continue to require those responsible for damage and water quality pollution to pay clean-up costs.	Compliance Permits Construction	• Implemented 300 foot setback in West Hills Rural Area Plan for designated significant streams as part of County's SEC zoning program. • Required graveled entrances/exits to construction area used by trucks to reduce tracking of debris. • Continued to require performance-payment bonds for post-construction. The bonds are in effect for a full year following completion of construction. • Required cash deposits to ensure compliance with erosion control requirements in many cases. • Final inspections were conducted to ensure compliance before release of performance bonds.	• Kept records of erosion control, bonds, and meetings attended. • Contractors were generally in compliance with requirements during PY3.	On schedule. No modifications.

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Structural Controls (STR)					
STR1. Evaluate need for construction of additional stormwater quality treatment facilities. If appropriate, develop plans for construction, maintenance and monitoring of the facilities. Construct and monitor appropriate facilities.	Consider water quality impacts of ongoing or planned treatment facility construction projects. Identify need for and feasibility of new projects where appropriate.	Compliance Design Construction	• Sedimentation manholes and pollution plate assemblies were built for 207th Connector. • Continued coordination in Johnson Creek Watershed Council meetings for inter-agency BMPs, capital projects, and watershed-wide design standards (new water quality facilities are recommended as part of the Johnson Creek Resources Management Program).	• Recorded level of effort expended on review of plans, design of water quality facilities, and attendance at committee meetings.	On schedule. No modifications.
STR2. Determine the practicability of retrofitting existing drainage and flood control facilities (e.g., retention basins, drainage channels) to improve water quality. If practicable, develop plan(s) and implement.	Continue sump replacement program, which was designed to improve pollutant reduction aspects of existing drainage and flood control facilities.	Design Transportation Planning Construction	• Retrofits are done as part of upgrades to County-owned roadways and associated drainages. • Continued to require any developers to install pollution plates on new inlets. • Conducted wetlands analysis as part of Transportation Capital Improvement Program. • County required extensive erosion control measures during design and repair of two slides (SW Cornelius Pass Rd.). This included major temporary drainage measures so as not to disturb soils; silt fences and hay bales; rip-rap basins; bio-bags at existing catchbasins; and seeding and matting all disturbed areas. Replaced culvert and added trash rack.	• Recorded level of effort expanded on design of retrofits, amount of mitigation projects, repair work done.	Due to annexations of County lands (and associated ~900 sumps) by City of Portland in 1995, there are very few County-owned sumps remaining in the Portland NPDES permit area. For this BMP, the County will focus its efforts on retrofits associated with County right-of-way projects. Existing agreement with City of Portland for City to maintain County-owned roadways on west side, includes sumps in the Portland NPDES permit area.

[1]All functional groups are formed in the Multnomah County Department of Environmental Services, Transportation/Land Use Division and/or the Technical Consultants contracted to manage the NPDES Program.

Best Management Practice	Overall Intent, Goals and Objectives	Functional Group(s) Responsible for BMP Implementation[1]	Key Accomplishments for Permit Year 3	Assessment of Controls	Proposed Modifications to Schedule or Activities/Status of Cooperative Arrangements with Co-Permittees
STR3. Support government and community tree planting programs.	Encourage tree planting and use of other vegetation to increase adsorption and infiltration, thereby reducing stormwater runoff pollution. Require appropriate landscaping on County right-of-way projects associated with new or improved roadways.	Design Land Use Planning	• Specifications for landscaping in right-of-way requires use of low impact species such as native plants. • Land Use Planning requires landscape materials on at least 15 percent of entire site, retention of existing trees, for approval of community service (schools) or conditional use developments. • Provided educational information re: native species workshops presented by the East Multnomah County Soil and Water Conservation District (SWCD).	• Tracked meetings, development review, including landscaping.	Due to annexations of County land by City of Portland in 1995, the County now only has small pockets of private property within the Portland NPDES permit area. For this BMP, the County will focus its efforts on landscaping in County rights-of-way. Annexation of the large SE Portland area (previously unincorporated County) to the City modified the County's contribution to the City for this BMP. The County has an agreement with the City of Portland to conduct building permit review (includes review of landscaping plans) for private property in the County's portion of the Portland NPDES permit area.

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Best Management Practice	Overall Intent, Goals and Objectives	Functional Group(s) Responsible for BMP Implementation[1]	Key Accomplishments for Permit Year 3	Assessment of Controls	Proposed Modifications to Schedule or Activities/Status of Cooperative Arrangements with Co-Permittees
STR4. Review and modify existing design standards for drainage/flood control and water quality facilities to improve water quality.	Enforce surface water quality requirements (established/being established by others) for unincorporated areas within the Portland NPDES permit area.	Compliance Design Land Use Planning	• County personnel continued to participate in the Johnson Creek Design Standards subcommittee. The committee is charged with recommending standards for water quantity and quality control in the watershed. • Reviewed draft water quality criteria issued by the City of Portland. Criteria have been delayed pending final draft of the new Portland Stormwater Manual. • Used Portland's existing Water Quality Facilities Design Manual for guidance. • Included sedimentation manholes and pollution plate assemblies in design of major roadway.	• Kept track of staff's participation in local activities related to this BMP.	Due to annexations of County lands by the City of Portland in December 1994, the County now only has small pockets of private property within the Portland NPDES permit area. For this BMP, the County will focus its efforts on development in public right-of-ways. The County has an agreement with the City of Portland to conduct building permit review (including review for compliance with water quality design criteria) for private property in the County's portion of the NPDES permit area.

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Best Management Practice	Overall Intent, Goals and Objectives	Functional Group(s) Responsible for BMP Implementation[1]	Key Accomplishments for Permit Year 3	Assessment of Controls	Proposed Modifications to Schedule or Activities/Status of Cooperative Arrangements with Co-Permittees
Planning/System Preservation and Development (PS)					
PS1. Modify landscape requirements for various land use district plans to encourage use of self-sustaining vegetation which reduces the need for pesticides, herbicides, fertilizers and water.	Reduce pesticide/herbicide use and encourage use of self-sustaining vegetation as means of improving water quality.	Design Land Use Planning	• Modified County code to implement 300 foot setback requirement in West Hills Rural Area Plan. This applies to designated significant streams as part of SEC zoning program. • Specifications for landscape in right-of-way require use of low impact species. • Planning Division managers are working with City of Portland to implement 2040 plan including incentives to use self-sustaining vegetation. • Information from City of Portland is available at the County Permits office: - Portland Native Plant list - "Alternatives to Pesticides" brochures - "Naturescaping for Clean Rivers" workbook • Permit approval for use of Significant Environmental Concern (SEC) zones required natural vegetative fringe along rivers, streams, and wetlands.	• Kept records of approved plans in SEC zones.	Due to annexations of County land by the City of Portland in December 1994, the County now only has small pockets of private property within the Portland NPDES permit area. For this BMP, County will focus its efforts on landscaping in County right-of-ways.
PS2. Evaluate practicability of providing financial incentives to property owners who protect natural areas considered to have valuable water quality characteristics.	Increase amount of natural areas in the urbanized parts of the County in order to reduce stormwater runoff and the pollutants carried with it.	Permits Land Use Planning	• Continued work with City of Portland Planning Bureau to coordinate 2040 plan. • County Zoning Code provides an incentive to protect natural areas and water courses through the Planned Development (PD) Section. • Provided the City of Portland with a copy of the County's ordinance for use as a possible model in the City's study of other agencies' incentive programs.	• Kept records of approved plans including those involving protection of natural areas.	On schedule. No modifications
PS3. Inventory and map the storm sewer system.	Improve knowledge of the County system, to facilitate identification of problem areas and implementation of control programs in strategic locations.	Design	• Planned and obtained budget approval for field verification of MS4 during next permit year. • Continued to inventory and update MS4 map to include new stormwater systems. • Allocated staff resources to ensure continued map updates.	• Tracked hours expended by staff person to update stormwater maps.	On schedule. No modifications.

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Best Management Practice	Overall Intent, Goals and Objectives	Functional Group(s) Responsible for BMP Implementation[1]	Key Accomplishments for Permit Year 3	Assessment of Controls	Proposed Modifications to Schedule or Activities/Status of Cooperative Arrangements with Co-Permittees
Other Activities (OA)					
OA1. Program development and management.	Develop and manage the County's stormwater program to ensure compliance with the NPDES permit. Develop and implement cost-effective, practical BMPs and activities that are designed to reduce stormwater pollution to the "maximum extent practicable," given the County's unique conditions.	Compliance	• County Stormwater Implementation Team continued to implement BMPs on schedule. • Hired a technical/policy consultant team to help direct and manage the program, including education of County staff and oversight of reporting activities. • Facilitated a series of work sessions with County staff related to program implementation and reporting. • Participated in the drafting and negotiation of IGAs with the City of Portland. • Actively participated in monthly meetings with the co-permittees to oversee program implementation. • Attended public and agency meetings to represent the County's interests. • Trained new County staff to manage respective BMPs and activities. • Attended annual DEQ summit meeting with state-wide NPDES managers.	• Kept track of staff time spent managing the program. • Conducted informal surveys of staff responsible for functional group tasks.	On schedule. No modifications.
OA2. Program assessment and evaluation.	On a continuous basis and especially annually, assess and evaluate the program to ensure the best use of available resources and make recommendations for continuous improvement.	Compliance	• Utilized semi-annual reporting forms for each BMP to continually evaluate progress of stormwater implementation team. • Utilized recordkeeping system for use by the County staff to track work done in the field, meetings attended, etc. • Designated a County staff to compile/summarize the field records so that management could evaluate the results. • Worked with County staff to compile BMP files for evaluation of progress at several work sessions with entire Implementation Team.	• Kept track of staff time spent evaluating and reporting BMP and program implementation tasks.	On schedule. No modifications.

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Multnomah County NPDES Annual Report for Portland Permit Area - Permit Year 3 - July 1, 1997 through June 30, 1998

Best Management Practice	Overall Intent, Goals and Objectives	Functional Group(s) Responsible for BMP Implementation[1]	Key Accomplishments for Permit Year 3	Assessment of Controls	Proposed Modifications to Schedule or Activities/Status of Cooperative Arrangements with Co-Permittees
OA3. Monitoring Program and Annual Water Quality Report.	Begin to identify: pollutant loads entering receiving waters via stormwater runoff, pollutant sources/problem areas, the most effective BMPs for controlling problem areas/sources, and degree to which stormwater discharges might be impacting water quality and aquatic environment. Add to existing water quality database.	Compliance	• Continued to support the City's ongoing monitoring program through contribution of in-kind services.	This work is being conducted by the City of Portland, as part of the overall program monitoring efforts. ***See City of Portland Annual Report.***	***See City of Portland Annual Report.***
OA4. Estimate seasonal pollutant loadings for major outfalls.	As required by the regulations, estimate seasonal pollutant loadings for each major stormwater outfall.	Compliance	• ***See City of Portland Annual Report.***	Not applicable to County.	Due to annexation of County lands by the City of Portland, the County no longer has ownership of any major stormwater outfalls.

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Section IV

PORT OF PORTLAND

Port of Portland
Municipal Storm Water
Annual Report
Permit # 101314
Submitted September 29, 1998

Introduction

This report is submitted to the Oregon Department of Environmental Quality (DEQ) in compliance with the NPDES Municipal Separate Storm Sewer System Discharge Permit (Municipal Permit) requirements. As a co-permittee, the Port of Portland (Port) annual report contains the information required by the Municipal Permit schedule B (6) and (7a.-d.). Please refer to the introductory section and executive summary of the entire co-permittee submission for report format details. All tables and figures referenced throughout this report are compiled in Appendix 1 and Appendix 2 respectively.

Schedule B (7 a.-b.) of the Municipal Permit requires a description of implemented components and changes to the Port's proposed Municipal Storm Water Management Plan (MSWMP). The Port MSWMP, submitted in the Part 2 NPDES Municipal Permit application, was approved by the Oregon Department of Environmental Quality (DEQ). The Port MSWMP describes a series of Best Management Practices (BMPs) to be implemented throughout the 5-year Municipal Permit term. The MSWMP BMPs were selected to satisfy the requirements for municipal compliance promulgated in 40 CFR 122.26(d)(2)(iv). The MSWMP BMPs are reviewed below in the same order as they were listed in the submitted MSWMP. The BMPs were fully described in the Municipal Permit application referenced above. For the purposes of this annual report, only the BMP description, status, implementation activities, and any proposed BMP changes will be discussed.

Schedule B (6) and (7c. - d.) of the Municipal Permit requires permittees to submit a summary of the analytical data collected for municipal monitoring compliance. The analytical data representing the quality of storm water runoff from various land uses within the municipal permit jurisdiction, and therefore the Port, are included in the Portland Urban area data analysis included in the final section of the co-permittee report document.

The Port submitted the completed Port Municipal Storm Water Monitoring Program to DEQ April 8, 1998. Following submittal, the Port initiated the BMP monitoring portion of that Port Monitoring Program. It has been identified by Oregon municipalities, the Association of Clean Water Agencies (ACWA), and other agencies that there is a need for storm water BMP infield monitoring. The Port has implemented a program to test three typical storm water BMPs including catch basin filters, an oil water separator, and a Stormceptor unit. The data will be submitted each year in the annual report and will also be shared with the co-permittees, ACWA, and other state agencies. The first set of data from the 1998 sampling are presented in Tables 1-3.

The Port's owns and/or manages approximately 9,700 acres in 4 operating areas within the City of Portland Urban Services Boundary, including: the Portland Ship Repair Yard (PSY), the Portland International Airport (PDX), several industrial parks, and the marine terminals. The operating areas were described in full in the Part 2 NPDES application, therefore, only a brief description is provided below.

The industrial permit compliance monitoring data from samples collected at specific Port industrial outfalls for the 1997/1998 season are included in Tables 4-9. The Port Industrial Storm Water Permit data represents the runoff quality from the range of industrial activities occurring on Port property. Samples were collected from PSY, PDX, and Marine Terminal 6 (T-6). These samples are representative of a variety of activities, including transportation, industrial, and commercial land uses. Although this data set was collected as part of the Port's Industrial Storm Water Permit compliance, it effectively represents a portion of the municipal storm water monitoring requirements and is therefore included in this annual report. The grab sample analysis from the industrial sampling was used to estimate pollutant loads for each storm sampled and each sampling location.

Airport

Portland International Airport (PDX) is approximately 3,229 acres in size and is located in Northeast Portland. The airport storm water runoff discharges into the Columbia Slough through a series of 9 outfalls. PDX is regulated under the General Industrial Storm Water Permit 1200-T. Tenant co-permittees are listed in Table 10 of this report.

Industrial Parks

The industrial parks managed by the Port include Swan Island/Port Center, Rivergate, Mocks Landing, and Portland International Center. The approximate total industrial/commercial park area is 3,838 acres. The Port has sold much of the property in the above mentioned parks, and the remaining property is approximately 80% leased. Figure 1 is a map of Swan Island, Mocks Landing, and Port Center, Figure 2 is a map of the Rivergate District. The maps show Port owned property, leased property, and sold parcels. The storm runoff from the industrial park areas discharges to the Willamette River, the Swan Island Channel, and the Columbia Slough. Tenants located in the industrial parks are responsible for obtaining and complying with applicable permits independent of the Port. The industrial park tenants with NPDES permits are listed in Table 10.

Marine Terminals

The marine terminal operating area includes five terminals occupying approximately 1,023 acres. The storm water runoff from the terminal areas enter into the Willamette and Columbia Rivers, and the Columbia Slough. Marine tenants with NPDES permits are listed in Table 10. Terminal 6 (T- 6), the only Port terminal located on the Columbia River, is operated by the Port, and complies with the 1200-Z permit.

Ship Repair Yard

The Portland Ship Repair Yard (PSY) consists of approximately 94 acres located on Swan Island in North Portland. The Ship Repair Yard is leased to, and operated by, Cascade General. Cascade General is responsible for daily environmental compliance. The industrial storm water permit at PSY, 1200-Z, is now in the operator's name, with the subtenants listed as co-permittees to the permit. The list of PSY tenants and co-permittees is included in Table 10.

Port of Portland Organizational Structure

Figure 3 is an organization chart of the Port's Environmental Program. The Environmental Services Division (ESD) is a corporate branch of the Port's Policy and Planning Division. The ESD is responsible for overseeing Portwide environmental issues, while the operating areas are responsible for day to day compliance. The ESD is responsible for property transactions. The ESD provides the property managers with the appropriate environmental language for property

transaction documents. If Phase I environmental site assessments or walk throughs are required, then ESD is responsible for scheduling and completion.

Schedule B (7a. - b.) Requirements

BMP Number:
PP1 - Planning and Policy Development

BMP Description:
Promulgate policy and practices to address storm water pollution issues on all Port lands.

Status

The ESD continues to provide policy and program direction to the Port operating areas. Many Portwide storm water programs have been developed and implemented for the purposes of storm water control and runoff water quality improvement. The ESD's role is to develop the required storm water programs, gain approval from operating area management, and then help implement the program in the respective areas. Ultimately the operating area environmental staff conducts and maintains the program components.

The programs that have been implemented and are a part of operating area compliance include the Illicit Discharge Detection and Removal Program, the Municipal Storm Water Monitoring Program, and the initial phase of the Storm Water Tenant Program.

A number of storm water related practices were developed during the last permit year. For example, PDX has implemented a "No Wash Policy", Marine has implemented a new catch basin inspection policy, and PSY has improved the Yard Clean Up and Sweeping Program. All new policies, practices, and programs relating to the storm water program will be discussed below in the appropriate BMP sections.

Operating area site specific practices are being improved and developed as operating area storm water awareness increases. The Port is dedicated to continued storm water education efforts. The site specific pollution control practices developed are documented in the operating area Storm Water Pollution Control Plans (SWPCPs). The benefit from these implemented practices is monitored via the wet season visual water quality observations, sampling data, and dry season screening and sampling data.

Implemented Activities

Task 1
Development of practices is typically concurrent with the implementation of the various portions of the program. As guidelines are developed they are documented as part of the implementation process. In some cases, documentation may include correspondence to a Port tenant and incorporation of a practice in Portwide environmental procedures for storm water. Ultimately significant changes to Port practices are presented and approved by Port Directors. In all cases, the documentation of the developed practice will be maintained in the Port MSWMP, the operating area SWPCP, or other appropriate storm water documents.

The ESD has made progress with practices development concerning property inspection walk through documentation, tenant follow-up protocols, environmental lease language updates, and the Portwide Environmental Management System (EMS) and Environmental Management Information System (EMIS).

Task 2
Assessment of the water quality monitoring data for Municipal Permit compliance consists of a review of the industrial storm water data and the data obtained from the City's monitoring program. The monitoring data collected for purposes of the Port's industrial storm water compliance are included in Tables 4-9 of this report. The samples collected represent a cross section of the industrial activities occurring on the Port's property. In summary, review and analysis of the data shows that 100% of the sample results were within the effluent limitations by the 1200-T and 1200-L permits, and 95% of the data results were below 1200-Z bench marks. Review of the permit jurisdiction data is included in the last section of the overall co-permittee report.

The assessment of the BMP monitoring data does not directly provide information on the quality of storm water leaving Port property. These data will be most valuable after numerous storm events have been sampled and analyzed. The intent is to determine infield effectiveness, cost effectiveness, appropriate maintenance schedules, and appropriate uses of the monitored BMPs. The data from the BMP analysis are presented in Tables 1-3.

Additional BMP Task
Task 3
The operating areas have the lead role in the continued development of the on site specific practices to ensure compliance with storm water regulations and progress with storm water pollution prevention goals. The ESD provides guidance and motivation to continue storm water practice development and implementation. New practices are to be documented and maintained in the operating area SWPCPs or other appropriate storm water documents. If a new practice or BMP is implemented on Port property that is not covered by a site specific SWPCP, then the practice is documented in the MSWMP and maintained by ESD at the corporate office. Figure 4 is the *Best Management Practice Summary Form* that has been developed and distributed to appropriate personnel to instigate documentation of new BMPs or practices in the operating areas. New operating area practices are described below in the appropriate BMP Section.

ED1 - Employee Education

BMP Description:
Inform employees of new storm water pollution control efforts and activities in each Port operating area. Provide guidance for implementing where applicable. Cooperate with the City's educational programs that relate to the Port operations.

Status

The Port continues to make substantial progress with the employee and tenant education BMP. Table 11 lists the storm water oriented training accomplished and attended this compliance

year. Educational meetings, information exchanges, and presentations have covered a variety of BMP topics ranging from de-watering practices to the BMP monitoring program. The agendas, list of attendees, and summary of information presented are maintained in either the operating area or ESD files, or the Port MSWMP.

Implemented Activities

Task 1
The Port attends ACWA, co-permittee, and other agency meetings focusing on storm water education issues. For example, the regional spill meetings are regularly attended by Port staff or a Port staff representative.

Task 2
Operating areas continue to develop and improve employee storm water awareness training. Spill procedures and hazardous waste training are conducted at least annually to increase Port operating area employee awareness. Monthly safety meetings contain environmental subjects, including spill response procedures and hazardous waste management.

Specific operating area training efforts that have been initiated, implemented, or maintained during the 1997/1998 permit year are summarized below. Marine, PDX, and PSY have storm water inlet stenciling programs in place or are being developed. Stenciling drains is an effective education tool that keeps non-storm water discharges out of the system. PDX is also developing an airport specific environmental training video that will be shown to Port employees as well as tenant employees. The Terminal 6 equipment operators received a letter with their paychecks that discusses spill and storm water information and procedures. Figure 5 is a copy of the letter distributed. Terminal 6 has also applied labels onto each of the toploaders operating on site. The labels contain a summary of spill procedures. A copy of the label is included as Figure 6. Both of these efforts are very effective employee education methods. PSY has also implemented some new training practices. PSY now conducts Environmental Awareness courses for supervisors and managers. These new courses, conducted this year, are listed in Table 11. All other documentation of operating area training is maintained in the operating area environmental files.

The training conducted or initiated by ESD is documented in the MSWMP. The sign in sheets of the personnel attending the training, copies of training materials, and in some cases slides and overheads are included in the MSWMP. These materials have been developed and are maintained to be used for continued training and awareness meetings throughout the Port. These materials are part of the training program that will be continued as part of municipal storm water compliance.

Task 3
The Port continues to participate with the City and other co-permittees in storm water meetings. Information from these meetings is disseminated to the Port operating areas when applicable. For example the *Erosion and Sediment Control at Small Sites: Simple Best Management Practices* information developed by DEQ in March of 1998 was distributed to relevant Port employees.

Additional BMP Task
Task 4
The Port Tenant Program continues to be developed. The initial training and awareness portions were conducted in 1996 and 1997. The operating areas are continuing with tenant meetings during which storm water issues are discussed. PDX conducted a tenant BMP meeting in May of 1998. PDX has developed a BMP Committee program that is an excellent forum for BMP training communications with PDX tenants. Any tenant environmental meetings conducted for the 1997/1998 permit year are listed in Table 11.

PI1 - Public Programs

BMP Description:
Support public programs which increase public awareness of the importance of water quality protection.

Status

The Port will continue to relay any relevant public information and materials to Port operating areas. Port representatives continue to attend City meetings to help promote the Public Participation Action Plan developed by the City of Portland Bureau of Environmental Services (BES).

Implemented Activities

Task 1
City storm water related brochures, documents, and pamphlets will continue to be reviewed and distributed. Metro Haz-Waste information, spill procedures, and BES developed brochures have been distributed to the operating areas. Other relevant information from the Public Participation Action Plan will be distributed, when appropriate.

Task 2
The Port will continue to participate in projects connected with water quality protection and enhancement. The Port contributed to the Clean Rivers Coalition for the 1997 fiscal year and will continue to support the Coalition's efforts. An Intergovernmental Agreement (IGA) has been signed with the City that provides for, in part, an annual contribution to the Clean Rivers Coalition.

Additional BMP Task
Task 3
All three operating areas made contributions to public water quality awareness activities throughout the 1997/1998 permit year. PDX environmental staff gave a storm water BMP presentation to an urban watershed management class at Clackamas Community College. PDX was a co-sponsor with the City for the Slough Regatta event. The Terminal 6 environmental staff gave a presentation about marine spill procedures at the Portland regional spill committee meeting. This meeting was attended by representatives of several agencies from the region. PSY hosted a North West Pollution Research Council Roundtable on shipyard pollution prevention. PSY also provided a tour of the shipyard to review storm water management for the Portland Community College environmental engineering class.

OM1 - Operations and Maintenance Storm Water Quality Facilities

BMP Description:
Evaluate existing storm water maintenance practices that affect water quality at existing storm water quality facilities.

Status

The Port currently complies with 3 industrial storm water permits for Port properties within the Portland Urban Services Boundary, two 1200-Z permits issued for Terminal 6, PSY, and one 1200-T for PDX. Cascade General is the operator for PSY and the permit is now in Cascade General's name. The operating areas have updated or are in the process of updating the site specific Storm Water Pollution Control Plans (SWPCPs). The updates include the new 1200-Z requirements and any changes in storm water practices and policies implemented at the facility.

Implemented Activities

Each operating area has developed and implemented specific storm water maintenance practices relevant to the Port and tenant operations occurring at the facility. Many of the maintenance practices were established and implemented over the last 2 years of compliance or were in place prior to the regulations. Because much of the work has been accomplished, there are fewer new maintenance activities to report in this submission.

PDX
PDX maintenance and the PDX environmental staff continue to complete storm water BMP maintenance activities according to the SWPCP schedules. Routine BMP maintenance completed includes: boom deployment, maintenance, and replacement; straw bale inlet protection with regular replacement; inlet filter installation maintenance and replacement; detention/quiescent pond cleaning; vegetative swale maintenance; maintenance of oil water separators; maintenance of outfall access; and catch basin inspection and cleaning.

PDX has developed a number of BMP maintenance tools including documented schedules for BMP maintenance, as well as methods for recording BMP management activities conducted. Tables 12 and 13 are examples of the Storm Water BMP Maintenance Schedule and the PDX Oil-Water Separator Cleaning Program Schedule that have been developed and implemented during the past permit year. Figure 8 is an example of the one of the many inspection forms that PDX will be using to inspect and record BMP maintenance activities. PDX has developed inspection forms for documenting the condition of Port areas and the efficacy of Port practices, including: Outdoor Material Storage Areas, Oil-Water Separators, Catch Basin Filters, Catch Basins, Above Ground Storage Tanks, Fuel Islands, Mobile Fueling, Wash Areas, and a Storm Water Cleaning and Repair Log. Examples of these forms can be found in both the PDX SWPCP and the Port MSWMP.

PDX continues to implement the computerized system that logs the Global Positioning System (GPS) location, inspection, cleaning, structural condition, and the condition of filter information for each of the 2,648 catch basins, inlets, and manholes at PDX. The system documentation records will be maintained in the PDX maintenance files. PDX maintenance cleaned

approximately 300 catch basins and inlets during the last fiscal year. When a catch basin, inlet, or manhole is inspected a record of the observation is completed and the information is transferred to the computerized management system.

PSY

Cascade General also retains many of the routine maintenance tasks on a computerized system. Storm water maintenance activities conducted by PSY include: boom deployment, maintenance, and replacement; maintenance of the ballast water and dry-dock water treatment plants; and catch basin cleaning, maintenance, and inspection. The maintenance records are maintained by Cascade General in their maintenance office. An estimated 100 catch basins per quarter were cleaned and inspected during the 1997/1998 permit year.

Terminal 6

The marine terminal maintenance computer systems upgrade has been initiated. The computer system has been selected and implementation of the system has begun. All maintenance and environmental inspections will be tracked and maintained on the system.

Storm water maintenance activities completed at T-6 throughout the last permit year include: catch basin inspection and cleaning; oil/water separator maintenance; and inlet filter maintenance and replacement. All the catch basins, inlets, and storm drain lines at Terminal 2 and the second half of the catch basins and lines at Terminal 6 were cleaned. The T-6 maintenance crew was able to clean 153 catch basins and an estimated 13 filters were replaced throughout the 1997/1998 permit year. Approximately 3 to 4 cubic yards of materials were recovered from the clean out process. The cleaning and waste disposal records are maintained in the Waste Stream Management Book in the T-6 Environmental Office. The inspections and maintenance schedule has been developed for T-6. The form used to document the inspections completed on the fuel island and UST areas is included as Figure 10.

Industrial Parks Maintenance

Industrial Parks Properties Maintenance Office is responsible for maintaining all Port landscaping for the industrial parks and the majority of the marine terminals. The storm water maintenance activities conducted by this maintenance group are limited, and consist mostly of informal visual inspections conducted during landscaping. The Industrial Parks Properties Maintenance Office adopted a new policy during the 1997/1998 permit compliance year. The catch basins located on Swan Island that are on Port property are now cleaned once a year by an outside professional contractor. The list of catch basins cleaned was updated and two more catch basins were added to the list. The contractor is responsible for proper waste disposal. The clean out records are maintained in the Industrial Parks Properties Maintenance Office files.

Operation and maintenance specifics for each operating area are documented in a number of places: the SWPCP; the maintenance computers (PDX, PSY, and Marine); the environmental files; and written Standard Operating Procedures. Records and documentation of the maintenance activities and inspections continue to improve.

BMP maintenance efforts that are not associated with a specific operating area or area SWPCP are documented in the Port MSWMP. Figure 11 is a copy of the BMP Maintenance Schedule Form. This form was distributed to the appropriate Port personnel. Complete BMP

maintenance forms will be maintained in the Controls Maintenance Section of the Port MSWMP.

OM2 - Operations and Maintenance - Streets and Vehicle Maneuvering Areas

BMP Description:
Evaluate operations and maintenance for the Port roads and vehicle maneuvering areas, to determine water quality impacts. Recommend improved procedures or practices that reduce the discharge of pollutants to the storm water system.

Status

Maintenance of road and vehicle maneuvering areas is conducted by the Port operating areas. Marine maintenance, PDX maintenance, Cascade General, and the Industrial Parks landscape and maintenance crew are responsible for maintaining the surfaces in their respective areas. The maintenance plans and SWPCPs for the operating areas address many of the operating and maintenance issues for roads and surfaces.

Currently the most intensive effort concerning road and surface maintenance is sweeping. The operating areas conduct sweeping regularly. The exception is the Industrial Parks where the sweeping is conducted by outside contractors. Records of sweeping are maintained at PSY, PDX, and T-6 in the maintenance files. Swept material is stockpiled in a manner that prevents impact to storm water runoff. The material is tested for hazardous waste content and appropriately disposed at Metro or Sanifill. The sampling and disposal tracking records are also maintained in the operating area maintenance files. In some cases, the information is also maintained by the operating area environmental staff as part of waste stream management.

Implemented Activities

The Port conducts limited deicing on streets and roads (exclusive of PDX). At PDX a new "No Urea Policy" has been formally adopted. The policy was initiated by a letter sent to all PDX tenants prohibiting the use of urea for surfaces deicing. A copy of the letter sent is included as Figure 12.

PDX Deicing
PDX deicing issues continue to be addressed by Port environmental staff, a consultant team, the PDX co-permittees, DEQ, BES, and other regional committees. The deicing chemicals used at PDX are FAA approved. The pavement deicing chemicals used are sodium formate, potassium acetate, and magnesium chloride.

The results from the 1997-1998 deicing projects are being compiled and will be submitted to DEQ. The document *PDX 1997/1998 Deicing Season End of Season Report*, will be available for review from the Port or Elliot Zais of DEQ.

The deicing studies slated for the 1998-1999 season are being developed by the Port deicing team and the Port's consultant. The 1998-1999 PDX deicing program will be documented in a winter operations plan. Many projects initiated last winter will be continued, including aeration of the detention ponds, trench drain closure and glycol collection, and deployment of two Glycol

Recovery Vehicles (GRV). Other deicing efforts include testing a new pavement chemical, potassium formate, using a two step chemical application process, switching the type of chemicals applied, adjusting chemical mixers based on application temperatures (to be done by airlines), and researching new deicing technologies.

Records of the deicing studies and projects are being maintained by PDX maintenance and Port environmental staff. Due to the extent of the projects, the amount of data, and the extensive coordination efforts, the PDX deicing information is maintained independently of the PDX SWPCP and storm water files.

PDX Surface Repairs

Roadway, surface repairs, and painting are conducted by PDX maintenance staff. The procedures for handling the waste products and cleaning the equipment continue to improve through careful storage, application, and disposal. The PDX maintenance facility will be undergoing construction to eliminate exposure of storm water and storm water runoff to potential contaminants. The construction project includes extending the indoor equipment storage areas, building an equipment wash bay, building an unloading bay for sweeper and catch basin clean out debris, and installation of a toluene recovery system. The improved protocols and waste disposal procedures are documented in the updated PDX SWPCP.

OM3 - Truck Hauling Practices

BMP Description:
Inform tenants and Port employees of City truck hauling practices.

Status

The Port operating area SWPCPs and maintenance standard operating procedures address vehicle operation and maintenance. The Port maintains a minimal fleet and transports small enough quantities of significant materials that the truck hauling practices do not apply.

Implemented Activities

Task 1

The Port continues to maintain sound vehicle operation and maintenance practices. Vehicle maintenance performed by Port staff is conducted indoors. Scheduled maintenance is performed on Port vehicles in order to avoid on road or off site breakdowns that could cause leaks and exposure of significant materials to storm water runoff.

Properties maintenance trucks have been installed with metal trays to avoid any leaking of spilled materials during the transport of fertilizers and herbicides. Other landscaping materials are conveyed on Port property by trained professional landscape contractors hired by the Port.

Task 2

The Port will continue to distribute appropriate informational material (concerning trucking practices) made available by the City and others to relevant Port operating areas. For example, the City's *Keep Your Shop In Tune* manual was distributed to Port maintenance shops during the 1996/1997 permit year.

IND1 - Industrial Control

BMP Description:
Develop a program to control the discharge of pollutants in the storm water system from existing and developing industries on Port property which are not already regulated by other NPDES requirements.

Status

The Port operating areas have been complying with the NPDES industrial storm water permits since they were issued by DEQ. Table 10 lists the Port tenants that are complying independently with an NPDES permit, and those that are complying with the storm water industrial regulations as co-permittees to the operating area permit. Table 10 has been updated to reflect current permitting status on Port property.

Storm water controls and BMPs have been implemented at the Port operating areas in accordance with their SWPCP schedules, requirements of the municipal storm water program, and ESD or consultant recommendations. The following BMPs have been implemented throughout the past permit year:

PDX
- New toluene recovery system to be installed
- New wash bay to be constructed for maintenance equipment and vehicles
- Storm inlets continue to be stenciled
- Catch basin filters continue to be installed in PDX maintenance area
- Dewatering permit sampling and management practices finalized
- Erosion control training information distributed
- Erosion control training meetings planned for Fall 1998
- Tenant BMP committee formed and meetings conducted (monthly)
- Three maintenance staff storm water trainings conducted
- Dry season inspections conducted
- New "No Urea Policy" established and enforced(see Figure 12 for letter sent to tenants)
- New "No Wash Policy" established and implemented (see Figure 13 for letter sent to tenants)
- New sweeper and catch basin waste containment system to be constructed Fall 1998
- BMP maintenance schedule developed and documented
- Developed a storm water training video for tenant and PDX staff training
- Tenants installing wash pads for containment and disposal of vehicle and equipment washing

Industrial Parks
- Added two catch basins to yearly cleaning and inspection schedule
- Revegetated large areas in the Rivergate district
- Conducted BMP monitoring
- Conducted dry season inspections

PSY

- Dry dock storm/wash water collection treatment system enlarged to increase holding capacity
- Established new environmental training courses for managers and supervisors
- Installed approximately 60 new catch basin inserts
- Increased frequency of yard sweeping and clean up
- Conducted dry season inspections

Marine Terminals

- Constructed a new fuel island at T-6; all storm water drainage goes through the oil water separator
- Downsized the current equipment wash area at T-6 and diverted it to the sanitary sewer system
- Stenciled T-6 inlets along dock
- Installed spill procedure labels into T-6 large equipment
- Constructed a hazardous cargo storage area at T-6 for all containers with hazardous chemicals. Drainage can be shut off with nearby sluice control valves to prevent hazardous materials from entering the Columbia River in the event of a spill of leak
- Conducted dry season inspections at all terminals
- Developed catch basin inspection policy – expanding number of catch basins inspected
- Reduced mowing and chemical applications by planting native species in landscaped area
- Developed new BMP inspection schedule and form

Tenant Properties

The Port Tenant Program intends to address storm water BMP implementation with all Port tenants that have the potential to impact Port storm water quality. The tenant survey and tenant meetings have been accomplished and are the first steps in the Program. One goal of the Tenant Program is to develop and implement management practices that will help reduce the amount of pollutants entering the storm water runoff from existing and developing Port tenant properties. PDX conducted a tenant BMP meeting this Spring. PDX is also forming a BMP Committee that will focus on deicing and storm water BMPs for PDX and PDX tenants.

Implemented Activities

Task 1

SARA Title III Section 313 facilities were identified through the Portwide tenant survey distribution and information compilation. The tenant survey was distributed to all Port tenants in August and September of 1996. The tenant survey was the first phase in the Storm Water Tenant Program. The survey information continues to be used in the development of the next phases of the Tenant Program: the Tenant Site Inspection, and Tenant Follow-up Programs.

Task 2

SARA Title III, Section 313 facility inspection procedures have been researched. Developing, finalizing, and adopting SARA Title III facility inspection procedures is one of the major goals for the 1998/1999 permit year. Once procedures and policies have been adopted by the Port, the operating areas will be responsible for implementation and follow up procedures

Task 3
Marine properties currently conducts a number of tenant inspections. The inspections are multimedia and are conducted by Marine properties and environmental staff. The intent of the inspections is to work cooperatively with the tenants. Other Port operating areas may use the Marine inspection program as a model for developing a similar inspection program. The inspection procedures, when developed, will include prioritization of inspections, monitoring requirements, follow-up procedures, and documentation protocols.

ILL1 - Spill Prevention and Response Training

BMP Description:
Review required spill response procedures in each operating area. Refine procedures as necessary, including improving interagency collaboration.

Status

Spill prevention and response plans have been developed and implemented for PDX, Terminal 6, and PSY. The Port operating areas have completed extensive spill training for relevant personnel. These operating areas, at a minimum, conduct annual spill training. The spill training dates and attendees are recorded in Table 11. The training emphasizes employee responsibility for preventing releases to the storm system or the receiving waters.

PDX, Terminal 6, and PSY have also developed both stationary and mobile spill kits in order to respond to spills occurring at any location on the site. Marine properties purchased two new spill kits in Spring of 1998. These kits are intended for mobile use and will accompany maintenance workers as they move from terminal to terminal. Marine will conduct a thorough training on use of new equipment this Fall.

Emergency response procedures have been established for PDX, Terminal 6, and PSY and employees have been trained in the procedures. The Port has on call environmental response contractors for clean up and containment. PSY continues as an active member of the Clean River Cooperative for river spills. The operating areas as well as ESD have compiled spill response phone lists. The ESD, PDX, and Marine also operate 24-hour hotlines in order to be responsive to Port property spills at any time.

Implemented Activities

Task 1
PDX environmental managers, the Marine Environmental Manager, and ESD representatives have attended the City's spill response task force meetings. The Port will continue to participate in City training events and attend the City's ILL1 meetings.

Task 2
Written materials regarding spills have been distributed at the spill response task force meetings, and have been shared with responsible mangers from the operating areas. Any applicable future spill information from the task force meetings will be distributed to the operating area environmental personnel, as well as tenants during Tenant Program meetings.

Task 3
Operating area spill response plans have been updated and modified to include all storm water requirements as listed in the 1200-T and 1200-Z permits. Spill prevention and response plans will continue to be reviewed on a regular basis.

Task 4
The co-permittees complying with NPDES storm water industrial permits are required to develop facility spill prevention and response procedures. The tenant surveys provided information as to which tenants have plans in place. Once the Port adopts tenant inspection and follow up procedures, tenant spill plans will be reviewed, if required. Any industrial tenants that indicate that a spill plan has not been implemented will be contacted for site review and plan development guidance, once protocols are in place.

ILL2 - Control of Illicit Discharges

BMP Description:
Detect and control illicit connections and discharges to the storm water system.

Status/Implemented Activities

Task 1
The written procedures for the Illicit Discharge Detection and Removal Program (IDDRP) Plan were finalized during the 1996/1997 permit year. The program is documented in the Port MSWMP, as well as in operating area environmental programs. The program contains the Port's procedures for enforcement of Port Ordinance 361; dry season and wet season field screening; priority and schedule of major outfall inspections; and discharge sampling, tracking, and elimination. The IDDRP lists the Port's public, tenant, and employee awareness efforts and activities. Port spill prevention and response procedures are addressed as part of the IDDRP as required by 40 CFR 122.26 (d)(2)(iv)(B), however the spill response procedures are maintained in separate documents located in the operating areas. The program write up also discusses how priority outfalls were identified.

Task 2
The Port will continue to compile and review all relevant monitoring data for influence of non-storm water discharges. The operating areas, including Cascade General at PSY, are now responsible for conducting wet season runoff observations, dry season inspections, and monthly inspections of potential significant material leakage or spillage areas. These inspections, along with storm water sample collection and analysis, provide information on the possible presence of illicit discharges and their sources. Review of this year's industrial data supports the conclusion that there are no illicit discharges or connections to the Port's storm water system. Analysis of the storm data from the 1997/ 1998 permit year showed that 100% of the sample results were within the effluent limitations by the 1200-T and 1200-L permits, and 95% of the data results were below 1200-Z bench marks. It appears likely that storm water quality was not adversely impacted by non-storm water discharges.

The data from the 1996 study and the results from the previous inspections (1991, 1993) were used to determine the Port priority outfalls and the schedule for dry season inspections for the

remaining years of permit compliance. Priority outfalls are added to the list throughout the permit term based on new data or inspection results. Review of the previous years of inspection data indicates that most non-storm water discharges were not illicit discharges, but rather permissible discharges, as defined by 40 CFR 122.26 (d)(2)(iv)(B)(1).

Task 3

The IDDRP Plan contains a description of the 5 year dry season inspection schedule. The schedule and priority are based on review of the data from the 1996 season, information collected in the 1993 and 1991 dry season studies, land use designations, and the location of significant material usage on Port properties.

Table 14 contains the 4-year rotating schedule for Port outfall dry season inspections for 1997-2000. The operating areas are currently using this schedule to dictate which outfalls they inspect each year through 2000. The outfalls that have been identified as priority outfalls are inspected every year.

Task 4

The developed IDDRP was transferred to the operating areas for implementation and compliance responsibility. Program transfer occurred during Spring of 1997. The operating areas are responsible for the dry season screening observations, sampling, and investigation work. The observations and inspections are documented on forms specifically developed for the Port IDDRP. The completed observation forms are maintained in the operating area environmental files. The ESD reviews the information and compiles an observation summary table. The dry season observation information for the 1997 season has been compiled and is included as Table 15.

For the 1997-1998 dry season, the operating areas inspected all priority outfalls in their jurisdiction, plus any outfalls identified for inspection for the 1998 season. The summary results from the 1998 dry season are provided in Table 16. If a non-storm water discharge is observed, the inspection team collects a sample, completes in field screening analysis, and conducts a follow-up investigation. Samples collected from a non-storm water discharge are analyzed for a list of parameters developed to help identify the source of the possible illicit discharge. Table 17 contains the sample results for the 1998 follow up work conducted.

Task 5

The Port continues to coordinate with the City and DEQ during illicit discharge investigations. The City's illicit discharge elimination program (IDEP) team and the Port continue to work closely, sharing observation and investigation results and information.

Task 6

The Port conducts follow-up actions when necessary. The follow-up and inspection procedures are documented in the IDDRP Plan. The Port intends to use Ordinance 361 to conduct tenant illicit discharge inspections and elimination of any discovered discharges when necessary.

ILL3 - Employee Haz Mat Training

BMP Description:
Provide information to employees and tenants on where and how to properly dispose of oil, antifreeze, pesticides, paints, solvents, and other potentially harmful materials.

Status

The Port continues to coordinate with the City and Metro concerning distribution of hazardous materials training information to Port employees and tenants.

The Port's Risk Management group has completed a Portwide inventory of all hazardous materials used throughout Port operated properties.

Implemented Activities

Task 1
The Port will continue to distribute relevant hazardous waste information obtained from the City and Metro to the Port operating areas. The Tenant Program will provide a means of distributing the Haz Mat training information to Port tenants during training and awareness meetings.

The tenant awareness meetings, conducted by ESD and the operating areas during the Fall of 1996 and Spring of 1997, included discussions on the proper disposal of wastes, and provided all the attendees with Metro's phone number in the handout materials. City developed information concerning proper waste disposal of maintenance shop materials was also distributed at the tenant meetings.

PDX environmental staff and the PDX maintenance group have worked together to improve maintenance staff awareness of proper handling, storage, and disposal of hazardous wastes. A number of improved waste disposal practices have been developed and incorporated into PDX maintenance protocols. For example, a toluene recovery system is being built to separate hazardous waste constituents (toluene) from paint, to allow for proper recycling and disposal of paint. The PDX hazardous waste storage area will also be updated. The structural changes to the building will provide even greater protection from a release of hazardous materials.

ILL4 - Illegal Dumping

BMP Description:
Reduce the potential for illegal dumping through active property management.

Status

Response to illegal dumping problems has varied depending on the area of the problem. However, Port operating areas have implemented procedures for dealing with abandoned waste. The Port methods of abandoned waste removal described below were implemented during the 1995/1996 year and have been effective management practices.

Implemented Activities

Task 1
Any abandoned solid waste material is removed from Port property and, depending on whether the waste is hazardous or non-hazardous, disposed of through Sanifill or Metro, respectively. Port staff completes most of the clean ups independently, however, Metro has been contacted several times to assist or lead clean-ups of large quantities of solid waste.

Task 2
Where possible, fences and locked gates have been constructed to prevent illegal dumping. In some areas it is not possible to block entrance to the Port property, so signs and warnings against illegal dumping have been posted. The Port landscaping crew, along with operating area maintenance personnel, continuously look for abandoned wastes and respond to incidences as quickly as possible.

Task 3
The Port continues to coordinate with Metro concerning illegal dumping on some Port properties. Metro has been very responsive to Port calls concerning abandoned wastes. Illegal dumping is also addressed in the City led ILL1 spill response task force meetings regularly attended by Port personnel.

ND1 - Erosion and Sediment Control

BMP Description:
Apply practical erosion, sediment and other controls to reduce all pollutant discharges at construction sites associated with properties being developed by the Port.

Status/ Implemented Activities

Task 1
The new 1200-CA permit was issued to the Port in the Fall of 1997. The permit covers Portwide construction activities. For Port construction projects of 5 acres or larger, the Port engineer, together with the construction contractor, compiles an erosion control plan based on the 1200-CA requirements and the Port's specifications for erosion control. The erosion control plan is reviewed and approved by BES, as well as Port staff. The Port also requires that erosion control plans be submitted for construction projects with less than 5 acres of soil disturbance. The erosion control plans, for the smaller projects, are reviewed by the Port engineering staff, as well as ESD.

The ESD conducted a number of erosion control training sessions with Port engineers and Port construction inspectors. The curriculum was developed cooperatively with DEQ. The training slides and overhead materials are maintained in the Port MSWMP for use in annual construction inspector training. For the 1997/1998 training, PDX environmental staff are working with a consultant to develop a training session. The erosion control training will be conducted in the Fall of 1998. The ESD distributed an erosion control and dewatering information packet to the relevant Port construction employees in the Spring of 1998. The materials distributed included erosion control information from DEQ, the Port Dewatering

Practices, and forms to be used during erosion control and dewatering site inspections. This information is included as Figure 7.

Erosion control compliance was also addressed in the Portwide tenant meetings conducted during the previous permit compliance year. Tenants on Port property that are disturbing 5 acres or more during a construction project are required to obtain a 1200-C NPDES construction permit from BES. Tenant erosion control plans are reviewed by BES prior to project onset. Port staff also review tenant erosion control plans before construction begins.

PDX and PIC properties are undergoing the most construction of any of the operating areas. A new PDX environmental staff member will conduct at least monthly PDX wide inspections of construction projects and construction staging areas. The inspector will verify compliance with 1200-CA requirements and the new dewatering permit requirements. The inspector will also verify that the control measures in place are adequate and installed properly. Inspections and follow-up procedures will be documented and filed in the PDX environmental files.

Task 2

DEQ issued the Port a Dewatering Permit. The permit allows construction dewatering discharges into the PDX/PIC storm water system with eventual discharge to the Columbia Slough. The ESD and PDX environmental staff have worked together to develop permit compliance procedures. PDX environmental staff is in charge of dewatering sampling, data compilation, and report submission for PDX projects. The ESD provides technical oversight and assistance. The ESD is responsible for managing dewatering projects that occur on PIC property. Tenant construction projects are included in the dewatering permit compliance work and are managed by both PDX staff and ESD.

Dewatering permit compliance procedures include submission of a contractor dewatering plan to ESD and PDX. The plan is reviewed and approved by ESD. For tenant projects, a dewatering agreement is written and signed by the Port and the tenant. Dewatering samples are collected before any initial discharge occurs. The initial sample is analyzed for chemical oxygen demand, total suspended solids, turbidity, volatile organic compounds, total petroleum hydrocarbons, pH, and BETX (benzene, toluene, ethylbenzene, and xylenes). Based on the sampling results, the discharge is treated or discharged to the system. For Port projects, the discharge is sampled monthly at the point of discharge to the Slough. For tenant projects, the discharge is monitored twice monthly, once at the end of the discharge pipe and once at the point of discharge to the Slough. Data is submitted monthly to DEQ as required by the dewatering permit.

Dewatering procedures have been drafted for Portwide construction projects. The Port Municipal Permit allows the discharge of "pumped uncontaminated ground water" into the storm system. Construction discharges typically fall into this category of a permissible discharge to the storm system. Visual observations are conducted and documented to determine if the discharges appear to be uncontaminated. The Port dewatering procedures describe the monitoring and reporting requirements for each construction scenario.

The ESD has completed training of staff concerning dewatering issues and monitoring requirements. Dewatering specifications have been compiled for inclusion in Port construction bid packages. Port construction inspectors will be trained this Fall on implementation of the

new dewatering specifications. A copy of the dewatering specifications is included as Figure 14.

STR1 - Structural Water Quality Facilities

BMP Description:
When warranted and appropriate, based on available water quality monitoring data, the Port will develop procedures for construction, maintenance, and monitoring of water quality facilities.

Status

The Port continues to participate in, and contribute to, water quality projects designed to improve the water quality of the Port and urban jurisdiction storm water runoff.

Implemented Activities

Task 1
The Port has been involved in several water quality improvement projects including the Leadbetter and Rivergate water quality facilities, the capture and treatment of PSY dry dock storm water runoff, the sampling and analysis of the deicing runoff at PDX, and the treatment of the PDX new Economy parking lot runoff. These projects were described in the 1996 annual report to DEQ.

The dry dock storm water treatment plant at PSY has been expanded to increase the capacity of water treated and held. The capacity has been increased by 1 million gallons. The improved system will decrease the treatment bypass and positively impact the water quality discharges at PSY.

Task 2
Storm water structural BMPs continue to be implemented as needed. Marine has installed a new oil water separator at the new fueling island facility. At Terminal 6, 13 catch basin filters were installed. At PDX, a new trench drain with a closing gate and diversion valves was installed around Concourse C to control deicing discharges. A number of tenants have installed wash pads. The pads will prevent any pollutants from vehicle and aircraft washing from impacting the storm water runoff. At PSY, 60 new catch basin inserts were installed during the permit year for storm water protection.

Please see the list of BMPs implemented in each operating area during the 1997/1998 compliance year in the Industrial Control BMP discussion above. The monitoring data from the storm water industrial permit compliance efforts indicates the success of these management practices.

IGC1 - Inter-Governmental Coordination

BMP Description:
Continue Port coordination with applicable agencies working on regulatory aspects of water quality protection including watershed management, combined sewer overflows, solid waste and recycling, and industrial waste source control. Cooperate with agencies to implement new source or non-source control practices where water quality data indicate the need for storm water quality improvements.

Status

The Port is currently actively involved with a variety of environmental agencies and programs including: the Clean River Cooperative, the Harbor Safety Committee, the Bi-State task force, the Lower Columbia Estuary Program, the Columbia Slough Watershed Council, Neighborhood Associations, Oregon Association of Clean Water Agencies, Metro, Department of Agriculture, Columbia Corridor Association, Oregon Department of Transportation, American Association of Airport Executives, Air Waste Management Association, Water Resources Policy Advisory Committee, Oregon Health Sciences University, Clean Rivers Coalition, and DEQ technical advisory committees.

Implemented Activities

Task 1
The Port continues to coordinate with other government agencies on water quality protection activities relevant to Port properties and activities. The Port has participated in coordinated efforts in a number of pollution control projects, including the Leadbetter water quality facility, and the Rivergate wetlands. The Port has participated in the ILL1 Spill Response Task Force meetings, municipal storm water compliance co-permittee meetings, and the Public Participation Action Plan meetings. The Port is also in the process developing a Portwide program to address Endangered Species Act compliance issues. Potential changes to storm water quality programs are being evaluated in order to improve water quality for endangered species and increase protection and restoration of fish and wildlife habitat.

Task 2
The Port tenants located in the industrial parks and the marine terminals are required to obtain their own storm water permits. Most of the tenants located at PDX are covered under the Port's storm water industrial permit as co-permittees. The co-permittees are required to comply with the permit requirements and the BMPs established in the PDX SWPCP. The tenants located at PSY are co-permittees on the Cascade General 1200-Z permit. All tenants with permits and all co-permittees are listed in Table 10.

The Port works cooperatively with the City's Industrial Storm Water Team sharing information concerning tenant industrial activity, drainage areas, and outfalls. The team's objective is to bring all regulated industries in the urban services boundary into compliance with the storm water regulations.

Task 3
The monitoring data collected for Port storm water industrial permit compliance is included in a series of tables following the BMP review section of this report. Evaluation of the data indicates that the BMPs in place are effective at reducing pollutants in the storm water runoff.

The data obtained from the BMP monitoring initiated during the Spring of 1998 will be shared with all municipalities and agency interested in the BMP data results. One intent of the BMP monitoring program is to understand in-field effectiveness of commonly used storm water BMPs. By sharing this data with other agencies the hope is that the BMPs with the highest efficiencies will be implemented, with an overall effect of improving Oregon's water quality. The data will be presented to any of the groups listed above with an interest in the results.

M1 - Water Quality Monitoring

BMP Description:
The Port will monitor storm water to characterize typical discharges from the Port's municipal system.

Status

The Port Storm Water Monitoring Program was updated and submitted to DEQ in April of 1998. The completed program components include storm water sample collection and analysis for industrial compliance, storm water wet season visual observations, dry season observations and sampling, and BMP effectiveness monitoring. The other components of the monitoring program that were discussed in the submitted plan include deicing monitoring, tenant monitoring, program analysis and effectiveness, and sample collection instructions.

Storm water sampling accomplished by the Port during the 1997/1998 compliance year includes industrial runoff sampling, deicing sampling, and BMP effectiveness monitoring.

Implemented Activities

The industrial storm water samples where collected from representative outfalls at PDX, Terminal 6, and PSY. The sample analysis represents runoff water quality from a wide range of industrial, commercial, and transportation activities on Port property. The Port storm water Industrial Permit compliance data are presented in Tables 4-9. Tables 7-9 contain the sampling analysis results for the grab samples collected at Terminal-6, PDX, and PSY respectively. Tables 4-6 list calculated pollutant load estimates for the sampled outfalls and storms. The calculations were based on the Rational Method (Q = CIA).

The Port samplers were provided with binders that contained detailed sampling instructions, forms for sample event documentation, and specific site sampling details. The BMP sampling will be conducted for the entire permit term. Samples are to be taken during 3 storm events a year. Information concerning the storm statistics as well as the area and BMP maintenance is recorded and will be used in the detailed analysis of the data. A copy of the form developed for use during sampling to record the required information is included as Figure 15. The BMP effectiveness sampling binders will be used to train new employees involved in sampling, and will establish representative sampling criteria and techniques to be followed by the Port

samplers. The consistency in sampling technique will improve the validity of the long term sampling analysis.

The T-6 samples were collected before and after treatment through the new oil water separator installed at T-6's new fuel island. The oil water separator model 660-CPS was selected for the treatment and flow rate capacity. The data from this first sample are included as Table 1.

The sampling data from all of the BMP monitoring projects will become more and more significant as the number of samples collected and analyzed increases. The statistical review of consistent infield effectiveness, the change in BMP effectiveness with the change in BMP maintenance, the change in effectiveness with industrial activity area housekeeping and maintenance, and overall cost effectiveness of the BMP will be more meaningful as the amount of sample data from each BMP increases. However, for the first set of data, the results from the oil water separator were impressive. The inlet sample contained 228 mg/L of oil and grease and the outlet sample analysis for oil and grease was below the laboratory detection limit of 5.0 mg/L. The oil water separator was installed in winter of 1998 and was not cleaned prior to the April 23rd sampling.

The PDX samples were collected upstream of two catch basin inlet filters and then down pipe, after filtration. Again, there is only one set of data to be analyzed, however, the analysis showed marked improvement after filtration. The filters installed are called "Stream Guard" and are designed to remove sediment and oils. The upstream samples (two were collected) had TSS results of 77.0 and 35.0 mg/L. The filtered sample had a TSS result of 25.0 mg/L. The two upstream samples both had oil and grease detected at 15.0 mg/L and 5.98 mg/L. The filtered sample results for oil and grease were below the laboratory detection limit of 5 mg/L. A summary data table is included as Table 2. The filter inserts tested had been installed approximately 3 months prior to sample collection. At the time of sample collection the filters had not been cleaned or replaced.

The final BMP sample was collected at a tenant facility on PIC property (Table 3). The tenant is responsible for all environmental compliance at the site and is responsible for the design and implementation of the "Stormceptor" unit installed before the outfall to the Columbia Slough. The new outfall is a tenant owned and permitted outfall. The tenant is cooperating with the Port's storm water efforts and allowing the monitoring to be conducted by the Port. The samples at the PIC "Stormceptor" were taken on May 8th 1998. Unfortunately the analysis conducted on the first sampling from the unit was incorrect and the data obtained was inconclusive. Two of the main parameters analyses of interest, TSS and oil and grease, both resulted in values below the laboratory detection limit in both the upstream and downstream samples. The 1998/1999 compliance sampling will provide more "Stormceptor" data. No maintenance has been performed on the unit to date.

The municipal regulations require sampling to be completed to represent various urban land uses within the permit jurisdiction. The City of Portland's municipal sampling program accomplishes this portion of the regulatory requirement. Port collection of municipal land use samples would be a duplication of effort. The DEQ has agreed that the Port is not required to conduct independent municipal land use storm water monitoring.

LM1 - Landscape Maintenance Practices

BMP Description:
Review landscaping maintenance practices. Recommend the use of vegetation which reduces the need for pesticides, herbicides, fertilizers and water where practical.

Status

The Port works with the City to provide landscaping information to the Port landscape crews. Port landscaping crews attend local agency meetings and have been working with the Department of Agriculture on vegetation management. Port crews also work with the Portland Parks and Recreation Department to stay current on pesticide application licensing requirements, regulations, and techniques.

All chemical applications on Port property are conducted by licensed applicators. All chemicals are used according to manufacturers' instructions.

Implemented Activities

The environmental staff at each of the operating areas is responsible for input and review of chemical applications in their respective jurisdictions. For example, PDX staff are having a consultant research alternative rodenticides for use at the airport. The intent of the study to find a way to reduce the amount of the current chemical used, or replace the current product. ESD continues to provide guidance to the operating areas on landscaping issues.

As part of a wetland mitigation effort, the Port Industrial Properties crew planted many acres in Portland with native plants and trees. A total of 4.8 upland plantings, 0.9 acres of conifer planting, 7.6 acres of shrub thicket, 6 acres of emergent wetland, and 2 acres of meadow were planted and are maintained by the Industrial Properties crew.

The Industrial Properties landscape crew is responsible for the majority of landscaping in the industrial parks and marine terminal areas. The crew continues to work cooperatively with the Department of Agriculture to help control invasive plant species using biological controls (insects) instead of chemicals. The crew continues to monitor and improve mowing practices to help control spread of invasive plants without the use of pesticides.

An Integrated Vegetation Management Plan has been prepared by the Port. The plan will be reviewed and updated to address possible reduction of chemical usage or changes in the products used, where applicable.

Appendix 1

Appendix 1 Table List

Table 1	Terminal 6 BMP Effectiveness Monitoring Data
Table 2	PDX BMP Effectiveness Monitoring Data
Table 3	PIC BMP Effectiveness Monitoring Data
Table 4	Terminal 6 Storm Water Pollutant Load Estimates
Table 5	PDX Storm Water Pollutant Load Estimates
Table 6	PSY Storm Water Pollutant Load Estimates
Table 7	Terminal 6 Industrial Storm Water Data
Table 8	PDX Industrial Storm Water Data
Table 9	PSY Industrial Storm Water Data
Table 10	Port Industrial Tenant Co-permittees and Permits
Table 11	Environmental Training Conducted or Attended
Table 12	PDX Storm Water BMP Maintenance Schedule
Table 13	PDX Oil-Water Separator Cleaning Program
Table 14	Port Dry Season Inspection Schedule
Table 15	Dry Season Inspection Results 1997
Table 16	Dry Season Inspection Results 1998
Table 17	Dry Season Sampling Results 1998

Table 1

BMP Effectiveness Monitoring Data
Terminal 6
Oil Water Separator 660 - CPS

Parameter	Sample Date	Results inlet pipe	Results outlet pipe	Method	Detection Limit
TSS	4/23/98	82.0 mg/l	10.0 mg/l	160.2	10 mg/l
pH	4/23/98	7.2	NA		NA
Oil & Grease	4/23/98	228 mg/l	ND	1664	5.00 mg/l
TPH polar	4/23/98	38.5 mg/l	NA w/ ND	1664	5.00 mg/l
TPH non- polar	4/23/98	189 mg/l	NA w/ ND	1664	5.00 mg/l
Benzene	4/23/98	ND	ND	8020A	0.5000 mg/l
Toluene	4/23/98	ND	ND	8020A	0.5000 mg/l
Ethylbenzene	4/23/98	ND	ND	8020A	0.5000 mg/l
Xylenes	4/23/98	ND	ND	8020A	1.00 mg/l

Results inlet pipe = before treatment through separator
Results outlet pipe = after treatment through separator
NA = not applicable
ND = below the laboratory detection limit

Flow rate calculations not possible for this year due to error in measuring flow in inlet pipe.
Flow rate will be calculated for all remaining samples.

Table 2

BMP Effectiveness Monitoring Data
Portland International Airport, Maintenance facility
Catch Basin Inlet Filters - "StreamGuard" Type II -O

Parameter	Sample Date	Results inlet N1	Results inlet N2	Results outlet manhole	Method	Detection Limit
TSS	5/29/98	77.0 mg/l	35.0 mg/l	25.0 mg/l	160.2	10 mg/l
pH	5/29/98	7.6	6.9	6.9		NA
Oil & Grease	5/29/98	15.0 mg/l	5.98 mg/l	ND	1664	5.00 mg/l
TPH polar	5/29/98	8.53 mg/l	ND	NA w/ ND	1664	5.00 mg/l
TPH non- polar	5/29/98	6.45 mg/l	5.98 mg/l	NA w/ ND	1664	5.00 mg/l
cadmium	5/29/98	0.0029 mg/l	0.001 mg/l	0.0016 mg/l	200.8	0.00100 mg/l
lead	5/29/98	0.045 mg/l	0.0250 mg/l	0.0113 mg/l	200.8	0.00100 mg/l
nickel	5/29/98	0.0133 mg/l	0.0109 mg/l	0.00830 mg/l	200.8	0.00200 mg/l
zinc	5/29/98	0.264 mg/l	0.255 mg/l	0.256 mg/l	200.8	0.00500 mg/l

Results inlets N1 & N2 = before treatment through filters
Results outlet manhole = after treatment through filters
NA = not applicable
ND = below the laboratory detection limit

Flow Rate Calculations
Manning's Formula Q = K/n X D8/3 X S1/2
K = 5.08
n = 0.013
D = 0.075 ft
S = 0.0075

Flow rate for the PDX sampling was calculated to be 0.034 ft / sec

Table 3

BMP Effectiveness Monitoring Data
Portland International Center, Trammel Crow Facility
Stormceptor model STC- 4800

Parameter	Sample Date	Results inlet	Results outlet	Method	Detection Limit
TSS	5/8/98	ND	ND	160.2	10 mg/l
pH	5/8/98	NA	6.9		NA
Oil & Grease	5/8/98	ND	ND	1664	5.00 mg/l
copper	5/8/98	0.0160 mg/l	0.0197 mg/l	200.8	0.00100 mg/l
lead	5/8/98	0.0035 mg/l	0.00320 mg/l	200.8	0.00100 mg/l
zinc	5/8/98	0.862 mg/l	1.40 mg/l	200.8	0.00500 mg/l

Results inlets = before treatment through Stormceptor
Results outlet = after treatment through Stormceptor
NA = not applicable
ND = below the laboratory detection limit

Flow Rate Calculations
Manning's Formula Q = K/n X D8/3 X S1/2
K = 3.86
n = 0.013
D = 0.333 ft
S = 0.004

Flow rate for the PIC sampling was calculated to be 1.000 ft / sec

TABLE 4

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
TERMINAL 6 (T-6)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
T-6	Man hole 1	10/29/97	COD	65.5	0.9	0.034	60.3	1.854	160205	4537006.7	2.97E+08
T-6	Man hole 1	10/29/97	TSS	79	0.9	0.034	60.3	1.854	160205	4537006.7	3.58E+08
T-6	Man hole 1	10/29/97	Oil & Grease	3.73	0.9	0.034	60.3	1.854	160205	4537006.7	16923035
T-6	Man hole 1	10/29/97	Phosphorus	0.226	0.9	0.034	60.3	1.854	160205	4537006.7	1025364
T-6	Man hole 1	10/29/97	TOC	18.8	0.9	0.034	60.3	1.854	160205	4537006.7	85295727
T-6	Man hole 1	10/29/97	Arsenic	ND							
T-6	Man hole 1	10/29/97	Cadmium	ND							
T-6	Man hole 1	10/29/97	Chromium	0.025	0.9	0.034	60.3	1.854	160205	4537006.7	113425.2
T-6	Man hole 1	10/29/97	Copper	0.0163	0.9	0.034	60.3	1.854	160205	4537006.7	73953.21
T-6	Man hole 1	10/29/97	Lead	0.0803	0.9	0.034	60.3	1.854	160205	4537006.7	364321.6
T-6	Man hole 1	10/29/97	Mercury	ND							
T-6	Man hole 1	10/29/97	Nickel	0.0053	0.9	0.034	60.3	1.854	160205	4537006.7	24046.14
T-6	Man hole 1	10/29/97	Zinc	0.24	0.9	0.034	60.3	1.854	160205	4537006.7	1088882
T-6	Man hole 1	4/23/98	COD	NA							
T-6	Man hole 1	4/23/98	TSS	92	0.9	0.012	60.3	0.633	54704.16	1549221.8	1.43E+08
T-6	Man hole 1	4/23/98	Oil & Grease	ND							
T-6	Man hole 1	4/23/98	Phosphorus	NA							
T-6	Man hole 1	4/23/98	TOC	NA							
T-6	Man hole 1	4/23/98	Arsenic	NA							
T-6	Man hole 1	4/23/98	Cadmium	NA							
T-6	Man hole 1	4/23/98	Chromium	NA							
T-6	Man hole 1	4/23/98	Copper	0.0246	0.9	0.012	60.3	0.633	54704.16	1549221.8	38110.86
T-6	Man hole 1	4/23/98	Lead	0.0656	0.9	0.012	60.3	0.633	54704.16	1549221.8	101629
T-6	Man hole 1	4/23/98	Mercury	NA							
T-6	Man hole 1	4/23/98	Nickel	NA							
T-6	Man hole 1	4/23/98	Zinc	0.491	0.9	0.012	60.3	0.633	54704.16	1549221.8	760667.9

ND=Non Detect, below laboratory detection limit

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TABLE 4

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
TERMINAL 6 (T-6)
New 1200-Z Parameter List and Outfalls

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
T-6	Man hole 2	4/23/98	TSS	10	0.9	0.012	60.3	0.633	54704.16	1549221.8	15492218
T-6	Man hole 2	4/23/98	Oil & Grease	ND							
T-6	Man hole 2	4/23/98	Copper	0.0059	0.9	0.012	60.3	5.653	488430	13832338	81610.79
T-6	Man hole 2	4/23/98	Lead	0.007	0.9	0.012	60.3	0.633	54704.16	1549221.8	10844.55
T-6	Man hole 2	4/23/98	Zinc	0.108	0.9	0.012	60.3	0.633	54704.16	1549221.8	167316
T-6	Man hole 3	4/23/98	TSS	60	0.9	0.012	60.3	0.633	54704.16	1549221.8	92953309
T-6	Man hole 3	4/23/98	Oil & Grease	ND							
T-6	Man hole 3	4/23/98	Copper	0.0235	0.9	0.012	60.3	0.633	54704.16	1549221.8	36406.71
T-6	Man hole 3	4/23/98	Lead	0.0585	0.9	0.012	60.3	0.633	54704.16	1549221.8	90629.48
T-6	Man hole 3	4/23/98	Zinc	0.405	0.9	0.012	60.3	0.633	54704.16	1549221.8	627434.8

ND=Non Detect, below laboratory detection limit

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TABLE 5

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATE
PORTLAND INTERNATIONAL AIRPORT (PDX)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
PDX	Basin 1	10/8/97	COD	23.7	0.225	0.025	1029	5.885	508428.9	14398706	341249343
PDX	Basin 1	10/8/97	TSS	17	0.225	0.025	1029	5.885	508428.9	14398706	244778010
PDX	Basin 1	10/8/97	Oil & Grease	ND							
PDX	Basin 1	10/8/97	Phosphorus	0.277	0.225	0.025	1029	5.885	508428.9	14398706	3988442
PDX	Basin 1	10/8/97	TOC	ND							
PDX	Basin 1	10/8/97	Arsenic	0.0025	0.225	0.025	1029	5.885	508428.9	14398706	35997
PDX	Basin 1	10/8/97	Cadmium	ND							
PDX	Basin 1	10/8/97	Chromium	0.0015	0.225	0.025	1029	5.885	508428.9	14398706	21598
PDX	Basin 1	10/8/97	Copper	0.0057	0.225	0.025	1029	5.885	508428.9	14398706	82073
PDX	Basin 1	10/8/97	Lead	0.0019	0.225	0.025	1029	5.885	508428.9	14398706	27358
PDX	Basin 1	10/8/97	Mercury	ND							
PDX	Basin 1	10/8/97	Nickel	0.0042	0.225	0.025	1029	5.885	508428.9	14398706	60475
PDX	Basin 1	10/8/97	Zinc	0.0355	0.225	0.025	1029	5.885	508428.9	14398706	511154
PDX	Basin 1	5/29/98	COD	18.5	0.225	0.014	1029	3.280	283386.6	8025508.5	148471907
PDX	Basin 1	5/29/98	TSS	ND							
PDX	Basin 1	5/29/98	Oil & Grease	ND							
PDX	Basin 1	5/29/98	Phosphorus	0.211	0.225	0.014	1029	3.280	283386.6	8025508.5	1693382
PDX	Basin 1	5/29/98	TOC	ND							
PDX	Basin 1	5/29/98	Arsenic	0.0021	0.225	0.014	1029	3.280	283386.6	8025508.5	16854
PDX	Basin 1	5/29/98	Cadmium	ND							
PDX	Basin 1	5/29/98	Chromium	ND							
PDX	Basin 1	5/29/98	Copper	0.0035	0.225	0.014	1029	3.280	283386.6	8025508.5	28089
PDX	Basin 1	5/29/98	Lead	ND							
PDX	Basin 1	5/29/98	Mercury	ND							
PDX	Basin 1	5/29/98	Nickel	0.004	0.225	0.014	1029	3.280	283386.6	8025508.5	32102
PDX	Basin 1	5/29/98	Zinc	0.0291	0.225	0.014	1029	3.280	283386.6	8025508.5	233542

Basin 1 outfall = MDD2

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**

ND=Non Detect, below laboratory detection limit.

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TABLE 5

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
PORTLAND INTERNATIONAL AIRPORT (PDX)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
PDX	Basin 2	10/8/97	COD	19.3	0.525	0.025	250	3.336	288225	8162532	157536867.6
PDX	Basin 2	10/8/97	TSS	ND							
PDX	Basin 2	10/8/97	Oil & Greas	ND							
PDX	Basin 2	10/8/97	Phosphorus	0.133	0.525	0.025	250	3.336	288225	8162532	1085616.756
PDX	Basin 2	10/8/97	TOC	ND							
PDX	Basin 2	10/8/97	Arsenic	0.0011	0.525	0.025	250	3.336	288225	8162532	8978.7852
PDX	Basin 2	10/8/97	Cadmium	ND							
PDX	Basin 2	10/8/97	Chromium	ND							
PDX	Basin 2	10/8/97	Copper	0.0051	0.525	0.025	250	3.336	288225	8162532	41628.9132
PDX	Basin 2	10/8/97	Lead	0.0018	0.525	0.025	250	3.336	288225	8162532	14692.5576
PDX	Basin 2	10/8/97	Mercury	ND							
PDX	Basin 2	10/8/97	Nickel	ND							
PDX	Basin 2	10/8/97	Zinc	0.0277	0.525	0.025	250	3.336	288225	8162532	226102.1364
PDX	Basin 2	5/24/98	COD	32.8	0.525	0.036	250	4.758	411075	11641644	381845923.2
PDX	Basin 2	5/24/98	TSS	ND							
PDX	Basin 2	5/24/98	Oil & Greas	1.16	0.525	0.036	250	4.758	411075	11641644	13504307.04
PDX	Basin 2	5/24/98	Phosphorus	0.151	0.525	0.036	250	4.758	411075	11641644	1757888.244
PDX	Basin 2	5/24/98	TOC	7.23	0.525	0.036	250	4.758	411075	11641644	84169086.12
PDX	Basin 2	5/24/98	Arsenic	0.0017	0.525	0.036	250	4.758	411075		
PDX	Basin 2	5/24/98	Cadmium	ND							
PDX	Basin 2	5/24/98	Chromium	0.0012	0.525	0.036	250	4.758	411075	11641644	13969.9728
PDX	Basin 2	5/24/98	Copper	0.0092	0.525	0.036	250	4.758	411075	11641644	107103.1248
PDX	Basin 2	5/24/98	Lead	0.0019	0.525	0.036	250				
PDX	Basin 2	5/24/98	Mercury	ND							
PDX	Basin 2	5/24/98	Nickel	0.0025	0.525	0.036	250	4.758	411075	11641644	29104.11
PDX	Basin 2	5/24/98	Zinc	0.0304	0.525	0.036	250	4.758	411075	11641644	353905.9776

Basin 2 outfall = MDD3

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**

ND=Non Detect, below laboratory detection limit.

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TABLE 5

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
PORTLAND INTERNATIONAL AIRPORT (PDX)

LOAD CALCULATIONS BASED ON Q=CIA

Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
PDX	Basin 4	10/8/97	COD	ND							
PDX	Basin 4	10/8/97	TSS	ND							
PDX	Basin 4	10/8/97	Oil & Grease	0.57	0.525	0.025	49	0.654	56492.1	1599856.3	911918.1
PDX	Basin 4	10/8/97	Phosphorus	0.0911	0.525	0.025	49	0.654	56492.1	1599856.3	145746.9
PDX	Basin 4	10/8/97	TOC	ND							
PDX	Basin 4	10/8/97	Arsenic	ND							
PDX	Basin 4	10/8/97	Cadmium	ND							
PDX	Basin 4	10/8/97	Chromium	0.001	0.525	0.025	49	0.654	56492.1	1599856.3	1599.856
PDX	Basin 4	10/8/97	Copper	0.0035	0.525	0.025	49	0.654	56492.1	1599856.3	5599.497
PDX	Basin 4	10/8/97	Lead	ND							
PDX	Basin 4	10/8/97	Mercury	ND							
PDX	Basin 4	10/8/97	Nickel	0.0084	0.525	0.025	49	0.654	56492.1	1599856.3	13438.79
PDX	Basin 4	10/8/97	Zinc	0.0205	0.525	0.025	49	0.654	56492.1	1599856.3	32797.05
PDX	Basin 4	5/24/98	COD	9.17	0.525	0.036	49	0.933	80570.7	2281762.2	20923760
PDX	Basin 4	5/24/98	TSS	ND							
PDX	Basin 4	5/24/98	Oil & Grease	ND							
PDX	Basin 4	5/24/98	Phosphorus	0.0935	0.525	0.036	49	0.933	80570.7	2281762.2	213344.8
PDX	Basin 4	5/24/98	TOC	ND							
PDX	Basin 4	5/24/98	Arsenic	0.0011	0.525	0.036	49	0.933	80570.7	2281762.2	2509.938
PDX	Basin 4	5/24/98	Cadmium	ND							
PDX	Basin 4	5/24/98	Chromium	0.0012	0.525	0.036	49	0.933	80570.7	2281762.2	2738.115
PDX	Basin 4	5/24/98	Copper	0.0066	0.525	0.036	49	0.933	80570.7	2281762.2	15059.63
PDX	Basin 4	5/24/98	Lead	0.0016	0.525	0.036	49	0.933	80570.7	2281762.2	3650.82
PDX	Basin 4	5/24/98	Mercury	ND							
PDX	Basin 4	5/24/98	Nickel	0.0069	0.525	0.036	49	0.933	80570.7	2281762.2	15744.16
PDX	Basin 4	5/24/98	Zinc	0.0321	0.525	0.036	49	0.933	80570.7	2281762.2	73244.57

Basin 4 outfall = SS03PP

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**

ND=Non Detect, below laboratory detection limit.

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TABLE 5

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
PORTLAND INTERNATIONAL AIRPORT (PDX)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
PDX	Basin 6	10/8/97	COD	17.1	0.643	0.025	476	7.779	672125.3	19034589	325491476.8
PDX	Basin 6	10/8/97	TSS	14	0.643	0.025	476	7.779	672125.3	19034589	266484250
PDX	Basin 6	10/8/97	Oil & Grease	ND							
PDX	Basin 6	10/8/97	Phosphorus	0.24	0.643	0.025	476	7.779	672125.3	19034589	4568301.429
PDX	Basin 6	10/8/97	TOC	ND							
PDX	Basin 6	10/8/97	Arsenic	0.0022	0.643	0.025	476	7.779	672125.3	19034589	41876.09644
PDX	Basin 6	10/8/97	Cadmium	ND							
PDX	Basin 6	10/8/97	Chromium	0.0013	0.643	0.025	476	7.779	672125.3	19034589	24744.96608
PDX	Basin 6	10/8/97	Copper	0.0064	0.643	0.025	476	7.779	672125.3	19034589	121821.3714
PDX	Basin 6	10/8/97	Lead	0.002	0.643	0.025	476	7.779	672125.3	19034589	38069.17858
PDX	Basin 6	10/8/97	Mercury	ND							
PDX	Basin 6	10/8/97	Nickel	0.0028	0.643	0.025	476	7.779	672125.3	19034589	53296.85001
PDX	Basin 6	10/8/97	Zinc	0.0424	0.643	0.025	476	7.779	672125.3	19034589	807066.5859
PDX	Basin 6	5/24/98	COD	16.2	0.643	0.036	476	11.095	958605	27147693	4E+08
PDX	Basin 6	5/24/98	TSS	ND							
PDX	Basin 6	5/24/98	Oil & Grease	0.816	0.643	0.036	476	11.095	958605	27147693	22152517.42
PDX	Basin 6	5/24/98	Phosphorus	0.201	0.643	0.036	476	11.095	958605	27147693	5456686.277
PDX	Basin 6	5/24/98	TOC	4.04	0.643	0.036	476	11.095	958605	27147693	109676679.4
PDX	Basin 6	5/24/98	Arsenic	0.0013	0.643	0.036	476	11.095	958605	27147693	35292.0008
PDX	Basin 6	5/24/98	Cadmium	ND							
PDX	Basin 6	5/24/98	Chromium	0.0011	0.643	0.036	476	11.095	958605	27147693	29862.46221
PDX	Basin 6	5/24/98	Copper	0.0113	0.643	0.036	476	11.095	958605	27147693	306768.93
PDX	Basin 6	5/24/98	Lead	0.0012	0.643	0.036	476	11.095	958605	27147693	32577.2315
PDX	Basin 6	5/24/98	Mercury	ND							
PDX	Basin 6	5/24/98	Nickel	0.0026	0.643	0.036	476	11.095	958605	27147693	70584.00159
PDX	Basin 6	5/24/98	Zinc	0.038	0.643	0.036	476	11.095	958605	27147693	1031612.331

Basin 6 outfall = POPE1

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**

ND=Non Detect, below laboratory detection limit.

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TABLE 5

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATE
PORTLAND INTERNATIONAL AIRPORT (PDX)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
PDX	Basin 7	10/8/97	COD	11	0.6	0.025	725	11.056	955260	27052963	2.98E+08
PDX	Basin 7	10/8/97	TSS	ND							
PDX	Basin 7	10/8/97	Oil & Grease	1.09	0.6	0.025	725	11.056	955260	27052963	29487730
PDX	Basin 7	10/8/97	Phosphorus	0.238	0.6	0.025	725	11.056	955260	27052963	6438605
PDX	Basin 7	10/8/97	TOC	3.81	0.6	0.025	725	11.056	955260	27052963	1E+08
PDX	Basin 7	10/8/97	Arsenic	0.0016	0.6	0.025	725	11.056	955260	27052963	43284.74
PDX	Basin 7	10/8/97	Cadmium	ND							
PDX	Basin 7	10/8/97	Chromium	0.0016	0.6	0.025	725	11.056	955260	27052963	43284.74
PDX	Basin 7	10/8/97	Copper	0.0104	0.6	0.025	725	11.056	955260	27052963	281350.8
PDX	Basin 7	10/8/97	Lead	0.0031	0.6	0.025	725	11.056	955260	27052963	83864.19
PDX	Basin 7	10/8/97	Mercury	ND							
PDX	Basin 7	10/8/97	Nickel	0.0024	0.6	0.025	725	11.056	955260	27052963	64927.11
PDX	Basin 7	10/8/97	Zinc	0.0834	0.6	0.025	725	11.056	955260	27052963	2256217
PDX	Basin 7	5/24/98	COD	23.8	0.6	0.036	725	15.769	1362420	38583734	9.18E+08
PDX	Basin 7	5/24/98	TSS	ND							
PDX	Basin 7	5/24/98	Oil & Grease	1.26	0.6	0.036	725	15.769	1362420	38583734	48615505
PDX	Basin 7	5/24/98	Phosphorus	0.262	0.6	0.036	725	15.769	1362420	38583734	10108938
PDX	Basin 7	5/24/98	TOC	6.34	0.6	0.036	725	15.769	1362420	38583734	2.45E+08
PDX	Basin 7	5/24/98	Arsenic	0.002	0.6	0.036	725	15.769	1362420	38583734	77167.47
PDX	Basin 7	5/24/98	Cadmium	ND							
PDX	Basin 7	5/24/98	Chromium	0.0014	0.6	0.036	725	15.769	1362420	38583734	54017.23
PDX	Basin 7	5/24/98	Copper	0.0115	0.6	0.036	725	15.769	1362420	38583734	443712.9
PDX	Basin 7	5/24/98	Lead	0.0014	0.6	0.036	725	15.769	1362420	38583734	54017.23
PDX	Basin 7	5/24/98	Mercury	ND							
PDX	Basin 7	5/24/98	Nickel	0.0033	0.6	0.036	725	15.769	1362420	38583734	127326.3
PDX	Basin 7	5/24/98	Zinc	0.113	0.6	0.036	725	15.769	1362420	38583734	4359962

Basin 7 outfall = MDD6, SS12200

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**

ND=Non Detect, below laboratory detection limit.

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TABLE 5

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATE
PORTLAND INTERNATIONAL AIRPORT (PDX)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (mg/l)	Runoff co-efficient C	Intensity I (in./hr.)	Area *A (acres)	Runoff quantity Q (cu. ft./sec.)	Cubic feet	Volume liters	Load mg
PDX	Basin 8	10/8/97	COD	13	0.297	0.025	679	5.126	442851.9	12541567.2	1.63E+08
PDX	Basin 8	10/8/97	TSS	13	0.297	0.025	679	5.126	442851.9	12541567.2	1.63E+08
PDX	Basin 8	10/8/97	Oil & Grease	ND							
PDX	Basin 8	10/8/97	Phosphorus	0.128	0.297	0.025	679	5.126	442851.9	12541567.2	1605321
PDX	Basin 8	10/8/97	TOC	ND							
PDX	Basin 8	10/8/97	Arsenic	0.0016	0.297	0.025	679	5.126	442851.9	12541567.2	20066.51
PDX	Basin 8	10/8/97	Cadmium	ND							
PDX	Basin 8	10/8/97	Chromium	0.001	0.297	0.025	679	5.126	442851.9	12541567.2	12541.57
PDX	Basin 8	10/8/97	Copper	0.0047	0.297	0.025	679	5.126	442851.9	12541567.2	58945.37
PDX	Basin 8	10/8/97	Lead	0.0012	0.297	0.025	679	5.126	442851.9	12541567.2	15049.88
PDX	Basin 8	10/8/97	Mercury	ND							
PDX	Basin 8	10/8/97	Nickel	0.0031	0.297	0.025	679	5.126	442851.9	12541567.2	38878.86
PDX	Basin 8	10/8/97	Zinc	0.0136	0.297	0.025	679	5.126	442851.9	12541567.2	170565.3
PDX	Basin 8	5/24/98	COD	19.8	0.297	0.036	679	7.310	631608.5	17887153.2	3.54E+08
PDX	Basin 8	5/24/98	TSS	18	0.297	0.036	679	7.310	631608.5	17887153.2	3.22E+08
PDX	Basin 8	5/24/98	Oil & Grease	ND							
PDX	Basin 8	5/24/98	Phosphorus	0.153	0.297	0.036	679	7.310	631608.5	17887153.2	2736734
PDX	Basin 8	5/24/98	TOC	3.86	0.297	0.036	679	7.310	631608.5	17887153.2	69044411
PDX	Basin 8	5/24/98	Arsenic	0.002	0.297	0.036	679	7.310	631608.5	17887153.2	35774.31
PDX	Basin 8	5/24/98	Cadmium	ND							
PDX	Basin 8	5/24/98	Chromium	ND							
PDX	Basin 8	5/24/98	Copper	0.0049	0.297	0.036	679	7.310	631608.5	17887153.2	87647.05
PDX	Basin 8	5/24/98	Lead	0.0011	0.297	0.036	679	7.310	631608.5	17887153.2	19675.87
PDX	Basin 8	5/24/98	Mercury	ND							
PDX	Basin 8	5/24/98	Nickel	0.0055	0.297	0.036	679	7.310	631608.5	17887153.2	98379.34
PDX	Basin 8	5/24/98	Zinc	0.0236	0.297	0.036	679	7.310	631608.5	17887153.2	422136.8

Basin 8 outfall = SS12000

***Rational method is not recommended for areas over 100 acres. Accruracy decreases as area increases over 100 acres.**

ND=Non Detect, below laboratory detection limit.

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TABLE 6

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
PORTLAND SHIP REPAIR YARD (PSY)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Amount (ppm)	Runoff coeffic. C	Intensity I (in/hr)	Area *A (acres)	Runoff Q (ft^3/sec)	Volume (ft^3)	Volume (liters)	Load (mg)
PSY	Basin 2	10/29/97	COD	11.90000	0.9	0.034	5.8	0.18	15489	438653	5220
PSY	Basin 2	10/29/97	TSS	ND5							
PSY	Basin 2	10/29/97	Oil & Grease	ND5							
PSY	Basin 2	10/29/97	TOC	3.29000	0.9	0.034	5.8	0.18	15489	438653	1443
PSY	Basin 2	10/29/97	Arsenic	ND0.001							
PSY	Basin 2	10/29/97	Cadmium	ND0.001							
PSY	Basin 2	10/29/97	Chromium	0.00230	0.9	0.034	5.8	0.18	15489	438653	1
PSY	Basin 2	10/29/97	Copper	0.10300	0.9	0.034	5.8	0.18	15489	438653	45
PSY	Basin 2	10/29/97	Lead	0.01050	0.9	0.034	5.8	0.18	15489	438653	5
PSY	Basin 2	10/29/97	Mercury	ND0.0002							
PSY	Basin 2	10/29/97	Nickel	0.00420	0.9	0.034	5.8	0.18	15489	438653	2
PSY	Basin 2	10/29/97	Zinc	0.52300	0.9	0.034	5.8	0.18	15489	438653	229
PSY	Basin 2	10/29/97	Silver	ND							
PSY	Basin 2	10/29/97	pH	6.69(pH units)							
PSY	Basin 2	4/24/98	COD	37.50000	0.9	0.003	5.8	0.02	1360	38516	1444
PSY	Basin 2	4/24/98	TSS	22.50000	0.9	0.003	5.8	0.02	1511	42795	963
PSY	Basin 2	4/24/98	Oil & Grease	ND5							
PSY	Basin 2	4/24/98	TOC	8.54000	0.9	0.003	5.8	0.02	1511	42795	365
PSY	Basin 2	4/24/98	Arsenic	ND0.001							
PSY	Basin 2	4/24/98	Cadmium	ND0.001							
PSY	Basin 2	4/24/98	Chromium	0.00260	0.9	0.003	5.8	0.02	1511	42795	0
PSY	Basin 2	4/24/98	Copper	0.18600	0.9	0.003	5.8	0.02	1511	42795	8
PSY	Basin 2	4/24/98	Lead	0.13700	0.9	0.003	5.8	0.02	1511	42795	6
PSY	Basin 2	4/24/98	Mercury	ND0.0002							
PSY	Basin 2	4/24/98	Nickel	0.75000	0.9	0.003	5.8	0.02	1511	42795	32
PSY	Basin 2	4/24/98	Zinc	1.06000	0.9	0.003	5.8	0.02	1511	42795	45
PSY	Basin 2	4/24/98	pH	6.5(pH units)							

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**
ND=Non Detect. below laboratory detection limit.
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TABLE 6

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATES
PORTLAND SHIP REPAIR YARD (PSY)

LOAD CALCULATIONS BASED ON Q=CIA

Location	Outfall	Date	Pollutant	Ammount (ppm)	Runoff coeffic. C	Intensity I (in/hr)	Area *A (acres)	Runoff Q (ft3/sec)	Volume (ft3)	Volume (liters)	Load (mg)
PSY	Basin 9	10/29/97	COD	18.40000	0.9	0.034	1.51	0.046	4012	113613	2090484
PSY	Basin 9	10/29/97	TSS	13.00000	0.9	0.034	1.51	0.046	4012	113613	1476973
PSY	Basin 9	10/29/97	Oil & Grease	ND5							
PSY	Basin 9	10/29/97	TOC	5.36000	0.9	0.034	1.51	0.046	4012	113613	608967
PSY	Basin 9	10/29/97	Arsenic	ND0.001							
PSY	Basin 9	10/29/97	Cadmium	ND0.001							
PSY	Basin 9	10/29/97	Chromium	0.00460	0.9	0.034	1.51	0.046	4012	113613	523
PSY	Basin 9	10/29/97	Copper	0.16100	0.9	0.034	1.51	0.046	4012	113613	18292
PSY	Basin 9	10/29/97	Lead	0.02070	0.9	0.034	1.51	0.046	4012	113613	2352
PSY	Basin 9	10/29/97	Mercury	ND0.0002							
PSY	Basin 9	10/29/97	Nickel	0.01150	0.9	0.034	1.51	0.046	4012	113613	1307
PSY	Basin 9	10/29/97	Zinc	0.56000	0.9	0.034	1.51	0.046	4012	113613	63623
PSY	Basin 9	10/29/97	Silver	ND							
PSY	Basin 9	10/29/97	pH	6.67 (pH units)							
PSY	Basin 9	4/24/98	COD	31.20000	0.9	0.003	1.51	0.005	391	11084	345828
PSY	Basin 9	4/24/98	TSS	ND5							
PSY	Basin 9	4/24/98	Oil & Grease	ND5							
PSY	Basin 9	4/24/98	TOC	8.65000	0.9	0.003	1.51	0.005	391	11084	95879
PSY	Basin 9	4/24/98	Arsenic	ND0.001							
PSY	Basin 9	4/24/98	Cadmium	ND0.001							
PSY	Basin 9	4/24/98	Chromium	0.00110	0.9	0.003	1.51	0.005	391	11084	12
PSY	Basin 9	4/24/98	Copper	0.22400	0.9	0.003	1.51	0.005	391	11084	2483
PSY	Basin 9	4/24/98	Lead	0.00300	0.9	0.003	1.51	0.005	391	11084	33
PSY	Basin 9	4/24/98	Mercury	ND0.0002							
PSY	Basin 9	4/24/98	Nickel	0.00300	0.9	0.003	1.51	0.005	391	11084	33
PSY	Basin 9	4/24/98	Zinc	1.37000	0.9	0.003	1.51	0.005	391	11084	15185
PSY	Basin 9	4/24/98	pH	6.25 (pH units)							

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**
ND=Non Detect, below laboratory detection limit.
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TABLE 6

INDUSTRIAL STORM WATER MONITORING POLLUTANT LOAD ESTIMATE
PORTLAND SHIP REPAIR YARD (PSY)

LOAD CALCULATIONS BASED ON Q=CIA											
Location	Outfall	Date	Pollutant	Ammount (ppm)	Runoff coeffic. C	Intensity I (in/hr)	Area *A (acres)	Runoff Q (ft^3/sec)	Volume (ft^3)	Volume (liters)	Load (mg)
PSY	Basin 12	10/29/97	COD	32.90000	0.9	0.034	9.3	0.284	24575	695975	22897588
PSY	Basin 12	10/29/97	TSS	35.00000	0.9	0.034	9.3	0.284	24575	695975	24359136
PSY	Basin 12	10/29/97	Oil & Grease	ND5							
PSY	Basin 12	10/29/97	TOC	8.60000	0.9	0.034	9.3	0.284	24575	695975	5985388
PSY	Basin 12	10/29/97	Arsenic	ND0.001							
PSY	Basin 12	10/29/97	Cadmium	ND0.001							
PSY	Basin 12	10/29/97	Chromium	0.00640	0.9	0.034	9.3	0.284	24575	695975	4454
PSY	Basin 12	10/29/97	Copper	0.14800	0.9	0.034	9.3	0.284	24575	695975	103004
PSY	Basin 12	10/29/97	Lead	0.18600	0.9	0.034	9.3	0.284	24575	695975	129451
PSY	Basin 12	10/29/97	Mercury	ND0.0002							
PSY	Basin 12	10/29/97	Nickel	0.00850							
PSY	Basin 12	10/29/97	Zinc	1.27000	0.9	0.034	9.3	0.284	24575	695975	883889
PSY	Basin 12	10/29/97	Silver	ND							
PSY	Basin 12	10/29/97	pH	6.8 (pH units)							
PSY	Basin 12	4/24/98	COD	57.90000	0.9	0.003	9.3	0.03	2398	67900	3931412
PSY	Basin 12	4/24/98	TSS	40.50000	0.9	0.003	9.3	0.03	2398	67900	2749951
PSY	Basin 12	4/24/98	Oil & Grease	ND5							
PSY	Basin 12	4/24/98	TOC	13.70000	0.9	0.003	9.3	0.03	2398	67900	930230
PSY	Basin 12	4/24/98	Arsenic	0.00110	0.9	0.003	9.3	0.03	2398	67900	75
PSY	Basin 12	4/24/98	Cadmium	ND0.001							
PSY	Basin 12	4/24/98	Chromium	0.01270	0.9	0.003	9.3	0.03	2398	67900	862
PSY	Basin 12	4/24/98	Copper	0.26400	0.9	0.003	9.3	0.03	2398	67900	17926
PSY	Basin 12	4/24/98	Lead	0.03680	0.9	0.003	9.3	0.03	2398	67900	2499
PSY	Basin 12	4/24/98	Mercury	ND0.0002							
PSY	Basin 12	4/24/98	Nickel	0.00990	0.9	0.003	9.3	0.03	2398	67900	672
PSY	Basin 12	4/24/98	Zinc	3.32000	0.9	0.003	9.3	0.03	2398	67900	225428
PSY	Basin 12	4/24/98	pH	6.78 (pH units)							

***Rational method is not recommended for areas over 100 acres. Accuracy decreases as area increases over 100 acres.**
ND=Non Detect, below laboratory detection limit.
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Table 7

STORMWATER MONITORING DATA REPORT FOR 1997-1998

Stormwater Discharge Permit 1200-Z

Location:
Port of Portland - Terminal 6
7201 N. Marine Dr. Portland OR 97203

Location: T-6 Outfall L - MH I (B603)

Parameters:	EPA Method	MRL	1st Sampling 29-Oct-97	2nd Sampling 23-Apr-98
Chemical Oxygen Demand, COD, (ppm)	410.4	5	65.500	NA
Total Suspended Solids, TSS, (ppm)	160.2	10	79	92.0
Total Organic Carbon, TOC, (ppm)	415.1	3	18.800	NA
Total Phosphorus, TP, (ppm)	365.3	0.035	0.226	NA
Ph level	----	----	6.9	6.6
Oil and Grease	413.1	5	3.73	ND
Metals (ppm): Total				
Arsenic (TRI)	7060	0.002	ND	NA
Cadmium	6010A	0.005	ND	NA
Chromium (HEX)	6010A	0.005	0.025	NA
Copper	6010A	0.005	0.0163	0.0246
Lead	7421	0.002	0.0803	0.0656
Mercury	7470	0.0002	ND	NA
Nickel	6010A	0.015	0.00530	NA
Zinc	6010A	0.01	0.240	0.491
Visual Observations:				
Color	----	----	Yellow Tint	Dirty
Foam	----	----	ND	ND
Oil/Grease Sheen	----	----	ND	ND
Rainfall Flow	----	----	1.5"-2.0"	4.0" Flow
Who Performed Sampling:	----	----	TD	TD
Time Samples Taken:	----	----	9:00 AM	9:34 AM
Who Performed Analysis:	----	----	NCA/P610382	NCA/P804432-03
Date Analyzed:	----	----	10/30/97-11/7/97	4/28/98-5/2/98

Notes: NCA=North Creek Analytical; TD= Tom Dean w/ MFM

Table 7

Stormwater Monitoring Data Report for 1997-1998

Location: T-6 Outfall M - MH 2 (CDC)

Parameters:	EPA Method	MRL	1st Sampling Not Established	2nd Sampling 23-Apr-98
Total Suspended Solids, TSS, (ppm)	160.2	10	----	10.0
Ph level	----	----	----	7.0
Oil and Grease	413.1	5	----	ND
Metals (ppm): Total				
Copper	6010A	0.005	----	0.00590
Lead	7421	0.002	----	0.00700
Zinc	6010A	0.01	----	0.108
Visual Observations:				
Color	----	----	----	Clean
Foam	----	----	----	ND
Oil/Grease Sheen	----	----	----	ND
Rainfall Flow	----	----	----	2.5"
Who Performed Sampling:	----	----	----	TD
Time Samples Taken:	----	----	----	9:03 AM
Who Performed Analysis:	----	----	----	NCA/P804432-01
Date Analyzed:	----	----	----	4/28/98-5/2/98

Notes: NCA=North Creek Analytical; TD = Tom Dean w/ MFM

Location: T-6 Outfall O - MH 3 (B605)

Parameters:	EPA Method	MRL	1st Sampling Not Established	2nd Sampling 23-Apr-98
Total Suspended Solids, TSS, (ppm)	160.2	10	----	60.0
Ph level	----	----	----	6.6
Oil and Grease	413.1	5	----	ND
Metals (ppm): Total				
Copper	6010A	0.005	----	0.0235
Lead	7421	0.002	----	0.0585
Zinc	6010A	0.01	----	0.405
Visual Observations:				
Color	----	----	----	Slightly Dirty
Foam	----	----	----	ND
Oil/Grease Sheen	----	----	----	ND
Rainfall Flow	----	----	----	2.0" Flow
Who Performed Sampling:	----	----	----	TD
Time Samples Taken:	----	----	----	9:20 AM
Who Performed Analysis:	----	----	----	NCA/P804432-02
Date Analyzed:	----	----	----	4/28/98-5/2/98

Notes: NCA=North Creek Analytical; TD = Tom Dean w/ MFM

Table 8

1997-1998 1200T NPDES STORMWATER DISCHARGE PERMIT
SCHEDULE B MONITORING DATA REPORT

Port of Portland
Portland International Airport, Portland, Oregon File No. 107220
Monitoring Location: PDX Basin No. 1

Monitoring Parameter	Analytical Method	Method Reporting Limit	Discharge Benchmarks	Fall Sampling Event October 8, 1997	Spring Sampling Event May 29, 1998
General Chemistry:		Concentrations in Milligrams per Liter (mg/L)			
Total Suspended Solids (TSS)	EPA 160.2	10.0	NA	17.0	ND
Total Phosphorus	EPA 365.3	0.0350	NA	0.277	0.211
Chemical Oxygen Demand (COD)	EPA 410.4	5.00	NA	23.7	18.5
Total Organic Carbon (TOC)	EPA 415.1	3.00	NA	ND	ND
Oil and Grease	EPA 413.2 NWTPH-Dx	0.500 0.500	10	ND	-- ND
pH	NA	NA	6.0 to 9.0	7.9	7.1
Total Metals:					
Arsenic	EPA 200.8	0.00100	0.190	0.00250	0.00210
Cadmium	EPA 200.8	0.00100	0.0011	ND	ND
Chromium	EPA 200.8	0.00100	0.011	0.00150	ND
Copper	EPA 200.8	0.00200	0.012	0.00570	0.00350
Lead	EPA 200.8	0.00100	0.0032	0.00190	ND
Mercury	EPA 245.1	0.000200	0.000012	ND	ND
Nickel	EPA 200.8	0.00200	0.160	0.00420	0.00400
Zinc	EPA 200.8	0.00500	0.110	0.0355	0.0291

Notes:

Chemical analyses by North Creek Analytical, Beaverton, Oregon.
pH measured in field using a Oakton® pHTestr 2 meter and is reported in standard pH units.
NA = Not applicable or not established.
ND = Not detected at the method reporting limit.
NWTPH-Dx analysis conducted without organic cleanup.
Benchmarks for metals from OAR 340, Division 41 (Table 20: Water Quality Criteria Summary - Fresh Chronic Criteria).

Table 8

1997-1998 1200T NPDES STORMWATER DISCHARGE PERMIT
SCHEDULE B MONITORING DATA REPORT

Port of Portland
Portland International Airport, Portland, Oregon File No. 107220
Monitoring Location: PDX Basin No. 2

Monitoring Parameter	Analytical Method	Method Reporting Limit	Discharge Benchmarks	Fall Sampling Event October 8, 1997	Spring Sampling Event May 24, 1998
General Chemistry:		Concentrations in Milligrams per Liter (mg/L)			
Total Suspended Solids (TSS)	EPA 160.2	10.0	NA	ND	ND
Total Phosphorus	EPA 365.3	0.0350	NA	0.133	0.151
Chemical Oxygen Demand (COD)	EPA 410.4	5.00	NA	19.3	32.8
Total Organic Carbon (TOC)	EPA 415.1	3.00	NA	ND	7.23
Oil and Grease	EPA 413.2 NWTPH-Dx	0.500 0.500	10	ND	-- 1.16
pH	NA	NA	6.0 to 9.0	8.3	7.3
Total Metals:					
Arsenic	EPA 200.8	0.00100	0.190	0.00110	0.00170
Cadmium	EPA 200.8	0.00100	0.0011	ND	ND
Chromium	EPA 200.8	0.00100	0.011	ND	0.00120
Copper	EPA 200.8	0.00200	0.012	0.00510	0.00920
Lead	EPA 200.8	0.00100	0.0032	0.00180	0.00190
Mercury	EPA 245.1	0.000200	0.000012	ND	ND
Nickel	EPA 200.8	0.00200	0.160	ND	0.00250
Zinc	EPA 200.8	0.00500	0.110	0.0277	0.0304

Notes:

Chemical analyses by North Creek Analytical, Beaverton, Oregon.
pH measured in field using a Oakton® pHTestr 2 meter and is reported in standard pH units.
NA = Not applicable or not established.
ND = Not detected at the method reporting limit.
NWTPH-Dx analysis conducted without organic cleanup.
Benchmarks for metals from OAR 340, Division 41 (Table 20: Water Quality Criteria Summary - Fresh Chronic Criteria).

Table 8

1997-1998 1200T NPDES STORMWATER DISCHARGE PERMIT
SCHEDULE B MONITORING REPORT

Port of Portland
Portland International Airport, Portland, Oregon File No. 107220
Monitoring Location: PDX Basin No. 4

Monitoring Parameter	Analytical Method	Method Reporting Limit	Discharge Benchmarks	Fall Sampling Event October 8, 1997	Spring Sampling Event May 24, 1998
General Chemistry:		Concentrations in Milligrams per Liter (mg/L)			
Total Suspended Solids (TSS)	EPA 160.2	10.0	NA	ND	ND
Total Phosphorus	EPA 365.3	0.0350	NA	0.0911	0.0935
Chemical Oxygen Demand (COD)	EPA 410.4	5.00	NA	ND	9.17
Total Organic Carbon (TOC)	EPA 415.1	3.00	NA	ND	ND
Oil and Grease	EPA 413.2 NWTPH-Dx	0.500 0.500	10	0.570	-- ND
pH	NA	NA	6.0 to 9.0	8.4	7.2
Total Metals:					
Arsenic	EPA 200.8	0.00100	0.190	ND	0.00110
Cadmium	EPA 200.8	0.00100	0.0011	ND	ND
Chromium	EPA 200.8	0.00100	0.011	0.00100	0.00120
Copper	EPA 200.8	0.00200	0.012	0.00350	0.00660
Lead	EPA 200.8	0.00100	0.0032	ND	0.00160
Mercury	EPA 245.1	0.000200	0.000012	ND	ND
Nickel	EPA 200.8	0.00200	0.160	0.00840	0.00690
Zinc	EPA 200.8	0.00500	0.110	0.0205	0.0321

Notes:

Chemical analyses by North Creek Analytical, Beaverton, Oregon.
pH measured in field using a Oakton® pHTestr 2 meter and is reported in standard pH units.
NA = Not applicable or not established.
ND = Not detected at the method reporting limit.
NWTPH-Dx analysis conducted without organic cleanup.

Table 8

1997-1998 1200T NPDES STORMWATER DISCHARGE PERMIT
SCHEDULE B MONITORING REPORT

Port of Portland
Portland International Airport, Portland, Oregon File No. 107220
Monitoring Location: PDX Basin No. 6

Monitoring Parameter	Analytical Method	Method Reporting Limit	Discharge Benchmarks	Fall Sampling Event October 8, 1997	Spring Sampling Event May 24, 1998
General Chemistry:		Concentrations in Milligrams per Liter (mg/L)			
Total Suspended Solids (TSS)	EPA 160.2	10.0	NA	14.0	ND
Total Phosphorus	EPA 365.3	0.0350	NA	0.240	0.201
Chemical Oxygen Demand (COD)	EPA 410.4	5.00	NA	17.1	16.2
Total Organic Carbon (TOC)	EPA 415.1	3.00	NA	ND	4.04
Oil and Grease	EPA 413.2 NWTPH-Dx	0.500 0.500	10	ND	-- 0.816
pH	NA	NA	6.0 to 9.0	8.1	7.1
Total Metals:					
Arsenic	EPA 200.8	0.00100	0.190	0.00220	0.00130
Cadmium	EPA 200.8	0.00100	0.0011	ND	ND
Chromium	EPA 200.8	0.00100	0.011	0.00130	0.00110
Copper	EPA 200.8	0.00200	0.012	0.00640	0.0113
Lead	EPA 200.8	0.00100	0.0032	0.00200	0.00120
Mercury	EPA 245.1	0.000200	0.000012	ND	ND
Nickel	EPA 200.8	0.00200	0.160	0.00280	0.00260
Zinc	EPA 200.8	0.00500	0.110	0.0424	0.0380

Notes:

Chemical analyses by North Creek Analytical, Beaverton, Oregon.
pH measured in field using a Oakton® pHTestr 2 meter and is reported in standard pH units.
NA = Not applicable or not established.
ND = Not detected at the method reporting limit.
NWTPH-Dx analysis conducted without organic cleanup.

Table 8

1997-1998 1200T NPDES STORMWATER DISCHARGE PERMIT
SCHEDULE B MONITORING REPORT

Port of Portland
Portland International Airport, Portland, Oregon File No. 107220
Monitoring Location: PDX Basin No. 7

Monitoring Parameter	Analytical Method	Method Reporting Limit	Discharge Benchmarks	Fall Sampling Event October 8, 1997	Spring Sampling Event May 24, 1998
General Chemistry:		Concentrations in Milligrams per Liter (mg/L)			
Total Suspended Solids (TSS)	EPA 160.2	10.0	NA	ND	ND
Total Phosphorus	EPA 365.3	0.0350	NA	0.238	0.262
Chemical Oxygen Demand (COD)	EPA 410.4	5.00	NA	11.0	23.8
Total Organic Carbon (TOC)	EPA 415.1	3.00	NA	3.81	6.34
Oil and Grease	EPA 413.2 NWTPH-Dx	0.500 0.500	10	1.09	-- 1.26
pH	NA	NA	6.0 to 9.0	8.2	6.9
Total Metals:					
Arsenic	EPA 200.8	0.00100	0.190	0.00160	0.00200
Cadmium	EPA 200.8	0.00100	0.0011	ND	ND
Chromium	EPA 200.8	0.00100	0.011	0.00160	0.00140
Copper	EPA 200.8	0.00200	0.012	0.0104	0.0115
Lead	EPA 200.8	0.00100	0.0032	0.00310	0.00140
Mercury	EPA 245.1	0.000200	0.000012	ND	ND
Nickel	EPA 200.8	0.00200	0.160	0.00240	0.00330
Zinc	EPA 200.8	0.00500	0.110	0.0834	0.113

Notes:

Chemical analyses by North Creek Analytical, Beaverton, Oregon.
pH measured in field using a Oakton® pHTestr 2 meter and is reported in standard pH units.
NA = Not applicable or not established.
ND = Not detected at the method reporting limit.
NWTPH-Dx analysis conducted without organic cleanup.

Table 8

1997-1998 1200T NPDES STORMWATER DISCHARGE PERMIT
SCHEDULE B MONITORING REPORT

Port of Portland
Portland International Airport, Portland, Oregon File No. 107220
Monitoring Location: PDX Basin No. 8

Monitoring Parameter	Analytical Method	Method Reporting Limit	Discharge Benchmarks	Fall Sampling Event October 8, 1997	Spring Sampling Event May 24, 1998
General Chemistry:		Concentrations in Milligrams per Liter (mg/L)			
Total Suspended Solids (TSS)	EPA 160.2	10.0	NA	13.0	18.0
Total Phosphorus	EPA 365.3	0.0350	NA	0.128	0.153
Chemical Oxygen Demand (COD)	EPA 410.4	5.00	NA	13.0	19.8
Total Organic Carbon (TOC)	EPA 415.1	3.00	NA	ND	3.86
Oil and Grease	EPA 413.2 NWTPH-Dx	0.500 0.500	10	ND	-- ND
pH	NA	NA	6.0 to 9.0	8.0	7.4
Total Metals:					
Arsenic	EPA 200.8	0.00100	0.190	0.00160	0.00200
Cadmium	EPA 200.8	0.00100	0.0011	ND	ND
Chromium	EPA 200.8	0.00100	0.011	0.00100	ND
Copper	EPA 200.8	0.00200	0.012	0.00470	0.00490
Lead	EPA 200.8	0.00100	0.0032	0.00120	0.00110
Mercury	EPA 245.1	0.000200	0.000012	ND	ND
Nickel	EPA 200.8	0.00200	0.160	0.00310	0.00550
Zinc	EPA 200.8	0.00500	0.110	0.0136	0.0236

Notes:

Chemical analyses by North Creek Analytical, Beaverton, Oregon.
pH measured in field using a Oakton® pHTestr 2 meter and is reported in standard pH units.
NA = Not applicable or not established.
ND = Not detected at the method reporting limit.
NWTPH-Dx analysis conducted without organic cleanup.

Table 9

1997-1998 ANNUAL STORMWATER MONITORING DATA SUMMARY REPORT
NPDES PERMIT 1200-L
CASCADE GENERAL, INC.
PORTLAND, OREGON

ANALYTE	UNITS	EPA METHOD	Sample Point 1		Sample Point 2		Sample Point 3	
			10/29/97	4/27/97	10/29/97	4/24/98	10/29/97	4/27/97
Chemistry								
pH	su	150.1/9040A	6.69	6.5	6.67	6.25	6.8	6.78
Total Suspended Solids	mg/L	160.2	ND5	22.5	13	ND5	35	40.5
Chemical Oxygen Demand	mg/L	410.4	11.9	37.5	18.4	31.2	32.9	57.9
Oil & Grease	mg/L	413.1	ND5	ND5	ND5	ND5	ND5	ND5
Total Organic Carbon	mg/L	415.1	3.29	8.54	5.36	8.65	8.6	13.7
Metals								
Arsenic	mg/L	200.8	ND0.001	ND0.001	ND0.001	ND0.001	ND0.001	0.0011
Cadmium	mg/L	200.8	ND0.001	ND0.001	ND0.001	ND0.001	ND0.001	ND0.001
Chromium	mg/L	200.8	0.0023	0.0026	0.0046	0.0011	0.0064	0.0127
Copper	mg/L	200.8	0.103	0.186	0.161	0.224	0.148	0.264
Lead	mg/L	200.8	0.0105	0.137	0.0207	0.003	0.0186	0.0368
Nickel	mg/L	200.8	0.0042	0.0075	0.0115	0.003	0.0085	0.0099
Zinc	mg/L	200.8	0.523	1.06	0.56	1.37	1.27	3.32
Mercury	mg/L	245.1	ND0.0002	ND0.0002	ND0.0002	ND0.0002	ND0.0002	ND0.0002

Notes:
ND: Not detected at indicated reporting limit
mg/L: Milligrams per liter
su: Standard Units

TABLE 10 PORT OF PORTLAND TENANT NPDES PERMIT STATUS

FACILITY	CO-PERMITTEE	COMPANY NAME	PERMIT TYPE
Portland International Airport			
	Yes	Aircraft Services International, Inc.	1200-T
	Yes	Airport terminal Services	1200-T
	Yes	Alaska Airlines	1200-T
	Yes	ABX Air, Inc	1200-T
	Yes	America West Airlines	1200-T
	Yes	American Airlines	1200-T
	Yes	Ameriflight	1200-T
	No, Independent	Boeing	1200-T
	Yes	Budget Rent-A-Car	1200-T
	Yes	Delta Airlines	1200-T
	Yes	Emery Worldwide	1200-T
	Yes	Empire Airlines	1200-T
	Yes	Evergreen International Aviation Company	1200-T
	Yes	Federal Express Corporation	1200-T
	Yes	Flightcraft, Inc.	1200-T
	No, Independent	General Motors Corporation	1500
	Yes	Horizon Airlines	1200-T
	Yes	Hertz Corperation	1200-T
	Yes	LSG /Sky Chefs	1200-T
	Yes	Mesa Airlines	1200-T
	Yes	Northwest Airlines	1200-T
	Yes	Ogden Aviation Services	1200-T
	No, Independent	Oregon Air National Guard	1200-T / 1700
	Yes	PacifiCorp Transportation, Inc.	1200-T
	Yes	Portland Fueling Facilities Corp	1200-T
	Yes	Reno Air	1200-T
	Yes	Skyflight Service, Inc.	1200-T
	Yes	Southwest Airlines	1200-T
	Yes	Trans World Airlines	1200-T
	Yes	United Airlines	1200-T
	Yes	United Parcel Service	1200-T
	Yes	Western Pacific Airlines, Inc.	1200-T
Portland Ship Yard	No, Operator	Cascade General	1200-Z
Industrial Tenants	Yes	American Bureau of Shipping	1200-Z
	Yes	Calef Machine Tool Rebuilding	1200-Z
	Yes	Cavi-Tech, Inc.	1200-Z
	Yes	Columbia Wire & Iron	1200-Z
	Yes	Farr West Marine, Inc.	1200-Z
	Yes	FOSS	1200-Z
	Yes	Industrial Marine, Inc.	1200-Z
	Yes	International Inspections	1200-Z
	Yes	International Paint	1200-Z
	Yes	John C. Murdoch, Inc.	1200-Z

TABLE 10 PORT OF PORTLAND TENANT NPDES PERMIT STATUS

FACILITY	CO-PERMITTEE	COMPANY NAME	PERMIT TYPE
	Yes	Kleen Blast	1200-Z
	Yes	Lips Propellers, Inc.	1200-Z
	Yes	Marine Propulsion Services	1200-Z
	Yes	Marine Spill Response Corporation	1200-Z
	Yes	Pacific Dynamics Corporation	1200-Z
	Yes	Steelhead Construction	1200-Z
	Yes	Thermal Services, Inc.	1200-Z
	Yes	Tyco Submarine System, Ltd.	1200-Z
	Yes	U.S. Coast Gaurd	1200-Z
	Yes	W & O Supply, Inc.	1200-Z
	Yes	West Coast Marine Cleaning, Inc.	1200-Z
MARINE TERMINALS			
T-1	No	no permits	
T-2	No	Stevedoring Services of America, Inc.	1200-T
T-4	No	Hall-Buck Marine	1200-T
	No	Port of Portland	1500-A
	No	Toyota	City of Portland wash water permit
T-5	No	Alcatel Submarine Network	1200-T
	No	Portland Bulk Terminals	1200-T
T-6	No	no permits	
INDUSTRIAL PARKS			
Port Center	No	Freightliner Corporation	1200-L
Swan Island	No	Eastern Oregon Fast Freight Truck Line	1200-T
Portland Inter. Center	No	no permits	
Tanker Basin	No	Chevron USA Inc.	1200-H

Table 11

Environmental Training Conducted or Attended in the 1997-1998 Permit Compliance Year

Port Initiated Training	Training Topic	Attendees	Date of Training
PSY	Environmental Awareness	Supervisors and Managers	8/87
PSY	Environmental Awareness	Supervisors and Managers	11/97
PSY	Environmental Awareness	Supervisors and Managers	3/98
Aviation	Construction Dewatering	Construction Inspectors	9/98
Aviation	Erosion Control	Construction Inspectors	9/98
Aviation	Storm Water Awareness	PDX Fire, Maintenance, Airside Operations	9/97
Aviation	Deicing Awareness	PDX Fire, Maintenance, Airside Operations	9/97
Aviation	Spill Response	Various PDX Staff	97/98
Aviation	Hazwoper 8 hr	Various PDX Staff	97/98
Aviation	Storm Water	PDX Environmental Staff, PDX tenants	4/98
Marine/AAPA	Harbors, Navigation Environmental Control - Port management practices, source control	Marine Environmental Manager	5/98
Marine/SETAC	Beneficial plants for storm water control/sediments	Marine Environmental Manager/ESD Staff	10/97
Properties	Columbia Corridor Association/Storm Water Title 3 Awareness	Properties Staff	Spring 98
Properties	Wetlands Seminar	Properties Staff	2/98
ESD	Hazwoper 8 hr	ESD Staff	97/98

Port Initiated Training	Training Topic	Attendees	Date of Training
ESD	Aircraft/Airfield Deicing	ESD Staff	8/97
ESD	Water Quality/Oregon Plan	ESD Staff	11/97
ESD	Wetlands Conference	ESD Staff	11/97
ESD	Storm Water Management	ESD Staff	12/97

Other Training Attended by Port Personnel	Training Topic	Attendees	Date of Training
REMCON	Environmental Awareness	ESD Staff, Marine Environmental Staff	9/97
Gov't Institute	Environmental Boot Camp	ESD Staff	6/15-19/98
Gov't Institute	Environmental Sampling	ESD Staff	8/98
Environmental Law Education Center	Storm Water 98	ESD Staff, Aviation Environmental Staff	6/98
AAAE	Aviation Environmental Management Symposium	PDX Environmental Staff, ESD Staff	3/30-31/98
Regional Spill Response Committee	T-6 Spill Response Plan	Spill Group Members, Marine Staff	7/8/98
Washington Public Port Association	Fall Environmental Conference	ESD Manager	7/98

Table 12

Storm Water BMP Maintenance Schedule (PDX and PIC)

Basin	Location	BMP	Frequency
1	South of west end of Taxiway C where pipe daylights	Absorbent boom	4 months
2	West Quiesent Pond	Absorbent boom - inlet end	2 months
2	West Quiesent Pond	Absorbent boom - middle section	4 months
2	West Quiesnent Pond	Hard boom - outlet end	1 year
4	Central Quiesent Pond	Absorbent boom - inlet end	2 months
4	Central Quiesent Pond	Absorbent boom - middle section	4 months
4	Central Quiesent Pond	Hard boom - outlet end	1 year
5	Outfall to slough just west of Cornfoot and Airtrans Way intersection	Absorbent boom	2 months
6	East Quiesent Pond	Absorbent boom - inlet end	2 months
6	East Quiesent Pond	Absorbent boom - middle section	4 months
6	East Quiesent Pond	Hard boom - outlet end	1 year
7	Ditch off perimeter road north of PDX Maintenance	Two sets of absorbent boom	2 months
7	Ditch on south side of PDX Maintenance	Absorbent boom	2 months
7	Ditch west of PDX maintenance just east of road into the military base	Absorbent boom	4 months
8	Outfall to slough, west of 92nd	Absorbent boom	4 months
9	Culverts on the south side of the Airport Way and I205 interchange	Absorbent boom	4 months

Table 13

Portland International Airport
Oil-Water Separator Cleaning Program

Separator Number	Location	Connection	Month of Cleaning
1	PDX Maintenance - Vehicle Storage Barn	Sanitary	February
2	PDX Maintenance - Wash Rack	Sanitary	April
3	PDX Maintenance - Vehicle Maintenance Bay	Sanitary	June
4	PDX Maintenance - Fuel Island	Storm	August
5	PDX Fire Station	Storm	October
6	PDX Fire Training Facility	Land Application	December

Table 14 **Dry Season Observation Schedule**

Operating Area	Major Outfall	Location	Priority Outfall	1997	1998	1999	2000
Aviation	SS12000	NE 92nd, west of bridge, north side of slough		X			X
Aviation	SS12500	NE 55th & Cornfoot, PDX			X		
Aviation	SS12200	NE Alderwood, PDX	X				
Aviation	SS04PP	NE 47th & Cornfoot				X	
Aviation	SS6300	Carl St., PDX			X		
Aviation	SS03PP	West of Airtrans and Cornfoot, PDX		X			X
Marine, T-1	WW43PP*	Near House 106, T-1 S		X			
Marine, T-1	WW48PP	Berth 101, T-1 N			X		
Marine, T-1	WW46PP	Berth 104, T-1				X	
Marine, T-1	WW41PP*	E. corner of terminal, T-1 S					X
Marine, T-1	WW42PP*	Berth 106, T-1 S		X			
Marine, T-1	WW45PP	Between B.104&105, T-1 S			X		
Marine, T-1	WW47PP	Berth 102, T-1 N				X	
Marine, T-2	BC50PP	N. of Ware. #203, T-2N		X		X	
Marine, T-2	BC54PP	Between B.204&205, T-2S			X		X
Marine, T-4	SJ25PP	T-4, Berth 415	X				
Marine, T-4	SJ23PP	N. of B.415		X			
Marine, T-4	SJ27PP	T-4, Berth 416			X		
Marine, T-4	SJ15PP	Berth 405, under pier				X	
Marine, T-4	SJ19PP	T-4, Berth 411, Pier 2, B.410	X				
Marine, T-4	SJ20PP	T-4 Berth 411, under pier		X			
Marine, T-4	SJ13PP	T-4, B 401			X		
Marine, T-4	SJ26PP	T-4, Berth 416				X	
Marine, T-4	SJ24PP	T-4, Berth 414					X
Marine, T-4	SJ17PP	T-4, S of Berth 405		X			
Marine, T-4	SJ21PP	T-4, Berth 411			X		
Marine, T-4	SJ22PP	T-4, Berth 414 N.				X	
Marine, T-4	SJ18PP	S. of B.405, under pier, T-4					X
Marine, T-4	SJ14PP	Between B.401& 403		X			
Marine, T-4	SJ28PP	Berth 416, South Lot				X	
Marine, T-5	RG11PP	T-5 north end of Columbia Grain					X
Marine, T-5	RG04PP	1st outfall, East end of T-6	X				
Marine, T-5	RG12PP	200 yds. south of RG11PP, T-5 Columbia Grain	X				
Marine, T-5	RG13PP	Port.Bulk Facility, under dock, T-5 300 yds S. of Alcatel property	X				

Table 14

Marine, T-5	RG12.5PP*	T-5 Alcatel Prop. NW of parking lot		X			
Marine, T-6	RG07PP	First Pier, 300 yards E of T-6			X		
Marine, T-6	RG04PP	1st outfall, East end of T-6	X				
Marine, T-6	RG08PP	NW end of pier- T-6				X	
Marine, T-6	RG10PP	T-6 Kelly Point Boat Ramp, Hyundai					X
Marine, T-6	RG05PP	800 yards E of T-6		X			
Marine, T-6	RG09PP	W of Pier at berth 601 next to Kelly Point Park			X		
Marine, T-6	RG06PP	450 yds. E. of T-6				X	
Marine, T-6	RG07.5PP*	NE end of Pier					X
Properties	RG15PP	30" outfall north of western transportation		X			
Properties	RG16PP	30" outfall south of western transportation		X			
Properties	RG17PP	30" outfall 1/2 way between rivergate blvd & N. lombard		X			
Properties	RG18PP	60" outfall N. lombard and Columbia slough		X			
Properties	SJ45PP*	Ports O'Call, Swan Island			X		
Properties	SE53PP	NW Front and Doane				X	
Properties	SJ43PP	Freightliner, Swan Island					X
Properties	SJ44PP*	Ports O'Call, Swan Island, under bridge			X		
Properties	WW44PP*	Berth 105, T-1 S				X	
Properties	WW77UN	Terminal 1, North of Ware.#5					X
PSRY	SJ26UN	Between B.79&B.91, berth 304		X			
PSRY	SJ37PP	East of Building #60			X		
PSRY	SJ23UN	PSY, berth 303, B.50				X	
PSRY	SJ41PP	PSY, berth 314, B.134					X
PSRY	SJ30UN	PSY, berth 303, p 38 & 39		X			
PSRY	SJ31UN	Between B.118&B.119, berth 305			X		
PSRY	SJ25UN	B.91, berth 304				X	
PSRY	SJ31.5UN*	B.111					X
PSRY	SJ36PP	East of Building #50		X			
PSRY	SJ42PP	N.Channel & N. Dolphin			X		
PSRY	SJ28UN	B.131&132				X	
PSRY	SJ35PP	PSY, berth 302, B.1	X				
PSRY	SJ39PP	PSY, berth 313	X				
PSRY	SJ33PP	PSY, berth 303, p 33					X
PSRY	SJ34PP	PSY, berth 302/303, B.4		X			
PSRY	SJ29UN	B.130			X		
PSRY	SJ24UN	PSY, berth 304, B.79				X	
PSRY	SJ27UN	PSY, berth 303/304, between B.55 and B.79					X
PSRY	SJ38PP	East of Ballast Water Fac.		X			

TABLE 15 **1997 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS**

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
RG04PP	E of T-6	7/24/96	Yes	None	None	Normal	Clear	Clear	None	Normal
RG05PP	800 yards E of T-6	7/24/96	No	None	None	normal				Normal
RG06PP	400-500 yards E of T-6	7/24/96	No	None	None	20' section of pipe broken off and laying in sand				Normal
RG07PP	First Pier, 300 yards E of T-6	7/24/96	No		None	20' section of culvert broken off and laying in sand				Excessive growth
RG08PP	NW end of pier-T-6	7/24/96	No		None	Normal				Normal
RG09PP	W of Pier at berth 601 next to Kelly Point Park	7/24/96	No		None	Normal				Normal
RG10PP	T-6 Kelly Point Boat Ramp	7/25/96	Yes	None	Rust	Normal	Clear	Clear	None	Normal
RG11PP	T-5 Columbia Grain	7/25/96	No	None	Sediments	Normal				None
RG12APP	T-5 Alcatel Prop. NW of parking lot	7/25/96	Yes	None	Sediments, rust	Normal	Clear	Clear	None	Excessive growth
RG12PP	T-5 Columbia Grain	7/25/96	Yes	None	Sediments	Last 8' section broken off from rest of line	Clear	Clear	None	None
RG13PP	T-5 300yds S. of Alcatel property	7/25/96	Yes	None	None	Normal	Yellow/ brown tint	Clear	None	Inhibited growth at outfall
RG14PP	T-5 300 yards S of Alcatel prop	7/25/96	Yes	None	None	Normal	Yellow/ brown tint	Clear	None	Inhibited growth at outfall

*May not be Port owned outfall. Still confirming

i:\docs\esd\stwater\98dy_swo.xls

TABLE 15 1997 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
SJ13PP	T-4, Schit. steal, B 401	7/30/96	No		Rust	Pipe cracked			None	None
SJ15PP	Berth 405, under pier	8/6/96	No							
SJ17PP	T-4, Berth 405	8/6/96	No							
SJ18PP	T-4, Berth 408, under pier	8/6/96	No		Sediments, moss-like	Normal				None
SJ19PP	T-4, Berth 411, Pier 2	7/30/96	Yes	None	Rust	Normal	Clear	Slightly turbid	None	None
SJ19PP	T-4, slip 2	Follow up visit 8/6/1996	No		None	Pipe normal, concrete cracking				Normal
SJ20PP	T-4 Berth 411, under pier	8/6/96	No		None	Normal				Normal
SJ21PP	T-4, Berth 411	8/6/96	No		None	Metal corrosion, pipe separating @ 3 places				
SJ22PP	T-4, Berth 414 N.	8/1/96	No		Sediments, rust	30'-40' steel section broken off from concrete pipe				None
SJ24PP	T-4, Berth 414	8/1/96	No		Sediments, rust	Metal corrosion, pipe is broken (uncoiled) in 4 sections				None
SJ25PP	T-4, Berth 415	8/1/96	Yes (water in pipe).	None	Rust	Normal	Clear	Clear	None	None

*May not be Port owned outfall. Still confirming

i:\docs\esd\stwater\98dy_swo.xls

TABLE 15 1997 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
SJ26PP	T-4, Berth 416	8/1/96	No		None	Normal				None
SJ27PP	T-4, Berth 416	8/1/96	No (end of pipe buried)		None	Normal				None
WW41PP	T-1 S.	8/7/96	No		Sediments, rust	Concrete cracking				None
WW42PP	T-1 S.	8/7/96	No		None	Normal				
WW43PP	T-1 S.	8/7/96	No		Sediments, rust	Normal				
WW44PP	T-1 S.	8/7/96	No		Sediments	Concrete cracking, outfall flush with concrete shore wall				None
WW45PP	T-1 S.	8/7/96	No		None	Normal				None
WW46.3PP	T-1, N.	8/7/96	No		None	Normal				None
WW46.5PP	T-1, N.	8/7/96	No		None	Normal				None
WW46PP	T-1	8/7/96	No		Sediments, rust	Metal corrosion, last section of pipe broken				None
WW47PP	T-1 N.	8/7/96	No		None	Normal				None
WW48.5PP	T-1 N.	8/7/96	No		Sediments, rust	Normal				None
WW48PP	T-1 N.	8/7/96	No		None	Normal				None
BC50PP	T-2 N.	8/7/96	No		None	Normal				None

*May not be Port owned outfall. Still confirming

i:\docs\esd\stwater\98dy_swo.xls

TABLE 15 1997 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
BC54PP	T-2 S.	8/7/96	No		Sediments	Normal				None
POC01PP	Ports O'Call, Swan Island	8/9/96	No		Sediments	Normal				Over grown with ivy
POC02PP	Ports O'Call, Swan Island	8/9/96	No		None	Normal				Completely covered under ivy
POC03PP	Boise Cascade, Swan Island	8/12/96	No		None	Normal				Normal
POC04PP	Boise Cascade, Swan Island	8/12/96	No		None	Normal				Normal
Chevron2 *	Tanker Basin	8/12/96	Yes	Oily	Sediments, rust, oily	Normal	Clear	Slightly turbid	Oily sheen	None
SJ23UN	PSY, berth 303	8/8/96	No		None	Normal				None
SJ24UN	PSY, berth 304	8/8/96	No		None	Normal				None
SJ25UN	PSY, berth 304	8/8/96	No		None	Normal				None
SJ26UN	PSY, berth 304	8/8/96	No		None	Pieces coming apart, beat up				None
SJ27UN	PSY, berth 303/304	8/8/96	No		None	Normal				None
SJ30UN	PSY, berth 303, p 38 & 39	8/8/96	No		Sediments, rust	Normal				None
SJ31UN	PSY, berth 305	8/8/96	No		None	Normal				None
SJ33PP	PSY, berth 303, p 33	8/8/96	No		None	Normal				None
SJ34PP	PSY, berth 302/303	8/8/96	No		None	Normal				None
SJ35PP	PSY, berth 302	8/8/96	Yes, dripping	None	Sediments, rust	Metal broken	Clear	Clear	None	None

*May not be Port owned outfall. Still confirming

i:\docs\esd\stwater\98dy_swo.xls

TABLE 15 1997 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
SJ39PP - picks up City flow-	PSY, berth 313	8/9/96	Yes	None	Sediments	Normal	Clear	Slightly turbid	None	None
SJ41PP	PSY, berth 314	8/9/96	No		None	Normal				Normal
SJ43PP	Freightliner, Swan Island	8/9/96	No		Sediments	Normal				None
SS03PP	PDX	8/13/96	No		None	Normal				None
SS04PP	PDX	8/13/96	No		Sediments	Normal				Normal
SS6300	PDX	8/13/96	No		None	Normal				Normal
SS12000	PDX, E.	8/13/96	Yes	None	Sediments	Normal	Clear	Clear	None	Normal
SS12200	PDX	8/13/96	No		None	Normal				Excessive growth
SS12500	PDX	8/13/96	No		None	Normal				Normal

*May not be Port owned outfall. Still confirming

i:\docs\esd\stwater\98dy_swo.xls

TABLE 16 **1998 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS**

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
RG06PP	T-6 E of Autodock 607	7/16/97	No	None	Rust	Last section of pipe separated				Normal
RG12.5PP	T-5 Alcatel	7/16/97	Yes	None	Sediments, rust	Normal	Clear first, then brown by sediments	Slightly turbid	Bubbles	Normal
RG15PP	Props, 30" outfall N of west. transp.	8/5/97	Yes	Rotten eggs	Rust	Normal	Yellow	Clear	None	None
RG16PP	Props, 30" outfall S of west. transp.	8/6/97	No		None	Fair, concrete sluffing				Normal
RG17PP	Props, between Rvrgte. blvd & N. Lombard	8/5/97	No		Oily	Normal				Normal
RG18PP	Props, 60" outfall, Col. Slough & N Lombard	8/5/97	Yes	Sewage	Rust	Normal	Yellow	Clear	None	None
SJ13PP	T-4, Down river from Cargill	7/16/97	No							
SJ15PP	T-4	7/16/97	No		None	Pipe has come apart 2 sections				None
SJ19PP	T-4, slip 2. W of HBM	8/5/97	No		Soda ash on rocks nearby	Normal				Normal
SJ25PP	T-4, Downriver end of 416 Autodock	7/16/97	Yes (water in pipe)	None	None	Normal	Clear	Clear	None	Normal, none
SJ26UN	PSY, berth 304				*Observation in progress*					

TABLE 16 **1998 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS**

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
SJ30UN	PSY, berth 303, p 38 & 39				*Observation in progress*					
SJ34PP	PSY, berth 302/303				*Observation in progress*					
SJ35PP	PSY, berth 302				*Observation in progress*					
SJ39PP	PSY, berth 313				*Observation in progress*					
SJ43PP	Swan Island / Freightliner parking lot	8/26/97	No		None	Normal				Normal
SJ44PP	Swan Island / Ports O'Call, under bridge	8/5/97	No		None	Normal				Normal
SJ45PP	Swan Island / Ports O'Call, under bridge	8/5/97	No		None	Normal				Normal
SJ46PP	Swan Island / Boise Cascade	8/26/97	No		None	Normal				Normal
SJ47PP	Swan Island / Boise Cascade	8/27/97	No		None	Normal				Normal
BC50PP	T-2, Berth 203	8/5/97	No		None	Normal				Normal
WW42PP	T-1, Berth 106	8/8/97	No		None	Normal				Normal
WW44PP	T-1, Berth 105	8/8/97	No		None	Normal				Nornal, none
SS03PP	PDX, S of central pond	7/15/97	No	None	None	Normal	Green	Clear	None	Normal
SS04PP	PDX, S of AMC, W of 47	7/15/97	No	None	None	Normal				None
SS6300	PDX, E Det. Pond	7/14/97	Yes	None	None	Normal	Clear	Clear	None	Normal

TABLE 16 1998 DRY SEASON STORM WATER OUTFALL INSPECTION OBSERVATIONS

OUTFALL	LOCATION	DATE	FLOW	ODOR	STAINING	STRUCTURAL CONDITION	COLOR	CLARITY	FLOATABLES	VEGETATION
SS12000	PDX, off 92nd	7/15/97	Yes	None	None	Normal	Clear	Clear	None	Normal
SS12200	PDX, FedEx parking lot	7/15/97	No	None	None	Normal				None
SS12500	PDX	7/15/97	No	None	None	Normal	Brown / green	Clear	None	Normal

TABLE 17

1998 DRY SEASON STORM WATER SAMPLING RESULTS

OUTFALL	DATE SAMPLED	pH	TEMP (°F)	SPECIFIC CONDUCTANCE (µs/cm)	FECAL COLIFORM (MPN/100mls)	RESIDUAL CHLORINE (mg/L)	COD (mg/L)	OIL AND GREASE (mg/L)	MBAS (mg/L)	TSS (mg/L)	NITRATE (mg/L)	TOTAL PHENOLS (mg/L)
RG12.5PP *	7/16/97	6.8	62.2	117	NA	NA	NA	NA	NA	NA	NA	NA
RG15PP	8/5/97	6.9	63	350	23	NA	NA	NA	0.01	NA	NA	NA
RG18PP	8/5/97	5.9	67	318	500	NA	32.7	NA	0.07	NA	0.948	NA
SJ25PP	7/16/97	8.4	71.6	88	17	ND	ND	ND	ND	32	0.173	ND
SS12000 **	7/15/97	9.2	73.8	259	NA	NA	NA	NA	NA	NA	NA	NA
SS12500 **	7/16/97	9.0	79.3	204	NA	NA	NA	NA	NA	NA	NA	NA
SS6300 **	7/16/97	8.9	74.1	330	NA	NA	NA	NA	NA	NA	NA	NA

* permitted discharge - analysis not required
** ground water, thus analysis not completed
ND non-detect
NA lab did not performed analysis

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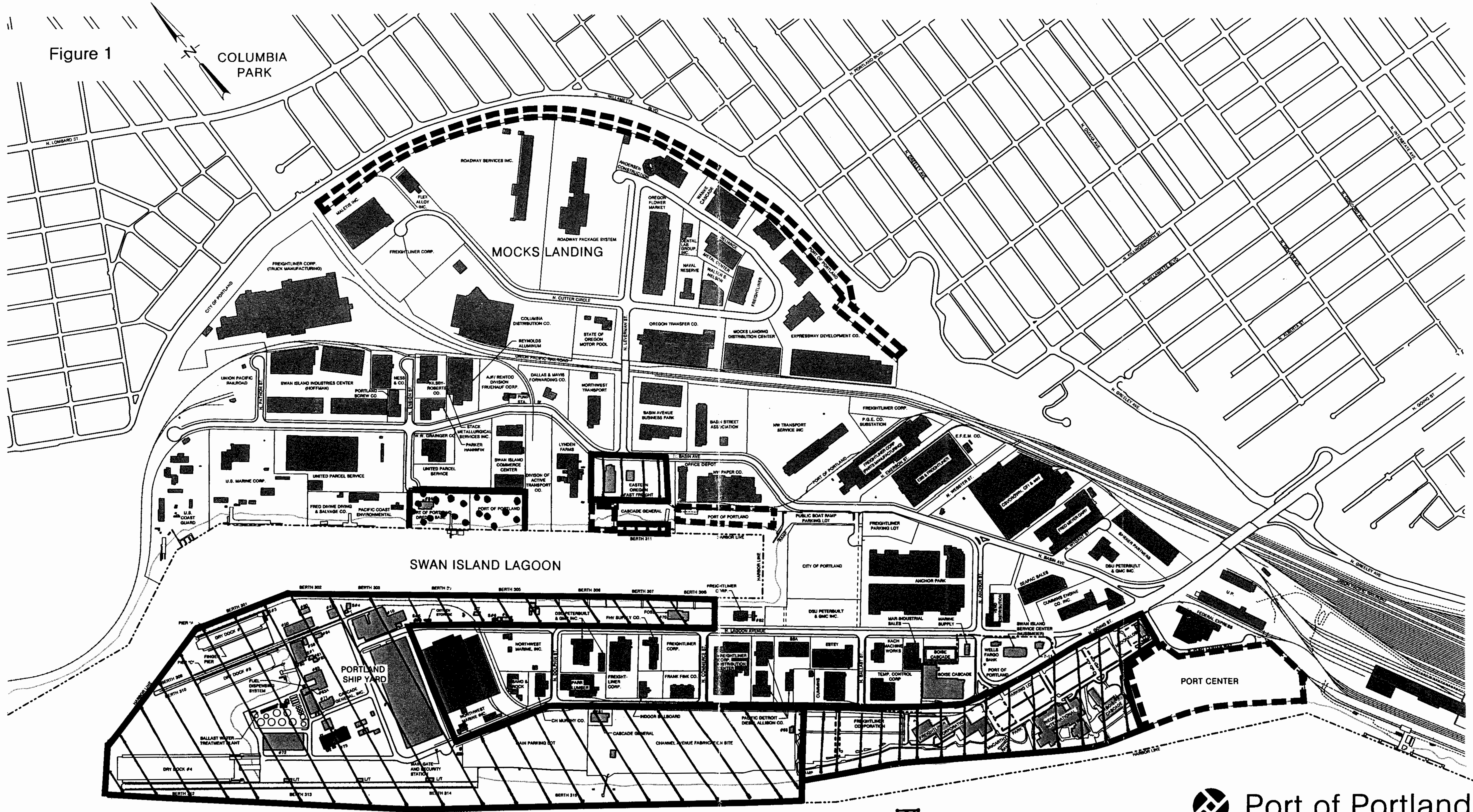
Appendix 2

Appendix 2 Figure List

Figure 1	Swan Island Map
Figure 2	Rivergate Map
Figure 3	Port Environmental Organization Chart
Figure 4	Best Management Practices Summary Form
Figure 5	T-6 Spill Letter
Figure 6	T-6 Spill Label
Figure 7	Erosion Control and Dewatering Compliance Letter and accompanying documents: Erosion and Sediment Control at Small Sites: Simple BMPs, Erosion Control Incident Record, Construction Dewatering Table, Construction Dewatering Visual Monitoring Record
Figure 8	Filter Maintenance Log
Figure 9	NPDES Storm Water Permit Compliance Requirements
Figure 10	BMP Inspection and Maintenance Form
Figure11	BMP Maintenance Schedule Form
Figure 12	PDX Urea Prohibition Letter
Figure 13	PDX "No Wash Policy Letter" and attachments: Port Ordinance No. 361 (Storm Water Regulation), Vehicle and Aircraft Washing Alternatives Memorandum, Acceptable Washing Practices and Locations, Washing Incident Investigation Procedures
Figure 14	Dewatering Specifications
Figure 15	Field Data Form / Sampling

Figure 1



CASCADE GENERAL

VACANT, AVAILABLE FOR LEASE, POSSIBLE SALE

LEASED BY PORT TO OTHERS

PORT OPERATED

Port of Portland

SWAN ISLAND INDUSTRIAL PARK
MOCKS LANDING INDUSTRIAL PARK
PORT CENTER BUSINESS PARK
PORTLAND SHIP YARD

800 0 800 1600
SCALE IN FEET

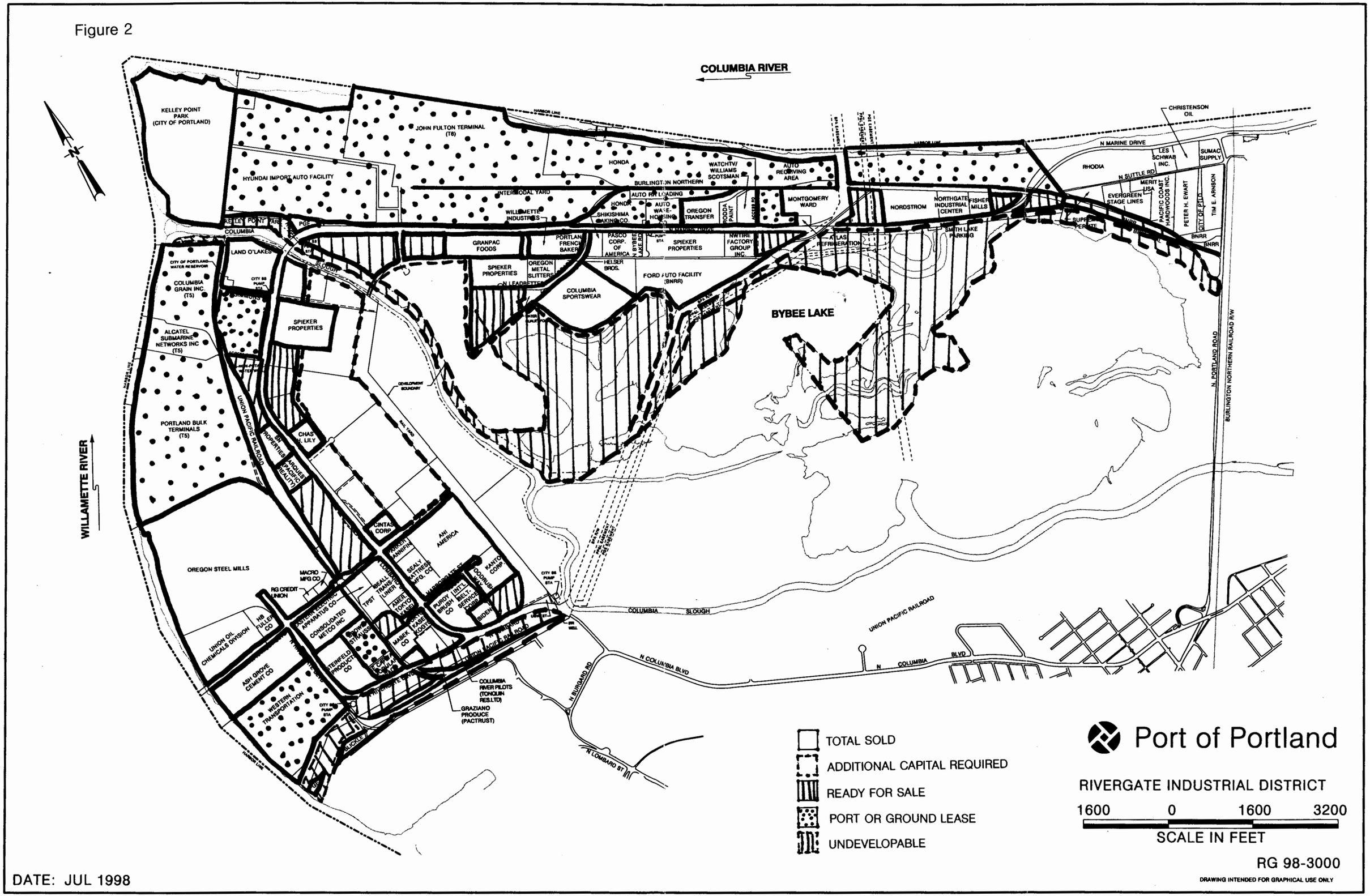
SI 98-3000

DRAWING INTENDED FOR GRAPHICAL USE ONLY

DATE: AUG 1998

REDUCED 50%

Figure 2



DATE: JUL 1998

REDUCED 50%

Figure 3

PORTWIDE ENVIRONMENTAL SERVICES

May 14, 1998

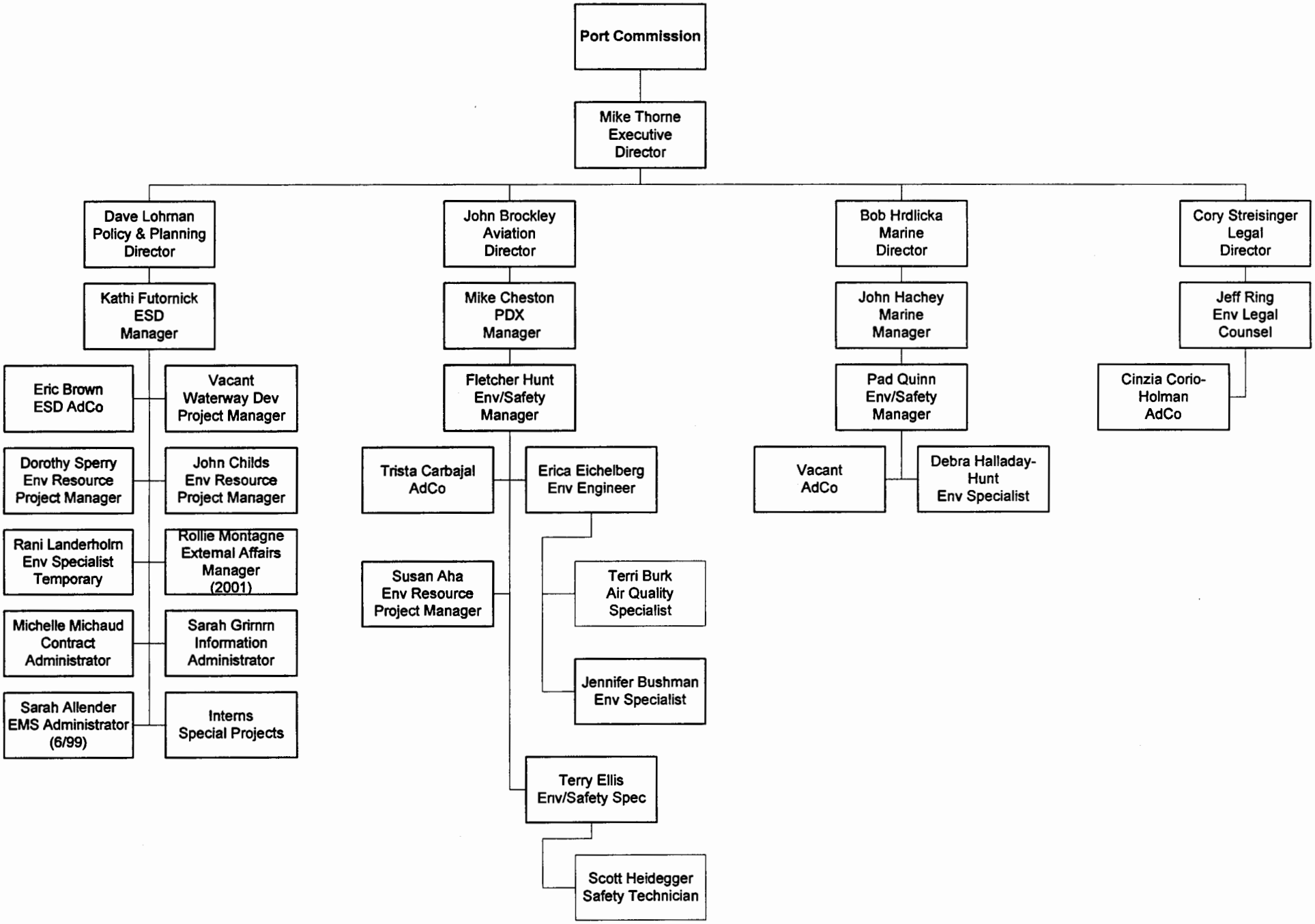


Figure 4

Best Management Practices Summary Form

Form completed by: _____ Date: _____

Port Operating Area(s) that the BMP has been or will be implemented in: _____

_____

Who is responsible for BMP implementation: _____

_____

Describe the BMP: _____

_____

_____

_____

_____

_____

_____

Who is responsible for maintenance of the BMP: _____

_____

Where are the maintenance records maintained: _____

_____

How / where is the BMP documented in the operating area: _____

_____

_____

Figure 5

Port of Portland

SPILL RESPONSE PROCEDURES FOR EQUIPMENT OPERATORS @ TERMINAL 6, PORTLAND

This protocol is issued as an element of the Terminal 6 Spill Response Plan to outline steps to be taken when an oil spill occurs from a toploader, semi-tractor or forklift on the terminal; for example, a ruptured hydraulic hose on a toploader.

1. Stop and park the vehicle is a safe, paved location away from storm drains.

2. Report all spills immediately to the Gearlocker, Supervision and Port Security; Give:

   - Vehicle type and number
   - Specific location
   - Nature of spill
   - Your name

3. Do not continue to operate the vehicle or drive it across the terminal. (To do so would spread the spill)

4. Do not park the vehicle in a gravel or sand area, unless it cannot be moved onto pavement.

5. If on a toploader: remove the storm drain cover from the kit on the toploader and place it over the storm drain closest to the spill.

6. Standby for further instruction from supervision.

2/97

Figure 6

Port of Portland

SPILL RESPONSE PROCEDURES

FOR EQUIPMENT OPERATORS AT TERMINAL #6

WHEN AN OIL SPILL OCCURS FROM A TOPLOADER, SEMI-TRACTOR OR FORKLIFT

1. STOP AND PARK THE VEHICLE IN A SAFE, PAVED LOCATION AWAY FROM STORM DRAINS.

2. **REPORT ALL SPILLS IMMEDIATELY** TO THE GEARLOCKER, SUPERVISION, PORT SECURITY AND

PROVIDE THE FOLLOWING INFORMATION

• VEHICLE TYPE & NUMBER	• NATURE OF SPILL
• SPECIFIC LOCATION	• YOUR NAME

3. DO NOT CONTINUE TO OPERATE THE VEHICLE OR DRIVE IT ACROSS THE TERMINAL.
4. DO NOT PARK THE VEHICLE IN A GRAVEL OR SAND AREA, UNLESS IT CANNOT BE MOVED ONTO PAVEMENT.
5. IF ON A TOPLOADER REMOVE THE STORM DRAIN COVER FROM THE KIT ON THE TOPLOADER AND PLACE IT OVER THE STORM DRAIN CLOSEST TO THE SPILL. IF POSSIBLE CAREFULLY EXIT VEHICLE AWAY FROM THE OIL SPILL AREA.
6. STANDBY FOR FURTHER INSTRUCTIONS FROM SUPERVISION.

Figure 7

Port of Portland

Memorandum

To:

CC: **Kathi Futornick**

From: **Sarah Yount**

Date: **April 9, 1998**

Re: **Erosion Control & Dewatering Compliance**

This memo is sent as a reminder of the Ports need to maintain compliance with the Construction, Dewatering and Municipal storm water permits. The construction inspectors are the Ports front line defense in protecting the Port from permit violations. Hopefully, most of you attended the erosion control awareness meeting conducted last year by Ken Willhite and Sarah Yount.

Attached is some new information concerning erosion control regulations, a form to help record any erosion control issues encountered in the field, Port dewatering protocols, and a dewatering form. The engineering group has developed dewatering specs for Port project bid packages. Ken can provide you with a copy of the specs.

ESD hopes to sponsor an erosion control / dewatering construction inspector workshop this spring. We will keep you posted.

Thanks for taking the time to review these materials, please call ESD with any questions.

EROSION AND SEDIMENT CONTROL AT SMALL SITES: SIMPLE BEST MANAGEMENT PRACTICES

In recent years, the impact of storm water runoff and other non-point sources of pollution on streams, lakes and estuaries has become more apparent. All communities, regardless of size or location, are becoming more concerned about storm water runoff from small as well as large construction sites. Presently there are no federal or state regulations for erosion and sediment control for construction sites under five acres.

Until there are regulations for small construction sites (less than five acres), the Department of Environmental Quality (DEQ) staff have compiled the following list of simple best management practices (BMPs) for consideration and use by local governments and contractors concerned about erosion control. BMPs are the most cost effective and efficient methods for reducing storm water runoff at small construction sites.

At the street:

- Protect street storm water inlets with block & gravel or biobags. **(This is the single most important practice for sites that drain to streets.)**
- Maintain the street inlets. After a heavy rain, shovel sediments out of the street.
- Rock is the best material for filtering active drain areas. Use rock in streets and drainage ditches.
- Don't cut your curbs until construction is essentially finished.
- Underlay driveways with geotextile fabric before laying down rock. This method saves money by not having to replace rock that otherwise would disappear into the mud. The fabric also helps to prevent mud from pumping up through the rock and running into the street.

On the site:

- Use silt fencing liberally and learn how to install it properly. (Recycle fencing and use again on your next job.)
- Limit the area onsite where heavy equipment is allowed; this will minimize soil disturbance.
- When it is raining, check where water is flowing onsite and act accordingly to minimize runoff.
- Find a place onsite where captured sediments can be safely dumped and covered, if necessary.
- If possible, use cutoff ditches to re-direct runoff that would otherwise run onto the site. Keep as much storm water off the active building site as possible.
- Use cutoff trenches to direct dirty water into depressions, open grassy fields, swales, etc... (The use of ditches is an inexpensive, yet effective management practice.)
- Dig a depression in areas where water will concentrate. Digging holes in the ground (natural surface, not fill areas) is an inexpensive method and can settle out a lot of sediment.

March 11, 1998

- Fill any gullies as soon as they become significant. Either regrade the area or fill the gully with straw bales, rock or biobags.

- If an area onsite is in a final grade state and will not be used for any subsequent construction purposes, lay topsoil down and seed it. This is a tremendously effective erosion control practice.

And some helpful practices and uses of materials:

- If you need rock for your construction, buy it early. Use the rock for erosion control now and construction later.

- Cover stockpiles with a tarp and/or dig in silt fencing around the stockpiles.

- Save slash and spread it on exposed ground to prevent erosion.

- If sidewalks are to be installed, cut them in early. The vacant "pour space" can store a lot of water.

- Straw is cheap and makes a good ground cover to slow runoff.

- Straw bales will create unwanted dams. If you use straw bales in active drainage ditches, leave a 1-foot opening between the two bales that border the low point of the ditch. Place rock in this 1-foot opening. This method keeps runoff flowing down the center of the ditch and prevents sidecutting.

- Straw wattles are a cheap and effective control for steep slopes.

- Burlap netting is another relatively inexpensive and effective method for use on steep slopes and/or fill slopes.

- Use scrap plywood to help slow down water velocities in trenches. Use rebar to secure the plywood.

- Consider using biobags. They can be cleaned and used again at another site.

STORM WATER MANAGEMENT: REGULATORY STATUS

In response to the 1987 amendments to the Clean Water Act passed by Congress, the U.S. Environmental Protection Agency (EPA) adopted "Phase I" storm water management rules. The Phase I rules require storm water permits for some industrial sources, all construction sites greater than 5 acres and urban areas with populations greater than 100,000. "Phase II" storm water rules are scheduled for release in 1998. If adopted, the Phase II rules will require a storm water permit for construction sites down to 1 acre in size and for communities with populations greater than 10,000. In 1996, the DEQ convened an advisory committee to develop state rules for erosion control at small construction sites (less than five acres). The proposed rules developed by the advisory committee may be adopted in the future, along with EPA's Phase II storm water management rules.

These changes will require storm water management from communities that have otherwise not been required to address the issue in the past. Until requirements are established, the Environmental Partnerships for Oregon Communities Advisory Committee recommended that DEQ identify simple, cost effective BMPs for small construction sites for implementation on a voluntary basis.

EROSION CONTROL INCIDENT RECORD
For Internal Use Only

Inspectors Name: _____ Date: _____

Drainage Basin Project Located In: _____

Name Of Project: _____

Port / Tenant Project Contact: _____

Contact Phone Number: _____

Erosion Control / Water Quality Issue: _____

_____

_____

_____

_____

Corrective Action: _____

_____

_____

Immediate Follow-up Action Required: _____

_____

_____

Follow-up Schedule: _____

_____

Record Distribution: _____

_____

Construction Dewatering

Visual Monitoring Record

Internal Use Only

Date Time	Water Quality Observations	Odor Present?	Oily Sheen	Estimated quantity of discharge reaching the storm system	Action Taken	Initials
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			
		yes / no	yes / no			

DRAFT 5/14

CONSTRUCTION DEWATERING

Project Entity	Location	Dewatering Discharge To:	Length of project	Permit Requirements	Port Agreements Required	Sampling Requirements & Guidelines	Monitoring Requirements	Documentation Requested
Port Project	PDX / PIC	Water	any length	SCO	NO: Contractor will be required to follow dewatering specifications as outlined in bid package.	Sampling as required by the SCO, Initial samples and one monthly sample will be analyzed for TPH, COD, TSS, VOCs, and turbidity. **Permit Requirements**	No visual monitoring is required	Dewatering Plan from contractor
Port Project	All other Port locations	Water	less than 2 weeks	Port NPDES Municipal Storm Water Permit	NO: Contractor will be required to follow dewatering specifications as outlined in bid package	Not required unless contamination is encountered	Continuous visual monitoring of discharge for any indications of contamination.	Dewatering Plan from contractor (Port Contractor must understand responsibility to stop discharging if contamination in encountered)
Port Project	All other Port Locations (except GA airports)	Water	more than 2 weeks	Port NPDES Municipal Storm Water Permit	NO: Contractor will be required to follow dewatering specifications as outlined in bid package	Sampling requirements are as follows: An initial sample and a quarterly sample will be analyzed for TSS, TPH, COD, VOCs and turbidity. **Guidelines**	Visual monitoring should be conducted between monthly samples	Dewatering plan - contractor
Port Project	PIC / PDX	Land (treated water)	any length	1500B - PIC/PDX permit in place	NO: Port contractor must understand requirements of the 1500B permit	Weekly to monthly monitoring may be required. Typical parameters, TPH, benzene, pH, and flow **Permit Requirements**	Visual monitoring for flow rates. Permit requires records on amount of discharge applied	Dewatering Plan from contractor Permit required monitoring records

DRAFT 5/14

Project Entity	Location	Discharge Option	Length of time	Permit Requirements	Port Agreements Required	Sampling Requirements & Guidelines	Monitoring Requirements	Documentation Requested
Port Project	All other Port Properties (except GA airports)	Land (treated water)	any length	1500B - must aquire for each project	NO: Port contractor must understand requirements of the 1500B permit	Weekly to monthly monitoring may be required. Typical parameters, TPH, benzene, pH, and flow **Permit Requirements**	Visual monitoring for flow rates. Permit requires records on amount of discharge applied	Dewatering Plan from contractor Permit required monitoring records
Port Project	Any Port Property	Land (untreated water)	any length	None	NO: Port Contractor must understand to stop discharging if contamination is encountered.	Not required unless contamination is encountered	Visual monitoring is required.	Dewatering Plan - Contractor
Tenant Project	PIC/PDX	Water	any length	SCO	YES: Tenant must enter into a dewatering agreement. See attached generic language.	Must sample as required by agreement. Initial and biweekly samples will be analyzed for COD, TSS, turbidity, VOCs, and TPH **Permit Requirement**	No visual monitoring is required - however still a good practice to maintain	Dewatering Agreement Dewatering plan - contractor Sample data
Tenant Project	All Other Port locations (except GA airports)	Water	less than 2 weeks	Port NPDES Municipal Storm Water Permit	YES. The needed language can be incorporated into the permit/right of entry for construction or in a dewatering agreement. The language must include a requirement for a historical review (to be done by ESD)of the property for possibility of contamination and a requirement for the contractor to stop dewatering upon any signs of contamination	Not required unless contamination is encountered	Continuous visual monitoring of discharge for any indications of contamination.	Dewatering Plan from contractor Signed right of entry language or dewatering agreement
Tenant Project	All Other Port locations (except GA airports)	Water	More than 2 weeks	Port NPDES Municipal Storm Water Permit	YES: Tenant must enter into a dewatering agreement.	Must sample as required by agreement. Initial and biweekly samples will be analyzed for COD, TSS, turbidity, VOCs, and TPH **Guidelines**	No visual monitoring is required - however still a good practice to maintain	Dewatering Agreement Dewatering plan - contractor Sample data

DRAFT 5/14

Project Entity	Location	Discharge Option	Length of time	Permit Requirements	Port Agreements Required	Sampling Requirements & Guidelines	Monitoring Requirements	Documentation Requested
Tenant Project	PDX / PIC	Land (treated water)	any length	Port 1500B*	YES: Tenant must enter into a dewatering agreement.	Must sample as required by agreement and permit. Weekly samples for flow and free product. Monthly samples for pH, TPH and benzene. **Permit Requirement**	Visual monitoring for free product weekly.	Dewatering plan from contractor Dewatering agreement Sample data
Tenant Project	All Other Port locations	Land (treated water)	any length	Water Pollution Control Facilities Permit - WPCF special permit**	NO: Must comply with conditions of permit issued by DEQ.	Weekly to monthly monitoring may be required. Typical parameters, TPH, benzene, pH, and flow **Permit Requirement**	Visual monitoring for flow rates. Permit requires records on amount of discharge applied	WPCF permit Dewatering Plan Permit required monitoring records
Tenant Project	All Port Property	Land (untreated water)	any length	None	YES. The needed language can be incorporated into the permit/right of entry for construction or in a dewatering agreement. The language must include a requirement for the contractor to stop dewatering upon any signs of contamination	Not required unless contamination is encountered	Continuous visual monitoring of discharge for any indications of contamination.	Dewatering Plan from contractor

* Acquiring a blanket WPCF - 1500B permit for PIC and PDX
** Permits must be obtained by tenant

Permit Requirements - must be completed as stated - mandated by DEQ

Guidelines - can be flexible depending on length and location of project

Figure 8

Filter Location (identify which filter - where it is in the yard)	**Date Filter Inspected**	**Date Filter Changed**	**Comments**

Figure 9

NPDES STORM WATER PERMIT COMPLIANCE REQUIREMENTS
INSPECTION - SAMPLING - MAINTENANCE

OUTFALL M - MANHOLE 2 (CDC)	OUTFALL O - MANHOLE 3 (B603)	OUTFALL L - MANHOLE 1 (B605)
INSPECTION: **Monthly** Inspection of MH *for Floating Solids and Oil Sheen* [Record Field Data Sheet]	INSPECTION: **Monthly** Inspection of MH *for Floating Solids and Oil Sheen* [Record Field Data Sheet]	INSPECTION: **Monthly** Inspection of MH *for Floating Solids and Oil Sheen* [Record Field Data Sheet]
SAMPLING: 2 Storm Sampling Events (Fall/Spring) at MH *for Total Copper, Lead, Zinc, pH, TSS and Oil&Grease* [Record Field Data Sheet & COC]	SAMPLING: 2 Storm Sampling Events (Fall/Spring) at MH *for Total Copper, Lead, Zinc, pH, TSS and Oil&Grease* [Record Field Data Sheet & COC]	SAMPLING: 2 Storm Sampling Events (Fall/Spring) at MH *for Total Copper, Lead, Zinc, pH, TSS and Oil&Grease* [Record Field Data Sheet & COC]
INSPECTION OF DRAIN AREA: **Monthly** Inspection of Filtered Storm Drains and Catch Basins *for Debris, Floating Solids and Oil Sheens* [Record Maintenance Form]	INSPECTION OF DRAIN AREA: **Monthly** Inspection of Unfiltered Catch *Basins for Floating Solids and Oil Sheens* [Record Maintenance Form]	INSPECTION OF DRAIN AREA: **Monthly** Inspection of Filtered Storm Drains at Gearlocker & Parking Area *for Debris and Oil Sheen.* **Monthly** Inspection of Unfiltered Catch Basins in Container Area *for Floating Solids and Oil Sheens* [Record Maintenance Form]
MAINTENANCE: STORM DRAIN ANNUAL CLEANING T6 YARD SWEEPING BEFORE FIRST STORM (FALL) SAMPLING EVENT - MFM DEPT WILL DO -	**MAINTENANCE**: STORM DRAIN ANNUAL CLEANING T6 YARD SWEEPING BEFORE FIRST STORM (FALL) SAMPLING EVENT - MFM WILL DO DOCK FACE -	**MAINTENANCE**: STORM DRAIN ANNUAL CLEANING T6 YARD SWEEPING BEFORE FIRST STORM (FALL) SAMPLING EVENT - MFM WILL DO PARKING & DOCK FACE -

OIL & WATER BAFFLE SEPARATOR SYSTEM AT FUEL ISLAND/TANKS (CDC)	INSPECTION & MAINTENANCE: **Monthly** Inspection and Maintenance of Separator [Record BMP Inspection/ Maintenance Form] **Annual** Cleaning of Separator [Record BMP Inspection/ Maintenance Form] Harbor Oil	SAMPLING: 3 Storm Sampling Events (Fall/ Spring/Summer). 2 Samples Inlet & Outlet *for BETX, TPH, Oil&Grease - Include pH and Flow at Inlet Pipe Only.* [Record BMP Field Data Form & COC]

T6 WASHWATER PERMIT FOR OIL & WATER SEPARATOR	SAMPLING: 12 Monthly Sampling Events at Separator *for Oil&Grease* [Record Field Data Sheet COC]

Figure 10

BMP Inspection and Maintenance Form

Fuel Island and USTs

Name:	Date:
Title:	Time:

Visual Observations:
Rainfall: (Yes/No)
pH Measurement:
Any Unusual Observances: (Color/Foam/Odor) If Yes, Action Taken:
Leaks: (Yes/No)
Location(s):
Actions Taken:
Samples/Measurements Taken:
Individual who performed analysis:
Analysis Performed:
Results of Analysis:
Additional Comments:

Figure 11

BMP Maintenance Schedule Form

Form completed by: _____ Date: _____

Port Operating Area where BMP is implemented: _____

_____

Port personnel or Port contractor responsible for BMP maintenance: _____

_____

What is the frequency of maintenance or the schedule for maintaining the BMP: _____

_____

_____

_____

_____

_____

Where / how are the maintenance records maintained: _____

_____

Where / how is the BMP maintenance procedure documented in the operating area:

_____

_____

Other relevant BMP maintenance information: _____

_____

_____

_____

Figure 12

Port of Portland

Box 3529, Portland, Oregon 97208, U.S.A.
503/231-5000

May 18, 1998

«Contact»
«Company»
«Address»

Dear Tenant:

As you may be aware, Portland International Airport (PDX) is evaluating options to reduce and control discharges of deicing and anti-icing materials into the Columbia Slough. In addition, a pending National Pollution Discharge Elimination System (NPDES) Permit will regulate all aircraft and pavement deicing and anti-icing discharges to storm water. Permit compliance will be achieved, in part, through the implementation of Best Management Practices (BMPs).

Consequently, starting immediately, the use of Urea for pavement deicing or anti-icing is prohibited at PDX. This restriction is required by the NPDES permit and is being implemented due to concern over water impacts to the Columbia Slough. Urea contains nitrogen, which breaks down to ammonia in the environment, resulting in greater degradation of water quality compared to alternative approved materials such as Sodium Formate.

If you have Urea stored at PDX, this material can be exchanged for an equivalent approved product. For additional information please contact Susan Aha at 460-4326.

Sincerely,

John P. Brockley
Director of Aviation

cc: Mike Cheston
Mary Maxwell
Larry Medearis
Fletcher Hunt
Bill Allen

Figure 13

Jennifer L. Bushman
Environmental Specialist
Portland International Airport

Port of Portland

Box 3529, Portland, Oregon 97208
503/460-4523
800/547-8411, Ext. 4523
FAX: 503/460-4150
Internet: bushmj@portptld.com

May 20, 1998

«Contact»
«Company»
«Address»

Dear Tenant:

Over the past year, the Port of Portland (Port) has conducted storm water education and awareness training for airport tenants in anticipation of receiving a new Industrial Storm Water Permit issued by the Oregon Department of Environmental Quality (DEQ). All tenants, regardless of co-permittee status, are obligated to comply with the terms, conditions and Best Management Practices included in the permit.

This permit only regulates the discharge of stormwater. It does not authorize the discharge or on-site disposal of process water, wastewater, wash water, boiler blowdown cooling water, air conditioning condensate, deicing residues, or any other non-storm discharges associated with the facility. The non-storm discharge that the Port is most concerned with at Portland International Airport (PDX) is wash water generated by vehicle, equipment, and aircraft washing. Deicing discharges are the subject of a Stipulated Consent Order issued by DEQ and will be eventually permitted separately.

The Port is aware many tenants at PDX wash vehicles, equipment, and aircraft. These activities have the potential to impact the storm water system which discharges to the Columbia Slough. The Columbia Slough is a water-quality limited stream as designated by DEQ, therefore subject to stringent discharge standards. In an effort to eliminate or minimize water quality impacts to the Columbia Slough from waste water, the Port adopted Ordinance 361, to regulate and prohibit the discharge of any wash water, or other non-stormwater to the storm water system.

The Port is requesting assistance from tenants in complying with Port Ordinance 361 along with other terms and conditions of the airport's Industrial Storm Water Permit. Washing of vehicles, equipment, and aircraft is allowed, but the discharge waste water can not enter the storm drain system, and/or residue from the washing activities be allowed on pavement surfaces where it could be carried off by rain water to the system. Included is a list of suggested alternatives which may be used to prevent the wash water and residue from entering the storm drains.

Beginning June 30, 1998, the Port will be shutting down any washing operations not in compliance with Port Ordinance 361 or the airport's Industrial Storm Water Permit. If wash water is observed going down a storm drain, you will be required to immediately stop the activity. In addition, we are requesting tenants prevent other types of illicit discharges by covering dumpsters and properly cleaning up any spills which may occur.

If you need assistance, Jennifer Bushman from our environmental department will be available as a resource to answer any questions or address any concerns you may have. Jennifer may be reached at (503) 460-4523.

Sincerely,

Fletcher Hunt
Environmental Manager
Portland International Airport

cc: Mike Cheston
Mary Maxwell
Sam Fowler

bcc:
Kathi Futornick
Dorthy Sperry
Danny Garcia
Steve Nagy
Jeff Ring
PDX Environmental & Safety

ORDINANCE NO. 361

OF

THE PORT OF PORTLAND

AN ORDINANCE REGULATING STORM WATER.

BE IT ENACTED BY THE PORT OF PORTLAND:

SECTION 1. FINDINGS AND PURPOSE

1.1 Findings

The Port of Portland Board of Commissioners finds:

(a) The public interest and the interests of the Port of Portland will be served if pollution of the Willamette and Columbia Rivers and other waters due to pollutants in storm water runoff can be minimized;

(b) Environmental Protection Agency storm water regulations adopted pursuant to the Clean Water Act require the Port to obtain a National Pollution Discharge Elimination System municipal storm water permit and to manage storm water by:

(i) Controlling the contribution of pollutants to Port municipal storm sewers by storm water associated with industrial activity;

(ii) Prohibiting illicit discharges of pollutants to Port municipal separate storm sewers;

(iii) Controlling the discharge to Port municipal separate storm sewers of spills, dumping, or disposal of materials other than storm water; and

(iv) Requiring compliance by third persons with the foregoing requirements under ordinances, permits, contracts, or orders issued by the Port.

1.2 Purpose

The purpose of this Ordinance is to regulate the discharge of storm water into Port storm sewers to minimize water pollution due to pollutants discharged in storm water, and to comply with the Clean Water Act and with the National Pollution Discharge Elimination System municipal storm water permit issued to the Port under the Clean Water Act.

SECTION 2 - DEFINITIONS

As used in this Ordinance, unless the context clearly requires otherwise:

2.1 "Executive Director" means the Executive Director of the Port.

2.2 "Illicit discharge" means any discharge to a storm sewer that is not composed entirely of storm water, except (1) discharges under an National Pollution Discharge Elimination System (NPDES) permit other than the municipal NPDES storm water permit issued to

the Port and (2) discharges resulting from fire fighting activities.

2.3 "Person in possession of land owned by the Port" means the individual, partnership, corporation, or other entity that has a right to occupy or control Port land pursuant to law or under a lease, permit, right of entry, facility use agreement, or other contract with the Port of Portland. "Port land" means land to which the Port holds legal title and in which the Port has something more than a mere security interest.

2.4 "Pollutant" means dredged material, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or agricultural waste.

2.5 "Port" means the Port of Portland.

2.6 "Storm sewer" means a conveyance or system of conveyances, including without limitation roads with drainage systems, catch basins, curbs, gutters, ditches, man-made channels, or storm drains, that is designed or used for collecting or conveying storm water.

2.7 "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

SECTION 3 - ILLICIT DISCHARGES

No person shall make, cause, or allow an illicit discharge into a storm sewer owned or operated by the Port.

SECTION 4 - CONNECTIONS

No person shall connect to a storm sewer owned or operated by the Port without first obtaining written permission from the Port.

SECTION 5 - INSPECTIONS

Upon reasonable notice to the person in possession of land owned by the Port, the Port may inspect that land and storm sewers on the land for violations of this Ordinance or of any law or regulation governing the conveyance or disposal of storm water. The right to inspect under this section is in addition to any right under a lease, use agreement, or other contract between the Port and the person in possession of the land.

SECTION 6 - RULES

The Executive Director or the Executive Director's designee shall adopt rules to control:

(1) The contribution of pollutants to storm sewers owned or operated by the Port;

(2) The quality of storm water discharged from the sites of industrial activity on land owned by the Port; and

(3) The discharge to storm sewers owned or operated by the Port of pollutants from spills, dumping, or the disposal of materials other than storm water.

SECTION 7 - PENALTIES

Any person violating section 3 or 4 of this ordinance shall be guilty of a misdemeanor pursuant to ORS 777.990(2). If a violation of section 3 or 4 of this Ordinance is continuing or recurrent, each calendar day during which the violation occurs or continues shall be deemed a separate violation.

SECTION 8 - SAVINGS CLAUSE

All parts of this Ordinance are hereby declared separable and independent of all others. If any phrase, clause, sentence,

paragraph, or section of this Ordinance is declared invalid for any reason, the remainder of this Ordinance shall not be invalidated by that declaration, but shall remain in full force and effect.

ADOPTED THIS 11th day of March, 1992, being the date of its second reading before the Board of Commissioners of the Port of Portland.

By: _____
Assistant Secretary

By: _____
President

APPROVED AS TO LEGAL SUFFICIENCY

_____
Counsel for the Port of Portland

APPROVED BY COMMISSION

3-11-92
(date)

M E M O R A N D U M

DATE: May 12, 1998

RE: Vehicle and Aircraft Washing Alternatives

The following is a list of washing alternatives for the Port and its tenants.

Alternatives:

A. Wash water may be discharged to the sanitary sewer. The City of Portland regulates the discharge to the sanitary sewer under certain conditions. If the quantity of effluent does not exceed 6,000 gallons a day and the effluent meets the water quality limitations set by the City, a permit is not required. Even though a permit may not be required, the City should be consulted prior to discharge to ensure all requirements are met and to alert them to the increase in volume to the treatment plant. Mark Bautista of the City's Environmental Services may be contacted at (503) 823-7856 for more information on requirements and cost.

B. Aviation Environmental, Inc. manufactures a semi-permanent Effluent Capture and Containment System (ECCS). The ECCS is a tear and abrasion resistant non-porous, tri-polymer alloy material which is chemically impervious to all fluids normally encountered in aircraft maintenance, washing, and deicing operations. The ECCS's semi-permanent platform is capable of being disassembled, transported and reassembled at other desired locations on the airfield should operations requirements change in the future. Effluent removal from the ECCS can be accomplished by utilizing either a sump pump or vacuum pump installation. The wash water generated will need to be disposed of to the City's sanitary system. Estimated cost of $30,000 to 40,000.

For more information, contact Aviation Environmental, Inc. at (800) 788-6450

C. Microsep International Corporation manufactures the Microsep Aircraft Washdown System. The Mircorsep System claims to provide a high rate clarification of inert and biological suspended solids, heavy metal precipitates, emulsified oils and fats, and colloidal solids. There is the possibility of recycling the water for reuse. Ultimately, the treated effluent would need to be discharged to the sanitary sewer.

This system would require a collection and containment area such as a wash pad or ECCS or vacu-boom (see D). Due to a limited treatment capacity, a storage tank may be necessary to hold the wash water prior to treatment. The treatment system would require regular maintenance and removal of the sludge. Due to the treatment of the water, a greater amount of sludge is expected to be

produced in this system compared to an oil-water separator. If the water from the system could be recycled, this may help to off-set some of the sludge disposal cost.

For more information, contact Microsep at (604) 432-7660.

D. Vehicles and aircraft can be washed using a vacu-boom collection system. The vacu-boom is a hollow, flexible tube 5" in diameter that is placed directly on a hard surface to form a downslope side dam or to completely encircle the wash or containment area. The boom has a C shaped cross section with the open side down. There are small waste water or liquid inlet openings on the water side of the boom at the bottom edge. During use, the boom is connected by a 25 ft. vacuum hose to the portable wet vac recovery unit. When the vacu-boom is turned on, it seals itself to the surface like a giant suction cup to form an impervious liquid barrier. The vac unit can then discharge the effluent to the sanitary sewer.

Each individual tenant could purchase their own system and make arrangements with the City of Portland to discharge the effluent to the sewer. Estimated cost of $2500 to 4000

For more information, contact Pressure Power Systems, Inc. at (910)996-5585.

E. Tenants can contract their vehicle washing through vendors such as Aero Wash or Websters Power Wash. The vendor should have the ability to collect and dispose of any wash water they generate. The Port will not allow the discharge of any wash water into its storm system, regardless of any permits held by the vendor.

This alternative is easy for the tenant, and least costly. Many mobile washing companies already have the ability to collect and dispose of wash water. Any company contracted by a tenant to perform work on Port of Portland property is required to have an operating agreement with the Port.

For more information see the Yellow Pages.

F. Washing of vehicles and aircraft on airport property could be conducted with dry chemicals. The use of dry chemicals would eliminate the wash water.

G. The GRVs could be used to collect the wash water from aircraft washing activity. The air carrier would be charged for the service and would have to work under a pre-set schedule, or a 48 hour notice requirement. The cost to the carrier would need to include operator expenses, GRV O&M, sanitary disposal charges, and sampling analysis expenses.

H. For washing of vehicles and small equipment wash racks could be used. United and Delta have both expressed a willingness to discuss the option of letting other tenants use their wash facilities. In addition, the Port's wash rack at the Maintenance Facility may be used if an agreement could be worked out to satisfy any of their concerns related to liablity.

I. The honey rooms could possibly be used for washing of vehicles and small equipment. The airlines would need to work out how the different uses of the room, sanitary disposal and washing, would be merged. The biggest concern with using these rooms would be the potential health issues related to the raw sewage disposal in the same area as the washing.

Acceptable Washing Practices and Locations

The following is a list of acceptable washing practices and locations. These are based on the collection of the wash water or the direct discharge of the wash water to the sanitary sewer system.

Practices

Use of a collection system such as a vacu-boom or storm drain stopper mat to facilitate the collection of the wash water for later disposal to the sanitary system.

Washing inside a hanger or other building is allowed (i.e. PDX Fire Station) because the drains inside the buildings drain to the sanitary system.

Locations

The following locations are acceptable for washing based on the direct drainage to the sanitary system. A facility map is attached showing the locations.

Oregon Air National Guard Facility: OANG has their own storm water and wash water permits and are allowed to wash under these permits.

Horizon Maintenance Facility: The ramp on the west end of the Horizon Maintenance Facility (the new facility) was constructed with a valve that can divert the wash water to the sanitary system. A lighting system has been installed on the valve controls located on the pump room/GSE building. A red color indicates the system is draining to the sanitary system and should be on when washing is occurring. If washing is occurring the light should be red, if it is green this indicates it is draining to the storm water system and is not allowed.

Honey Rooms: These drain to the sanitary system and washing will be allowed in the rooms.

United Airlines Maintenance Facility: UAL has an vehicle and equipment wash pad located on the north end of their maintenance facility building, to the east of the North Cargo Building. This pad drains to the sanitary system.

Delta Airlines Ground Service Equipment Facility: The Delta GSE has a washing facility on the NW corner of the building that is enclosed.

Flightcraft: Flightcraft is in the process of installing a washing pad which will be located on the NE corner of building 7405. The completion date for the pad is currently estimated as August 1, 1998. Washing at this facility will be acceptable after this date.

Rental Car Facilities: Individual rental car maintenance facilities and the quick turn around area have wash facilities that discharge to the sanitary system, washing is acceptable at these facilities.

PDX Maintenance Facility:

- The PDX Maintenance Facility wash rack and the drains on either end of the wash rack all drain to the sanitary system. Washing is allowed in the wash rack and at either end of the wash rack.
- The drains in the breezeway of the Maintenance Facility drain to the sanitary system and washing of equipment is allowed.

Washing Incident Investigation Procedures

1. Verify the discharge is not allowed under the Aviation Policy (see acceptable washing practices and locations)

2. Ask that the washing activity be stopped immediately

3. Complete a Washing Incident Report Form

4. Give one copy of the form to the person who is washing along with a copy of the wash water policy letter dated May 20, 1998 and attachments.

5. Give two copies of the form to Jennifer Bushman who will follow up on the incident.

Figure 14

SECTION 02140
DEWATERING

A note refers to the article or paragraph which immediately follows. Notes referring to more than one article or paragraph will be explicitly worded to that effect.

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section describes dewatering required for trenching, excavation, and construction of underground utilities.

B. Sand and silt soils that are expected to be encountered in this area are sensitive to groundwater seepage and pore pressures.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200, Earthwork

B. Section 02221, Trenching, Backfilling, and Compacting

1.3 REFERENCED STANDARDS

A. ASTM: American Society for Testing and Materials.

1.4 SUBMITTALS

A. At least 2 weeks prior to beginning construction work, submit to the Engineer for review a statement of method, details, installation, and operation of the proposed dewatering system for trenching, excavating, and construction work. The plan shall demonstrate the control of groundwater to improve stability of the walls and bottom of the excavations for a period of time sufficient for the placement of pipe and structure foundations as shown on the drawings.

B. Determine and demonstrate the dewatering methods necessary to achieve the groundwater conditions specified herein. The range of dewatering options is not intended to exclude the use of open pumping with sumps and ditches, subject to the open pumping conditions specified herein.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Select A for PDX or PIC. Select B for RG, HI, or SI. Seclect C for GA airports.

3.1 DEWATERING REQUIREMENTS

A. The Contractor may select from the following options:

1. Option 1, Land Disposal:

a. Discharge water from dewatering operations to the ground surface for eventual infiltration or evaporation. Water shall be contained in a natural or created basin or swale approved by the Engineer. If satisfactory containment cannot be achieved, utilize Option 2.

b. Perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

2. Option 2, Sorm Sewer System Disposal:

a. Discharge water into the storm sewer system which eventually feeds into the Columbia Slough. Provide a discharge sampling site located where water leaves the construction area. Notify the Engineer at least 24 hours before the sampling site is ready. Assist the Port in obtaining effluent samples at least 48 hours prior to the beginning of dewatering activities. Do not begin dewatering operations until notified by the Engineer.

b. The Port will test samples for turbidity, total suspended solids (TSS), volatile organic campounds (VOCs), total petroleum hydrocarbons (TPH), chemical oxygen demand (COD), benzene, ehylbenzene, toluene, and xylenes (BETX). If no significant pollutants are found, the Contrator may discharge into the storm sewer system without restriction. The Port will perform monthly sampling at the outfall while dewatering discharge is occurring.

c. After initial testing, perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

Reminder: Choose B for RG, HI, or SI.

B. The Contractor may select from the following options:

1. Option 1, Land Disposal:

a. Discharge water from dewatering operations to the ground surface for eventual infiltration or evaporation. Water shall be contained in a natural or created basin or swale approved by the Engineer. If satisfactory containment cannot be achieved, utilize Option 2 or Option 3 based on the duration of dewatering operations.

b. Perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Stop work and notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

2. Option 2, Storm Sewer System Disposal (Less Than Two Weeks):

a. Discharge water from dewatering operations to the storm sewer system as long as the effluent looks clean. Perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Stop work and notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

3. Option 3, Storm Sewer System Disposal (Greater Than Two Weeks):

a. Discharge water from dewatering operations into the storm sewer system. Provide a discharge sampling site located where water leaves the construction area. Notify the Engineer at least 24 hours before the sampling site is ready. Assist the Port in obtaining effluent samples at least 48 hours prior to the beginning of dewatering activities. Do not begin dewatering operations until notified by the Engineer.

b. After initial testing, perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Stop work and notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

Reminder: Choose C for GA airports.

C. The Contractor may select from the following options:

1. Option 1, Land Disposal:

a. Discharge water from dewatering operations to the ground surface for eventual infiltration or evaporation. Water shall be contained in a natural or created basin or swale approved by the Engineer. If satisfactory containment cannot be achieved, utilize Option 2.

b. Perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Stop work and notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

2. Option 2, Storm Sewer System Disposal:

a. Discharge water from dewatering operations to the storm sewer system as long as the effluent looks clean. Perform daily inspections of the effluent to determine its cleanliness. Evidence of contamination includes oil sheen on the water surface, discoloration of soil or water, odor of solvents or fuel, or any knowledge of pollutants. Stop work and notify the Engineer immediately if evidence of soil or water contamination is encountered. When contamination is suspected, the Port will obtain effluent samples for testing.

3.2 POLLUTION CONTROL

A. If pollutants are found in any sample above allowable levels, the Contractor shall work in coordination with the Engineer and with the Port Environmental Services Division (ESD) to develop a treatment plan to treat effluent prior to discharge. Submit the treatment plan for Port review and approval. The treatment plan must satisfy Port permit requirements for pollutants identified in the testing. Treatment methods may include settling tank, settling pond, or filtration system. Continue to perform daily inspections of the effluent to determine its cleanliness. Stop work and notify the Engineer immediately if evidence of soil or water contamination is encountered.

3.3 DEWATERING OPERATIONS

A. Control ground water in a manner that will preserve the strength of the bottom soils of trenches and excavations, will not cause instability of the excavation slopes, and will not result in damage to existing structures.

B. Lower the ground water level before beginning excavation or using wells, wellpoints, or similar methods. Maintain the drawdown water level at least 12 inches below the bottom of the trench.

C. Open pumping with sumps and ditches will not be permitted if it results in boils, loss of fines, softening of the ground, or instability of slopes.

D. The Contractor is responsible for dewatering, including the adequacy of the dewatering system. Keep trenches and excavations free of water and provide adequate pumping and piping equipment to handle and dispose of water.

E. Provide adequate screens or plugs to prevent objectionable material from entering the downstream storm sewer system. Provide adequate screens or filters so that continuous pumping of fines does not occur.

F. Excavation and filling of sumps and ditches in the trench or excavation bottoms for dewatering purposes shall be considered incidental to the work and shall be done at no added cost to the Port.

G. Maintain drawdown water level until the trench is backfilled to the original ground water level.

END OF SECTION

Figure 15

Field Data Form
BMP Effectiveness Monitoring

Sampling Location: _____

Sampler Name: _____ Date: _____

Storm Event Information

Days / hours since last runoff occurred: _____

Days since last sample was collected: < 60 > 60

Estimated time rain began: _____

Estimated time storm water discharge began: _____

Estimated time rain ended: _____

Total rain gauge amount: _____
(If storm is over 24hrs long - record the 24 hour rainfall amount)

Sample Analysis Information

Time samples collected: _____

pH of flow: _____

Depth of flow in pipe: _____

Area Condition Information

Visual observations of area: _____

_____

Attach copy of relevant maintenance records: _____

Estimate last time area was swept: _____

Have any spills occurred in the area in the last 3 months? _____
(if yes attach spill incident information)

Comments: _____

_____

_____

Section V

OREGON DEPARTMENT OF TRANSPORTATION (ODOT)

National Pollutant Discharge Elimination System (NPDES)

Annual Report

August 1998

Oregon Department of Transportation
123 NW Flanders, Portland, Oregon 97209

TABLE OF CONTENTS

	PAGE
ACRONYMS	4
FOREWORD	5
INTRODUCTION	6
REPORT STRUCTURE	6
PROGRAM STRUCTURE	6
BACKGROUND	7
REPORT CONTENT	7
LEVEL OF EFFORT	9
Operations and Maintenance (O&M)	9
Public Education and Involvement	11
Illicit Discharge Controls	13
New Development Standards	14
Structural Controls	16
Planning System Preservation and Development	18
CHANGES TO PROGRAM	19
INVENTORY	21
MONITORING	21
BUDGET	22
PROGRAM GOALS AND FUTURE ACTIVITIES	22
SUMMARY	22

LIST OF APPENDICES

APPENDIX A: NPDES TABLES

Table 1.1: ODOT District Maintenance Activities
Table 1.2: Dry Weather Field Screening of Major Outfalls
Table 1.3: Illicit Discharge Inspections
Table 1.4: BMP reference table

APPENDIX B: MONITORING DATA

Table 2.1: Street Sweeping Data
Table 2.2: Snowmelt Data
Table 2.3: Detention Pond Data

APPENDIX C: ODOT OREGON PLAN FOR SALMON AND WATERSHEDS ANNUAL REPORT 1997-1998

Table Summary

ACRONYMS

ACWA	Association of Clean Water Agencies
BMP	Best Management Practices
CCO	Clackamas County
CFR	Code of Federal Regulations
CFS	Compost Filter Systems
COG	City of Gresham
COP	City of Portland
COS	City of Salem
DMV	Department of Motor Vehicles
IGA	Intergovernmental Agreement
IPM	Integrated Pest Management
MS4	Municipal Separated Storm Sewer System
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
O&M/OM	Operations and Maintenance
OTC	Oregon Transportation Commission
P2O	Pollution Prevention Outreach
SWMP	Storm Water Management Plan
TAC	Technical Advisory Committee
TMOC	Traffic Management Operations Center
USA	Unified Sewerage Agency

FOREWORD

As stated in federal regulations, 40 CFR 122.42(c), all National Pollutant Discharge Elimination System (NPDES) storm water discharge permits require an annual report summarizing the status of the permittee's storm water management plan (SWMP).

This document meets the 1998 annual report requirements for the six required Municipal Separated Storm Sewer System (MS4) NPDES permits that are currently held by the Oregon Department of Transportation (ODOT). As all six of the permits are implementing the same ODOT NPDES storm water management program, ODOT is submitting one report that summarizes the status of all six permit programs. The six permit programs summarized in this report are:

- **Portland NPDES Permit- #101314**
  - Lead Agency: City of Portland
  - Co-permitees: Oregon Dept. of Transportation
    Port of Portland
    Multnomah County
    Peninsula Drainage Districts 1 & 2

- **United Sewerage Agency NPDES Permit- #101309**
  - Lead Agency: United Sewerage Agency
  - Co-permitees: Oregon Dept. of Transportation
    Washington County

- **City of Gresham NPDES Permit- #101315**
  - Lead Agency: City of Gresham
  - Co-permitees: Oregon Dept. of Transportation
    City of Fairview
    Multnomah County

- **Clackamas County NPDES Permit- #108016**
  - Lead Agency: Clackamas County
  - Co-permitees: Oregon Dept. of Transportation
    Oak Lodge Sanitary District
  - And the Cities of: Gladstone, Happy Valley, Johnson City, Lake Oswego, Milwaukie, Oregon City, River Grove, West Linn, Wilsonville

- **City of Eugene NPDES Permit- # 101244**
  - Lead Agency: City of Eugene
  - Co-permitees: Oregon Dept. of Transportation

- **City of Salem NPDES Permit- # 108919**
  - Lead Agency: City of Salem
  - Co-permitees: Oregon Dept. of Transportation

INTRODUCTION

The Clean Water Act of 1972 identified the need to return "bodies of water" of the U.S. to beneficial uses: swimming, fishing, habitat, etc. In 1987 Congress passed amendments to the Clean Water Act, initiating the National Pollutant Discharge Elimination System (NPDES) Nonpoint Source Permit program.

The NPDES program requires the Oregon Department of Transportation (ODOT) to participate in a municipal separated storm sewer system (MS4) permit process. This process requires ODOT to obtain an NPDES permit for all ODOT public stormwater sewer systems that are located within Oregon's urban areas (municipalities with a population greater than 100,000).

Complying with the MS4 permits and implementing the required Best Management Practices (BMPs) involves every region, section, and unit within ODOT.

An annual report is a requirement of the National Pollutant Discharge Elimination System (MS4) permit. This document will serve to meet the reporting requirements of the permit issued to the City of Portland, the Unified Sewerage Agency, Clackamas County, the City of Gresham, City of Eugene, City of Salem and ODOT. This report provides an overview of ODOT's NPDES program accomplishments from August 1, 1997- August 1, 1998.

REPORT STRUCTURE

This report includes a summary of goals and accomplishments for specific permit areas, and includes monitoring accomplishments, budget expenditures, and proposed program modifications.

Technical documentation is available that includes monitoring results and other detailed technical and administrative information. ODOT will supply this information to interested parties upon request.

PROGRAM STRUCTURE

The NPDES unit acts as a technical resource to ODOT staff, liaison to the public, city, county, and state agencies and helps insure implementation of BMPs in accordance with the NPDES permit. A statewide ODOT environmental team develops policies to guide the agency in implementing the NPDES program.

ODOT maintenance and construction staff are responsible for performing the tasks of the appropriate and applicable BMPs. ODOT implements the NPDES program statewide to align with the commitments and program goals of the Oregon Plan for Salmon and Watersheds and the ODOT Integrated Pest Management Program.

BACKGROUND

In order to meet NPDES permit requirements in the Portland-Metro, Eugene, and Salem areas, ODOT worked with co-permittees to develop a storm water monitoring plan (SWMP). The plan addresses pollutant reduction and considers impacts of pollutants associated with ODOT facilities on receiving waters.

Eight program categories were identified and defined in order to meet federal requirements of the NPDES program, as outlined in the Code of Federal Regulations (40 CFR.) The following eight categories reflect areas of ODOT's participation:

1) Operations and Maintenance
2) Public Education and Involvement
3) Illicit Discharge Controls
4) New Development Standards
5) Structural Controls
6) Planning, System Preservation, and Development
7) Inventory of Storm Drain System
8) Monitoring

BMPs were identified within these categories to reduce pollutant loadings to the maximum extent practical in storm water runoff from ODOT facilities. Inventory and Monitoring are requirements of the permit but have no attached BMPs. See page 21 for detailed information on Inventory and Appendix B for detailed monitoring information.

REPORT CONTENT

This report is directed to the Oregon Department of Environmental Quality (DEQ), the regulatory agency issuing and overseeing the implementation of ODOT's NPDES permits.

Organization of this report reflects ODOT's storm water management plan and BMPs as written in the Portland-Metro, Eugene, and Salem NPDES permit applications. Identical program categories and/or BMPs may vary in name or reference number among the six NPDES permits. Identical BMPs are listed and cross referenced according to permit lead agencies in Appendix A. Lead agencies for each permit are abbreviated as follows:

COP = City of Portland
USA = United Sewerage Agency
CCO = Clackamas County
COG = City of Gresham
COE = City of Eugene
COS = City of Salem

Program goals and attached BMPs are stated, and, where appropriate, followed by a description of accomplishments, obstacles to implementation, and proposed changes to the program. Other required permit information is included in tables at the end of this report.

Also included in this report are ODOT accomplishments not directly required by the MS4 permits, but related to the statewide Oregon Plan for Salmon and Watersheds and Integrated Pest Management programs.

Detailed information related to this report, including documentation of field investigations, mapping results, monitoring data, administrative documentation and other technical information is available upon request:

Contact: Oregon Department of Transportation
Oregon Plan for Salmon and Watersheds Manager
Office of Maintenance
800 Airport Rd SE
Salem, OR 97310
(503) 986-3008

An executive summary of this report will be available September 1998, upon request.

LEVEL OF EFFORT

Operations and Maintenance (O&M)
The goal in meeting the O&M requirements is to evaluate and modify, as appropriate, current practices to reduce impact from highway maintenance activities on receiving waters, and adopt new policies and procedures that reduce the amounts of pollutants discharged to the storm sewer system.

OM 1 & OM 2

DESCRIPTION
Develop an Operations and Maintenance (O&M) plan for public storm water quality structural controls.
Evaluate existing stormwater maintenance practices that effect storm water quality.

ACCOMPLISHMENTS
Task 1 - Inventory and map existing storm facilities.

- Field inspected and verified major outfalls for Salem NPDES permit.
- Dry weather screened major outfalls within ODOT MS4 permit areas. See Table 1.3.
- Added new "as-constructed" plans to inventory as requested.
- Continued work on an ODOT "Location" project which is compiling an inventory of highway culverts and outfalls for utility locating purposes.
- Continued 1997 inventory of ODOT culverts (statewide) for fish passage issues in cooperation with ODFW.

Task 2 -Review and describe current O&M practices, evaluate in terms of stormwater quality and identify pollutants of concern.

- Reviewed field methods used to store and stockpile roadway materials (sanding material, sweepings, landslide debris, etc.) for negative impacts to water quality. Distributed appropriate recommendations.
- Developed a research project work plan to investigate environmental effects of the de-icer Calcium Magnesium Acetate (CMA) on surface waters and located an appropriate testing area.
- Evaluated highway culverts and riparian areas for negative impacts to fish passage. Produced handbook of retrofit and remediation methods addressing fish passage problems typically associated with culverts and riparian areas. (Maintenance concerns of erosion control, vegetation, and emergency fixes were addressed.)
- Continued work on the ODOT "resource mapping" project. This project is identifying and locating natural resources or environmental sensitive areas along ODOT highways. Areas of special maintenance activities can then be identified along ODOT roads by highway milepoint (no spray zones, endangered species, etc.). ODOT completed a pilot draft set of "natural resources" maintenance maps for Hwy. 38 this year. Resource inventory has been completed for Region 3.

Task 3 – Develop a pilot study to evaluate current waste disposal practices, identify treatment and disposal options, determine accumulation rates, and compare water quality improvements from different treatment practices.

- Adopted and implemented street sweeping screening program based on findings from 1997 pilot street sweepings screening project. (Screening is now standard operation in the Portland area.)
- Continued to document and track roadwaste material generated and disposed. Roadwaste survey questionnaire was distributed to ODOT and other public highway departments.
- Completed Phase 1 of Highway Roadwaste Research Project. Included a literature search on roadwaste disposal issues and options, current legal requirements, and a pollutant characterization investigation that analyzed existing roadwaste data.
- Produced Phase 1 research report: "Roadwaste: Issues and Options".
- Produced Phase 1 research report specific to vactor waste and decant facilities " Management of Stormwater Facility Maintenance Residuals".

OM 3

DESCRIPTION

Review current certification procedures/requirements for high volume users of pesticides, herbicides and fertilizers to assure water quality impacts are addressed. As appropriate, make recommendations for changing the requirements.

ACCOMPLISHMENTS

- Created a Regional level Integrated Vegetation Management (IVM) Coordinator position (Region 2 - Salem and Eugene) that offers full time support and guidance to ODOT's existing District level IVM Coordinators. Implemented standard IVM operations throughout Region 2 (as well as many other areas of the State) that reduce chemical use and protect water quality:
  - Narrow all herbicide spray strips.
  - Reduce fertilizer, herbicides, and irrigation through use of appropriate plantings (pilot planting projects).
  - Ditch and Spray only during dry weather.
  - Use erosion control on all maintenance projects where appropriate.
- Continued work on the development of a herbicide and pesticide chemical tracking database. The data base will be accessible to all ODOT maintenance yards and will track chemicals purchased, used, and stored by each maintenance unit.
- Completed Phase One (literature search) of research project that is investigating stormwater transport of herbicides and environmental impacts to surface waters.

OM 4

DESCRIPTION

Review existing truck hauling practices and make recommendations, if necessary, to limit the occurrence of leaks, spills, or other releases.

ACCOMPLISHMENTS

- Purchased new spray equipment as appropriate. (Included replacement of outdated equipment in Region 1.)

Public Education and Involvement
The NPDES permit requires a comprehensive public education and involvement program with the goal of increasing public awareness on pollutants in stormwater runoff. Due to state constitutional limitations on expenditure of gas tax dollars, ODOT's education efforts are primarily directed to ODOT staff.

ED 1

DESCRIPTION
Develop a comprehensive stormwater/watershed education program.

ACCOMPLISHMENTS AND OBSTACLES TO IMPLEMENTATION

- Hosted Annual Fall Horticultural Symposium in conjunction with Clackamas Community College. Symposium included presentations on highway maintenance and improving water quality.
- Hosted two statewide and one Regional (Region 2 -Salem and Eugene) Integrated Vegetation Management (IVM) meetings for ODOT Maintenance forces. Meetings included presentations specific to improving water quality through IVM methods.
- Hosted 13 training classes statewide (including Portland, Salem, Eugene) on culverts and salmon issues. Classes included information related to improving water quality.
- Hosted 14 District Orientations (including Portland, Salem, and Eugene) on the Oregon Plan for Salmon and Watersheds. Orientations included information relevant to ODOT's Clean Water Program.
- Hosted 3 programs on ODOT construction requirements for clean water (included Portland area).
- Participated with the Regional Coalition for Clean Water (Portland/Salem). ODOT agreed to contribute to appropriate 1999 projects.

Task 1 - ODOT NPDES unit will request that the Department of Motor Vehicles (DMV) include a brochure with each motor vehicle registration describing impacts to stormwater quality resulting from improper disposal of automobile fluids.

- Reprinted 1997 good house keeping flyer that includes auto tips for clean water.
- Distributed good housekeeping flyer to The Regional Coalition for Clean Water for distribution.

(DMV is unable to distribute flyer as noted in 1997 Annual Report - see Proposed Change to Program.)

Task 2 - ODOT will make available to staff any brochure on "housekeeping practices" developed by other jurisdictions.

- ODOT reviewed "Keep Your Shop In Tune" by the Pollution Prevention Outreach Team and offers it as requested.
- ODOT reviewed "Municipal Stormwater Toolbox for Maintenance Practices" by the Oregon Association of Clean Water Agencies (ACWA) and offers it as requested.

PI 1

DESCRIPTION

Develop a comprehensive stormwater/watershed public participation plan. Participate in watershed planning groups statewide.

ACCOMPLISHMENTS AND OBSTACLES TO IMPLEMENTATION

- ODOT participated as appropriate with watershed councils. ODOT District Managers or their representatives participated on various watershed councils statewide (including ODOT's NPDES MS4 permit areas – Portland, Salem, and Eugene).
- ODOT participated with other state agencies in the implementation of the Oregon Plan for Salmon and Watersheds.
- ODOT participated with DEQ's volunteer Wellhead Protection Program.

Task 1 – List the Traffic Management Operations Center (TMOC) telephone number on all signs posted at illegal dumpsites.

- The ODOT Traffic Management Operations Center is up and running at this time. The telephone number has been available and advertised since May 1997.

(ODOT will not list the TMOC number at dump sites as noted in the 1997 Annual Report – see Proposed Changes to Program.)

Illicit Discharge Controls
The goal of the category is to develop and implement a program to detect, investigate and eliminate illicit discharges to the ODOT storm sewer system.

ILL 1

DESCRIPTION
Manage a spill prevention and response program that reduces the frequency and impacts of spills to the stormwater system.

ACCOMPLISHMENTS AND OBSTACLES TO IMPLEMENTATION
Task 1 - Evaluate existing spill response program for water quality with recommendations.

- Participated on the Regional (Portland) Spill Response Technical Advisory Committee (TAC).
- Expanded ODOT participation with the Regional (Portland) Spill Response TAC by adding the ODOT haz-mat unit as a new committee member.
- Identified ODOT Region 1 (Portland) spill response issues as part of a formal haz-mat spill investigation (I-5/Barbur Blvd.-Willamette).
    - Field accurate pipe locations
    - Coordination of haz-mat spill response
    - Operation of ODOT haz-mat detention facilities
    - Response training

(ODOT resources to address these issues have not yet been identified)

ILL 2

DESCRIPTION
Develop a program to prevent, search for, detect and control illicit discharges to the stormwater system.

ACCOMPLISHMENTS
- Investigated 25 illicit discharge complaints. See Table 1.2.
- Performed 11 ODOT construction site assessments and made recommendations for improvements to sites.

(Construction site assessment information is now tracked through ODOT's Oregon Plan for Salmon and Watersheds)

Task 1 -Enter into an intergovernmental agreement with lead agencies to conduct illicit discharge investigations.

- Continued with ongoing research of existing ODOT intergovernmental agreements and considered how they might be amended to include NPDES concerns.
- Continued with ongoing research to develop a new standard intergovernmental agreement that would be flexible enough to incorporate NPDES concerns.
- Identified the need for ODOT Regional illicit discharge investigation protocol. Initiated ODOT discussions to identify appropriate ODOT illicit investigation procedures on a Regional level.

New Development Standards
The goal of this category is to develop and define standard practices for new construction to insure compliance with the permit by reducing storm water pollutant loadings and controlling erosion.

ND 2

DESCRIPTION
Work with landowners, tenants, and/or public agencies to apply practical erosion/sediment control and other practices to reduce pollutant discharges associated with undeveloped and developed properties and parklands.

ACCOMPLISHMENTS
Task 1* -Implement and adopt recommended procedures for adequately identifying areas of erosion concern early in the project development and construction process.

- Continued assessment of the erosion control design process for ODOT construction jobs. Increased direct communications between erosion control designers and construction field staff.
- Developed an erosion control training program for ODOT project managers and inspectors.
- Continued work on identifying and locating known and potential slide areas along ODOT right of way (ODOT Geology - Regions 1,2 and 3).
- Continued development of ODOT's statewide "resource mapping" project that identifies and locates natural resources or environmental sensitive areas along ODOT highways. Maps identify areas of special concern (unstable land, wetlands, parks, etc.) and may be useful to ODOT Project Development Teams. Completed first draft set of road maps that locate natural resource areas of concern (Hwy. 38). Resource inventory has been completed for Region 3.

Task 2 -Develop a statewide erosion control handbook.

- Distributed Draft handbook to ODOT forces for review.
- Continued work on finalizing draft handbook (ODOT Design Unit).

Task 3* - Standardized designs and contract plans.

- Initiated work on a new draft of Seeding and Erosion Control ODOT Specifications

Note: * Designates task was completed in permit year one, 1996-1997. Work listed is "in addition".

ND 3

DESCRIPTION
Improve involvement in the National Environmental Protection Act (NEPA) project review process to better address water quality issues.

ACCOMPLISHMENTS
- Completed this task in permit year one, 1996-1997. ODOT now uses the NEPA project review process to address water quality issues.

ND 4

DESCRIPTION
Develop a comprehensive pollutant discharge control program for all construction sites.

ACCOMPLISHMENTS
Task 1 - Identify the most appropriate and effective way to educate personnel on pollutants associated with construction sites and the impacts to water quality.

- Developed inspection program to perform random inspections on ODOT construction projects.
- Developed inspection methods and work sheet forms to help educate construction project managers on erosion and pollutant control methods and needs.
- Distributed ODOT's contractor's pollutant control plan packet to help contractors develop appropriate pollution control plans.
- Distributed information to ODOT staff on the latest technology in pollution and erosion control.
- Distributed updated ODFW guidelines for in-water work to statewide maintenance and construction forces.
- Attended pre-construction conferences to educate contractors of NPDES requirements for projects with sensitive receiving water issues.

ND 6

DESCRIPTION
Establish incentives and/or requirements for contractors/developers to insure that damages from erosion and/or sediment deposition are addressed and paid for.

ACCOMPLISHMENTS
Task 1 - Review existing conditions and make recommendations for improvements.

- Completed in permit year one, 1996-1997. ODOT now includes the cost of erosion control and sediment deposition damage in contract bid documents.

Structural Controls
The goal of this category is to insure stormwater treatment standards are current, and facilities are effective in pollutant removal.

STR 1 & STR 2

DESCRIPTION
Evaluate the need for stormwater quality treatment facilities. If appropriate, develop plans for construction, maintenance and monitoring of the facilities. Construct and monitor appropriate facilities.

ACCOMPLISHMENTS
- Initiated a formal partnership with DEQ to develop a new water quality permit program for ODOT. One goal of this permit program is to define appropriate stormwater mitigation for ODOT projects.
- Formed an ODOT/DEQ steering committee that will work to identify appropriate stormwater treatment and mitigation for ODOT projects statewide (including stormwater treatment goals and priorities).
- Formed an ODOT stormwater facility technical team to address technical issues associated with ODOT stormwater facilities and to assist with the development of ODOT's new water quality permit.
- Developed a stormwater facility plan for ODOT projects that are planned within the City of Portland over the next four years (1998-2001).

Task 1 - Review each project prospectus for possible water quality treatment needs and/or facility.

- Reviewed plans on a project-by-project basis for appropriate stormwater treatment.

STR 3

DESCRIPTION
Support government and community tree planting programs.

ACCOMPLISHMENTS
Task 1 - Examine and evaluate existing tree planting policies and programs, including the America Treeways Initiative.

- Prepared Draft of "Roadside Vegetation Management Principals and Guidelines" which, in part, address tree planting policies and programs.
- Created the ODOT Roadside Advisory Committee. The committee will offer support in implementing recommended tree planting guidelines, among other duties.

STR 4

DESCRIPTION
Review and modify existing design standards for drainage/flood control and water quality facilities to improve water quality.

ACCOMPLISHMENTS
Task 1 - Increase awareness of water quality issues, methods available, and opportunities for treatment through training and orientations.

- Attended and participated in watershed planning groups statewide.
- Attended and participated in NPDES co-permittee meetings.
- Distributed ODFW guidelines for timing of in-water work to statewide maintenance and construction forces.
- Distributed "contractor's packets" to assist contractors in developing erosion control plans for ODOT construction projects.
- Evaluated highway culvert impacts to fish passage. Produced handbook of culvert retrofit and remediation methods that address fish passage.
- Held training sessions throughout ODOT on water quality issues. (See ED1 – page 11)

STR 5

DESCRIPTION
Encourage public and private groups to research new, more economical methods of improving storm water quality. Adopt methods as appropriate and document and distribute information from research efforts.

ACCOMPLISHMENTS
- Completed Phase One literature search of a research project investigating stormwater transport of herbicides and their environmental effects. This is a joint project with United Stated Geological Survey (USGS) and the Federal Highway Administration.
- Completed work outline for a research project on the environmental effects of the de-icer, Calcium Magnesium Acetate (CMA). This project has been proposed as a joint project with USGS and the Federal Highway Administration.

Task 1 - Identify and evaluate the effectiveness of alternative water quality treatment options.

- Partnered with Multnomah County, DEQ, and the Federal Highway Administration on an ODOT Roadwaste Research Project. The project is investigating roadwaste disposal options that will minimize negative impacts to water quality.
- Participated with other state, county, and city transportation agencies region-wide (Northwest OR. and WA.) touring roadwaste water treatment and disposal facilities and sharing relevant information.
- Produced and distributed two Phase One reports on the disposal and treatment of streetwaste.
- Presented a design course in conjunction with ODFW and OSU on culvert design for restoring salmon passage.

Planning System Preservation and Development
The goal is to insure that planning efforts encompass long term solutions to reduce pollutant loadings and to include stormwater management in project development.

PS 1

DESCRIPTION
Modify landscape requirements for various land uses to encourage use of self-sustaining vegetation which reduces the need for pesticides, herbicides, fertilizers and water.

ACCOMPLISHMENTS
Task 1 - Develop an Integrated Pest Management program as defined by OAR 634.122.1

- ODOT Integrated Pest Management (IPM) program continued to define BMPs for pest management specific to each ODOT district.
- Reviewed and updated IPM training programs. (on-going)
- Developed and presented "NPDES and IPM" training at two statewide District IPM Coordinator's meetings.
- Initiated multiple IPM research projects that will investigate the effects of ODOT's use of pesticides, herbicides, and fertilizers on waterways.
- Produced Draft of "Roadside Vegetation Management Principals and Guidelines" which outlines goals of ODOT's IPM program.

PS 3

DESCRIPTION
Inventory and map stormwater systems.

ACCOMPLISHMENTS
- Produced a prototype set of "resource maps" that inventory environmental resource concerns by mile point within ODOT highway right of way.
- Researched drainage systems on an as-needed, as-requested basis.
- Continued work on developing a "Location" one-stop drainage information system. (on-going)

PROPOSED CHANGES TO PROGRAM - PERMIT YEAR 1997-1998

- ODOT proposes to apply for an ODOT-specific MS4 NPDES Permit (1997 request).

ODOT is currently working with DEQ to develop an ODOT specific NPDES permit. This permit will incorporate requirements of ODOT's current MS4 permits as well as future Phase 2 NPDES requirements. It is expected that this permit will be in place to meet the renewal requirements of ODOT's existing MS4 permits.

- ODOT proposes to submit specific monitoring plans and projects to DEQ as they are developed.

ODOT has developed a new NPDES monitoring program that incorporates water quality monitoring into specific research projects. There are currently four ODOT research projects in various stages of development that have a water quality-monitoring component attached to them. It is ODOT's plan to submit to DEQ more complete monitoring plans and data as these research projects develop. Data collected thus far for these projects is included in this report (see Appendix B).

CHANGES TO THE PROGRAM

The following are program changes that have been documented in past annual reports:

1996 - 1997 CHANGES

PROPOSED - Move City of Eugene annual report due date to September.

CHANGE: ODOT now submits one September Annual Report for all ODOT MS4 permits.

PROPOSED - ODOT will submit a new monitoring program to DEQ for approval during Permit Year three.

CHANGE: ODOT identified and submitted 7 potential ODOT Monitoring Projects to DEQ during the 1997 permit year (permit year 3). Four of these monitoring projects were selected for implementation by ODOT. These projects are all being implemented as independent projects on separate timelines. For this reason, a single ODOT NPDES monitoring plan was not developed or submitted.

1995 - 1996 CHANGES

OM1 & OM2 (Task 3) – Develop a pilot study to evaluate ODOT's current sweeping practices.

CHANGE: ODOT's original sweeping pilot study was replaced with a more comprehensive roadwaste research project. This is a long-term roadwaste research project investigating and evaluating treatment and disposal options for street sweepings and vactor waste. Negative impacts to water quality that result from the management of these wastes are being investigated as part of this study.

OM 4 (Task 1) – Review and re-evaluate current exemptions to state truck hauling statutes.

CHANGE: Based on the outcome of conversations with local exempted industries, ODOT does not believe an ODOT proposal for legislative change to truck hauling practices is appropriate. ODOT will not be implementing this task.

ED1 (Task 1) - ODOT NPDES unit will request the Department of Motor Vehicles (DMV) include with each motor vehicle registration, a flyer, describing impacts to stormwater quality from improper disposal of automobile fluids.

CHANGE: DMV was unable to distribute flyers as requested. Flyers have been distributed to ODOT and DMV personnel through the State mail system, and to the public through ODOT and DMV information kiosks. The flyers have also been distributed to other MS4 permit holders through the Regional Coalition for Clean Rivers and Streams.

PI1 (Task 1) – List the Traffic Management Operations Center (TMOC) number on all signs posted at illegal dumpsites.

CHANGE: ODOT replaced the PI1 task of posting the TMOC number at dumpsites with a more extensive outreach plan. The TMOC number has been highly publicized on radio, TV, and through newspaper advertising. ODOT response units have the number posted and are on the road and available 24 hours a day. Signs with the TMOC telephone number are posted on major ODOT highways throughout the Portland-Metro area.

Inventory

The NPDES permit requires an inventory of ODOT's storm drain system that lists all major outfalls over 36 inches in size within NPDES permit boundaries. ODOT owns 20 such outfalls in the Portland, Clackamas County, Unified Sewerage Agency and Gresham permit areas, one in the Eugene permit area, and one in the Salem permit area. ODOT outfalls have been located, inspected, and are summarized in Table 1.3.

- Continued to research and update records documenting outfalls located within ODOT's NPDES MS4 permit boundaries. Specific minor drainages were researched as information was requested.
- Field checked and verified all ODOT's "major" outfalls located within the Salem MS4 Permit area.
- Identified a need to develop statewide outfall inventory.
- Continued work on "Location" project inventorying major culverts to comply with a new state utility law (one-call locating). Cross culverts have been identified and marked in Region 2.
- Continued a culvert inventory project in cooperation with Oregon Department of Fish & Wildlife to identify and prioritize barriers to salmon and trout passage.

Monitoring

The NPDES permit requires an on going monitoring program. This program is intended to characterize storm water within the permitted system, detect pollutants, and assess the effectiveness of control measures and/or BMPs that are employed to reduce these pollutants.

- Proposed 7 monitoring projects to assess BMPs or gather further data related to pollutant characterization studies.
- Continued with streetwaste research project monitoring. Monitoring work included gathering ODOT streetwaste data (see appendix) as well as collecting and analyzing existing streetwaste data from other Northwest Transportation Agencies. See the ODOT Research Report: "Roadwaste: Issues and Options" (FHWA-OR-RD-99-05) which is available upon request.
- Continued development of a monitoring program for Herbicide Research Project. Work included researching existing data available on herbicide transport. (A report from USGS is expected.)
- Continued development of a monitoring program for the chemical de-icer: Calcium Magnesium Acetate (CMA). Appropriate field test plot for monitoring was located.
- Implemented Snowmelt Monitoring Project. Collected snowmelt runoff and analyzed for stormwater pollutants. (see Appendix B)
- ODOT's original MS4 NPDES Permit monitoring plan has been completed. Results have been previously submitted to DEQ in the report: "ODOT Stormwater Quality Data Report (May 1996)". Copies of this monitoring report are available upon request.

Budget

The ODOT NPDES unit program expenditure for fiscal year (July 1997-July 1998) was $118,171.78. This figure represents only money spent directly by the NPDES unit. It does not reflect other ODOT money spent to support water quality work. Other ODOT programs focused on water quality as part of their work include the Integrated Pest Management program and the Oregon Plan for Salmon and Watersheds. Their 1998 administrative expenditures are listed below (again for ODOT fiscal year July 1997-July 1998)

NPDES	$118,171.78
Integrated Pest Management	$ 77,998.30
Oregon Plan for Salmon and Watersheds	$ 136,587.99
Total	$332,758.07

ODOT's Oregon Plan Program also received a betterment budget of $1,000,000. This was in addition to general program administrative costs listed above. Betterment money was spent specifically on ODOT projects related to improving salmon habitat and watershed health.

Program Goals and Future Activities

- Develop and initiate an ODOT specific statewide NPDES permit that addresses requirements of the Clean Water Act.
- Develop further monitoring and research plans to evaluate the effectiveness of specific water quality BMPs.
- Continue work within ODOT and with other appropriate agencies to develop further training and informational sharing programs (erosion control, maintenance, etc.).
- Continue to develop appropriate NPDES IGAs with co-permittees and other appropriate agencies.
- Continue to develop watershed partnerships and projects that will improve water quality with other appropriate agencies.

Summary

This report documents the principal programs and activities that ODOT has implemented during the 1997-1998 permit year in order to meet the NPDES requirements of ODOT's six MS4 permits. This report is submitted to DEQ as a requirement of those permits. ODOT intends to continue its effort to improve the quality of the State's highway stormwater. ODOT will also continue its support of the Oregon Plan for Salmon and Watersheds, which is closely aligned with ODOT's Clean Water (NPDES) program.

APPENDIX A

Table 1.1 – ODOT Maintenance Activities

Table summarizes ODOT District maintenance activities that directly impact NPDES water quality BMPs.

Table 1.2 – Dry Weather Field Inspections

Table summarizes annual field inspections of the ODOT major stormwater outfalls that are located within ODOT's MS4 permit areas.

Table 1.3 – ODOT Illicit Discharge Investigations

Table summarizes work ODOT's NPDES Unit has done that is specifically related to Illicit discharges associated with the ODOT stormwater system.

Table 1.4 – ODOT Interagency BMP Cross Reference Chart

Table summarizes related BMP codes for all 6 of ODOT's MS4 NPDES Permits.

Table 1.1
ODOT MAINTENANCE ACTIVIES - 1997-1998

ODOT ACTIVITY NUMBERS	ACTIVITY DESCRIPTION	MEASURMENT	DISTRICT TOTALS				
			2A	2B	2C	4	5
117	Pick up sweeping	Lane kilometers swept	1484	1558	427	132	590
119	Shoulder maintenance	Work hours	1416	436	344	1392	3792
120	Ditch cleaning and shaping	Ditch kilometers cleaned and shaped	61	20	113	79	72
121	Culvert and inlet cleaning	Installations cleaned	6120	3962	825	2425	1860
122	Erosion repair	Work hours	312	0	640	4264	265
123	Culvert and inlet repair	Work hours	608	288	1312	1544	1376
129	Drainage maintenance	Work hours	1280	862	704	2048	416
134	Litter pick up	Shoulder kilometers	1272	1038	1152	1816	1248
135	Youth Litter Patrol and Adopt a Highway	Shoulder kilometers	1984	1656	1640	1457	2952
181	Slide removal	Work hours	3008	1296	1760	21648	4288

Districts 2A,2B, & 2C include the Portland Metro area (COP, COG, USA, & CCO - MS4 permit areas)
District 4 includes the City of Salem (COS - MS4 permit area)
District 5 includes the City of Eugene (COE - MS4 permit area)

District work can not be broken out by MS4 permit area

Table 1.2
Dry Weather Field Screening of Major Outfalls

ODOT Outfall Inventory - Dry Weather Screening (1997-98)										
Permit	**Outfall ID**	**Hwy #**	**ODOT #**	**Rec. Water**	**Location**	**Size**	**Date**	**Pics**	**Results**	**Action**
COP	WW0101	I-5	1	Willamette Rvr.	S. of Marquam Bridge	42"	7/98	yes	clean -half submerged	none
COP	EW 1300	I-5 & I-405	1, 61	Willamette Rvr.	I-405/I-5 Interchange	48"	7/98	yes	clean - half submerged -wood debris	none
COP	WW0200	I-405	61	Willamette Rvr.	I-405 @ Fremont Br.	42"	7/98	yes	clean-gravel infill	none
COP	(not listed)	43	3	Willamette Rvr.	Macadam @ Bancroft	42"	7/98	yes	clean	none
COP	SS24040	I-205	64	Col. Slough	I-205/Airport Way	48"	7/98	yes	clean	none
COP	SS26020	I-205	64	Col. Slough	I-205/Airport Way	36"	7/98	yes	clean	none
COP	SS27010	I-205	64	Col. Slough	I-205 /Airport Way	36"	7/98	no	clean	none
COP	SS9000	I-205	64	Col. Slough	I-205/NE Holman Glass Plant Rd.	60"	7/98	yes	clean - half submerged	none
COP	CB01005	I-205	64	Col. Slough	I-5 @ Columbia Blvd.	42"	8/98	yes	musty odor, garbage - structure normal	future
COP	SS23050	I-205	64	Col. River	E. of I-205 on Marine Dr.	9'x5'	7/98	yes	clean	none
COP	EW58UN	I-84 & I-5	1, 2	Willamette Rvr.	I-84/I-5 Interchange	36"	7/98	yes	clean	none
COP	EW1200	I-84	2	Willamette Rvr.	I-84 E. Burnside	42"	8/98	yes	clean	none
COP	JC02J2	213	68	Johnson Creek	SE 82d/Harney	72"	7/98	yes	dry	none
COP	JC05J5	213	68	Johnson Creek	SE 82nd/Harney	54"	7/98	yes	dry	none
COP	SS12100	213	68	Col. Slough	NE 82nd/Holman (by Holiday Inn)	36"	7/98	yes	clean - half submerged	none
										none
USA	O-104761	I-5	1	Tualatin	I-5 @ Tualatin Bridge	36"	8/98	yes	clean - rocks and blackberries	future
USA	OD4	99W	1W	Chicken Creek	99W @ Scholls Sherwood Rd.	36"	8/98	yes	dry - structure normal	future
										none
COG	G18	26	26	Johnson Creek	Hwy. 26 @ Powell Loop	30"	8/98	no	not located / possibly buried	future
										none
CCO	(not listed)	I-205	64	Clackamas Rvr.	I-205 @ Willamette/Oregon City	36"	8/98	yes	dry -structure normal - blackberries	none
	(not listed)	I-205	64	Willamette Rvr.	I-205 @ Hwy. 213 South	48"	8/98	yes	dry	none
COE	(not listed)	I-105	227	Willamette Rvr.	Hwy 105 @ Willamette Rvr.(S)	42"	8/98	yes	clean - veg. pipe not visible	none
COS	ODOT-I-5-256	I-5	1	Eastgate Basin Prk	I-5 @Sunnyview Rd.	72"	8/98	yes	clean - maintenance needed - veg.	future

Table 1.3
Illicit Discharge Inspections

ILLICIT DISCHARGE INVESTIGATIONS (7/97 - 7/98)							
JURISD.	DATE	CITY	COUNTY	ROAD	NAME	ACTION	STATUS
CCO	7/97	Boring	Clackamas	Hwy. 212	Hwy.212@222nd	Suspect failed septic. Notified Cnty. Health	Closed
COG	8/97	Wood Village	Multnomah	I-84/238th	Wood Village.	Disconnect sanitary overflow from storm sys.	Closed
COP	8/97	Portland		I-205/Flavel	I-205/Flavel Apts.	Discussed erosion control plan with contractor	Closed
ODOT	9/97	Roseburg	Douglas	I-5	Nordic Veneer	ODOT sample 2/98	Closed
CCO	9/97	Clackamas	Clackamas	Hwy. 224	Knez Bldg.	Discharge discontinued.	Closed
ODOT	9/97	Albany	Marion	99E	Misc. Owners	Reg2. IPM Coord.spoke with adjac. prop owners. Reached no spray agreement.	Closed
ODOT	9/97	Clatskanie	Columbia	Hwy.30	Ed Miller	Flood swept away house. NFA req.	Closed
USA	9/97	Portland	Washington	Canyon Road	Genyevost	Sampled H2O Non detect	Closed
USFS	9/97	Parkdale	Hood	Hwy. 43	Clark Creek Camp	Flood washed out campground. NFA req.	Closed
COP	9/97	Portland	Multnomah	Sandy Blvd.	Best Buys Cars	Out of business NFA req.	Closed
COP	9/97	Portland	Multnomah	I-205@Airport Way	Airport Way 9x5	Tested for pollutants non-detect	Closed
USA	9/97	Portland	Multnomah	I-5 @ Ash Creek	Ash Creek	Made recommendations to Ash Creek watershed group	Closed
COP	9/97	Portland	Multnomah	I-405@Will. R.	W. Freemont Br.	Reported excessive silting to Maintenance	Closed
COP	9/97	Portland	Multnomah	E. Burnside Bridge	Pac.Cst.Fruit	Reported truck washing discharge	Closed
CCO	10/97	Oregon City	Clackamas	Hwy 213	B&B Leasing	Illicit truck washing discharge reported to DEQ	Open
ODOT	10/97	Arch Cape	Clatsop	Hwy 101	Arch Cape Tunnel	Contaminated sediments - Phillips Environmental clean up	Closed
ODOT	10/97	Canby	Clackamas	99E	99E near New Era Rd.	No illicit found - no action taken	Closed
CCO	10/97	Clackamas	Clackamas	I-205	I-205/SE Janssen Rd.	Illegal tie - Reported to Cnty.	Open
COP	11/97	Wood Village	Multnomah	I-84/238th	Krugers Truckstop	Petroleum waste in ditch. Refered to DEQ	Closed
COP	11/97	Wood Village	Multnomah	I-84/238th	Willamette Greystone	Grey water discharge to ditch	Open
COP	11/97	Portland	Multnomah	Sandy Blvd.	Sandy/158th	Siltation due to const. Reported to DEQ	Closed
USA	12/97	Wilsonville	Clackamas	I-5@Wilsonville	Wilsonville S.	Erosion Control discussed with PM	Closed
COP	2/98	Portland	Multnomah	I-84/SE12th	I-84@Lloyd Center	Sewer overflow. Discussed with COP	Closed
USA	2/98	Beaverton	Washington	Hwy.217@Allen	Greenwood Inn	Excess water to ditchline. Cityof Beaverton required fix	Closed
ODOT	3/98	Brooks	Marion	99E	Gervais/Brooks	Petroleum waste in ditch.	Open

Table 1.4
BMP Cross Reference Chart

Agency	*BMP Code*															
ODOT, City of Portland, & Clackamas County	OM1, OM2	OM3	OM4	ED1	PI1	ILL1	ILL2	ND2	ND3	ND4	ND6	STR1, STR2	STR3	STR4	STR5	PS3
Unified Sewerage Agency	2g, 13a, 13f, 14a	1b, 1e	4d	*	2b,2d	4a	2i,3e	8a	13f	8a	*	12c,13a	*	13f	*	*
City of Gresham	RC 2, RC 4/7, RC 9, RC 11	RC 8/15, RC 13, RC16/17	*	*	*	*	*	RC1, RC 4/7	*	*	*	RC 4/7, RC 12	*	RC 12	RC 16/17	*
City of Eugene	OM1, OM2,	OM2	OM4	ED1	*	OM10	MON2	P&A4	*	P&A7	P&A4	*	ED3	*	*	OM2
City of Salem	RC1, RC4, RC5, RC6, RC12, RC16	RC8, RC9	ILL1	RC10	*	ILL1	ILL2	CON1	CON3		*	RC1	*	RC1	*	RC12

Notes:
**Program BMP is being implemented, but there is no corresponding BMP codes for other jurisdictions*

Explanation of ODOT BMP codes:

Operations and maintenance
OM1: Develop plan for stormwater quality structural controls
OM2: Evaluate existing stormwater maintenance practices
OM3: WQ impacts due to herbicides, pesticides, and fertilizers
OM4: Truck hauling practices; minimize risk of spills and leaks

Public education and Involvment
ED1: Comprehensive stormwater/watershed education program
PI1: Watershed public participation plan

Illicit dishcarge control
Ill1: Spill prevention and response program
Ill2: Prevent, detect, and control illicit discharges

Standard practices for new development
ND2: Coordinate erosion control practices with land owners
ND3: NEPA project review involvment
ND4: Comprehensive pollutant discharge program for construction sites
ND6: Incentives and/or requirements for land owners to insure damages due to erosion and/or sediment depostion are compensated

Structural controls
STR1, STR2: Evaluate the need for stormwater treatment facilities
STR3: Support tree planting programs
STR4: Review and modify existing design standards for drainage flood control structures
STR5: Encourage public and private groups to research better methods to improve stormwater quality

Planning system preservation/development
PS3: Modify landscape requirements to encourage the reduction of use of pesticides, herbicides, and feritlizers.

APPENDIX B

MONITORING DATA

Table 2.1 – Monitoring data collected as part of ODOT's Streetwaste Research Project.

This data represents the pollutant levels found in ODOT street sweeping roadwaste material. Random grab samples were taken from ODOT street sweeping piles and tested for pollutant levels. ODOT is currently developing a streetwaste pilot study that will more closely examine pollutant levels associated with streetwaste materials and how they may impact stormwater runoff.

Table 2.2 – 1998 Monitoring data collected for ODOT snowmelt pollutant characterization project.

This data represents snowmelt samples collected as part of an ODOT snowmelt pollutant characterization project. The project has sampled winter snow pack adjacent to ODOT Highway 26 in the Mt. Hood area for the last three years (see ODOT 1997 NPDES Annual Report). This year, 4 water runoff grab samples were taken instead of snow pack samples. Samples were collected from Highway 26 ditch lines during a period of high snowmelt in April. ODOT will be submitting a complete write up on this characterization study after more snowmelt data has been collected.

Table 2.3 – 1998 Monitoring data collected for ODOT stormwater facility pollutant characterization project.

This data represents water and soil samples that were collected from stormwater settling ponds located on the I-84 freeway in Portland. ODOT will be compiling data on pollutant levels from these ponds over time to determine if and when pollutants reach toxic levels.

Table 2.1
Street Sweeping Data

Marquam Composite Sample Sample Date: Aug 4, 1997	Concentration ppm	Detection Limit ppm
Total Lead	220	2.5
Acenaphthene	ND	0.005
Acenaphthylene	ND	0.005
Anthracene	0.018	0.005
Benzo (A) Anthracene	0.097	0.005
Benzo (A) Pyrene	0.095	0.05
Benzo (B) Flouoranthene	0.089	0.05
Benzo (GHI) Perylene	0.17	0.05
Benzo (K) Fluoranthene	0.089	0.05
Chrysene	0.11	0.005
Dibenzo (AH) Anthracene	ND	0.05
Flourlanthene	0.23	0.005
Flourene	0.047	0.005
Indfno (1,2,3-CD) Pyrene	ND	0.05
Napthalene	0.033	0.005
Pheneaniherene	0.16	0.005
Pyrene	0.22	0.005
Surrogate (% recovery)	54	50 to 100
TPH	1.600	50
TCLP Metals		
Arsenic	0.14	0.12
Barium	1.3	0.02
Cadmium	0.010	0.01
Chromium	0.030	0.01
Lead	0.099	0.06
Mercury	ND	0.0003
Selenium	0.14	0.14
Silver	ND	0.02

Wilsonville Composite Sample Sample Date: Aug 4, 1997	Concentration ppm	Detection Limit ppm
Total Lead	140	2.3
Acenaphthene	0.028	0.005
Acenaphthylene	0.010	0.005
Anthracene	0.031	0.005
Benzo (A) Anthracene	0.13	0.005
Benzo (A) Pyrene	0.092	0.05
Benzo (B) Flouoranthene	0.11	0.05
Benzo (GHI) Perylene	0.14	0.05
Benzo (K) Fluoranthene	0.11	0.05
Chrysene	0.17	0.005
Dibenzo (AH) Anthracene	ND	0.05
Flourlanthene	0.27	0.005
Flourene	0.056	0.005
Indfno (1,2,3-CD) Pyrene	0.052	0.05
Napthalene	0.042	0.005
Pheneaniherene	0.21	0.005
Pyrene	0.29	0.005
Surrogate (% recovery)	54	50 to 100
TPH	2.380	50
TCLP Metals		
Arsenic	0.14	0.12
Barium	1.8	0.02
Cadmium	0.011	0.01
Chromium	0.029	0.01
Lead	ND	0.06
Mercury	ND	0.0003
Selenium	ND	0.14
Silver	ND	0.02

Table 2.1
Street Sweeping Data

Sandy (ditching) Sample Date Aug 4,1997	Concentration ppm	Detection Limit ppm
Total Lead	25	1.4
Acenaphthene	ND	0.005
Acenaphthylene	0.010	0.005
Anthracene	ND	0.005
Benzo (A) Anthracene	0.064	0.005
Benzo (A) Pyrene	0.14	0.05
Benzo (B) Flouoranthene	0.083	0.05
Benzo (GHI) Perylene	0.20	0.05
Benzo (K) Fluoranthene	0.083	0.05
Chrysene	0.11	0.005
Dibenzo (AH) Anthracene	ND	0.05
Flourlanthene	0.19	0.005
Flourene	0.044	0.005
Indfno (1,2,3-CD) Pyrene	ND	0.05
Napthalene	0.058	0.005
Pheneaniherene	0.097	0.005
Pyrene	0.26	0.005
Surrogate (% recovery)	57	50 to 100
TPH	1.200	50
TCLP Metals		
Arsenic	0.16	0.12
Barium	2.1	0.02
Cadmium	ND	0.01
Chromium	0.031	0.01
Lead	ND	0.06
Mercury	ND	0.0003
Selenium	ND	0.14
Silver	ND	0.02

Sandy (sweepings) Sample Date Aug 4,1997	Concentration ppm	Detection Limit ppm
Total Lead	30	1.2
Acenaphthene	ND	0.005
Acenaphthylene	ND	0.005
Anthracene	ND	0.005
Benzo (A) Anthracene	ND	0.005
Benzo (A) Pyrene	ND	0.05
Benzo (B) Flouoranthene	ND	0.05
Benzo (GHI) Perylene	ND	0.05
Benzo (K) Fluoranthene	ND	0.05
Chrysene	0.029	0.005
Dibenzo (AH) Anthracene	ND	0.05
Flourlanthene	0.090	0.005
Flourene	0.056	0.005
Indfno (1,2,3-CD) Pyrene	ND	0.05
Napthalene	0.050	0.005
Pheneaniherene	0.035	0.005
Pyrene	0.12	0.005
Surrogate (% recovery)	91	50 to 100
TPH	3.300	50
TCLP Metals		
Arsenic	0.20	0.12
Barium	1.6	0.02
Cadmium	ND	0.01
Chromium	0.039	0.01
Lead	ND	0.06
Mercury	ND	0.0003
Selenium	ND	0.14
Silver	ND	0.02

Table 2.1
Street Sweeping Data

Rocky Butte (sweepings) Sample Date July 1,1998	Concentration ppm	Detection Limit ppm
Total Lead	40	24
Acenaphthene	ND	1.5
Acenaphthylene	ND	1.5
Anthracene	ND	1.2
Benzo (A) Anthracene	ND	0.15
Benzo (A) Pyrene	ND	0.006
Benzo (B) Flouoranthene	ND	0.09
Benzo (GHI) Perylene	ND	0.15
Benzo (K) Fluoranthene	ND	0.06
Chrysene	ND	0.15
Dibenzo (AH) Anthracene	ND	0.15
Flourlanthene	ND	1.5
Flourene	ND	1.5
Indfno (1,2,3-CD) Pyrene	ND	0.06
Napthalene	ND	1.2
Pheneaniherene	ND	0.9
Pyrene	ND	0.9
Surrogate (% recovery)	110	50 to 100
TPH	ND	1250
TCLP Metals		
Cadmium	ND	0.02
Copper	0.130	0.04
Lead	ND	0.1
Zinc	2.300	0.04

Table 2.2
Snowmelt Data

ODOT Snowmelt Pollutants Data (4/98)

Station	*#1*	*#2*	*#3*	*#4*
Date Sampled	4/15/98	4/15/98	4/15/98	4/15/98
Conventional Parameters (mg/l)				
TSS	**1800**	17	49	49
BOD5	ND	ND	ND	ND
Ammonia Nitrogen	ND	ND	ND	ND
Nitrate	**0.06**	**0.06**	0.03	0.01
Orthophosphate	ND	ND	ND	ND
Total Phosphorus	ND	ND	**0.94**	0.25
Total Kjeldahl Nitrogen	ND	ND	ND	ND
Metals (mg/l)				
Total Cadmium	ND	ND	ND	ND
Total Copper	**0.04**	ND	ND	ND
Total Lead	**0.07**	ND	ND	ND
Total Zinc	**0.14**	ND	ND	ND
Total Hardness	**37**	21	8	5.1
Dissolved Cadmium	ND	ND	ND	ND
Dissolved Copper	ND	ND	ND	ND
Dissolved Lead	ND	ND	ND	ND
Dissolved Zinc	ND	0.05	**0.07**	0.05
Dissolved Hardness	-	-	-	-
Other Parameters (mg/l)				
Total Oil & Grease	ND	ND	ND	ND
Polar Oil & Grease	-	-	-	-
TPH	-	-	-	-
Conductivity (umhos/cm)	13	**65**	19	3.8

Bold values represent the highest concentration in the snowmelt samples.

Table 2.3
Detention Pond Data
Sediment

Chemical Analysis of Soil
07/16/98

Parameter		148th Pond * Concentration	181st E. Pond Concentration	181st W. Pond Concentration	201st Drainage Concentration
Total Metals					
	Cadmium	1.9	1	2	2
	Copper	53	37	30	28
	Lead	60	53	51	41
	Zinc	300	210	210	130
TCLP Metals					
	Cadmium	0.03	0.03	0.02	ND
	Copper	0.12	0.09	0.05	0.07
	Lead	ND	ND	ND	ND
	Zinc	5	4.1	2.4	1.5
TPH - HCID (+/-)					
	Gasoline	ND	ND	ND	ND
	Diesel	ND	ND	ND	ND
	Hydrocarbons > C28	D	D	D	D
	Surrogate Recovery %	90	99	104	85
	TPH-Gx Total				
	TPH-Dx Total	5000	10000	13000	3000
EPA Method 8310					
	Acenaphthene	ND	ND	ND	ND
	Acenaphthylene	ND	ND	ND	ND
	Anthracene	ND	ND	ND	ND
	Benzo(a)anthracene	ND	0.3	ND	ND
	Benzo(a)pyrene	0.02	0.02	ND	ND
	Benzo(b)fluoranthene	ND	ND	ND	ND
	Benzo(g,h,I)perylene	ND	ND	ND	ND
	Benzo(k)fluoranthene	ND	ND	ND	ND
	Chrysene	ND	ND	ND	ND
	Dibenzo(a,h)anthracene	ND	ND	ND	ND
	Fluoranthene	ND	ND	ND	ND
	Fluorene	ND	ND	ND	ND
	Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND
	Naphthalene	ND	ND	ND	ND
	Phenanthrene	ND	ND	ND	ND
	Pyrene	ND	ND	ND	ND

* All concentrations are in parts per million (ppm)

Table 2.3
Detention Pond Data
Water

Chemical Analysis of Water
07/16/98

Parameter		148th Pond * Concentration	181st E. Pond Concentration	181st W. Pond Concentration
Metals				
	Cadmium	ND	ND	ND
	Calcium	8.3	21	24
	Copper	ND	ND	ND
	Lead	ND	ND	ND
	Magnesium	0.54	0.91	1.9
	Zinc	ND	ND	ND
	Total Hardness	23	56	68
TCLP Metals				
	Cadmium	ND	ND	ND
	Copper	ND	ND	ND
	Lead	ND	ND	ND
	Zinc	ND	ND	0.09
Microbiological				
	Fecal Coliform	340	<2	4
	Total Dissolved Solids	190	140	120
	Total Suspended Solids	16	17	6
	Total Oil & Grease	ND	ND	ND
	Nitrate	ND	ND	0.1
	Biochemical Oxygen Demand	36	13	5
	Chemical Oxygen Demand	250	71	43
	Ammonia Nitrogen	1.1	ND	0.6
	Total Kjeldahl Nitrogen	7.8	1.4	1.7

* All concentrations are in parts per million (ppm)

APPENDIX C

Oregon Plan for Salmon and Watersheds Annual Report (March 1998)
Table Summary

This table summarizes work ODOT has done during the 1997-1998 year for the Oregon Plan for Salmon and Watersheds. Much of the work done in this ODOT Program overlaps with, or is closely tied to, work done for ODOT's Clean Water Program (NPDES). ODOT's complete Annual Report for the Oregon Plan is available upon request.

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
National Pollutant Discharge Elimination System Permit Program	Erosion Control for construction	55%	Ongoing	Manual out for agency review. Training beginning	Adequate staff resources to provide level of technical assistance needed.	Geo Hydro Section	ODOT construction inspectors have started participating in a training program; conversations have begun with DEQ for a contractor certification program; voluntary erosion control reviews for construction projects
	Completion of Maintenance Management System review for water quality and habitat: guide developed for best management practices	100%	Adopted by District Managers, distributed to ODOT and county staff, **Completed**	Continued input and modifications		District Managers, Salmon Recovery Program Manager	Manual basis for statewide biological assessment and incidental take permit for maintenance activities. 14 of 16 district crews have held crew level orientations.
	Illicit discharge investigations to locate and remove non storm water runoff from system	5%	Ongoing	109 complaints received, 101 resolved: erosion and sewerage entering ODOT right of way	Resources to adequately address all ODOT right of way.	Office of Maintenance staff	Illicits discharges to ODOT right of way are difficult to quantify.
Endangered Species Act Compliance	Develop programmatic biological assessments (BA) for geographic areas for construction projects	100% for first round of BA's.	Ongoing for new construction projects	BA's prepared and submitted for Umpqua River, Lower Columbia (programmatic non project specific) and a specific BA for culvert modification for fish passage.		Salem Environmental	NMFS concurred with ODOT findings, issued incidental take statements for south coast and Umpqua Basin. NMFS issued a conferencing opinion for north coast. BA's being prepared for Lower Columbia and Snake Basin ESU.

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
Endangered Species Act Compliance, Continued	Develop programmatic biological assessments (BA) for statewide maintenance activities	50%	Submitted to NMFS in October, 1997	ODOT and NMFS negotiating on level of detail and monitoring	Discussions with NMFS are resuming.	Salem Environmental	An extension has been received for the Umpqua River incidental take permit. Competing priorities with project BA's have 'bumped' the completion of the negotiations.
	Educate staff and county staff on ESA	60% ODOT staff 20% county	Ongoing	Liaison to NMFS for county projects where listings occur.	ODOT has no authority over county staff, no resources to assist.	Salem Environmental and Region Environmental staff	Federal actions direct involvement with counties: funding or listings
Integrated Pest Management	Develop 16 district IPM Plans, hold stakeholder meeting	88%	Ongoing	14 plans submitted for review by IPM Coordinator. Stakeholder meetings cancelled, plans available in districts for information	Resources to develop and implement the plans	IPM Coordinator	The district plans are unique to conditions of the local area, little consistency between the plans. Several other IPM activities: study on using infrared rays to destroy weeds; roadside rehabilitation project in the Jordan Valley; cooperative fate/transport study with USGS on residual.
Integrated Pest Management, continued	Upper Rogue Valley vegetation management program prototype	25%	Ongoing	Goals and objectives have been identified, stakeholders and land use management zones for the valley have been identified.	None at this time	IPM Coordinator	

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
Hazardous Materials	Identify pollutant loading based on Average Daily Traffic for waste disposal guidelines	20%	Ongoing	Oregon Department of Environmental Quality and ODOT are negotiating long term agreement	Research directing negotiations not completed	Hazardous Materials Coordinator and Geo/ Hydro Section	The waste disposal program for the ODOT metro area received the State of Oregon Recycler of the Year Award for waste reduction.
	Establish best management practices for maintenance	100%	Ongoing	Review of practices completed, document in distribution	None at this time	District Managers, Hazardous Materials coordinator, and Geo Hydro section	ODOT works with DEQ to provide technical clean up on large spills, ODOT staff being trained to clean up small spills associated with vehicle fluids.
ODOT 1: Salmon Recovery Program Manager	Hire permanent position to manage the ODOT Salmon Recovery Program	100%	**Completed**	Position filled	None at this time		
ODOT 2: Culvert Inventory, Assessment and Remediation	Locate, prioritize and repair culverts that do not provide fish passage	100% complete on inventory of coastal, Lower Columbia, Grande Ronde, Imnaha Basins.	Ongoing	Inventory for Upper Willamette Basins continues, in budget development for Deschutes, Umatilla, and John Day basins	None at this time	Salmon Recovery Manager	434 culverts identified to date on ODOT roads in basins inventoried. NMFS and ODOT will work with ODFW to develop regional priority schemes to aid in ODOT prioritization.

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
	District culvert repairs	1%	Ongoing	Culverts cleaned, weirs installed, tide gates removed, plunge pools modified, deck drains plugged throughout state.	Knowledge of best fix, eight hour course presented across state.	Salmon Recovery Manager	All ODOT high priority culverts in coastal basins have been scoped and design solutions identified. Over 25 miles of habitat opened from enhanced or assessed fish passage.10 culverts modified, two tide gates opened or removed. One new channel created to Pacific.
ODOT 3: Maintenance Management Maps	Develop for district roads, resource inventory maps and restricted activity zone maps that identify specific resource issues and management solutions	5%	Ongoing	Prototype for Highway 38 near completion. Results of prototype required new protocols, standards for inventorying resources. The Oregon Coastal Zone Management Association is not participating in this action item as identified in the Oregon Plan. ODOT staff are developing the maps.	20%	Information Systems Branch Project Manager	Funding for maps include federal dollars. Commitment to regions needed to be delayed as resource inventories are postponed until plant growing season. North coast right of way has been inventoried and surveyed for slide material disposal sites. Permit requirements for sites are being investigated.

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
ODOT 4: Participate in Watershed Councils	ODOT District Managers or their representatives will participate in watershed councils/planning	60%	Ongoing	Each district that has active watershed councils has attended or made contacts with the local watershed	Multiple watersheds within a district, different development of watershed	District Managers	ODOT participates as appropriate with watershed councils: in some instances ODOT has been asked to be members of the council. ODOT staff serve on GWEB technical advisory committee
ODOT 5: Master Plan for Surplus Property	Identify ODOT properties suitable for slide disposal sites, or mitigation sites.		Ongoing	Incorporated into ODOT 3	Protecting surplus property from undesirable uses.		
ODOT 6: Environmentally Sensitive Design	Integrate environmental requirements and needs into project design	2%	Ongoing	A three day training program on habitat needs was held, region roll outs on action item held in regions and Technical Services Branch.	Engineering liability, knowledge, cultural shift	Project team managers, team members, region managers	Construction costs are expected to rise approximately 15-20 percent
ODOT 7: Storage and Disposal Plan for Woody Debris	Develop storage and disposal plan for woody debris	50%	Ongoing	Material available and sites identified in coastal districts	Timely installation of material	District Managers	Intergovernmental agreements between private landowners may be needed.

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
ODOT 8: Statewide Erosion Control Handbook	Develop a statewide erosion control handbook	50%	Ongoing	"Construction Project Pollution Control: Guidelines for Developing, Implementing, and Inspecting Pollution Control" developed and submitted to field for review		Region construction staff, region environmental staff and Geo Hydro Section	Training program for ODOT construction staff and contractors is being developed
ODOT 9: Review Winter Maintenance Activities and sidecast sweeping	Review winter maintenance activities and develop geographically appropriate best management practices	100%	Review and development of best management practices completed	Implementation ongoing		District Managers	Public perception that ODOT is sacrificing public safety for fish. Continuing conflicting opinion on winter maintenance activities and impacts between/among biologists.
ODOT 10: Aggregate Permit Review	Review instream, or near stream aggregate permits for material source		Deleted from plan, very few permits, those reviewed in conjunction with DSL			DSL/ODOT	Aggregate permits now managed by DOGAMI
ODOT 11: Integrated Pest Management	Develop a statewide IPM program		Ongoing	See IPM Program		IPM Coordinator	

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
ODOT 12: Education	ODOT will educate staff and stakeholders on impacts to resources and ways to minimize impacts	75%	Ongoing	Extensive training presented to ODOT staff: 14 districts orientations, 8 project development sessions, 7 culvert training classes, 6 culvert guideline classes.	None at this time	ODOT staff	ODOT presents information at Association of Oregon County meetings, and provides copies of all material to county roadmasters.
ODOT 13: Preferential Use of Bioengineering Solutions	Use bioengineering solutions rather than 'hard' solutions where appropriate	Project specific	Ongoing	Implementation ongoing	Impacts to public safety from bioengineering.	ODOT designers	ODOT has installed bioengineered solutions in several locations, monitoring effectiveness
ODOT 14: Burning in Riparian Area	Avoid burning in riparian area		Deleted from plan	Standard operating procedure			
ODOT 15: Habitat for Fish in Wetland Mitigation	Include habitat for fish in wetland mitigation as appropriate	Project specific	Ongoing	Implementation ongoing		ODOT wetland team and designers	ODOT has included off channel pools on several large projects
ODOT 16: Minimize Potential Impacts of Accident Spills	Map sensitive areas		Included in ODOT 3				
ODOT 17: Aquatic Pest Plant Management Plan	Develop an aquatic pest plant management plan		Deleted from plan, ODOT has no authority over water resources.				

ODOT OREGON PLAN ANNUAL REPORT
1997-1998

Action Item	Task/ Commitment	Percent Complete	Timeline	Status	Obstacles	Unit	Comments
ODOT 18: Retention of Surplus Properties	Retention of Surplus Properties	0%	Future activity	Future activity, need legislative approval	Legislative approval required		
ODOT 19: Mitigation banking	Develop credit/debit system for wetland mitigation, fish enhancement	5%	Ongoing	Funds to begin process were allocated	There are no established credits identified for fish enhancement or riparian improvements	ODOT environmental staff and regulators	ODOT has recently created a wetland bank along the Columbia River
ODOT 20: Compliance Review	Develop review process for construction permit compliance	Just beginning	Ongoing	Process developed and tested, first projects reviewed.		Geo Hydro Section, Office of Maintenance	Project Managers have begun requesting reviews, and technical assistance.

Section VI

MULTNOMAH COUNTY DRAINAGE DISTRICT NO. 1 (MCDD#1)

PENINSULA DRAINAGE DISTRICT NO. 1 (PENN 1)

PENINSULA DRAINAGE DISTRICT NO. 2 (PENN 2)

MCDD#1/PENN1/PENN2
NPDES
1997-98 Annual Report

OM1.
Develop an O&M plan for Public stormwater quality structural controls and evaluate existing practices that affect water quality.

Outcome

- **O&M manuals for the following District operations have been completed:**

(A) VEGETATION MANAGEMENT FOR:
Levees
Slough Banks (Land Base)
Slough Banks (Water Base)
Secondary Ditches
Nuisance Aquatic Vegetation

(B) SEDIMENT AND DEBRIS REMOVAL FOR:
Columbia Slough
Secondary Ditches
Culverts and Pipes

(C) PUMP STATIONS FOR:
Trash Rakes
Pumps
Outfalls
Flow Control Structures

(D) Equipment Operations
(E) Nuisance Animal Control
(F) Shop and Repair Yard
(G) Spill Containment

- ***Review and describe existing O&M practices***

(A) VEGETATION MANAGEMENT

Mechanical Control: Whenever mowing or cutting applications are used a log boom or a anti-drift device is placed down stream of the operations to capture all debris entering the waterway. The debris is then removed and disposed of at a wood recycling center. This method of containment has proven to be very effective on controlling downstream blockages.

Chemical Control: MCDD has three certified applicators and one trainee. These certifications require that 15 hours of continuing education be taken every year to maintain their certification. Knowing the environmental concerns and the newest types of herbicides approved for use around waterways, enables the applicators to select the most environmentally safe herbicide for the each application.

MCDD is always looking for alternative methods for vegetation control verses herbicide use.

BIOLOGICAL CONTROL: MCDD is presently working with the City of Portland, Bureau of Environmental Services to re-vegetate the slough banks to promote native vegetation and shade out the nuisance vegetation.

MCDD is also researching the feasibility of using the grass carp for vegetation control within the waterway itself, as well as the possible use of EPA approved herbicides.

(B) SEDIMENT AND DEBRIS REMOVAL:

Sediment Removal: Sediments are removed with an excavator, whether it is a land base or a water base operation. In order to keep the turpidity to a minimum the District shuts down their pumping operations during the time of excavation to reduce or stop the flows in the Columbia Slough and/or the secondary ditch systems. This allows time for the suspended sediment to re-deposit in the general area of disturbance. This method has been very effective for the District and we will continue the practice.

Debris Removal: Is an ongoing operation for the District. MCDD is working with SWINE, Inverness County Jail and Columbia River Corrections in locating and picking up illegal dumped debris. The debris is sorted for recycling by one of the Corrections facilities and transported by MCDD. Metro has provided MCDD with a disposal program for the Columbia slough clean up and tire recycling.

(C) PUMP STATIONS:

MCDD inspects, services and records water elevations at the pumping facilities bi-weekly. All debris collected at the trash rakes and culverts is sorted by inmates and disposed of at the appropriate locations.

MCDD has installed automated trash racking systems at the primary pumping facilities and removed the log booms that used to stop the floating debris from plugging up the grates. With this system in place the debris is cleared from the water as it reaches the pump station and not accumulating in the water at the log boom.

Flow control structures are inspected and serviced bi-annually

(D) EQUIPMENT OPERATIONS:

All equipment is inspected every morning for hydraulic leaks and repaired if any are identified before the machine can be operated.

(E) NUISANCE ANIMAL CONTROL

MCDD has an annual permit from the Oregon Department of Fish and Wildlife to control nuisance animals in and around the waterways. MCDD employs its' own licensed trapper or contracts with a licensed trapper for this project. MCDD and or its contractor are required to notify and file reports with ODFW whenever we enforce these controls.

(F) SHOP AND REPAIR YARD:

All work performed on equipment is done in the shop where all fluids and metals can be collected and disposed of in a safe environmentally manner. MCDD does not have any open storage areas.

(G) SPILL CONTAINMENT:

MCDD has installed spill containment compartments in all their storage buildings. All trucks and excavating equipment has its own 35 gal spill containment kit. These kits are inspected on a monthly basis. All of MCDD's employees have been trained as a first responder and how to handle small non hazardous spills.

OM3

Develop and implement conscientious pesticide/herbicide application program. Determine effectiveness of other methods for managing nuisance and non-native vegetation. Develop overall management program for application of herbicides in and around environmentally sensitive areas.

Outcome

An Integrated Pest Management Program (IPM Program), has been developed to control invasive non-native plants using weed suppression interventions, when and where they are needed, and with what strategy and mix of tactics to use. Thus an effective, safe, and environmentally sound IPM Program can be implemented in and around public right of ways as well as in and around environmentally sensitive areas. Copies of the IPM Program are on file in the District Office.

In addition, the IPM Program has been extended to assess the macrophyte problem which is expanding because of the continued implementation of low water flow management for addressing eutrophication. The macrophyte problem is apparent in all of the districts. Currently, Mr. Stan Geigar is working with the districts in assessing the severity of the problem and possible management alternatives for control.

With MCDD#1 assuming management of PENN1, we have also implemented our IPM Program within the district. In the past, PENN1 has contracted their spraying work with an independent contractor.

As per our IPM Program, all records are kept on file at the District Office.

OM4.
Continue to enforce regulations and educate regarding truck hauling practices and the stormwater quality impacts of leaks, spills or other releases.

* **Enforce state statutes for District owned vehicles and contractor vehicles. Maintenance records on haul vehicles and documentation on requirements to contractors.**

Outcome

We have developed a maintenance and safety check for all District vehicles. All dump boxes were inspected and rebuilt to insure tightness in order to limit spillage. Operators were trained not to over-fill boxes, which would result in

spillage. All operators carry shovels with them so that if there is spillage it can be cleaned up immediately.

If the area that we are hauling from is muddy, appropriate haul roads and rock aprons are being constructed and, if need be, truck tires are washed before entering public roads.

* **Notify proper authorities of hauling violations within and around the District.**

* **Disseminate educational materials, as available and approved, to District employees and contractors.**

Outcome

Weekly safety and training meetings have been established. One hour per week, all employees receive training and information concerning appropriate measures to be taken concerning activities to take place. Proper hauling and truck handling training films have been made available. In addition, District employees have attended classes sponsored by the Columbia Corridor Association teaching safe operator practices.

Projected Actions for Next Year.

Continue with the existing on-going programs. Require re-certification of all District equipment operators and annual educational classes.

ED1.
Develop comprehensive education program.

* **Provide MCDD1 representative to attend meetings of the City committee as appropriate.**

Outcome

Both the Manager and Assistant Manager have attended and participated in City programs.

* **Hold internal meetings and disseminate education materials to District staff.**

Outcome

Incorporated into our weekly safety/training meetings

* **Provide volunteers access to District property.**

Outcome

Participated in Slough Regatta and provided educational groups such as the Urban League of Portland tours as well as presentations with the City of Portland.

The Slough Regatta is a significant program which gets interested people out on the water of the slough. A total different perspective of the slough and associated system is seen from the water. Getting the awareness for the potential of the slough is a significant step in revitalizing the resource.

For the past four years the district has provided 4 or more employees for monitoring and helping during the regatta. In addition, our barges and work boats were used to help facilitate getting in and out of the water and providing patrol boats in case of emergencies.

* **Send personnel to educational workshops offered locally.**

Outcome

Have sent key personnel to a number of training programs concerning the proper handling of hazardous materials and knowing the proper notification process when spills are observed.

Projected Actions for Next Year

Most of our internal BMP's for ED1 have been integrated with OM1 for ease of report administration. All other aspects remain the same. Will hold annual general assessment meetings with the City of Portland, DEQ and District staff regarding the impacts and benefits of our low flow management and IPM Programs.

PI1.
Develop comprehensive public participation program.

Integrated PI1 with OM1 and ED1

IND1.
Control discharges from industries and solid waste facilities.

* **Review permits for all development on properties within the District.**

Outcome

This is the third year that we have implemented a permit review program for all properties within the district. We review building permits, Land Use Reviews (LUR's), land sub-divisions and parcels plats as well as being involved in planning and policy decisions.

Once a week, a district representative goes to the City of Portland building permit office and the planning bureau office to review applications for the previous week. File numbers are obtained and flagged so that a decision can not be made until the district has reviewed the proposal and the City has received our written comments. Contact is usually made directly with the developer/owner and plan sets of the proposal are forwarded directly to this office.

A district representative does a preliminary review of the plans and develops a quick outline of what the proposal is and exactly where it is located in the district. Then, once a week, staff meets to review, discuss and assign each project. The project is listed on a status board with the review persons initials and are discussed as to weekly status until the written decision is submitted to the appropriate entity.

Areas of primary review are, type of land use, location of property i.e. next to a slough, levee or wetland, location of any outfalls into an open waterway or if it discharges into a City system, amount of impervious surface, available future expansion, impact to adjoining property, erosion control, proper DSL/COE permits etc...

Plan sets are then filed at the district office by location for future reference.

This program has been implemented in PENN1 and PENN2 over this last year. Results have bee very beneficial in making the developer aware of the presence and concern of and by the District.

Projected Actions for Next Year.

Continue with program and continue to review internally to make more efficient. Try to hook into City computer system so we can be directly on line for all land use actions.

* **Notify City or appropriate entity when problems are observed.**

Outcome

District is usually the first to notify of problems within the drainage system. Our people are continually out in the area and on the waterways and are trained to notify if they see something of concern. They all carry radios and or cellular phones and notification is usually immediate.

Documentation of any notification is recorded on daily work reports by the employees and follow up is encouraged by the employees.

Projected Actions for Next Year.

We have participated in numerous meetings with the City to identify problems in the system where we may notify of a problem and then we figure out who is responsible to take appropriate action. Responsibility to take action has been a topic of many meetings with the City and other Bureaus. We will continue to work with the City and others to rectify the problem of responsibility. In most cases where we have notified the owner, the problem gets taken care of prior to needing to notify any other entity.

IND2.
Control discharge of animal waste to the MS4.

* **Notify and assist ODA of violations within the District boundaries.**

Outcome

The district has continued to work with various horse boarding stables and cattle ranchers to fence the animals away from the ditches and open sloughs where historically the animals have been left free to graze and water.

We inspect these lands periodically and encourage the owners to contact the district if they have any questions. Grazing is currently limited to Port of Portland lands and one boarding stable for MCDD#1 and Portland Meadows for PENN2.

PEN 2 Specific Actions

PEN 2 has met with Portland Meadows (horse racing track) owners and management along with the Department of Agriculture to discuss the need to control the discharge of pollutants associated with their horse stable area. During the racing season, November through April, up to 500 horses are stabled at their facility. During the off season up to 200 horses are housed there. High fecal readings in the ditch system have historically been recorded downstream of the facility.

The owners have contracted with a consulting firm, SRI Shapiro, to work on development of storm water plan which addresses the proper handling and disposal of the animal waste. A preliminary report has been issued to the Department of Agriculture and the district.

The Department of Agriculture has extended the time frame for compliance for Portland Meadows. PM is currently negotiating with the City for discharging their animal waste into the sanitary system. Because of capacity constraints, the City is not able to accept all of the effluent and is working with PM to develop a loading standard for them to design to.

Project Actions for Next Year.

We will continue to monitor the properties where we have restricted use and will contact any new additional grazing uses.

PEN 2 will continue to work with Portland Meadows and the Department of Agriculture, and DEQ to develop and implement a suitable animal waste management plan.

ILL1.
Manage a spill prevention and response program that reduces the frequency and impact of spills to the stormwater system.

* **Send representatives to interagency committee meetings.**

Outcome

A district representative has attended and participated in every meeting the City has sponsored for the ILL1 program. This program has involved numerous agencies and has helped identify the role of the district in handling and responding to spills. As a result, it has been determined that when a spill is observed the first response is the responsibility of the Fire Bureau. The Fire Bureau will then assess the situation and request appropriate assistance from other entities.

* **Develop and implement a spill response program for operation of all District equipment. Provide training for all District personnel on the effective implementation of spill response. Provide adequate equipment and materials for all spill response. Perform quarterly, spill containment exercises.**

Outcome

The district has developed an internal spill response program pertaining to the operation of all district related maintenance activities. This program ranges from containment of hydraulic fluids from heavy equipment, changing fluids and oils in the shop where spills can be cleaned up instead of outside on the ground, pump station automatic oilers and plugging of direct drains to the wet well sumps.

Additionally, the district helps BES and other bureaus in containment of spills in the waterways. All district vehicles carry spill containment kits and soaker booms and all district personnel are trained in their proper use and deployment. Some of our key personnel have taken the 40 hour hazmat training for first responder. We have assisted the Portland fire bureau in the design and construction of an open ditch to use for training exercises.

Projected Actions for Next Year.

Continue our involvement in the ILL1 program with the City and other entities. Continue internal training and implementation of spill containment for district operations.

* **Continue to inventory, mark and investigate suspect barrels currently in the Columbia Slough. Determine if they are empty or still may contain material. Remove if they are empty, mark the location and inventory on map. Describe condition and observations during removal. Report to appropriate agency for removal action.**

Outcome

The district has continued to remove and inventory the primary sloughs and drainages for illegally disposed of barrels or containers. These areas were mapped and recorded and meetings were held with DEQ and the city concerning the proper handling and disposal.

Most of the barrels were old and rotted through. Photos were taken of the sights and barrels prior to and after removal for future reference. Most were removed and disposed of in the land-fill. Two barrels were removed intact and the contents were analyzed for proper disposal. METRO has assisted in the proper disposal of these containers.

Projected Actions for Next Year

Continue with program to identify any additional buried treasures and provide for proper disposal.

* **Train operations manager and equipment operator as first responders when possible hazardous materials or spills are identified.**

Outcome

Training of key district personnel has been done and annual classes and additional training will be provided. Currently are working with City of Portland Fire Bureau to train as first responder for identifying types of spills and appropriate action to be taken.

Project Actions for Next Year

The Fire Bureau has personnel trained for handling hazardous materials and it has been determined it is their responsibility to take the lead. We will still be able to assist the Fire Bureau if requested in order to gain access to the spill or dump site. There is a certain amount of liability that the district may not want to incur. We will continue to evaluate our in field involvement with the ILL1 team.

ILL2.
Develop and implement a program to prevent, search for, detect, and control illicit discharges to the stormwater system.

* **Develop IGA with COP to assist City on this task. Assist City as needed with follow-up for investigations. Notify property owners along water ways of illegal dumping in the vicinity of a water resource and assist, where practicable, with the removal of the debris from the water ways for their disposal. If property owners refuse to cooperate, notify ODF&W, DEQ, COP and State Police of the dumping violations.**

Outcome

Cooperation continues between the district, City and other agencies in investigating and stopping illegal dumping.

MCDD#1 specific Actions

We have been working with DEQ and their consultant to remedy the contamination problem associated with the NuWay Oil site. MCDD#! will be contracting with DEQ to remove the contaminated sediments from the Whitaker Slough arm of the Columbia Slough this next fall.

PEN 2 Specific Actions

This past year as well as the previous years, during and following rainfall events, a significant oil sheen has been observed floating on the water surface in and around the pump station on Schmear Rd. Soaker booms are maintained in front of the intake bay of the pump station. The district is working with the City of Portland to try and identify the source of the contamination.

Projected Actions for Next Year.

Continue to work with the City and other agencies to stop illegal dumping.

Continue to work with the City to identify the source of the discharge at PEN 2. Continue to maintain the oil booms at the pump stations and inspect suspect culverts for discharges.

ND2. & ND4 Combined

Work with landowners, tenants, and/or public agencies to apply practical erosion control practices to reduce pollutant discharges associated with undeveloped and developed properties and park lands.

- **Report all observed erosion control problems to the City.**

Outcome

Through the Districts building permit review process, monitoring of erosion controls on new development site is occurring. When we observe that construction sights do not have erosion control in place or that the erosion control devices are not functioning as needed we notify the building bureau and give them the permit reference number or the address for enforcement.

MCDD also works with landowners and developers directly to improve, maintain and replace erosion control devices as needed.

Specific Violations in PENN2 and MCDD#1

The District worked hand in hand with DEQ and the City of Portland to enforce and fine Mariners Gale for erosion control violations this past year. Remediation and cleanup of the Bridgeton slough will be performed this next fall. In addition,

numerous violations were observed in MCDD#1 and in most cases the developer responded to our concerns and fixed the problem.

Projected Action Next Year.

We will work with the City of Portland and DEQ to see if we can put together a erosion control enforcement program that has some teeth for those developments of 5 acres or less. Logic tells us that if we can stop the problem at the source, we will have less sediment to remove out to the waterways. Our time spent now is much better than the effort we will have to expend trying to remove sediments from the channels. Current enforcement is only good while the material is on site. Once the material is off site and into the waterways, only DSL has enforcement capabilities and then only if it is greater than 50 cubic yards of deposited material.

STR1.
Evaluate need for new stormwater quality treatment facilities...

* **Track on-going and planned water quality facility projects and improvements, get involved in planning and review process.**

Outcome

The district is currently working with the City, Port of Portland and Air National Guard in review of all existing and proposed regional and private water quality facilities. The district currently maintains all of the public water control facilities by contract with the City and Port. Since we maintain them we assist in the design in order to facilitate efficient maintenance practices. This past year, we cleaned the facilities for the Port as well as surveyed the City facilities for deposition and impacts to proper functioning.

In addition, the District is on the Advisory Committee for the City of Portland for development of their stormwater policy as well as development of the handbook.

STR2/STR4
Determine practicability for retro-fitting drainage and flood control facilities to address water quality. If practicable, develop plans and implement.

* **Work with the City to understand the current operation and function of District facilities. Evaluate the water quality benefits of changing the operations of the facilities and look at the operation scenario's.**

Outcome

Because of past flooding events, the City Bureau of Maintenance (BOM) and district have continued meeting regularly in order to understand responsibilities for stormwater management. Primary focus at this time has been flood control but water quality issues are also being discussed.

The district has also been working with the City of Portland on the maintenance of their water quality ponds in the Airport Way area. Currently there is no maintenance schedule or manual for the ponds and their design for removla of contaminants has been exceeded.

The district has also been actively participating with the City in understanding the management of the Columbia Slough for water quality. This program is known as the "low flow" and the purpose is to augment the flows in the upper Columbia Slough during the summer time in order to limit the algae growth and improve water quality parameters. Additionally, the district is working with the City as well as the Port in understanding winter management of the slough and impacts from low dissolved oxygen associated with Port de-icing activities. The district and City have entered into an IGA to continue review and implementation of slough management alternatives for water quality benefits.

As was previously mentioned, the District is concerned with the amount of aquatic weeds that have evolved into the system since the implementation of the low flow program. Evaluations and assessments are ongoing and the City and DEQ will be involved in the assessment.

Projected Actions for Next Year

Continue current program with City, Port, and other agencies. Continue to work with consultant to help evaluate macrophyte problem and analyze water quality benefits versus operations problems. The District will enter into a Local Cooperation Agreement with the City of Portland Maintenance Bureau this next year.

STR3.
Support government and community tree planting program.

* **Develop and implement a pilot re-vegetation program for ditch slopes of the Columbia Slough. Work with the Port and City to re-vegetate bank slopes with native trees in order to increase shading of the waterways.**

Outcome

As was discussed earlier in BMP OM1 the district has developed a vegetative pilot program at NE 82nd. In addition, the district has worked with the City in their re-vegetation program. The district has used equipment and labor to re-slope bank slopes and remove existing un-wanted vegetation, blackberries in order to facilitate planting and survival.

A number of sites in PENN1, PENN2 and MCDD#1 have been re-vegetated in cooperation with the City of Portland's' projects. The District continues to work with the City and other public groups to identify and re-vegetate existing ditch and slough banks.

PS2.
Evaluate practicality of providing financial incentives for property owners who protect natural areas considered to have valuable water quality characteristics.

* **Meet with the City of Portland and identify natural areas that may be of joint beneficial use for water quality and water quantity i.e. storage and conveyance.. Once these areas are identified, participate in helping to develop incentive programs for the preservation of these areas.**

Outcome

Met with City Planning Bureau and private property owners in order to incorporate benches and maintenance access and riparian areas along certain identified stretches of slough. These areas will serve as wetland/buffer areas as well as flood storage and conveyance routes.
Water quality will be improved because of shading of the waterway and bio-filtration prior to discharge into the system. Provided City personnel updated 200 scale aerial maps with river miles for aiding in this task.

Will continue as needed to work with the City and others.

PS3.
Inventory and map the storm sewer system.

* **Inventory outfalls discharging into the Upper Columbia Slough. Delineate the catchment areas for major outfalls.**

* **Develop and implement procedures for updating maps on a routine basis.**

Outcome

The district conducted an inventory of the storm sewer system at the same time as we did the cross sections of the slough for BMP OM1. District identified and mapped all outfalls from large to small. Also noted whether they were discharging during dry weather conditions. Inventory is recorded on spread sheet as well as in the process of being recorded on the district aerial maps. Most of the major slough has been mapped and we are in the process of mapping and inventorying the secondary ditches and sloughs. Also through the permit process, new outfalls are being documented and inspected by the district.

PENN 2 Specific Actions

A study has been completed by Crawford Engineering Inc. to perform an assessment of the existing drainage system as well as future requirements. Inventory will be on Aerial maps at 200 scale as well as in digitized electronic format. Assessment should be finalized by November of this year.

PENN1 Specific Actions

The City of Portland established a Natural Resources Management Plan for the PENN1 area this last year. In addition an assessment of the existing drainage conveyance system and pumping facility is being performed in conjunction with the possible siting of the jail facility within the district bounds. The district has been working on the jail siting committee concerning the hydrology of the area and possible wetland mitigation. We feel we have been a key to helping others understand the benefits of transforming the existing low value wetland into a functional environmental resource.

Projected Actions for Next Year

Continue with the program until all waterways are mapped and inventoried. MCDD#1. PENN1 and PENN2 should all be completed this next year.

MCDD#1/PENN1/PENN2
NPDES ANNUAL REPORT FOR PORTALND PERMIT AREA---PERMIT YEAR 3

BMP ID.	OVERALL INTENT, GOALS AND OBJECTIVES	PERMIT YEAR 3 KEY ACCOMPLISHMENTS	PROPOSED MODIFICATIONS TO SCHEDULE OR ACTIVITIES
OM1	Review & describe existing O&M practices Prepare O&M manuals for District operations Eval. Existing practices and make recommendations for improvements Develop O&M manual—implementation water based maint. Op. Imp. Water based as primary maint. Op. For Columbia Slough Focus on vegetation control/removal of debris & garbage Determine future min. hydraulic cross sections/Columbia Slough Perform cross sectional soundings of slough Estimate amts. of sediments to be removed Develop & implement pilot re-vegetation program	Evaluate written O&M manuals Water based maintenance for 2 miles of slough, vegetation only Hand cleared fallen trees obstructing flow Constructed one new off-load location Silt removal and disposal on levee slopes levee repair/rebuild for all Districts Low flow for water quality program Incorporate Management Practices for PENN1	Assess effectiveness of O&M Plans Silt & vegetation removal and disposal using water based maintenance and levee disposal w/erosion control Construct two new off-load locations Finish SWMM Model of watershed Integrate w/Gresham model Install Stream Gauge Equipment Complete Emergency Operation Manual for Floods Complete Capital Improvements for MCDD#1, PENN1, PENN2
OM3	Develop and implement conscientious pesticide program Assess effectiveness of other control methods Develop overall management program	Evaluate Integrated Pest Management Program Refined herbicide record keeping system Assisted with vegetative mgmt. Programs/Seminars Attended certification school	Continue existing program Assess impacts of Macrophyte growth on O&M and water quality benefits
OM4	Enforce state statutes for Dist. Vehicles and contractor vehicles Maint. Records on haul vehicles & documentation on repairs Notify proper authorities of hauling violations Disseminate educational materials to Dist. Employees and contractors	Performed weekly maintenance/safety check for all vehicles Weekly safety/training meetings established for Dist. Employees and contractors	Continue with existing on-going programs Require re-certification of all District equipment operators/annual ed. Classes
ED1	Provide MCDD1 rep. to attend mtgs of City committee Hold internal mtgs and disseminate ed. Materials to Dist. Employees Send personnel to educational workshops (local) District Staff Participate in Public Workshops & Projects	Manager and Assistant Manager attended and participated in City programs Incorporated into weekly safety/training meetings Participated in Slough Regatta and provided educational groups tours, etc. Sent key personnel to training programs	Continue with existing on-going programs Fold internal education in with our OM1 BMP's Annual Assessment meeting w/COP & DEQ

BMP ID.	OVERALL INTENT, GOALS AND OBJECTIVES	PERMIT YEAR 3 KEY ACCOMPLISHMENTS	PROPOSED MODIFICATIONS TO SCHEDULE OR ACTIVITIES
IND1	Review permits new industrial/commercial development Notify City when problems are observed	Continued permit review program Incorporate PENN1 Into review system City notified of problems	Continue with program and try to hook up with City computer system Start Review for PENN1
IND2 ==========	Control discharge of animal waste to the MS4 ========== **PEN 2 SPECIFIC ACTIONS** Work with DEQ and Portland Meadows on Discharge Problem	Inspect lands periodically ========== **PEN 2 SPECIFIC ACTIONS** Met with Portland Meadows owners & mgmt. And District Board to discuss options	Continue to monitor properties ========== **PEN 2 SPECIFIC ACTIONS** Continue to work with Portland Meadows and DEQ and COP to develop & implement suitable animal waste mgmt. Plan
ILL1	Send representatives to interagency committee meetings Develop & implement spill response program Inventory, mark & investigate suspect barrels currently in environmental areas Train Operations Mgr. & equipment operator as hazardous materials handlers	Attended/participated in every City sponsored program meeting(s) Developed internal spill response program Continue to Inventory primary sloughs/drainages and ID barrels or containers	Continue with program Continue with involvement in ILL1 program with City and other entities Continue with program/identify any additional sources Continue to evaluate our in field involvement with the ILL1 team
ILL2 ==========	Develop IGA with COP for investigations ========== **PEN 2 SPECIFIC ACTIONS** Try to identify source of oil sheen on water	Currently, IGA with City not developed and may not be necessary ========== **PEN 2 SPECIFIC ACTIONS** Maintained floating oil boom to trap/contain	========== **PEN 2 SPECIFIC ACTIONS** Continue to work with City to identify source Continue to maintain oil boom
ND2	Reduce Pollutant discharges and Erosion into System Report all observed erosion control problems to City	Used building permit review program and monitor of erosion controls standards On other properties confer with property owner	Continue with existing program
ND4	Require adequate erosion and other pollutant control measures	Enforcing erosion control standards on all District activities and contracts	Continue with existing program
STR1	Track on-going and planned water quality facility projects/improvements get involved in planning and review process	Currently working with City, Port of Portland & Air National Guard in review of all existing/proposed, regional/private water quality facilities Maintain all public water control facilities by contract with City and Port of Portland	Continue with existing programs

BMP ID.	OVERALL INTENT, GOALS AND OBJECTIVES	PERMIT YEAR 3 KEY ACCOMPLISHMENTS	PROPOSED MODIFICATIONS TO SCHEDULE OR ACTIVITIES
STR2	Work with City to understand operation/function of District	Met regularly with City Bureau of Maintenance Work with Port of Portland in understanding management of the slough	Continue current program with City, Port of Portland and other agencies IGA w/Maintenance Bureau
STR3	Support Tree Planting Programs Along Waterways	Developed vegetative pilot program at NE 82nd	Continue with existing programs
STR4	Provide available drainage & flood control design manual references to the City of Portland	Refer to SR2	Continue with existing program
PS2	Identify natural areas which may be of joint beneficial **us** quality and quantity	Met with City personnel; provided City personnel with 200 scale aerial maps with river miles	Will continue as needed. Work with Planning Bureau for slough improvements
PS3 ==========	Inventory outfalls discharging into the Upper Columbia Slough Develop and implement procedure for updating maps ========== **PEN 2 SPECIFIC ACTIONS** Inventory outfalls	Inspection of outfalls and update inventory ========== **PEN 2 SPECIFIC ACTIONS** Hydrology and Inventory of System	Continue with program ========== **PEN 2 SPECIFIC ACTIONS** Evaluate Inadequacies of System

Section VII

PORTLAND NPDES THIRD ANNUAL STORMWATER MONITORING COMPLIANCE REPORT

FINAL REPORT

PORTLAND NPDES, THIRD ANNUAL STORMWATER MONITORING COMPLIANCE REPORT

(JULY 1997-JUNE 1998)

Prepared for
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Bureau of Environmental Services
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September 18, 1998

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TABLE OF CONTENTS

Section	Description	Page
1.0	**INTRODUCTION**	1
1.1	Background	1
1.2	Permit Year 3 Activities	3
1.3	Report Organization	3
2.0	**PROGRAM PLANNING/ ANNUAL REPORTING/ REVIEW OF EXISTING WATER QUALITY DATA (TASK 1)**	4
2.1	Compilation of Data from Balch Creek Watershed	5
2.2	Illicit Discharge Elimination Program (IDEP)	6
2.3	Non-Stormwater Discharges	6
2.4	Industrial Stormwater Program	6
3.0	**CONSTRUCTION SITE RUNOFF SAMPLING (TASK 2)**	7
3.1	Construction Site Descriptions	7
3.1.1	Mount Scott Apartment Complex	7
3.1.2	Lexington Hills	8
3.1.3	Forest Heights	9
3.2	Sampling Methods, Events and Analysis	9
3.3	Results	9
3.3.1	Conventional Parameters	10
3.3.2	Total and Dissolved Metals	11
3.3.3	Field Measurements and Petroleum Products	11
3.3.4	Particle Size Distributions	12
3.3.5	QA/QC Review of Analytical Data	12
3.4	Conclusions	13
4.0	**STRUCTURAL BMP MONITORING (TASK 3)**	16
4.1	Facility Description	16
4.1.1	Water Garden	16
4.1.2	Grass Swales	16
4.1.3	Walnut Park Infiltration Facility	17
4.1.4	Parkrose Pilot Project	17
4.1.5	Eco-Roofs	17
4.1.6	Port of Portland Monitoring Activities	18
4.2	Water Garden: Methods, Storm Events, and Analyses	18
4.2.1	Method	18
4.2.2	Storm Events	18
4.2.3	Analyses	19
4.3	Results	19
5.0	**COMPREHENSIVE STREAM MONITORING TO ASSESS STORMWATER IMPACTS (TASK 4)**	20
5.1	Methods	20
5.2	Permit Year 3 Activities	21
6.0	**CONTINUED STORMWATER MONITORING AT EXISTING LAND USE STATIONS (TASK 5)**	23

Section	Description	Page
6.1	Monitoring Location Descriptions	23
6.2	Summary of Wet and Dry Sampling Events	24
6.3	Sample Analysis	24
6.4	Summary of Precipitation Data	24
6.5	Results and Interpretation	25
7.0	**ACWA (TASK 6)**	27
8.0	**REFERENCES**	28

LIST OF TABLES

Table	Description
3-1	Construction Site Sampling Events
3-2	Construction Site Stormwater Constituents Analyzed
3-3	Conventional Parameters
3-4	Total and Dissolved Metals
3-5	Field Measurements and Petroleum Products
3-6	Sub Particle Size Distribution
4-1	Water Garden Site Sampling Events
4-2	Summary of Water Garden Analytical Data for Spring 1998 Monitoring
5-1	Agencies Contacted for Monitoring Data
6-1	Sampling Event Characteristics
6-2	Analytical Parameters for Sampling Events
6-3	Summary of Analytical Data for Fall/Winter 1997/98 Monitoring
6-4	Stormwater Quality Data Summary
6-5	Comparison of Stormwater Data with Acute and Chronic DEQ and EPA Criteria
A-1	Industrial Discharge Elimination Program Data Summary
A-2	Non-Stormwater Discharge Monitoring Data Summary
A-3	Walnut Park Infiltration Facility Data Summary
A-4	Parkrose Bio-Swale Monitoring Project Data Summary
A-5	Port of Portland BMP Monitoring Data Summary

LIST OF FIGURES

Figure	Description
3-1	Mt. Scott Apartments
3-2	Lexington Hills
3-3	Forest Heights
3-4a	Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Conventional Parameters
3-4b	Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Total Heavy Metals
3-4c	Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Dissolved Heavy Metals
4-1	Water Garden
4-2	Bio-Swale
4-3	Walnut Park Infiltration Facility
6-1	Portland Stormwater Sampling Stations
6-2a	Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Total Heavy Metals
6-2b	Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Dissolved Heavy Metals
6-3	Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Conventional Parameters

1.0 INTRODUCTION

This document represents the Third Annual Stormwater Monitoring Compliance Report. The purpose of this report is to comply with the City of Portland's NPDES (National Pollutant discharge Elimination System) reporting requirements stipulated in Permit Schedule B. The information presented is intended to account for stormwater quality monitoring activities conducted by the City of Portland (hereafter referred to as City) and it's co-permittees during Permit Year 3. Specific Port of Portland stormwater related monitoring activities are also included in Section 4.0.

While the information contained in this report summarizes activities from 1991 to 1998, emphasis on the current year's activities are presented in detail. Therefore, the reader may refer to this (most current) monitoring report to review both previous and current monitoring activities and results.

Throughout this report, figures and tables are used to provide summaries of data collected. The current year's data are gray-shaded or highlighted for emphasis.

1.1 Background

During the period from 1991-1996, several cities and agencies in Oregon collected urban stormwater runoff data to meet their NPDES stormwater permit application and permit requirements. Data were collected in order to characterize pollutant concentrations in urban runoff from various land uses. As a significant amount of monitoring has been performed by the different cities and agencies in Oregon, the data were compiled into a single data set to evaluate the need for additional land use monitoring. ACWA (The Oregon Association of Clean Water Agencies), a consortium of these cities and agencies, prepared a report "Analysis of Oregon Urban Runoff Water Quality Monitoring Data Collected From 1991 to 1996", which consisted of a compilation and statistical analysis of available land use-based stormwater monitoring data for the state. Six NPDES jurisdictions in Oregon made contributions to ACWA to conduct this work. The findings of the report indicate that stormwater quality for different land uses is reasonably well characterized by the existing data set, and that additional monitoring is not likely to significantly improve current knowledge in this area.

Based on these findings and in an effort to answer new questions and to increase the cost effectiveness of their monitoring efforts, ACWA petitioned DEQ (Department of Environmental Quality) to allow modifications to the monitoring programs stipulated in NPDES Permit Schedule B. A new monitoring program was subsequently developed and proposed by the City during the second permit year. DEQ approved the new program on February 4, 1998 for the remainder of the permit period to August 2000.

Implementation of the new monitoring program began in Permit Year 2. The new plan builds upon the information produced from previous monitoring efforts and more effectively directs resources toward acquiring new information to support the development and refinement of

stormwater management activities. To this end, six monitoring objectives were established. These are listed below:

Monitoring Program Objectives

1. Compile and interpret stormwater data collected as part of other city watershed monitoring efforts and other ongoing studies. Prepare reports to summarize data results with respect to stormwater impacts and stormwater management activities.

2. Conduct construction site monitoring to evaluate the impact of local construction sites on stormwater quality and to evaluate the effectiveness of construction site best management practices (BMP's).

3. Conduct monitoring to evaluate the effectiveness of BMP's.

4. Conduct comprehensive in-stream stormwater monitoring to evaluate stormwater impacts associated with the chemical, biological, and physical (channel) characteristics of receiving waters.

5. Continue to conduct land use characterization monitoring at four existing stations in order to assess trends.

6. Continue to coordinate/collaborate with state and local jurisdictions (e.g., DEQ, ACWA) to share information and minimize duplication of efforts.

1.2 Permit Year 3 Activities

The activities conducted during Permit Years 2 and 3 were organized according to five principal tasks. These include:

Task 1 - Program Planning/Annual Report/Review of Existing Water Quality Data

Task 2 - Construction Site Runoff Sampling

Task 3 - Structural BMP Monitoring

Task 4 - Comprehensive In-Stream Monitoring to Assess Stormwater Impacts

Task 5 - Continued Stormwater Monitoring at Existing Land Use Stations

Task 6 – Collaboration with Oregon DEQ and ACWA

These tasks were conducted to meet the program objectives described in Section 1.1.

1.3 Report Organization

This annual report is organized into eight Sections. Section 1 provides an introduction, background, and an outline of the Third Annual Stormwater Monitoring Compliance Report. Sections 2 through 7 summarize the progress of Tasks 1 through 6, respectively. Section 8 contains a list of references cited within the report.

2.0 PROGRAM PLANNING/ ANNUAL REPORTING/ REVIEW OF EXISTING WATER QUALITY DATA (TASK 1)

This section summarizes the activities conducted under Task 1 of the City's NPDES monitoring plan. The purpose of this task is to conduct evaluations of stormwater related data if they become available as a result of other program monitoring efforts such as those conducted under the city's watershed programs. The purpose of the evaluations will be to look at the data with respect to stormwater impacts and resulting implications to stormwater management activities.

The monitoring plan identifies a list of several sources of water quality data that could potentially provide useful information for the City's stormwater program. These sources include:

1. Balch Creek: Routine in-stream wet weather and dry weather sampling has been conducted since 1991.

2. Illicit Discharges Elimination Program (IDEP Program): Monitoring is currently being conducted to support the evaluation of unpermitted non-stormwater discharges into the city storm sewer system.

3. Non-Stormwater Discharges: The City is conducting a program to monitor the quality of selected permitted non-stormwater discharges to the storm system.

4. Industrial Stormwater Quality: A stormwater quality database is maintained as part of the City of Portland's industrial stormwater monitoring program.

5. Pesticides: As part of the City's Columbia Slough watershed program, stormwater runoff samples were collected from residential land uses and analyzed for pesticides.

6. Trace elements/Organic compounds: A study has been completed for the Willamette River Basin by the U.S. Geological Survey.

7. Groundwater: Reports have been produced locally concerning the potential impact of stormwater runoff on groundwater quality.

8. Washington DOT: A BMP testing facility organized by the Washington Department of Transportation and Environmental Technology Evaluation Center (EvTech) is currently in the planning stages. The purpose of this facility is to test the effectiveness of four structural BMPs. The facility will contain a flow splitter which will direct a controlled flow to each flow-through BMP. Samples will be collected at the inlet and outlet of each BMP and analyzed for concentrations of constituents commonly found in urban stormwater runoff.

Current Data Collection Programs

During Permit Year 2, data from Balch Creek were evaluated. A summary of the Balch Creek data is repeated below. During Permit Year 3, data were collected for the programs listed in bullets two, three and four above which are also described below. Because these data were collected toward the close of Permit Year 3, further evaluation of the results will be conducted during Permit Year 4. The associated data are provided in Appendix A. The City will continue to track the studies conducted in bullets 5 through 7 and review information in following permit years as it becomes available.

2.1 Compilation of Data from Balch Creek Watershed

In June of 1997 (Permit Year 2), water quality data collected from Balch Creek were compiled and evaluated. Data had been collected from various locations on the creek from 1991 to the present. The data from the watershed's ambient monitoring program were compiled along with stormwater data from the NPDES program. The information was compiled to update and replace the water quality section of the Balch Creek Stormwater Management Plan. The evaluation included:

- Description of the monitoring stations and the analytical parameters
- Discussion of the NPDES sampling performed
- Comparison of wet and dry weather water quality
- Trends analysis
- Review of data from upstream and downstream of the Bones Creek tributary
- Comparison of the data to EPA and DEQ water quality objectives
- Technical appendix of data tables and results of the statistical analyses

The results of the Balch Creek analysis indicated that fecal coliform bacteria had the greatest number of water quality exceedances, and the magnitude of the exceedance correlated well to distance downstream. The downstream section is more heavily used for recreational use, as compared to upstream areas. This information also coincides with an event which occurred in 1996 where visual observations were made of significant amounts of dye in the creek (dye is most often used to detect leaks in the public sanitary sewer system or on-site private systems).

Other potential parameters of concern included nitrate and TSS. The suspected source of the nitrate is septic tank systems and/or potentially the existence of piped sanitary sewer systems with leaks as mentioned above. The data also indicate that TSS concentrations are increasing over time.

Finally, the higher concentrations of most parameters detected during wet weather as compared to dry weather indicated that stormwater runoff contributes a larger portion of the pollutant loads to the Balch Creek Watershed than non-stormwater sources.

2.2 Illicit Discharges Elimination Program (IDEP Program)

Monitoring is currently being conducted to evaluate unpermitted discharges. The project involves sampling dry-weather discharges from approximately 100 outfalls throughout the city. Initial sampling has been completed to identify those outfalls which discharge specific pollutants and to prioritize a subset of outfalls for further investigation. The parameters measured for prioritization include: pH, temperature, fecal coliform, chlorine, and conductivity. Permit Year 3 sampling data and the priority outfalls are included in Appendix A-1.

2.3 Non-Stormwater Discharges

The City is currently monitoring the quality of selected allowable non-stormwater discharges to the storm system. The goal of this project is to identify sources and impacts of these non-stormwater discharges to the separated storm sewer system and receiving waters. For FY 1997-98, the focus was on the quality of air conditioning condensate. The sampling points were located in the Portland Building and at the City's Water Pollution Control Laboratory. The initial data set from this project is included in Appendix A-2.

2.4 Industrial Stormwater Program

The City implements an Industrial Stormwater Program to monitor and control pollutants in stormwater runoff and non stormwater discharges from industrial and commercial facilities. As part of this program, the Industrial Stormwater Section performs grab sampling at industrial sites with NPDES Industrial Stormwater Permits that discharge to the MS4. Analyses include all of the parameters that are in the permit for the facility plus COD and temperature.

During Permit Year 3, 66 stormwater runoff samples were collected at industrial facilities that discharge to the MS4. This data, along with self-monitoring performed by the permittee, is stored and maintained in a database by the City and is used to evaluate compliance with the permit and effectiveness of the facility's Stormwater Pollution Control Plan. The Section also requires that facilities with other NPDES permits that discharge to the MS4 must submit their monitoring reports to the City for tracking purposes. These reports are also required to be submitted to DEQ.

3.0 CONSTRUCTION SITE RUNOFF SAMPLING (TASK 2)

Construction sites have often been identified as major sources of suspended solids in urban stormwater runoff. The City's stormwater management plan contains a BMP which is specifically designed to address the discharge of suspended solids and other pollutants in runoff from construction sites. However, little local data are available on the characteristics of this runoff and the effectiveness of the BMPs. To address this deficiency, the City developed a sampling plan to characterize construction site runoff in Portland.

During Permit Year 2, six construction sites were reviewed and three were selected for sampling based on their physical characteristics, stormwater controls, and degree of development. The monitoring site descriptions, sampling methods and sampling results are provided below.

3.1 Construction Site Descriptions

The three sites chosen for sampling included an apartment complex development at 9598 Mt. Scott Boulevard; Lexington Hills (formerly Hawthorne Ridge), a residential development at 7299 SE 162nd Ave; and Forest Heights, a large multi-phase residential development west of Skyline Boulevard and north of Cornell Road. While the Mt. Scott Apartment construction site is not regulated by DEQ for stormwater, both Lexington Hills and Forest Heights are regulated by DEQ through a 1200z stormwater permit. However, Mt. Scott Apartments is regulated under City Code Title 33, Chapter 535, Johnson Creek Plan District. Similarly, the Lexington Hills and Forest Heights sites are also regulated under City Code Title 33, Planning and Zoning, Chapter 430, Environmental Zone. The three sites are described in more detail below.

3.1.1 Mount Scott Apartment Complex

This site is located just south of Mt. Scott Boulevard near SE 98th Avenue (refer to Figure 3-1 for a plan sketch of the Mt. Scott Apartments).

Two open channels drain the construction site. These channels convey runoff from overland flow sources. One is a westward flowing channel referred to as the E-W stream, the other flows northward and is referred to as the N-S stream. These two channels merge together just upstream of a large culvert, which runs beneath Mt. Scott Boulevard and discharges into Johnson Creek. Samples at the Mt. Scott site are typically collected at four locations: one upstream and one downstream location along both the E-W stream and N-S stream.

In early 1997, construction began at the multi-building apartment complex and was approximately 50% percent complete as of late spring 1997. It was noted that extensive erosion had occurred during this period and construction site BMPs (such as silt fences) were not properly installed. Construction continued through the fall of 1997 and winter of 1998.

As of May 1998, the construction and grading was approximately 80% complete. An access road and retaining wall was being constructed along the northeast side of the property. The soil near the retaining wall construction (draining to the E-W stream) was exposed without erosion controls, however, a dense vegetated buffer was in place adjacent to the wall. The upland sediment pond located in the southeast corner of the property drains westward into the N-S stream. While this pond was in good condition, it had very little flow directed to it. Several large mounds of excavation materials (containing soil, rock and pavement, apparently from the road construction) were placed within the lower grassed area at the northwest side of the property without silt controls; the existing grass was serving as a buffer between the debris and N-S stream.

The pollution control practices at this site include silt fences, straw bales, and tarps. During Permit Year 3 sampling, field observations indicated severe erosion and dumping of concrete and gravel along the banks of the east-west channel. As of May 1998, many of the original silt fences were overgrown with tall grass while new fences were in place for approximately 80% of the exposed soil.

3.1.2 Lexington Hills

This site, formerly called Hawthorne Ridge, is located on the west side of SE 162nd Avenue, approximately 1/4 mile south of SE Foster Road (Refer to Figure 3-2 for a plan sketch of the Lexington Hills site).

During the spring of 1997, two temporary open channels conveyed flow to two separate sedimentation ponds for treatment prior to the discharge into Kelley Creek. Sampling stations for these ponds are located at the pond discharge points adjacent to SE 162nd Avenue.

In the spring of 1997, construction began at the large single-family residential housing development. During the spring and summer sampling events, the construction was estimated to be 5% complete. During the fall of 1997 and winter of 1998, construction continued and was estimated to be 15% complete by May 1998. Roads had been built and the piped storm drainage was in place to convey stormwater to the north and south ponds.

In addition to the sedimentation ponds, erosion control measures used at the site included silt fencing and a straw cover on exposed soils. During Permit Year 3 sampling, field observations indicated turbid conditions at the outfalls from these ponds. During a subsequent site visit in May 1998, the ponds were observed to have moderate silt accumulation at the inlets and outlets. While silt fences were in place at nearly all of the lower lots, soil mounds and grading in upland areas of the property were often exposed without silt fences or other erosion controls. At most inlets however, mesh bags of rock and straw were in place in an attempt to shield drop inlets from heavy debris and large sediment.

3.1.3 Forest Heights

This site is located in the Phase 7 East Region of the Forest Heights Estates development. (Refer to Figure 3-3 for a plan sketch of the Forest Heights site).

Runoff flows overland to streets and into conventional drop inlets where it is conveyed through pipes to a 4-acre detention pond located south of Thompson Road on the east side of Miller Road. Samples are collected at a manhole located along NW Bella Vista Drive and at the pond outfall.

During the spring of 1997 monitoring, construction appeared to be approximately 50% complete. The grading activities had been initiated and the roads had been constructed. Construction continued during the fall of 1997 and winter of 1998 and appeared to be approximately 85% complete as of May, 1998.

Erosion control measures used at Forest Heights include silt fencing, a straw cover over exposed soils, and a sedimentation pond. Additional measures, such as mesh bags, had been placed in an attempt to shield the inlets from large debris. Field notes indicated that these shields had failed during the October 97 monitoring event. During both Permit Year 2 and 3 sampling, field observations also indicated that both the manhole and pond appeared to be impacted with large amounts of sediment from the development. During a site visit in May 1998, silt fences were in place in the lower, mostly complete areas of the site, while soil at upland areas was mostly exposed, without silt fences. It appeared that many of the controls have been removed in preparation for sod installation and/or further grading.

3.2 Sampling Methods, Events and Analysis

Grab samples were collected at each of the sites either by directly filling the sample bottles from flow streams or by transferring the sample from a clean stainless steel bailer.

Both wet and dry events were sampled at the construction sites. A summary of the event date, type, and rainfall depth preceding the collection of each sample is provided in Table 3-1.

During each sampling event, an attempt was made to collect one sample at each of the four sites at Mt. Scott Apartments, and 2 sites at Lexington Hills and Forest Heights. At each site, samples were collected using two 1-gallon clear glass bottles and one 1-liter preserved amber bottle. The samples were then analyzed for the constituents shown in Table 3-2.

3.3 Results

The analytical results from the construction site samples are organized according to four classes of parameters:

- Conventionals
- Total and Dissolved Metals
- Field Measurements and Petroleum Products
- Particle Size Distributions

The results for each parameter are presented in Tables 3-3 through 3-6. Figure 3-4 illustrates a relative comparison of the concentrations observed at the land use characterization sites and construction sites.

To provide a relative evaluation of the quality of construction site stormwater runoff, dissolved metal and bacteria concentrations were compared to existing in-stream water quality criteria as specified in the Oregon State Statutes to provide an indication of the potential for construction runoff to impair receiving water quality. The in-stream fresh water quality criteria for bacteria and dissolved metals are presented in the EPA (US Environmental Protection Agency) Quality Criteria for Water (1986). EPA's water quality objectives for metals are based on the dissolved fraction, because dissolved metals are considered to be more biologically available than metals associated with particulates. In-stream criteria are only valid for comparisons to in-stream data. Criteria comparisons to in-pipe data are provided for relative comparative purposes only. As of the draft of this report, EPA has not established water quality standards or criteria for TSS or total oil and grease. However, benchmarks of 130 mg/l for TSS and 10 mg/l for total oil and grease were established by the DEQ (Oregon Department of Environmental Quality) for the NPDES general stormwater 1200-Z permits. These DEQ benchmarks were used here for comparison purposes only.

For dissolved metals, there are both chronic and acute criteria. Chronic criteria are used for comparisons with long term exposure (generally more than 24-hours) while the acute criteria are for short term exposure (generally less than 24-hours). In general, both the acute and chronic criteria may not be exceeded more than once every 3 years. In this report, wet weather data were compared to the acute criteria while the dry-weather measurements were compared with chronic criteria. This distinction was based on the assumption that storms produce short term water quality effects while dry-weather samples are representative of long term concentrations.

3.3.1 Conventional Parameters

The conventional parameters include TSS, BOD, COD, bacteria and nutrients. With the exception of bacteria, the results are presented in Table 3-3 and Figure 3-4a. Bacteria results are presented in Table 3-5. Figure 3-4a presents the minimum, maximum, median and base flow concentrations. The concentration range is represented by the vertical line. Land use data are presented for comparison with the construction site data. As shown, 13 out of the 24 samples (54%) exceeded the TSS benchmark during wet weather. All the exceedances occurred during wet weather. While all wet weather TSS samples at the Forest Heights site exceeded the benchmark, three TSS exceedances at the Mount Scott site occurred at the middle and downstream sampling sites of the N-S stream. Three of the four wet weather samples from the Lexington Hills site exceeded the TSS benchmark.

Elevated TSS, COD, total phosphorus and TKN concentrations were observed at all sites during the 4 storms when compared to the dry weather conditions. Levels of orthophosphate, nitrate, and ammonia were within the same range when comparing dry weather and wet weather results.

When compared to concentrations observed from land use monitoring stations shown in Figure 3-4a, Forest Heights generally had high concentrations of TSS, TKN and phosphorous. While concentrations of most conventional parameters at Mt. Scott apartments were low or equivalent to the land use stations, concentrations of E coli were higher than any of the land uses monitored. Concentrations at Lexington Hills were in the range of the land use stations for most parameters with the exception of phosphorous and TSS which were somewhat high when compared to many of the land use stations.

Bacteria counts were below criteria at all sites except for Mt. Scott during the February 6, 1997 event when both the E-W and N-S stream exceeded E. coli criteria of 406 CFU/100ml by as much as 5594 CFU/100ml.

3.3.2 Total and Dissolved Metals

The analytical results for total and dissolved metals are displayed in Table 3-4 and Figures 3-4b and 3-4c. As shown, the metal results are most noteworthy because of the large number of non-detects (concentrations less than reporting limits) during the spring of 1997. During this period, total and dissolved metals were detected mostly in wet weather samples collected at Forest Heights. During the fall of 1997 and winter of 1998, metal concentrations (with the exception of cadmium and some dissolved zinc results), were above the detection limit for all sites. This change in results appears to be due to the fact that the detection limit was lowered for the analyses conducted during the fall of 1997 and spring of 1998.

Dissolved metals concentrations in samples collected in dry weather were compared to the chronic criteria while the wet weather samples were compared to the acute criteria. Two exceedances were observed at the north-south and east-west downstream sampling stations for dissolved copper during the fall 1997 storm event at Mt. Scott Apartments.

Figures 3-4b and 3-4c also present a comparison between the construction sites and the land use data. There is a reasonable amount of variability in the concentrations among all the land use stations. With the exception of total copper, the construction site data appear to be comparable, given this variability. The maximum total copper concentration at the Forest Heights site was higher than any maximum concentration measured at the land use stations.

3.3.3 Field Measurements and Petroleum Products

The field measured parameters and petroleum products results are displayed in Table 3-5. Field measurements include temperature, pH and conductivity while petroleum products include non-polar, polar and total oil and grease. Concentrations of total oil and grease (petroleum products) are compared to land use data in Figure 3-4a. As shown, there are a

large number of non-detects for the petroleum constituents. At Mt. Scott, four out of nine samples along the N-S stream had detectable concentrations of petroleum products while only one out of eight samples along the E-W stream had a detectable concentration. At Forest Heights, two out of five samples from the manhole had detectable concentrations. At Lexington Hills, one out of three samples from the north pond had a detectable concentration. Also, note that pH values were generally higher for dry weather samples, and temperatures were generally higher for wet weather samples. The only water quality standard available for this class of parameters is the fresh water pH benchmark (DEQ, NPDES general stormwater permit, 1997) which specifies an acceptable range (5.5 - 9.0). All the field measurements were within the benchmark range for pH. Likewise, there were no exceedances for total oil and grease based upon DEQ NPDES general stormwater benchmark criteria of 10 mg/l.

When compared to concentrations observed at the land use monitoring stations shown in Figure 3-4a, concentrations of oil and grease observed at each of the construction sites were relatively low.

3.3.4 Particle Size Distributions

Particle size distributions are displayed in Table 3-6. Size distributions are broken down into six particle size distributions ranging from silt to sand. As shown, most particles in all of the samples were within fine silt size range between 5-20 microns, accounting for up to 98% of the counts per 100 milliliters in the Forest Heights pond. The second largest fraction was silt in the 20-40 micron size range, accounting for up to 27% of the count per 100 milliliters in the Mount Scott N-S stream. The literature indicates that it is very difficult to effectively remove particles less than 10 microns in size (Watershed Protection Techniques, 1997).

Table 3-6 also lists the relative percentage of particle counts within each particle size range. Based on the counts observed at the Forest Heights manhole and pond exit, the pond appears to be effective at reducing suspended solids, especially within the 20-60 micron particle size range. The particle size range where counts appeared to slightly increase was between 80 and 100 microns.

3.3.5 QA/QC Review of Analytical Data

A Quality Assurance/Quality Control (QA/QC) review of the analytical data was performed by a qualified chemist. The data were reviewed in compliance with U.S. EPA National Functional Guidelines for Organic and Inorganic Data Review (1994). The data were reviewed for exceeding analytical method holding times, potential sample contamination, accuracy, and precision.

During Permit Year 2, low levels of metals were detected in the laboratory method blanks, indicating potential false-positive sample results due to laboratory contamination. Therefore, metal concentrations in the samples were qualified by raising the sample reporting limits to the concentrations detected in the samples, for sample results less than five times the associated method blank concentration. Cases where sample reporting limits have been

raised are indicated on Table 3-4 with a "U" qualifier. The samples collected on March 14, 1997 were analyzed outside the prescribed method holding times for nitrate and oil and grease. Therefore, these results should be considered estimated values, and detected results have been qualified with a "J", and non-detects have been qualified with a "UJ".

Other qualified sample results were due to exceeded data quality objectives for analytical accuracy. All qualified sample results are indicated on Tables 3-3, 3-4, 3-5 and 3-6 with their appropriate qualifiers.

During Permit Year 3, the City of Portland's Water Quality Laboratory performed the analysis and QA/QC on all stormwater samples collected for the City's NPDES Permit. The QA/QC procedures and criteria followed at the lab were essentially equivalent to those applied to samples analyzed during Permit Year 2. The laboratory maintains all references for EPA Methods and Standard Analytical Methods listed in Table 3-2.

Based upon QA/QC procedures and results, the data quality for Permit Year 3 was acceptable, with no limitations for use.

3.4 Conclusions

Based on the three construction sties that were sampled, it appears that regulation through a DEQ 1200z permit or City ordinance does not ensure that BMPs are properly installed or maintained or that installed erosion control measures are effective. Certain pollutants consistently exceed DEQ benchmarks and/or criteria. The City compared the TSS load from one storm event from 15 acres of Forest Heights to the expected annual TSS load from 15 acres of the Balch Creek watershed and found that the Forest Heights storm event TSS load was 4.5 times higher than the annual Balch Creek TSS load. Therefore, total loadings from one construction site are likely to exceed many years of total loadings from developed land use types and several more years of total loadings from vacant land. Even where treatment ponds were installed, the particle size of TSS at these Portland sites was predominantly less than 20 microns which are the most difficult to contain/treat indicating that good planning and erosion control measures are needed to minimize soil disturbances.

From this analysis and in the interest of reducing impacts from these (construction) types of activities, the following recommendations are made:

- Better educate contractors
- Increase inspection procedures and notice to contractors
- Encourage site development methods that prevent/minimize soil disturbance
- Continue to increase research of better erosion control, prevention, and treatment methods

Turbidity Results

The water quality criterion for turbidity is provided in the Oregon Administrative Rules (OAR) Chapter 340, Division 41 as follows:

No more than a 10 percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:

(A) Emergency activities: Approval coordinated by DEQ with the Department of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare.

(B) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of Section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 141-85-100 et seq. (Removal and Fill Permits, Division of State Lands) with limitations and conditions governing the activity set forth in the permit or certificate.

The turbidity results from Lexington Hills are provided in Table 3-7. As shown, the highest minimum, mean and maximum turbidity values were all recorded at the sedimentation pond outfall. The table also provides a comparison between the turbidity results from Mitchell Creek upstream of the pond outfall (site #3) and Mitchell Creek downstream from the pond outfall (site #4). Thirty out of thirty-five samples (or 86% of the samples) showed an increase in turbidity downstream from the pond outfall. The average percent increase in turbidity was 61% with 23 out of 35 samples (or 66% of the samples) exceeding the maximum allowable 10% increase in instream turbidity as described above.

Temperature Results

The water quality criterion for temperature is provided in the Oregon Administrative Rules (OAR) Chapter 340, Division 41 as follows:

(A) To accomplish the goals identified in OAR 340-041-0120(11), unless specifically allowed under a Department-approved surface water temperature management plan as required under OAR 340-041-0026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed:

(i) In a basin for which salmonid fish rearing is a designated beneficial use, and in which surface water temperatures exceed 64.0°F (17.8°C);

***

(iii) In the Willamette River or its associated sloughs and channels from the mouth to river mile 50 when surface water temperatures exceed 68.0°F (20.0°C);

***

Note: *** indicates text that was not repeated here due to the fact that it did not apply.

Temperature results are provided in Table 3-8. None of the Mitchell Creek instream temperatures upstream from the sedimentation pond exceeded the 17.8 or 20 degree celcius limits listed above. However, 6 of 28 samples (or 21% of the samples) in Mitchell Creek downstream of the sedimentation pond had temperatures greater than 17.8 degrees C. The average increase in temperature was 9% when comparing samples in Mitchell Creek from upstream and downstream of the sedimentation pond outfall.

3.5 Conclusions

Based on the three construction sties that were sampled, it appears that regulation through a DEQ 1200z permit or City ordinance does not ensure that BMPs are properly installed or maintained or that installed erosion control measures are effective. Certain pollutants consistently exceed DEQ benchmarks and/or criteria. The City compared the TSS load from one storm event from 15 acres of Forest Heights to the expected annual TSS load from 15 acres of the Balch Creek watershed and found that the Forest Heights storm event TSS load was 4.5 times higher than the annual Balch Creek TSS load. Therefore, total loadings from one construction site are likely to exceed many years of total loadings from developed land use types and several more years of total loadings from vacant land. Even where treatment ponds were installed, the particle size of TSS at these Portland sites was predominantly less than 20 microns which are the most difficult to contain/treat indicating that good planning and erosion control measures are needed to minimize soil disturbances.

From this analysis and in the interest of reducing impacts from these (construction) types of activities, the following recommendations are made:

- Better educate contractors
- Increase inspection procedures and notice to contractors
- Encourage site development methods that prevent/minimize soil disturbance
- Continue to increase research of better erosion control, prevention, and treatment methods

Table 3-1 Construction Site Sampling Events

Date	Event Type	Forest Heights		Mt. Scott		Lexington Hills	
		Hydra Gauge 58		Hydra Gauge 14		Hydra Gauge 145	
		72-Hour Antecedent Rainfall (inches)	24-Hour Antecedent Rainfall (inches)	72-Hour Antecedent Rainfall (inches)	24-Hour Antecedent Rainfall (inches)	72-Hour Antecedent Rainfall (inches)	24-Hour Antecedent Rainfall (inches)
3/14/97	Dry	0.39	0.01	0.56	0.08	0.75	0.02
4/14/97	Wet	0.16	0.16	0.44	0.44	0.01	0.01
4/19/97	Wet	0.62	0.47	0.21	0.14	0.24	0.00
5/28/97	Wet	0.30	0.30	0.11	0.00	0.16	0.01
10/8/97	Wet	0.15	0.13	0.36	0.24	0.31	0.27
2/20/98	Wet	0.56	0.30	0.35	0.28	0.42	0.28

* Shaded values represent information collected during Permit Year 3.

Table 3-2 Construction Site Stormwater Constituents Analyzed

Constituent	Detection Limit	Analytical Method	Units
Conductivity	1	SM 2510 B	umhos/cm
Dissolved Oxygen (DO)	0.1	SM 4500-O	mg/l
PH	0.1	SM 4500-H	pH Units
Temperature	0.1	SM 2550 B	Celsius
Ammonia-Nitrogen	0.02	EPA 350.1	mg/l
Biological Oxygen Demand (BOD)	2	SM 5210 B	mg/l
Chemical Oxygen Demand* (COD)	1	SM 5220 D	mg/l
E. Coli	2	SM 9222 G	#/100ml
Hardness	1	SM 2340 C	mg CACO3/l
Nitrate-Nitrogen	0.1	EPA 300.0	mg/l
Ortho Phosphate	0.02	EPA 365.1	mg/l
Total Phosphorous	0.03	EPA 365.1	mg/l
Total Suspended Solids (TSS)	1	SM 2540 D	mg/l
Cd (Total)	0.0001	EPA 200.8	mg/l
Cu (Total)	0.0002	EPA 200.8	mg/l
Pb (Total)	0.0001	EPA 200.8	mg/l
Zn (Total)	0.0005	EPA 200.8	mg/l
Cd (Dissolved)	0.00001	EPA 200.8	mg/l
Cu (Dissolved)	0.00002	EPA 200.8	mg/l
Pb (Dissolved)	0.00001	EPA 200.8	mg/l
Zn (Dissolved)	0.00005	EPA 200.8	mg/l
Total Oil and Grease	0.7	SM 5520 C/F	mg/l
Total Petroleum Hydrocarbons (TPH)	0.7	SM 5520 C/F	mg/l
Polar Oil and Grease	0.7	SM 5520 C/F	mg/l
Particle Size Distribution (microns)		ASTM D422	#/100ml

* Laboratory analysis of COD was discontinued in 1997-98.

Table 3-3
Conventional Parameters

Sample Date	Sampling Location	Sample Type		TSS mg/l		BOD mg/l	COD mg/l	Total Phosphorus mg/l	Ortho-Phosphate mg/l	Total Kjeldahl Nitrogen mg/l	Nitrate-N mg/l		Ammonia-N mg/l
			DL	1		2	1	0.03	0.02	0.2	0.1		0.02
	Forest Heights												
3/14/97	Manhole	Dry		37		<3	<1	0.16	0.07	<0.2	0.5	J	<0.2
4/19/97	Manhole	Wet		**5700**	J	11	110	4.70	1.70	5.1	0.1	J	0.30
5/28/97	Manhole	Wet		**6200**		5	190	5.80	0.12	4.8	0.1		<0.2
5/28/97	pond exit	Wet		**4500**		10	150	2.50	0.07	5.4	0.3		<0.2
10/9/97	Manhole	Wet		**846**		11	280	1.92	0.06		0.3		0.08
10/9/97	pond exit	Wet		**563**		3	73	0.74	0.10		<0.1		0.07
2/6/98	Manhole	Wet		**460**		<2		0.69	0.04		<.1		<.02
2/6/98	pond exit	Wet		**212**		<2		0.57	0.06		<.1		<.02
			Med	**704.5**		10	**150**	1.33	0.07	5.1	0.3		0.08
	Lexington Hills												
3/14/97	North Pond	Dry		9		<3	<1	0.08	0.02	<0.2	0.7	J	<0.2
3/14/97	South Pond	Dry		20		17	3	J 0.22	0.06	<0.2	0.9		<0.2
10/9/97	North Pond	Wet		**860**		3	73	1.07	0.04		1.8		0.20
10/9/97	South Pond	Wet		**1170**		2	80	3.54	0.03		1.2		0.06
2/6/98	North Pond	Wet		**186**		<2			0.03		0.5		<.02
2/6/98	South Pond	Wet		100		<2			0.03		5.5		0.08
			Med	**143**		3	73	0.65	0.03	NA	1.0		0.08
	Mount Scott												
3/14/97	E-W Stream: U/S	Dry		9		<3	<1	0.03	<0.01	<0.2	0.8	J	<0.2
3/14/97	E-W Stream: D/S	Dry		4		5	<1	0.01	0.01	<0.2	0.8	J	<0.2
3/14/97	N-S Stream: U/S	Dry		5		<3	<1	<0.01	0.02	<0.2	0.7	J	<0.2
3/14/97	N-S Stream: D/S	Dry		4		<3	<1	0.06	0.03	<0.2	0.7	J	<0.2
4/14/97	E-W Stream: U/S	Wet		82		5	21	0.15	0.03	0.3	0.4		<0.2
4/14/97	E-W Stream: D/S	Wet		88		6	20	0.15	0.02	0.3	0.4		<0.2
4/14/97	N-S Stream: U/S	Wet		17		7	14	0.08	0.02	0.3	0.4		<0.2
4/14/97	N-S Stream: D/S	Wet		**530**		12	61	0.34	0.10	1.0	0.2		<0.2
4/14/97	N-S Stream: MID	Wet		**760**		9	36	0.36	0.04	0.6	0.3		<0.2
10/9/97	E-W Stream: U/S	Wet		95.5		3	30	0.21	0.03		0.2		0.05
10/9/97	E-W Stream: D/S	Wet		64		2	25	0.15	0.02		<0.1		0.05
10/9/97	N-S Stream: U/S	Wet		115		4	34	0.26	0.05		<0.1		0.06
10/9/97	N-S Stream: D/S	Wet		**140**		3	52	0.50	0.04		<0.1		0.03
2/6/98	E-W Stream: U/S	Wet		33		<2		0.07	<.02		1.0		<.02
2/6/98	E-W Stream: D/S	Wet		22		<2		0.08	<.02		0.9		<.02
2/6/98	N-S Stream: U/S	Wet		15		<2		0.12	<.02		0.6		<.02
2/6/98	N-S Stream: D/S	Wet		14		<2		0.11	<.02		0.5		<.02
			Med	33		5	30	0.14	0.03	0.3	0.5		0.05

DL = detection limit.

Bold results designate samples which exceed the DEQ NPDES 1200-Z permit bench mark for TSS of 130 mg/L.

J = The result should be considered an estimated value based on the QA/QC review.

All units in mg/L unless otherwise noted

Shaded values represent information collected during permit year 3.

Median concentrations (Med) are calculated for all values at or above the detection limit

Table 3-4
Total & Dissolved Metals

Sample Date	Sampling Location	Sample Type		Cadmium (mg/l) Total		Cadmium (mg/l) Dissolved		Copper (mg/l) Total		Copper (mg/l) Dissolved		Lead (mg/l) Total		Lead (mg/l) Dissolved		Zinc (mg/l) Total		Zinc (mg/l) Dissolved		Total Hardness (mg/l)
			DL	0.0001		0.0001		0.0002		0.0002		0.0001		0.0001		0.0005		0.0005		1.0
	Forest Heights																			
3/14/97	Manhole	Dry		<0.0002		<0.0002		<0.007	U	<0.002	U	<0.0022	U	<0.0004		<0.023	U	<0.007	U	75
4/19/97	Manhole	Wet		0.0057		0.0005	J	0.0450		<0.006	U	0.0640		<0.0004		0.3000	J	<0.017	U	26
5/28/97	Manhole	Wet		0.0007		<0.0002		0.1900		0.0018		0.0730		<0.0004		0.5500		0.0130		28
5/28/97	pond exit	Wet		0.0005		0.0004		0.1000		0.0034		0.0490		0.0010		0.3500		0.0250		25
10/9/97	Manhole	Wet		0.0002		0.0001		0.0965		0.0029		0.0355		0.0004		0.3300		0.0129		84
10/9/97	pond exit	Wet		<0.0001		<0.0001		0.0249		0.0034		0.0070		0.0003		0.0870		<0.005		63
2/6/98	Manhole	Wet		0.0002		<0.0001		0.0225		0.0038		0.0111		0.0009		0.0625		0.0072		34
2/6/98	pond exit	Wet		<0.0001		<0.0001		0.0104		0.0030		0.0072		0.0007		0.0311		0.0061		38
			Med	0.0005		0.0004		0.0450		0.0032		0.0355		0.0007		0.3000		0.0129		35.8
	Lexington Hills																			
3/14/97	North Pond	Dry		<0.0002		<0.0002		<0.002	U	<0.001		<0.0009	U	<0.0004		<0.043	U	<0.025	U	12
3/14/97	South Pond	Dry		<0.0002		<0.0002		<0.007	U	<0.003	U	<0.0025	U	<0.0004		<0.029	U	<0.007	U	34
10/9/97	North Pond	Wet		<0.0001		<0.0001		0.0385		0.0030		0.0137		0.0004		0.0770		<0.005		36
10/9/97	South Pond	Wet		<0.0001		<0.0001		0.1050		0.0024		0.0394		0.0004		0.2020		<0.005		48
2/6/98	North Pond	Wet		<0.0001		<0.0001		0.0157		0.0022		0.0944		0.0003		0.0284		0.0026		41
2/6/98	South Pond	Wet		<0.0001		<0.0001		0.0142		0.0030		0.0661		0.0005		0.0227		0.0041		65
			Med	NA		NA		0.0271		0.0027		0.0528		0.0004		0.0527		0.0034		39
	Mt. Scott																			
3/14/97	E-W Stream: U/S	Dry		<0.0002		<0.0002		<0.003	U	<0.007	U	<0.0009	U	<0.0004		<0.012	U	<0.007	U	32
3/14/97	E-W Stream: D/S	Dry		<0.0002		<0.0002		<0.002	U	<0.006	U	<0.0007	U	<0.0008	U	<0.009	U	<0.008	U	33
3/14/97	N-S Stream: U/S	Dry		<0.0002		<0.0002		<0.002	U	<0.002	U	<0.0006	U	<0.0004		<0.013	U	<0.013	U	28
3/14/97	N-S Stream: D/S	Dry		<0.0002		<0.0002		<0.002	U	<0.002	U	<0.0007	U	<0.0004		<0.01	U	<0.008	U	-
4/14/97	E-W Stream: U/S	Wet		<0.0002		<0.0002		<0.006	U	<0.004	U	0.0039		<0.0013	U	0.0300		<0.026	UJ	30
4/14/97	E-W Stream: D/S	Wet		<0.0002		<0.0002		<0.006	U	<0.004	U	0.0031		0.0006		<0.02	U	<0.021	UJ	38
4/14/97	N-S Stream: U/S	Wet		<0.0002		<0.0002		<0.004	U	<0.004	U	<0.0007	U	<0.0008	U	<0.02	U	<0.017	UJ	31
4/14/97	N-S Stream: D/S	Wet		<0.0002		<0.0002		0.0120		<0.005	U	0.0041		<0.0006	U	0.0400		<0.014	UJ	46
4/14/97	N-S Stream: MID	Wet		<0.0002		<0.0002		0.0110		<0.004	U	0.0054		<0.0007	U	0.0300		<0.015	UJ	30
10/9/97	E-W Stream: U/S	Wet		<0.0001		<0.0001		0.0127		0.0030		0.0066		0.0005		0.0256		0.0071		36
10/9/97	E-W Stream: D/S	Wet		<0.0001		<0.0001		0.0075		**0.0123**		0.0025		0.0005		0.0153		<0.005		42
10/9/97	N-S Stream: U/S	Wet		<0.0001		<0.0001		0.0050		0.0020		0.0034		0.0002		0.0523		0.0055		38
10/9/97	N-S Stream: D/S	Wet		<0.0001		<0.0001		0.0117		**0.0140**		0.0054		0.0004		0.0852		<0.005		23
2/6/98	E-W Stream: U/S	Wet		<0.0001		<0.0001		0.0033		0.0015		0.0033		0.0005		0.0106		0.0039		36
2/6/98	E-W Stream: D/S	Wet		<0.0001		<0.0001		0.0024		0.0015		0.0018		0.0005		0.0070		0.0036		35
2/6/98	N-S Stream: U/S	Wet		<0.0001		<0.0001		0.0015		0.0028		0.0015		0.0007		0.0100		0.0099		30
2/6/98	N-S Stream: D/S	Wet		<0.0001		<0.0001		0.0028		0.0029		0.0013		0.0007		0.0084		0.0074		30
			Med	NA		NA		0.0063		0.0028		0.0033		0.0005		0.0256		0.0063		33

DL = Current Detection Limit.
U = The reporting limit has been raised due to possible laboratory contamination detected in the laboratory blanks.
J = The result should be considered an estimated value based on the QA/QC review.
All units in mg/L unless otherwise noted.
Bold values exceed acute toxicity criteria
Shaded values represent information collected during permit year 3.
Median concentrations (Med) are calculated for all values at or above the detection limit

Table 3-5
Field Measurements, Petroleum Products, and Bacteria

Sample Date	Sampling Location	Sample Type		pH	Conductance umhos	Temperature Deg. Celcius	Total Oil and Grease mg/l		Total Petroleum Hydrocarbons mg/l		Polar Oil and Grease mg/l		E. Coli CFU/100 ml
			DL	0.1	1	0.1	0.6-0.7		0.6-0.7		0.6-0.7		2
	Forest Heights												
3/14/97	Manhole	Dry		8.5	182.6	9.3	0.6	J	<0.5	UJ	<0.5	UJ	
4/19/97	Manhole	Wet		-	-	-	<0.5		<0.5		<0.5		
5/28/97	Manhole	Wet					<0.5		<0.5		<0.5		
5/28/97	Pond Exit	Wet					<0.5		<0.5		<0.5		
10/9/97	Manhole	Wet		9.7	50.0	12.0	1.4		1.0		<0.7		
10/9/97	Pond Exit	Wet		8.6	142.0	12.3	<0.7		<0.7		<0.7		
2/6/98	Manhole	Wet		6.5	74.7	7.9	<0.7				<0.7		180
2/6/98	Pond Exit	Wet		7.2	85.1	7.9	<0.8				<0.8		270
			Med	8.5	85.1	9.3	1.0		1.0		NA		225.0
	Lexington Hills												
3/14/97	North Pond	Dry		8.1	38.3	9.7	0.9	J	0.6	J	<0.5	UJ	
3/14/97	South Pond	Dry		8.0	96.9	7.3	<0.5	UJ	<0.5	UJ	<0.5	UJ	
10/9/97	North Pond	Wet		7.5	76.0	13.0	<0.7		<0.7		<0.7		
10/9/97	South Pond	Wet		7.7	49.0	12.7	<0.7		<0.7		<0.7		
2/6/98	North Pond	Wet		7.0	86.0	9.2	<0.6				<0.6		52
2/6/98	South Pond	Wet		7.1	158.0	9.1	<0.7				<0.7		340
			Med	7.6	81.0	9.5	0.9		0.6		NA		196.0
	Mount Scott												
3/14/97	E-W Stream: U/S	Dry		8.1	90.9	7.8	<0.5	UJ	<0.5	UJ	<0.5	UJ	
3/14/97	E-W Stream: D/S	Dry		8.2	91.1	8.3	<0.5	UJ	<0.5	UJ	<0.5	UJ	
3/14/97	N-S Stream: U/S	Dry		8.2	82.5	8.8	1.4	J	0.6	J	0.8	J	
3/14/97	N-S Stream: D/S	Dry		8.4	83.1	10.5	0.6	J	<0.5	UJ	<0.5	UJ	
4/14/97	E-W Stream: U/S	Wet		7.6	78.0	10.8	0.5		<0.5		0.5		
4/14/97	E-W Stream: D/S	Wet		7.4	118.0	10.8	<0.5		<0.5		<0.5		
4/14/97	N-S Stream: U/S	Wet		7.6	72.0	10.6	<0.5		<0.5		<0.5		
4/14/97	N-S Stream: D/S	Wet		7.8	96.0	11.6	0.8		<0.5		0.8		
4/14/97	N-S Stream: MID	Wet		-	-	-	<0.5		<0.5		<0.5		
10/9/97	E-W Stream: U/S	Wet		8.1	82.0	13.5	<0.6		<0.6		<0.6		
10/9/97	E-W Stream: D/S	Wet		8.2	100.0	13.4	<0.7		<0.7		<0.7		
10/9/97	N-S Stream: U/S	Wet		8.0	96.0	11.9	<0.6		<0.6		<0.6		
10/9/97	N-S Stream: D/S	Wet		7.8	50.0	13.5	0.6		<0.6		<0.6		
2/6/98	E-W Stream: U/S	Wet		7.0	93.0	8.7	<0.7				<0.7		**1300**
2/6/98	E-W Stream: D/S	Wet		7.0	89.0	8.8	<0.7				<0.7		**2000**
2/6/98	N-S Stream: U/S	Wet		6.9	80.0	9.4	<0.7				<0.7		**5100**
2/6/98	N-S Stream: D/S	Wet		7.2	76.0	8.9	<0.7				<0.7		**6000**
			Med	7.8	86.1	10.6	0.6		0.6		0.8		**3550**

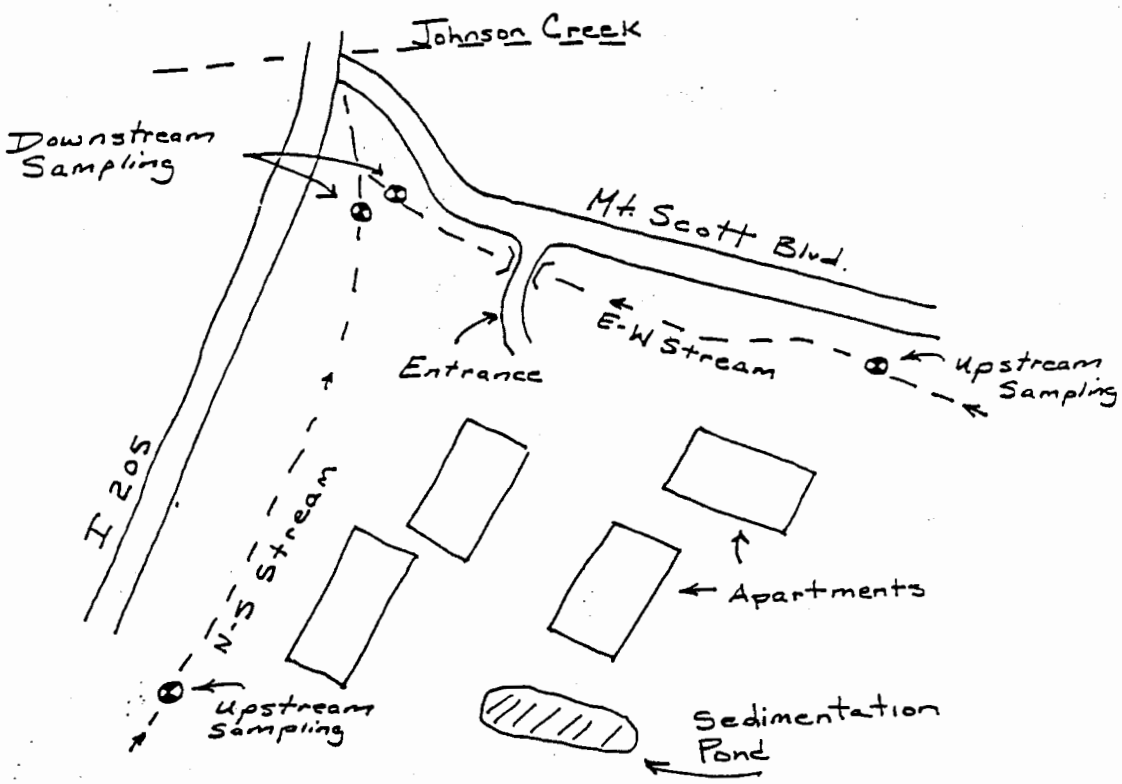
DL = Current Detection Limit.
U = The reporting limit has been raised due to possible laboratory contamination detected in the laboratory blanks.
J = The result should be considered an estimated value based on the QA/QC review.
All units in mg/L unless otherwise noted.
Bold values exceed acute toxicity criteria
Shaded values represent information collected during permit year 3.
Median concentrations (Med) are calculated for all values at or above the detection limit

Table 3-6
Sub Particle Size Distribution

Percent by Count Per Size Range										
Sample Date	Sampling Location	Sample Type	Particles Size Range (microns) 5-20 fine silt	20-40 silt	40-60 fine sand	60-80 fine sand	80-100 fine sand	>100 sand	Parts/100ml Total
	Forest Heights								
4/19/97	Manhole		79%	12%	4%	3%	1%	1%	8777397
5/28/97	Manhole		79%	14%	4%	2%	0%	1%	20459000
2/6/98	Manhole	Wet	93%	5%	2%	0%	0%	NA	2670000
			Avg: 84%	10%	3%	2%	1%	1%	
5/28/97	Pond		97%	1%	1%	1%	0%	0%	12260700
2/6/98	Pond	Wet	98%	1%	0%	0%	0%	NA	1700000
			Avg: 98%	1%	1%	1%	0%	0.0%	
	Lexington Hills								
2/6/98	North Pond	Wet	93%	4%	1%	1%	0%	1%	513000
2/6/98	South Pond	Wet	83%	10%	5%	1%	0%	0%	451000
			Avg: 88%	7%	3%	1%	0%	1%	
	Mount Scott								
2/6/98	E-W Stream: U/S	Wet	78%	16%	5%	1%	0%	NA	483000
2/6/98	E-W Stream: D/S	Wet	72%	18%	6%	2%	1%	0%	860000
2/6/98	N-S Stream: U/S	Wet	79%	15%	3%	2%	1%	0%	515000
2/6/98	N-S Stream: D/S	Wet	64%	27%	5%	2%	1%	1%	423000
			Avg: 73%	19%	5%	2%	1%	0%	

Particle Count of Suspended Solids Per 100 milliliters									
Sample Date	Sampling Location	Sample Type	Particles Size Range (microns) 5-20 fine silt	20-40 silt	40-60 fine sand	60-80 fine sand	80-100 fine sand	>100 sand	Parts/100ml Total
	Forest Heights								
4/19/97	Manhole		6947489	1011512	334646	236569	125492	121689	8777397
5/28/97	Manhole		16237900	2966200	722500	380300	38000	114100	20459000
2/6/98	Manhole	Wet	2480000	139000	42000	11400	1900	NA	2670000
5/28/97	Pond		11902800	91700	152100	76100	38000	0	12260700
2/6/98	Pond	Wet	1670000	13300	5700	7600	3800	NA	1700000
	Lexington Hills								
2/6/98	North Pond	Wet	475000	19000	7600	5700	1900	3800	513000
2/6/98	South Pond	Wet	373000	43700	24700	5700	1900	1900	451000
	Mount Scott								
2/6/98	E-W Stream: U/S	Wet	378000	76100	22800	3800	1900	NA	483000
2/6/98	E-W Stream: D/S	Wet	618000	159000	52300	19000	8560	2850	860000
2/6/98	N-S Stream: U/S	Wet	407000	78000	15200	10500	3800	950	515000
2/6/98	N-S Stream: D/S	Wet	270000	114000	22800	8560	4750	2850	423000

Shaded values represent information collected during Permit Year 3.



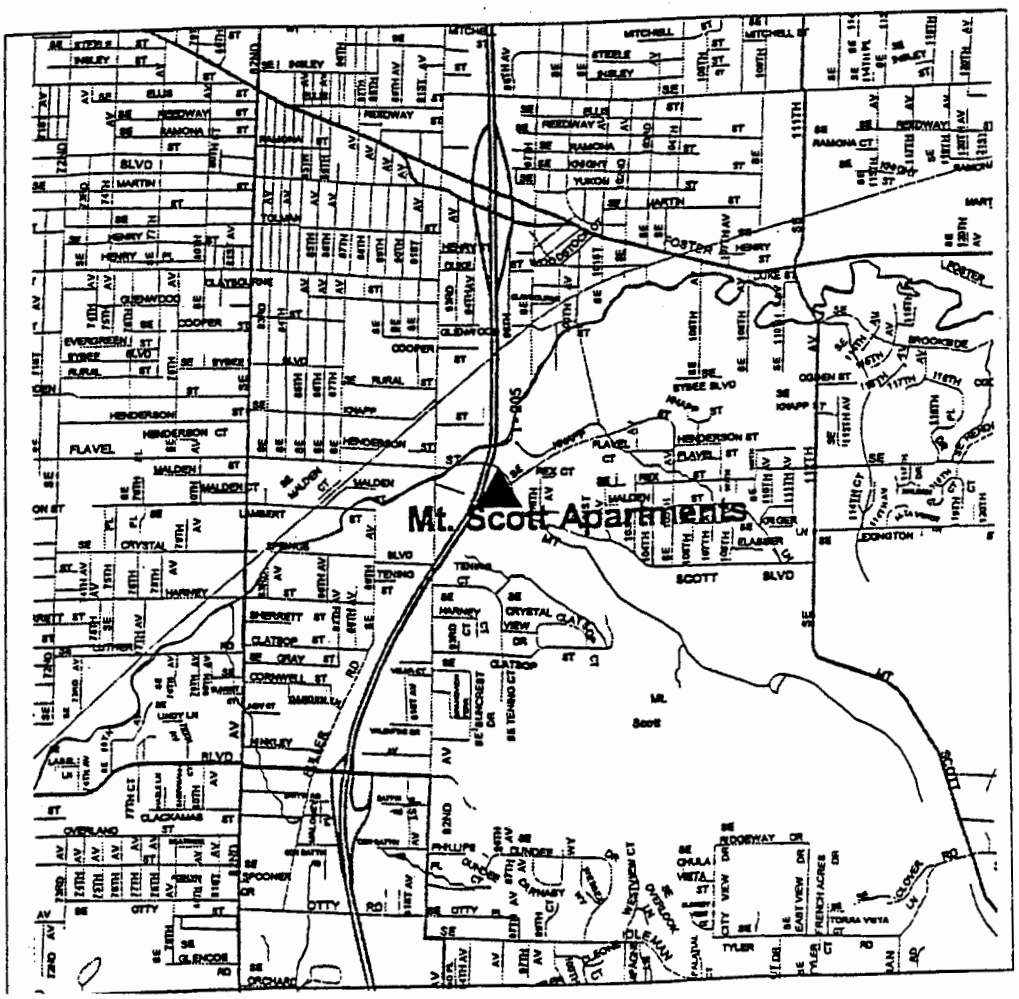
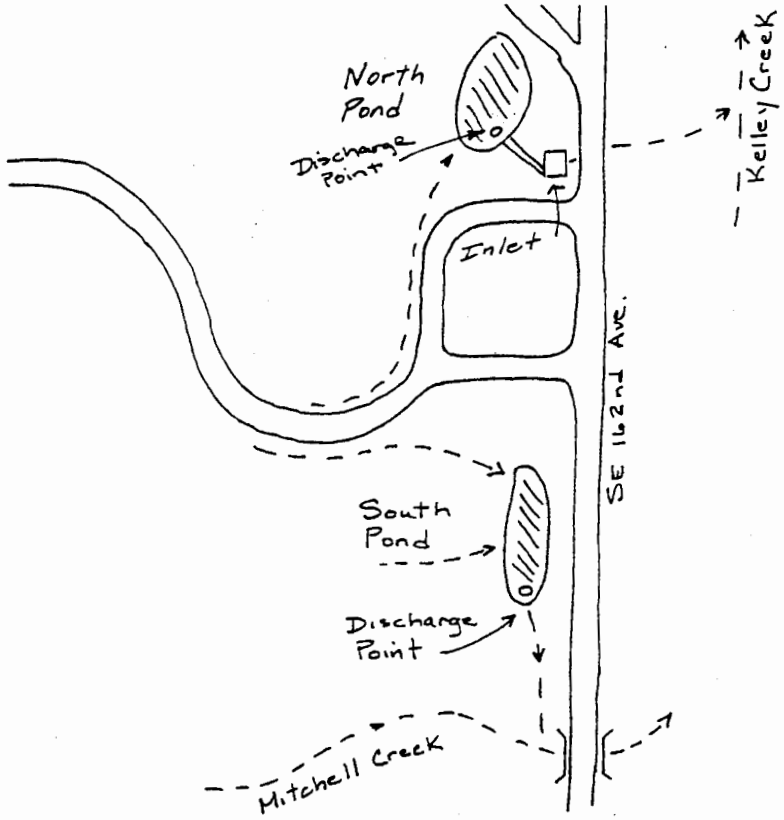


Figure 3-1 Mt. Scott Apartments



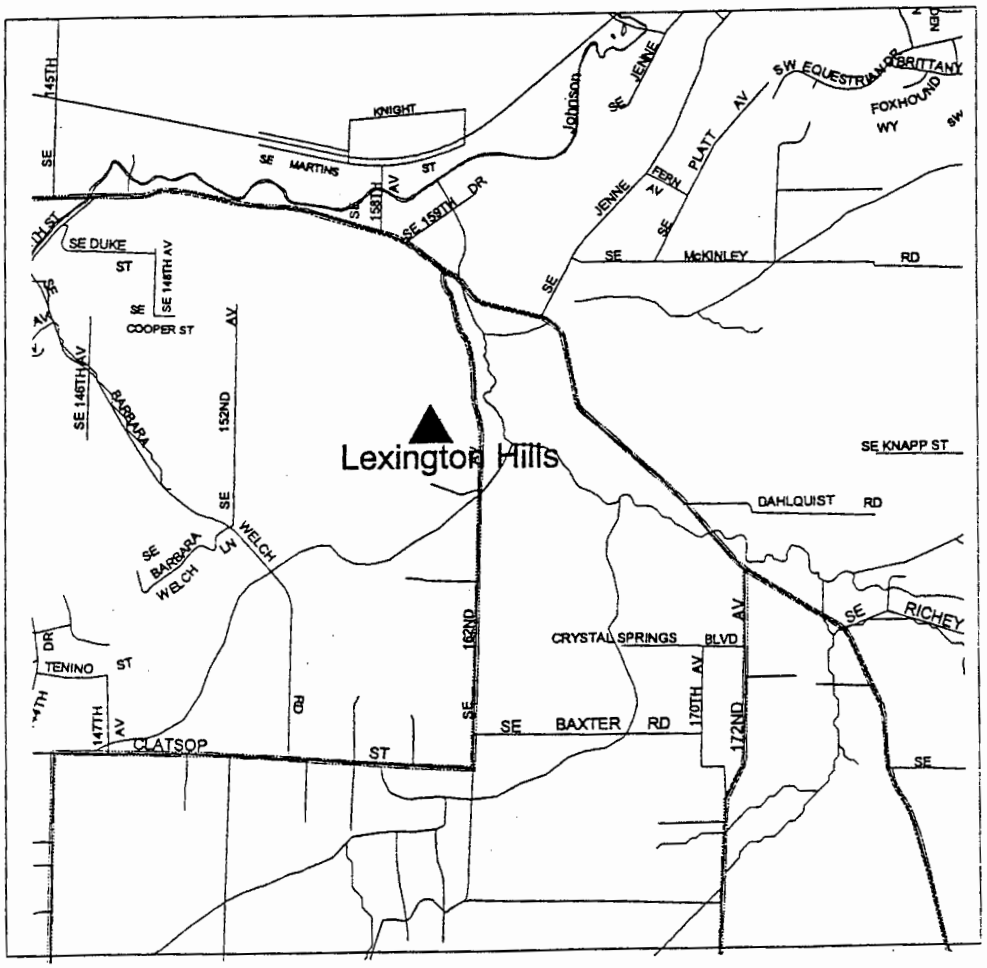
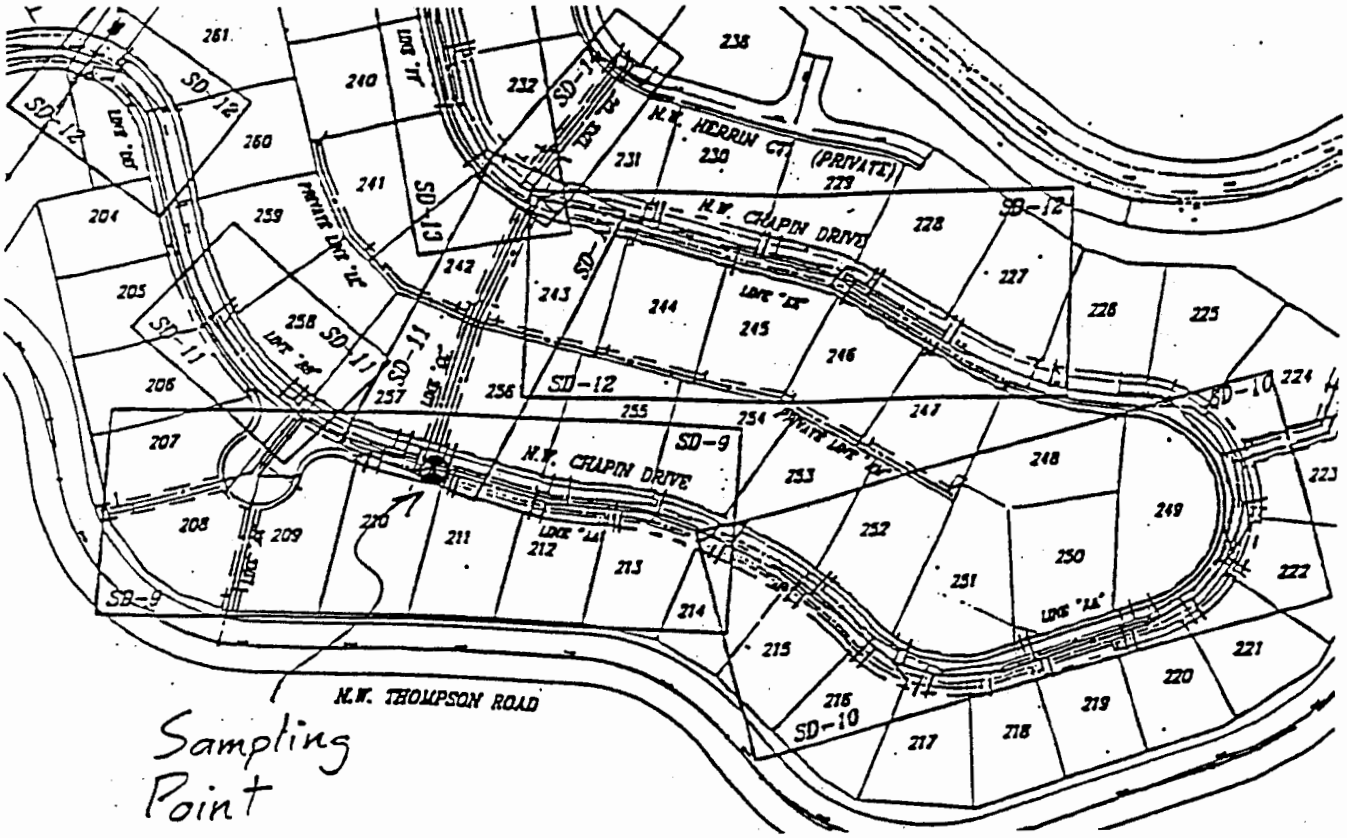


Figure 3-2 Lexington Hills



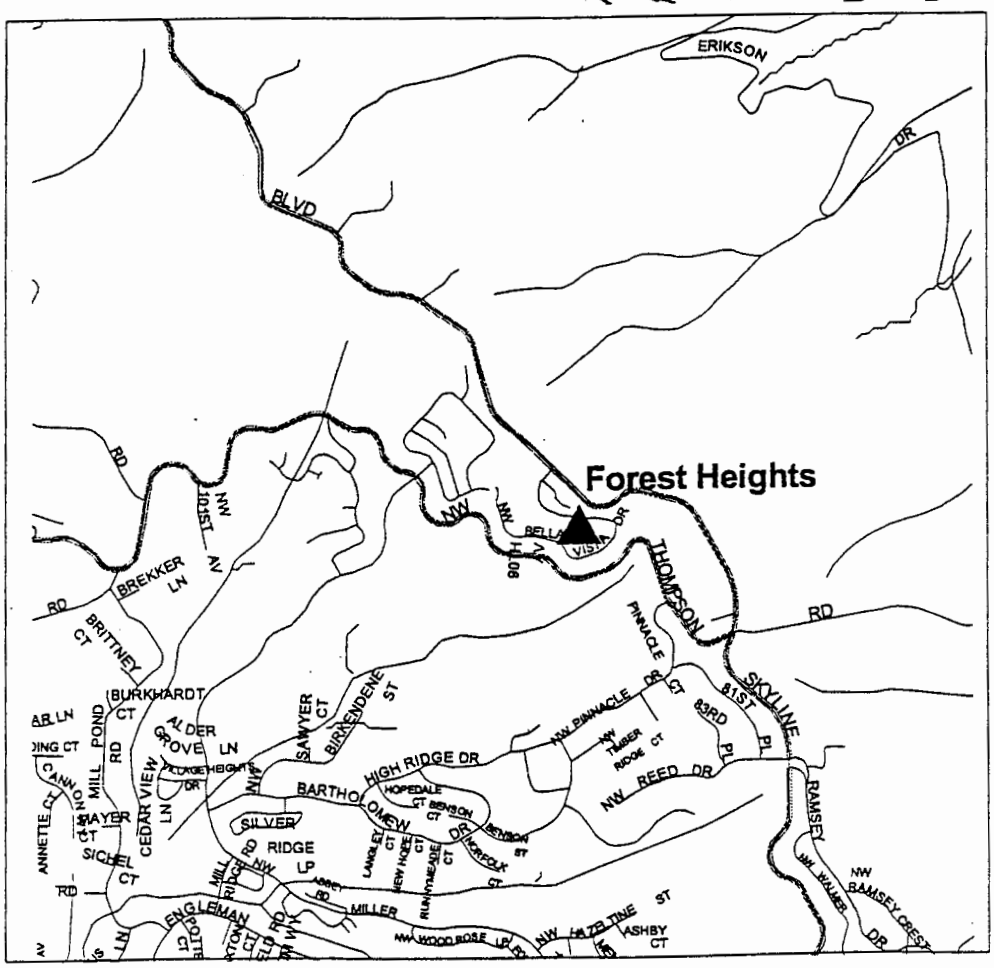
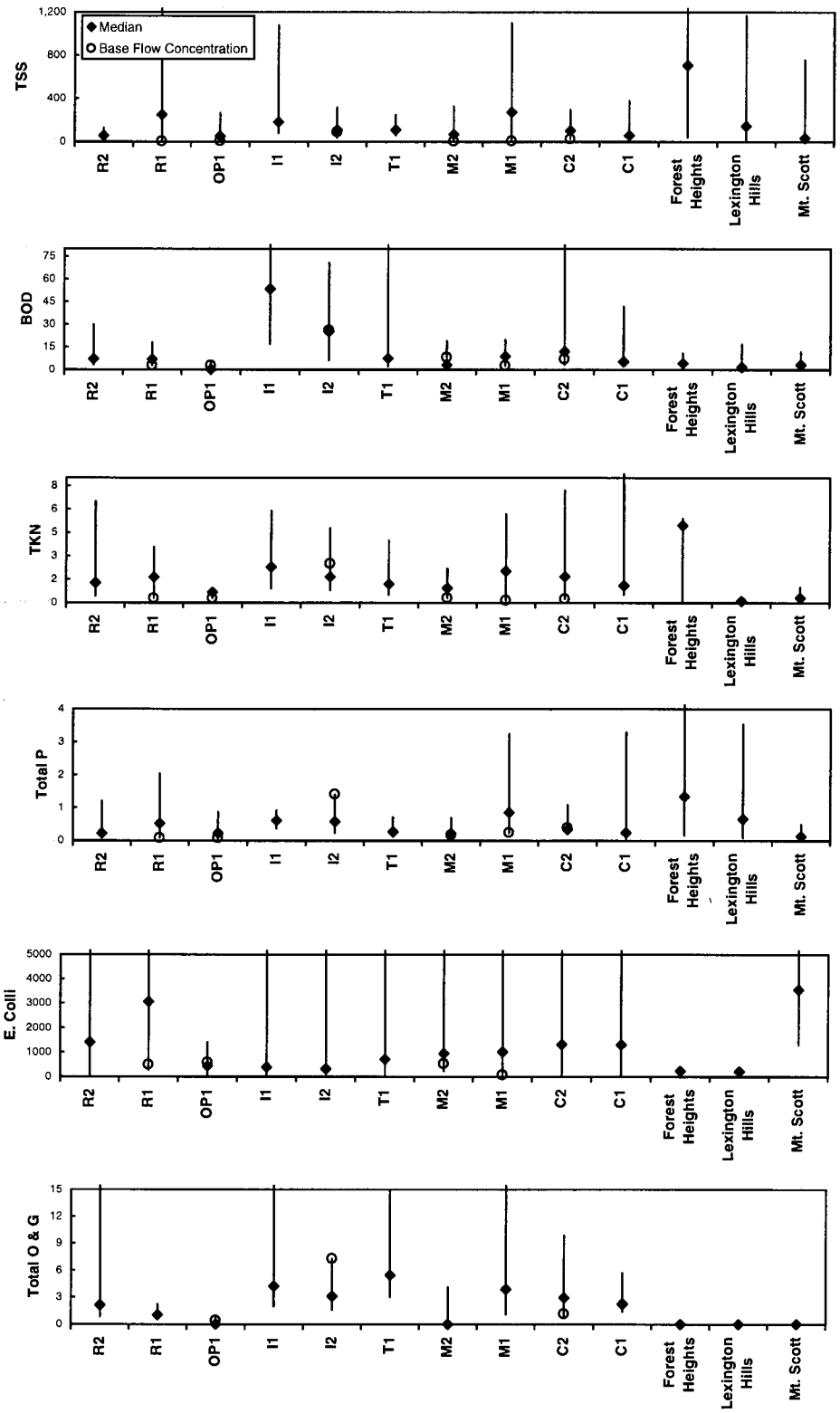


Figure 3-3 Forest Heights

Figure 3-4a
Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Conventional Parameters



Notes:

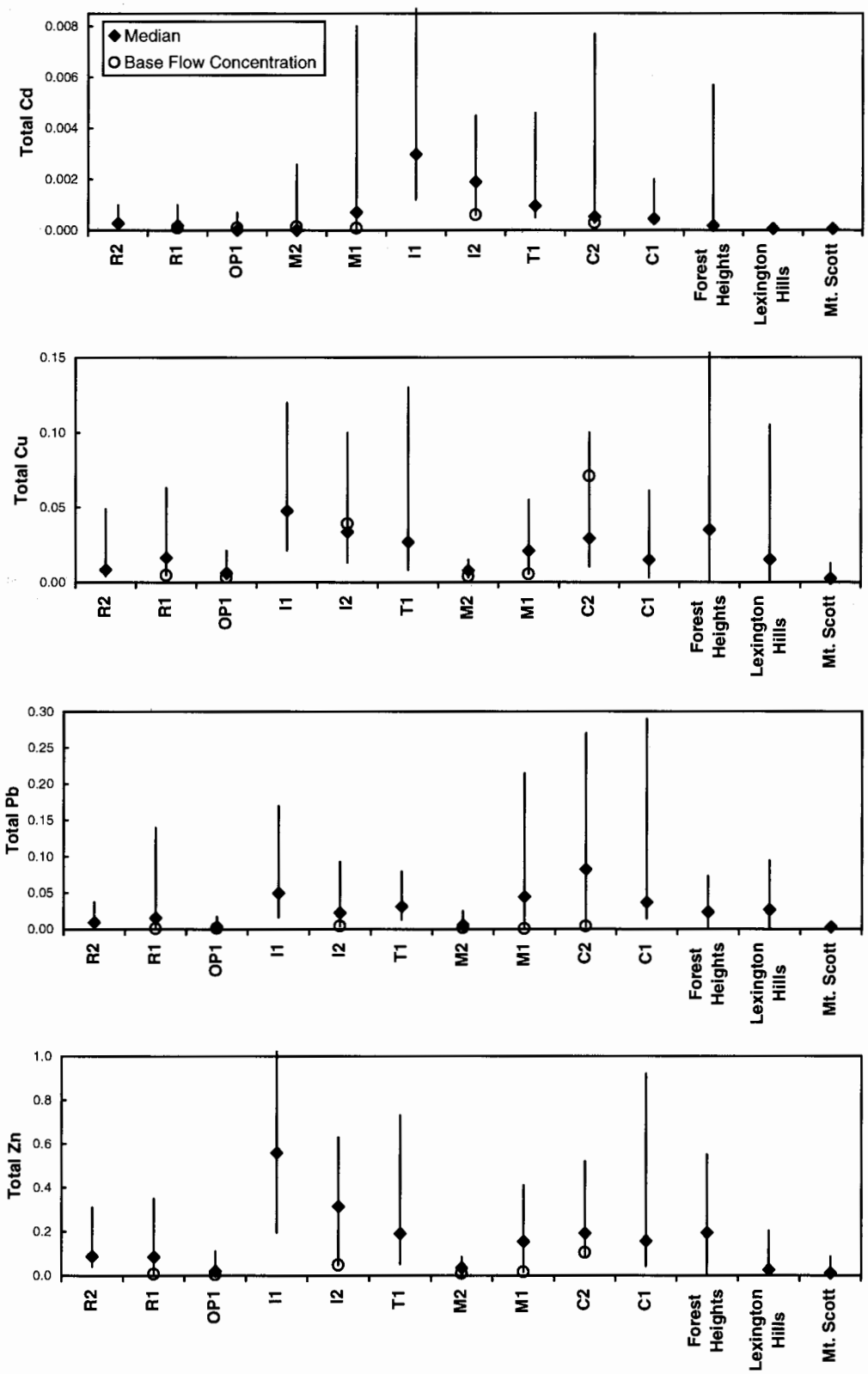
The concentrations of all parameters are in mg/L, except for fecal coliform, which is expressed in colonies/ 100 mL.

The full range of concentrations at some stations is not displayed so that the relative differences are more apparent.

Values for stations M1, M2, R1, and OP1 have been updated to include Permit Year 3 monitoring data.

Sumgraph.xls:CONV (const)
9/17/98

Figure 3-4b
Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Total Heavy Metals



Notes:

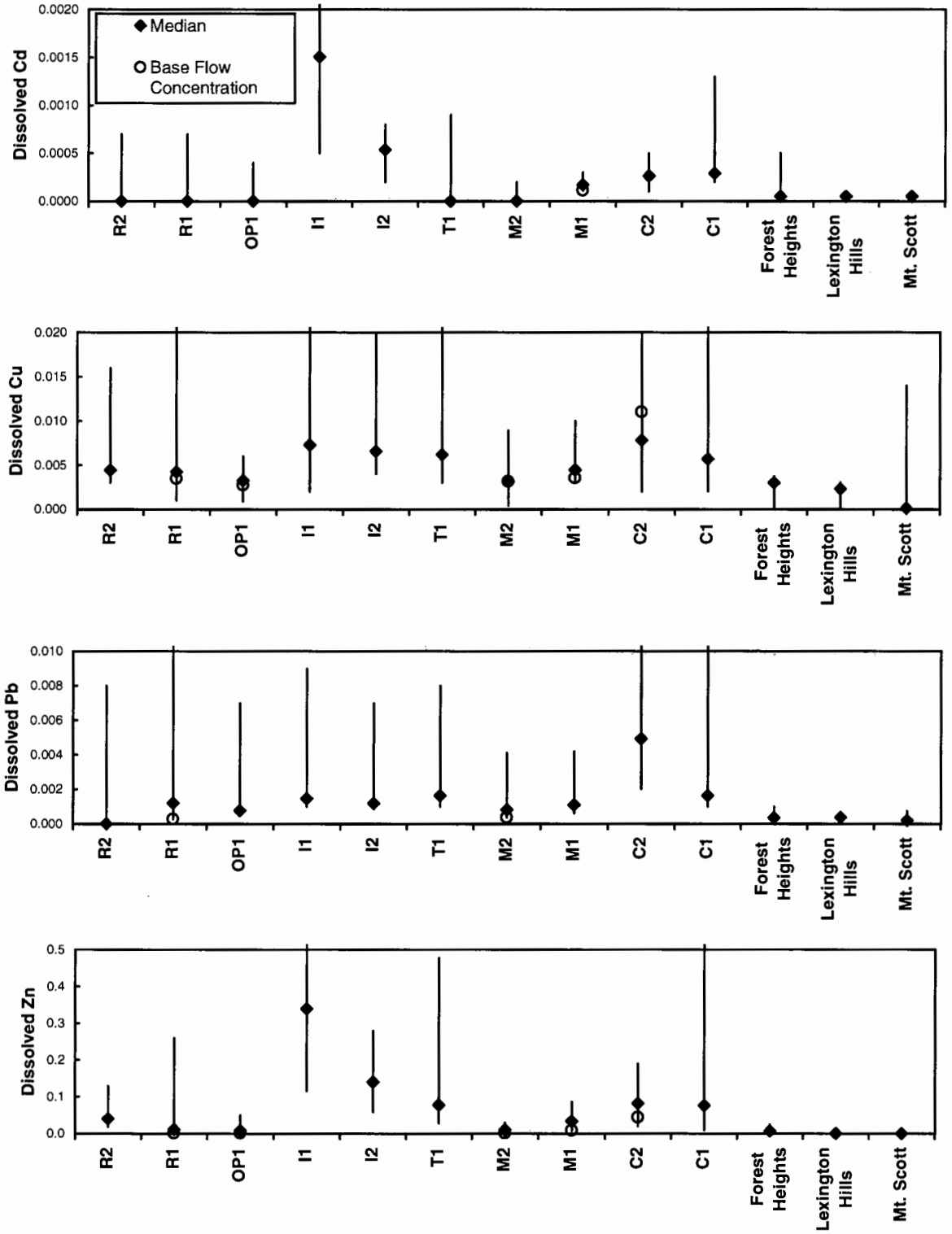
The concentrations of all parameters are in mg/L

The upper range of concentrations at some stations is not displayed so that the relative differences are more apparent.

Values for stations M1, M2, R1, and OP1 have been updated to include Permit Year 3 monitoring data.

Sumgraph.xls:Metals (const)
9/17/98

Figure 3-4c
Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Dissolved Heavy Metals



Notes:

The concentrations of all parameters are in mg/L

The full range of concentrations at some stations is not displayed so that the relative differences are more apparent.

Values for stations M1, M2, R1, and OP1 have been updated to include Permit Year 3 monitoring data.

Sumgraph.xls:dissMetals (const)
9/17/98

4.0 STRUCTURAL BMP MONITORING (TASK 3)

The objective of this task is to provide estimates of the treatment characteristics of different types of water quality facilities in Portland. As more structural BMP facilities are designed and built, predicting their effectiveness will become increasingly important. Although estimates of treatment efficiencies for different facilities are available in engineering literature, these values are generally intended for planning purposes and do not reflect site-specific conditions in Portland. Therefore, this monitoring task will involve the collection of samples at stormwater treatment facilities located in Portland. These results will be used by the City to improve treatment goals, better design water quality facilities, identify or confirm new treatment alternatives, and assist in watershed planning.

4.1 BMP Description

There are a number of water quality treatment facilities that have either been constructed or are planned to be built in Portland over the next few years. Five sites were selected for analysis: 1) a water garden at the Water Pollution Control Laboratory; 2) a pair of grass swales, also at the Water Pollution Control Laboratory; 3) an infiltration facility at Walnut Park; 4) a grass swale at Parkrose Middle School and 5) an eco-roof, the location of which is to be determined. In addition, the Port of Portland conducted monitoring of BMPs. Each of these six BMP monitoring activities are described below.

4.1.1 Water Garden

The first site monitored as part of this task during Permit Year 3 was the water garden (see Figure 4-1). The water garden is a wet pond that was constructed in 1997 as part of the City's new Water Pollution Control Laboratory and combined sewer overflow (CSO) neighborhood separation project. It was designed to treat stormwater runoff from a 50 acre catchment of mixed land use. The primary inlet, identified as Site 2, is a 12 inch pipe conveying water quality design storm runoff from the catchment. An outlet control structure is identified as Site 4 while the outlet from the facility is identified as Site 5.

The equipment used to monitor the water garden was installed and calibrated during the fall and winter of the current permit year. Monitoring conducted during this permit year represents the pond's establishment period with respect to pond vegetation.

4.1.2 Grass Swales

The two test swales, also located at the City's Water Pollution Control Laboratory, were built side by side in order to test the treatment effectiveness of two different grass types (see Figure 4-2). During the spring of 1997, the north swale was planted with non-native grass (Hobbs and Hopkins Pro-Time 835 Biofilter Mix) while the south swale was planted with native grass (Hobbs and Hopkins Pro-Time 840 Native Biofilter Mix). These biofilter mixes each contain a small, though variable percentage of clover. As of the spring of 1998, vegetative

coverage of each swale was estimated to be at 80 percent. However, while the south swale had a small amount of clover, more than 50 percent the north swale was covered by clover. Stormwater flow to the swales was too low and dispersed to conduct sampling. To provide adequate flow to the swale, a pumping system has been installed to convey some flow from the 50 acre catchment to the swales. Monitoring of the grass swales was not conducted during Permit Year 3 because of continued technical difficulties with the pump and equipment and because of illicit discharges into the system (i.e., metal shavings that attached to the float magnet. However, this issue is being resolved and it is planned that sampling will begin during the fall 1998. Sampling locations are shown in Figure 4-2 as Sites 2 and 3 for influent and Sites 4 and 5 for effluent, respectively.

4.1.3 Walnut Park Infiltration Facility

This parking lot infiltration facility is located between NE Emerson and NE Roselawn Streets, and NE 6th Avenue and MLK Jr. Boulevard (see Figure 4-3). The City is monitoring the behavior of this facility by sampling concentrations of various parameters (metals, petroleum hydrocarbons, and TKN in the facility's soil. The sampling point is located in the NW corner of the parking lot within the landscaped area. The objective of this project is to study the soil and vegetation community to document and quantify it's effectiveness at treating stormwater. Data will also be used to evaluate the performance of the BMP as a stormwater management technique. Initial soil sampling data are included in Appendix A-3. Future monitoring will include collecting and analyzing runoff before it infiltrates.

4.1.4 Parkrose Pilot Project

Monitoring is currently being conducted at the Parkrose Middle School Bioswale Project. The Parkrose swale is located between NE Shaver Avenue and the north side of the school. The drainage basin for the bioswale is approximately 2.4 acres (1.4 acres impervious and 1.0 acre pervious). The bioswale was constructed in 1997 as a pilot project for treating stormwater runoff from the school parking lot and surrounding area. Stormwater enters and exits the swale through 12 inch pipes. Discharge is directed to the storm sewer located on NE Shaver Avenue. Tests were taken during the establishment period. In the future, both water quality and flow will be measured at the inlet and outlet of the structure to assess the effectiveness of this BMP. The initial data set from this project is included in Appendix A-4.

4.1.5 Eco-Roofs

Oregon Graduate Institute and BES are planning to conduct monitoring to measure the effectiveness of eco-roofs at reducing pollutants and attenuating stormwater runoff flows. Currently the eco-roofs are being selected and prepared for testing. Sampling is scheduled to begin during Permit Year 4.

4.1.6 Port of Portland Monitoring Activities

The Port of Portland is testing the effectiveness of three stormwater BMPs including a catch basin, a StormCeptor filter, and an oil water separator. These particular BMPs were selected to provide new information about their effectiveness in the Portland Metro area. While one storm event was sampled at each of these BMPs during Permit Year 3, the future monitoring plan includes sampling three storm events per year. The initial data set from this project is included in Appendix A-5.

Methods and results for the water garden are provided below in Sections 4.2 and 4.3. With respect to the remaining five BMP monitoring activities described in Sections 4.1.2 through 4.1.6, data collection and/or data evaluations are planned for permit years four and five.

4.2 Water Garden: Method, Storm Events, and Analyses

4.2.1 Method

The method chosen for analysis of the water garden BMP involved sampling the influent and effluent from Site 2 and Site 5, respectively, shown on Figure 4-1. Portable automated samplers were installed to collect composite samples at these two locations while similar data collection equipment simultaneously recorded flow rate through the inlet (Site 1), bypass (Site 3), and discharge pipe (Site 5). Equipment has also been installed at Site 4 to monitor flow and sample water quality. However, Site 4 will only be used as a back-up if Site 5 becomes submerged with water backing up in the line from the Willamette River. After each event, the samples were processed in the laboratory to measure the concentrations of pollutants and physical characteristics. If baseflow was present prior to the storm event, grab samples were also collected for analysis.

During the storm events, grab samples were collected by lowering decontaminated stainless steel bailers into the flow and pouring the contents into analyte-specific sample bottles. Oil and grease samples were collected directly by lowering sample containers into the flow.

4.2.2 Storm Events

Two storm events were sampled at the water garden. However, the early portion of the May 13th event was not sampled, thus the results may not reflect the true performance of the pond. A summary of the event date and rainfall depth preceding the collection of each sample is provided in Table 4-1.

4.2.3 Analyses

After samples were collected, the following constituents were analyzed:

- TSS
- BOD_5
- hardness
- total phosphorous
- ortho-phosphate
- TKN
- nitrate-nitrogen
- ammonia-nitrogen
- total and dissolved cadmium, copper, lead, zinc
- oil and grease (polar, non-polar, and total)
- bacteria (E. coli)
- conductivity
- dissolved oxygen
- pH
- temperature
- particle size

The analytical methods listed in Table 3-2 were also applied to the water garden BMP samples.

4.3 Water Garden Results

Pollutant data results from the storm events are provided in Table 4-2.

Parameters that exceeded water quality criteria/or DEQ benchmarks included bacteria, total suspended solids and dissolved copper. When compared to the land use data, the concentrations of the pond samples were similar. Although percent change in concentrations between the inlet and outlet are noted in Table 4-2, further evaluation of the data will be conducted during Permit Year 4.

Table 4-1 Water Garden Site Sampling Events

Date	72-Hour Antecedent Rainfall (inches)	24-Hour Antecedent Rainfall (inches)	Total Volume Rainfall (inches)
05/13/98	0.13	0.13	0.29
05/25/98	0.58	0.40	0.29

Table 4-2
Summary of Water Garden Analytical Data for Spring 1998 Monitoring

Grab Parameters	Units	Inlet		Outlet		% Change	
		5/13/98	5/24/98	5/13/98	5/24/98	5/13/98	5/24/98
E. COLI	CFU/100 ml	**>6000**		**3800.00**		37%	
pH (FIELD)	pH units	6.40		6.70		-5%	
DISSOLVED OXYGEN (FIELD)	mg/L	9.10		6.20		32%	
TEMPERATURE	Deg. C	11.00		10.10		8%	
CONDUCTIVITY (FIELD)	umhos/cm	60.00		128.00		-113%	
NON-POLAR OIL & GREASE	mg/L	5.09		0.70		86%	
POLAR OIL & GREASE	mg/L	0.87		0.21		76%	
TOTAL OIL & GREASE	mg/L	5.96		0.91		85%	
Composite Parameters	**Units**						
BOD5	mg/L	11.00	14 J	7.00	6 J	36%	57% J
TOTAL SUSPENDED SOLIDS	mg/L	96.00	**158.00**	21.00	23.00	78%	85%
TOTAL PHOSPHORUS	mg/L	**0.27**	**0.39**	**0.42**	**0.22**	-56%	44%
AMMONIA-NITROGEN	mg/L	**0.10**	0.09	**0.23**	<0.02	-142%	
NITRATE-NITROGEN	mg/L	0.16	0.28	<0.1	<0.1		
ORTHO PO4-PHOSPHOROUS (DIS)	mg/L	0.02	0.03	0.12	0.06	-445%	-94%
HARDNESS	mg CaCO3/L	14.40	22.00	43.60	23.00	-203%	-5%
CADMIUM (Total)	µg/L		0.59		0.10		83%
COPPER (Total)	µg/L		44.60		10.60		76%
LEAD (Total)	µg/L		33.10		2.17		93%
ZINC (Total)	µg/L		156.00		19.70		87%
CADMIUM (Dissolved)	µg/L		0.10		<0.1		
COPPER (Dissolved)	µg/L		**11.90**		**7.95**		33%
LEAD (Dissolved)	µg/L		0.46		0.55		-20%
ZINC (Dissolved)	µg/L		25.00		10.10		60%
Total Particles	count/100ml	3751100	NR	2749100	882500	27%	NA
5-15 microns	count/100ml (% total)	2410000 (64)%	NR	1400000 (51)%	488000 (55)%	42%	NA
15-25 microns	count/100ml (% total)	637000 (17)%	NR	570000 (21)%	231000 (26)%	11%	NA
25-50 microns	count/100ml (% total)	485000 (13)%	NR	513000 (19)%	99800 (11)%	-6%	NA
50-100 microns	count/100ml (% total)	143000 (4)%	NR	190000 (7)%	27600 (3)%	-33%	NA
>100 microns	count/100ml (% total)	76100 (2)%	NR	76100 (3)%	36100 (4)%	0%	NA

J = The result should be considered an estimated value based on the QA/QC review.
Bold shaded values exceed acute toxicity criteria
* Concentration within particle range is computed as the product of the percent count and TSS
NR = Sample Not Recorded
NA = Not Applicable

Figure 4-1

Water Garden

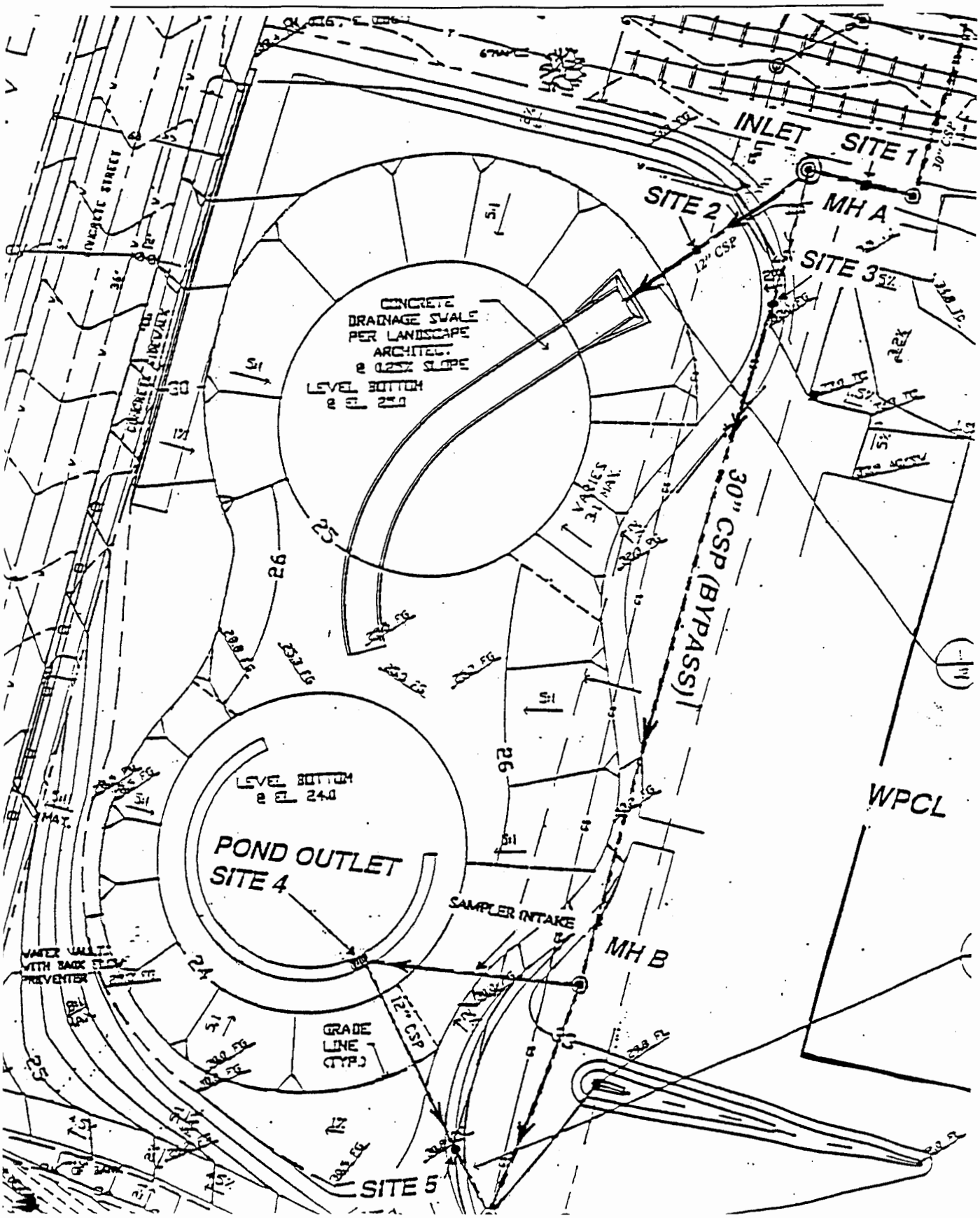


Figure 4-2

Bio Swale

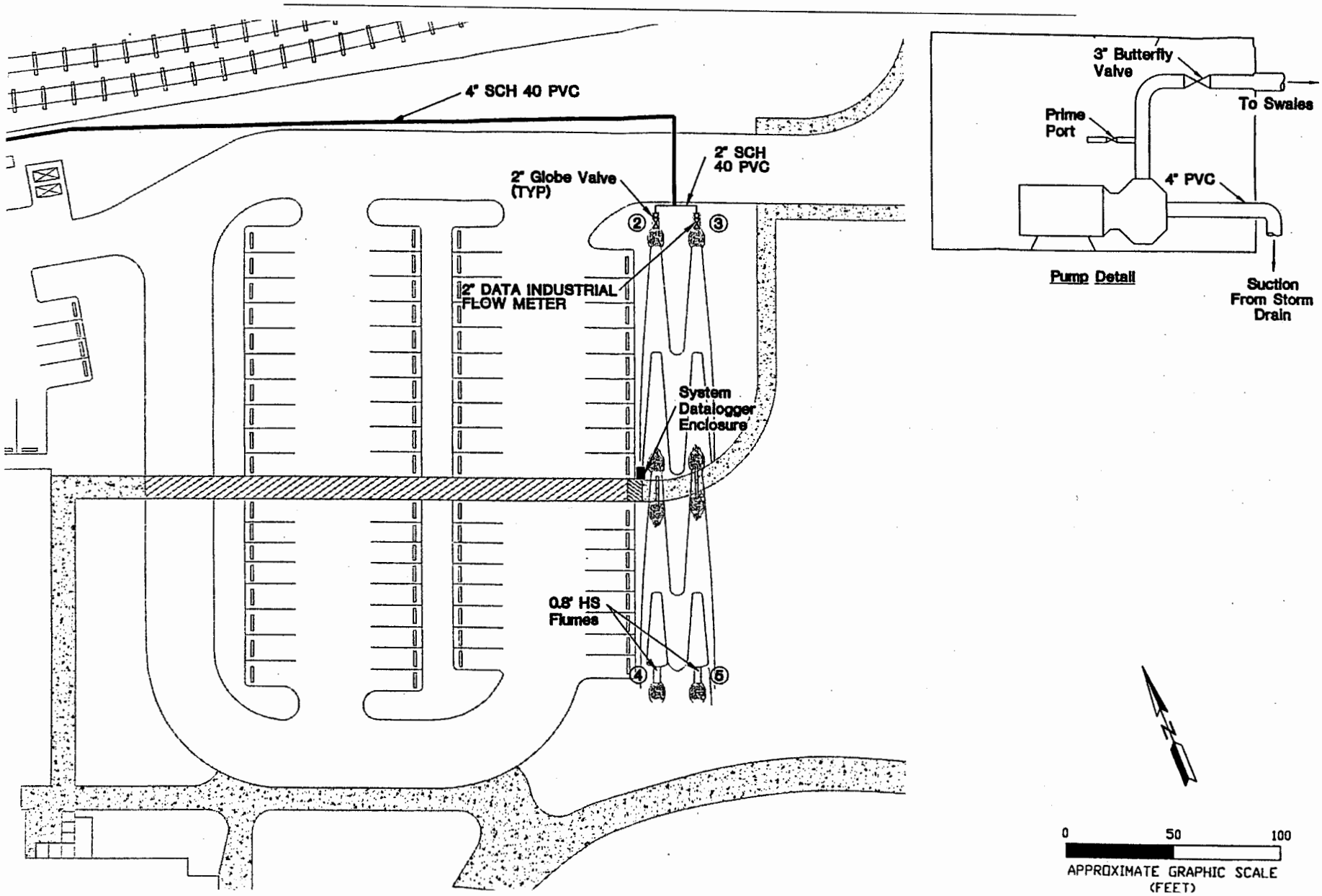
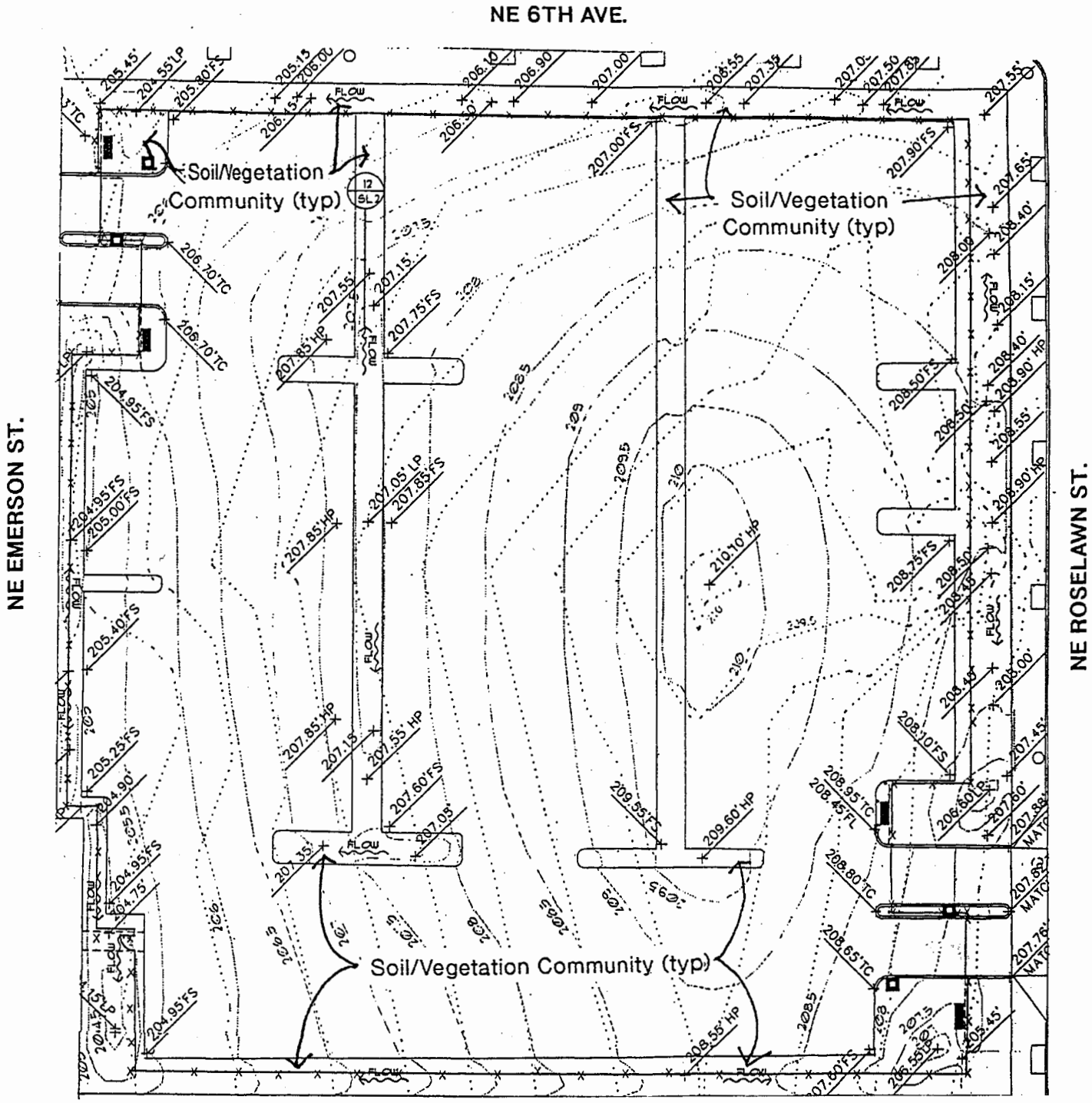


Figure 4-3

Walnut Park Infiltration Facility



5.0 COMPREHENSIVE STREAM MONITORING TO ASSESS STORMWATER IMPACTS (TASK 4)

Three challenges that the City's stormwater management group is currently facing include:

- Identifying the degree to which stormwater discharges are impacting receiving waters
- Establishing receiving water goals
- Determining treatment levels for water quality and quantity needed to meet receiving water goals

The approach of the comprehensive stream monitoring task is to use three different measures of receiving water health (chemical, physical, and biological) to evaluate the impacts of stormwater runoff on Portland's urban streams. Knowledge of the types of parameters most predominantly affecting stream health is important for devising stream management strategies and prioritizing different treatment/management options.

These measures will provide the groundwork for better identification of what aspects of stormwater runoff most significantly impact the conditions of Portland's streams and to what extent. At present, the only impact of urban stormwater runoff on Portland's streams that has been documented through the monitoring program is its effect on chemical water quality (i.e., comparisons between Balch and Fanno Creek stormwater data)(City of Portland, 1996). This task will add to these current water quality comparisons and supplement them with more direct measures of stream health incorporating physical and biological factors.

Portland's existing stormwater data provide a range of concentrations for various parameters corresponding to different land uses. However, it is often difficult to determine whether these concentrations constitute significant water quality problems because there are relatively few criteria for comparison with the stormwater data. Therefore, a goal of this task will be to determine wet weather reference conditions for Portland's creeks. Reference conditions represent locations where *significant* urbanization has not occurred. These reference conditions will be used to determine the extent to which urban stormwater runoff is impacting stream channels and/or contributing pollutant loads in excess of natural background conditions.

5.1 Methods

The following work items were outlined in the monitoring plan for completing this task:

- Work with City watershed managers and local experts from the Oregon Department of Fish and Wildlife, USGS, and DEQ to select potential reference sites.

- If possible, identify two reference streams representing conditions on the east (flat topography) and west (steeply sloped) sides of Portland. If Fish and Wildlife, City Watershed Managers, USGS, or DEQ staff are aware of existing data that would help us meet the task objectives, it is possible that no additional data will need to be collected in the field.

- Review reference creek data to determine what types of data are available in sufficient amounts to compare to Portland's storm event data from creeks.

- Determine where data gaps exist and develop a plan for collecting data with available resources.

- Prepare simple to read graphics and posters to visually portray the data comparisons between reference creeks and creeks in the Portland urban area. Comparisons would ideally be made with respect to the chemical, biological, and physical aspects of the creeks.

5.2 Permit Year 3 Activities

During Permit Year 3, the focus of this task was on the first bullet listed under methods in Section 5.1 above. A significant amount of research effort was spent on locating agencies who have or know of those who have existing data describing reference streams. Agencies that were contacted included:

- Clackamas County, Oregon
- Oregon Department of Fish and Wildlife
- Oregon Department of Environmental Quality
- Unified Sewerage Agency
- United State Geological Survey
- City of Eugene, Oregon

Although water quality related data have been collected from several streams that could potentially be used to represent reference conditions, data collected during storm events were limited. Table 5-1 provides a summary of the information obtained. From the research conducted, the three streams that were identified as the best reference stream candidates include:

- Little Abiqua Creek. This tributary drains approximately 6,275 acres of predominately forested land use to the Pudding River.

- Gales Creek. This tributary drains approximately 48,500 acres of predominately forested land use to the Tualatin River.

- Balch Creek. This tributary drains approximately 1500 acres of predominately open space and forested land use into to the Willamette River.

Although these tributaries drain predominately forested land uses, it should be noted that they are not without human impacts. For example, Balch Creek is located within the City of Portland and includes intensive recreational use. When data from each of these potential reference creeks are reviewed, it may be determined that some parameters are not appropriate to be used as indicators of reference conditions. During Permit Year 3, the City was unable to find storm event data from creeks with drainage areas that were completely pristine and without any human influence.

During Permit Year 4, existing storm event data will be compiled and evaluated from these reference streams. A determination will be made regarding the need for additional data and a plan will be developed to potentially fill the data gaps. After all data have been compiled, the reference streams will be assigned to streams within developed Portland watersheds that have similar terrain. Comparisons will be made between reference creek data and Portland data.

Table 5-1 Agencies Contacted for Monitoring Data

Potential Sites					
Agency	**Water Body**	**Chemical Data**	**Biological Data**	**Physical Data**	**Storm Events**
Clackamas Co.	Rock Creek	X	X	X	
DEQ	Mill Creek	X	X		
DEQ	Rickreall Creek	X	X	X	NA
USA	Bronson Creek	X	X	X	X
City of Eugene	Willow Creek	X	X	X	X
USGS	Gales Creek (Tualatin)	X	X	X	5/Month
USGS	Abiqua Creek (Pudding)	X	X	X	3/Month
City of Portland	Balch Creek	X			X

6.0 CONTINUED STORMWATER MONITORING AT EXISTING LAND USE STATIONS (TASK 5)

The City's NPDES permit area includes about 65,000 acres that surround a smaller area served by combined sewers (approximately 25,000 acres). Approximately 20,000 acres of the permit area drain into subsurface sumps and drywells and do not discharge into surface waters. To meet NPDES permit application requirements, the City selected and installed ten stations throughout the City that monitor stormwater runoff from residential, commercial, industrial, state highway, open space, and mixed land uses (Figure 6-1). The ten stations include three in-stream stations, which collect samples directly from Fanno, Johnson, and Balch creeks, and seven in-pipe stations. The in-pipe stations are located within storm sewer manholes.

6.1 Monitoring Location Descriptions

The ten monitoring stations are briefly described below.

- **R1 (Fanno Creek at SW 56th St.)** is an in-stream station that receives runoff from a 1,594 acre catchment where the land use is over 95% residential, with the remaining area comprised of commercial land use.

- **R2 (NE 141st Avenue & Sandy Blvd.)** is an in-pipe station that receives runoff from a 55 acre residential and parkland area.

- **C1 (Jantzen Beach)** is an in-pipe station located in a large shopping center on Hayden Island. The station received runoff from 35 acres of commercial land use. This station no longer exists, as the site was totally redeveloped in 1997.

- **C2 (SW 1st Avenue & SW Salmon St.)** is an in-pipe station located in the downtown business district. This station receives runoff from 92 acres, of which approximately 85% is commercial development and 15% is high-density residential development. Although this catchment is surrounded by a combined sewer area, its drainage system is separate.

- **I1 (NW Yeon Avenue & NW 35th St.)** is an in-pipe station that receives runoff from a 50 acre heavy industrial manufacturing area.

- **I2 (Ensign Court - Swan Island)** is an in-pipe station which receives runoff from 164 acres of light and general industrial manufacturing land uses.

- **T1 (NW Yeon Avenue & NW 35th St.)** is an in-pipe station located on a state highway in a heavy industrial manufacturing area. It receives runoff from 10 acres of roadway, including State Route 30 and an adjacent frontage road. This station represents runoff from a high-volume traffic corridor. Runoff from lower volume traffic corridors (i.e., local streets) is included in samples collected from other stations. For example, runoff from residential roadways is included in samples collected from stations R1 and R2.

- **OP1 (Balch Creek - Forest Park)** is an in-stream station that receives runoff from approximately 1,500 acres consisting primarily of open space land use, with some roads and homes within the watershed.

- **M1 (NE 122nd Avenue at the Columbia Slough)** is an in-pipe station that receives runoff from 144 acres of mixed land use including residential, commercial, open space, and industrial.

- **M2 (SE Milport Avenue at Johnson Creek)** is an in-stream station that receives runoff from approximately 33,000 acres (note: not all of this area is within the City's NPDES boundary). The catchment for M2 includes residential, commercial, industrial, agricultural, open space land uses, and state highways.

To maintain a long-term stormwater sampling data set, BES has continued their collection of stormwater samples. However, based upon an analysis of the data collected during the previous years and the 1996 ACWA report (Strecker, 1997), a revised monitoring plan was developed. Four stations have been selected for continued monitoring: OP1, R1, M1 and M2.

6.2 Summary of Wet and Dry Sampling Events

From 1991 to the current permit year, 24 events have been sampled. These include both 21 wet and 3 dry events during various seasons of the year. Table 6-1 summarizes the events monitored.

During Permit Year 3, stormwater samples were collected at all stations in October and November of 1997, and in February of 1998.

6.3 Sample Analysis

Table 6-2 shows the parameters analyzed for the sampling events, and the method of sample collection (e.g., composite, grab). In addition to the parameters listed, measurements of temperature, pH, conductivity and dissolved oxygen were performed in the field. These are summarized in Table 6-3.

6.4 Summary of Precipitation Data

Rainfall depths were estimated at each of the four monitoring stations using values from rain gauges operated by the City of Portland. The City's network of gauges has been in operation since 1976 (shown as open squares on Figure 6-1). In addition, National Weather Service operates gauge #6751, which is located at the Portland Airport, and provides the long-term average rainfall from 1950 to 1987, for the Portland NPDES permit area. Table 6-1 displays the characteristics of the sampled events as well as the historic average storm characteristics that were based on measurements collected from 1950 to 1987.

6.5 Results and Interpretation

This Section summarizes the results of sampling from three in-stream sampling stations (M2, R1 and OP1) and one in-pipe station (M1). While in-stream fresh water quality criteria are applied to both the in-stream and in-pipe samples, the evaluation of the in-pipe samples using fresh water quality criteria is for comparison purposes only.

Table 6-3 provides the results of the Permit Year 3 sampling events. In general, when compared to minimum, median and maximum statistics through Permit Year 2, concentrations of parameters at M1, M2, and R1 during Permit Year 3 were generally consistent with previous data. However, in several instances at site OP1, counts of bacteria and concentrations of solids, nutrients and metals were higher than the maximum value of previous data. At M2, one sample had a concentration of dissolved cadmium which was greater than previous data. However, only dissolved copper exceeded water quality criteria.

Table 6-4 presents the minimum, median, and maximum stormwater concentrations for each parameter and station for all events collected to date (through February, 1998). To make comparisons between storm and base flow, Table 6-4 also includes the geometric mean of the base flow sampling events and the dry weather data, where available. Baseflow samples were collected at sampling stations between storm events. Dry weather samples are collected in-stream, also between storm events during dry weather.

Table 6-5 summarizes the EPA and DEQ water quality exceedances for dissolved metals and conventional parameters. Information updated to incorporate Permit Year 3 monitoring data is shaded. As shown in the upper portion of Table 6-5, acute toxicity criteria are computed for several parameters and summarized for all storm event samples as the ratio of exceedences to observations. Among these, the parameters with the largest number of exceedances include fecal coliform, dissolved copper and zinc. In particular, dissolved zinc concentrations in all twelve samples from site I1 exceeded water quality criteria. Out of four sites that have exceeded oil and grease benchmark criteria, site T-1 has experienced the largest number of exceedances (5/13) while three other sites have experienced three or fewer exceedances. The TSS benchmark criteria was exceeded at all sites with the largest number of exceedances (16/19 and 13/19) occurring at sites M-1 and R-1, respectively. Exceedances of the TSS benchmark at other sites occurred for between 20 and 50 percent of the observations.

As shown in the lower portion of Table 6-5, chronic criteria are computed for dry weather-base flow samples. While copper is the only dissolved parameter with exceedances (4/12), fecal coliform had the highest ratio of exceedances at 6/12. While there was only one exceedance for oil and grease, there were no observed exceedances for TSS.

The stormwater and base flow results for selected heavy metals and conventional parameters are presented graphically in Figures 6-2 and 6-3. These figures show the range and median stormwater concentrations and the geometric mean base flow concentrations. Note that while the range of observed concentrations (represented by the vertical line) may be large for

several of the parameters, the median values are more indicative of the majority of the results. Also, the base flow concentration (during dry periods) is typically lower than the median thus suggesting that the higher concentrations are resulting from stormwater runoff. This holds true for nearly all parameters with the exception of copper, TKN and total phosphorous, where the commercial and industrial sites tended to have higher base flow concentrations.

Impacts of these pollutants on receiving water is described in the Permit Year 1 Monitoring Report (City of Portland, 1996).

Table 6-1 Sampling Event Characteristics

Storm Event #	Date	Storm Volume (inches)	[1]Coverage of Storm (%)	Duration (hours)	Average Storm Intensity (in/hour)	Time from Previous 0.10" Rain (hours)	Total Rain in Preceding 72 Hours (inches)	Season
1	5/7/91	0.83	50%	19	0.044	100	0.08	Spring
2	8/9/91	0.31	40%	18	0.017	360	0.01	Summer
2a	10/15/91	0.08	NA	12	0.007	384	0.01	Fall
3	10/22/91	0.51	70%	11	0.046	1224	0.0	Fall
4	12/5/91	1.60	70%	33	0.048	3	0.2	Winter
5	12/18/91	0.63	100%	23	0.027	133	0.0	Winter
6	1/10/92	0.48	80%	40	0.012	143	0.0	Winter
7	9/23/92	0.69	100%	15	0.046	192	0.0	Fall
8	10/29/92	1.29	100%	36	0.036	168	0.06	Fall
9	11/18/92	0.54	70%	9	0.060	180	0.09	Fall
10	1/19/93	0.94	70%	19	0.049	348	0.01	Winter
11	4/7/95	0.59	90%	16	0.037	60	0.20	Spring
12	10/25/95	0.69	60%	15	0.046	186	0.01	Fall
13	3/2/96	0.80	65%	27	0.030	170	0.0	Winter
15	4/13/97	0.15	85%	15	0.010	119	0.01	Spring
16	4/22/97	0.50	80%	26	0.019	58	0.33	Spring
17	**10/2/97**	**1.22**	**100%**	**50**	**0.024**	**113**	**0.01**	**Fall**
18	**11/20/97**	**1.58**	**16%**	**43**	**0.032**	**28**	**0.55**	**Fall**
19	**02/12/98**	**0.70**	**98%**	**32**	**0.014**	**21**	**0.23**	**Winter**
[2]EH #1	5/3/94	0.23	80%	9	0.026	237	0.03	Spring
EH #2	10/13/94	0.19	100%	9	0.021	292	0.0	Fall
EH #3	10/30/94	3.10	70%	39	0.079	15	0.33	Fall
EH #4	3/3/95	0.61	70%	24	0.025	304	0.0	Spring
Average of the Monitored Events	**-**	**0.79**	**-**	**21**	**0.036**	**259**	**0.064**	**-**
[3]Historic Avg.		**0.48**	**-**	**16.0**	**0.033**	**123**	**-**	**-**
Dry weather #1	6/17/93	-	-	24	-	72	0.0	Spring
Dry weather #2	1/11/96	-	-	24	-	34	0.35	Winter
Dry weather #3	6/18/97	-	-	32	-	127	0.0	Spring

[1]Coverage of storm is defined as the runoff volume measured during the sample collection period divided by the total runoff volume of the storm averaged over all of the stations in operation during a given event.
[2] EH = Event History.
[3]Historic average storm based on rainfall data collected at National Weather Service Station #6751 (Portland Airport) from 1950 to 1987.
Shaded values represent information collected during Permit Year 3.

Table 6-2 Analytical Parameters for Sampling Events

Parameter	Sample Type	Analytical Method
Oil and Grease (Total, Polar, Non-Polar)	Grab	SM 5520 B/F
E. Coli	Grab	EPA 1103
Fecal Coliform	Grab	SM 9222
Total/Dissolved Metals (Cd, Cu, Pb, Ag, Zn)	Composite	PA 200.8
BOD_5	Composite	SM 5210
COD	Composite	SM 5520D
TSS	Composite	SM 2540
TDS	Composite	SM 2540
Total Solids	Composite	SM 2540B
TKN	Composite	EPA 351.2
Total Phosphorus	Composite	EPA 365.1
Orthophosphate	Composite	EPA 365.1
Ammonia-Nitrogen	Composite	EPA 350.1
Nitrate-Nitrogen	Composite	EPA 300.0
Total Hardness	Composite	SM 2340C

Table 6-3
Summary of Analytical Data for Fall/Winter 1997/1998 Monitoring (Permit Year 3)

		M1			M2			OP1			R1		
		10/2/97	11/20/97	2/12/98	10/2/97	11/20/97	2/12/98	10/2/97	11/20/97	2/12/98	10/2/97	11/20/97	2/12/98
Grab Parameters	**Units**	**SE-17**	**SE-18**	**SE-19**	**SE-17**	**SE-18**	**SE-19**	**SE-17**	**SE-18**	**SE-19**	**SE-17**	**SE-18**	**SE-19**
FECAL COLIFORM	CFU/100 ml	**3200**	**700**	**1300 J**	**2400**	**2700**	**380**	**>6000**	**1300 J**	**500**	**4600**	**440**	**4500**
E. coli	CFU/100 ml	**3000**	420	**960**	**700 J**	**1000 J**	390 J	**>6000**	**1500 J**	**550**	**4500**	280 J	**5000**
pH (FIELD)	pH units	6.8	6.3	7.1	7.7	7.0	6.9	7.7	7.5	7.1	7.0	7.1	7.0
DISSOLVED OXYGEN (FIELD)	mg/L	9.6	14.5	11.6	10.4	12.9	13.7	11.9	15.7	14.3	10.0	12.8	13.6
TEMPERATURE (FIELD)	Deg. C	17.2	10.3	10.5	15.7	9.6	9.1	15	7.2	7.7	16.4	9.4	8.8
CONDUCTIVITY (FIELD)	umhos/cm	107	82	118	190	127	352	167	162	285	132	175	241
OIL & GREASE (NON-POLAR)	mg/L	<5	3.76	6.33	<5	<0.5	0.95	<5	<0.5	<0.5	<5	<0.5	<0.5
OIL & GREASE (POLAR)	mg/L		1.51	2.86		<0.5	<0.50		<0.5	<0.5		<0.5	<0.5
OIL & GREASE (TOTAL)	mg/L	9.4	5.27	9.18	<5	<0.5	1.33	<5	<0.5	<0.5	<5	<0.5	0.607
Composite Parameters	**Units**												
BOD5	mg/L	5	5	5	4	<4	2	5	<4	<2	8	4	<2
TOTAL SUSPENDED SOLIDS	mg/L	**238**	**149**	100	120	42	75	**266**	**237**	43	**656**	100	35
TOTAL DISSOLVED SOLIDS	mg/L	6	49	25	118	75	100	223	125	128	NR	91	111
TOTAL SOLIDS	mg/L	244	198	125	238	117	175	489	362	171	NA	191	146
TOTAL PHOSPHORUS	mg/L	**0.78**	**0.80**	**0.70**	**0.40**	**0.17**	**0.22**	**0.88**	**0.53**	**0.15**	**1.12**	**0.34**	**0.17**
AMMONIA-NITROGEN	mg/L	**0.150**	**0.170**	**0.210**	0.042	<0.02	0.036	<0.020	<0.02	0.026	0.065	<0.02	0.034 J
NITRATE-NITROGEN	mg/L	0.25	0.21	0.15	2	2.50	2.10	2.3	3.40	2.50	0.62	0.54	0.08
ORTHO PHOSPHATE (Dissolved)	mg/L	0.08	0.10	0.05	0.05	0.04	0.03	0.09	0.09	0.03	0.09	0.08	0.03
HARDNESS	mg CaCO3/L	14.8	14.8	15.8	43.6	45.2	34.6	50.2	43.4	34.2	26.0	30.6	43.2
COD	mg/L			39.0000			21.0000			9.0000			17.0000
CADMIUM (Total)	mg/L	0.0019	0.0004	0.0003	0.0002	0.0005	0.0002	0.0001	0.0002	0.0007	0.0003	0.0002	0.0002
COPPER (Total)	mg/L	0.0168	0.0152	0.0200	0.0130	0.0078	0.0083	0.0210	0.0093	0.0072	0.0264	0.0099	0.0092
LEAD (Total)	mg/L	0.0229	0.0198	0.0209	0.0101	0.0039	0.0054	0.0122	0.0094	0.0030	0.0292	0.0093	0.0056
SILVER (Total)	mg/L	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
ZINC (Total)	mg/L	0.0967	0.0750	0.0859	0.0475	0.0237	0.0282	0.0540	0.0285	0.0135	0.1040	0.0354	0.0361
CADMIUM (Dissolved)*	mg/L	0.0003	0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.0004	0.0001	<0.0001	<0.0001
COPPER (Dissolved)*	mg/L	0.0042	0.0044	**0.0073**	0.0041	0.0038	0.0039	0.0070	0.0055	0.0051	**0.0053**	**0.0073**	0.0053
LEAD (Dissolved)*	mg/L	0.0009	0.0009	0.0011	0.0004	<0.0006	0.0004	0.0009	0.0009	0.0008	0.0008	0.0008	0.0006
SILVER (Dissolved)*	mg/L	<0.0001	<.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
ZINC (Dissolved)*	mg/L	0.0156	0.0118	0.0193	<0.01	0.0064	0.0057	<0.01	0.0046	0.0055	<0.01	0.0081	0.0135

J - The concentrations are considered estimated values based on the QA/QC review
Bold shaded values exceed water quality criteria
* Criteria for dissolved metals are hardness dependent

Table 6-4 Stormwater Quality Data Summary (1991-1998)

Total Suspended Solids (TSS)	Monitoring Station									
DL = 1 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	249	54	56	99	182	107	272	64	107	48
Maximum (mg/l)	1900	130	380	295	1080	317	1100	329	250	266
Minimum (mg/l)	10	18	14	47	78	37	82	10	58	5
# Observations / non-detects	19/0	11/0	12/0	16/0	11/0	8/0	19/0	16/0	12/0	13/0
Base Flow Sampling	3			24		89	4	3		6
Dry Weather Data - Watershed Programs	5						4	11		3

Total Dissolved Solids (TDS)	Monitoring Station									
DL = 1 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	65	31	23	319	61	80	28	112	61	117
Maximum (mg/l)	165	175	120	2240	154	134	160	192	338	223
Minimum (mg/l)	20	3	4	23	7	42	4	54	12	8
# Observations / non-detects	17/1	11/0	12/0	13/0	11/0	8/0	15/1	16/0	12/0	13/0
Base Flow Sampling	144			1339		142	193	125		119
Dry Weather Data - Watershed Programs	230						203			104

Biochemical Oxygen Demand (BOD5)	Monitoring Station									
DL = 1 - 5 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	7	7	5	12	53	25	9	3	7	-
Maximum (mg/l)	18	30	42	108	160	71	20	19	89	5
Minimum (mg/l)	4	3	4	3	17	6	4	2	2	2
# Observations / non-detects	17/0	11/0	12/0	13/0	11/0	8/0	16/0	15/0	11/0	13/1
Base Flow Sampling	3			7		26	2	8		3
Dry Weather Data - Watershed Programs							<2	<3		

Chemical Oxygen Demand (COD)	Monitoring Station									
DL = 1 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	44	40	44	66	124	66	68	20	59	25
Maximum (mg/l)	226	300	330	324	284	140	280	56	440	110
Minimum (mg/l)	6	9	8	4	34	22	15	5	15	5
# Observations / non-detects	17/0	11/0	12/0	13/0	11/0	8/0	16/0	15/0	11/0	13/1
Base Flow Sampling	2			23		77	1	6		7

Nitrate (NO3)	Monitoring Station									
DL = 0.1 - 0.3 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.68	0.29	0.23	0.25	0.13	0.10	0.30	2.87	0.23	1.69
Maximum (mg/l)	1.20	6.50	2.60	1.70	0.50	0.70	0.90	4.60	1.00	3.40
Minimum (mg/l)	0.40	0.08	0.08	0.12	0.14	0.10	0.11	2.00	0.10	0.80
# Observations / non-detects	19/0	11/1	12/1	16/2	11/5	8/4	19/1	15/0	11/1	11/0
Base Flow Sampling	1.12			0.14		0.40	5.62	4.01		1.44
Dry Weather Data - Watershed Programs	0.60						6.08	5.60		3.70

Ammonia (NH3)	Monitoring Station									
DL = 0.1 - 0.2 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.09	0.23	-	0.23	0.26	0.22	0.22	-	0.37	-
Maximum (mg/l)	0.30	2.20	4.20	0.84	1.50	1.70	4.00	0.50	1.40	0.03
Minimum (mg/l)	0.03	0.20	0.20	0.10	0.30	0.20	0.10	0.03	0.20	0.03
# Observations / non-detects	18/8	11/5	11/6	16/3	11/4	7/3	18/5	14/7	9/2	11/10
Base Flow Sampling	0.06			0.10			0.05	0.06		0.17
Dry Weather Data - Watershed Programs							<0.1	0.04		<0.1

Table 6-4 (Cont'd) Stormwater Quality Data Summary (1991-1998)

Total Kjeldahl Nitrogen (TKN)	Monitoring Station									
DL = 0.1 - 0.2 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	1.6	1.3	1.1	1.7	2.3	1.7	2.0	0.9	1.2	0.7
Maximum (mg/l)	3.6	6.5	8.3	7.2	5.9	4.8	5.7	2.2	4.0	0.9
Minimum (mg/l)	0.5	0.4	0.5	0.8	0.9	0.8	0.8	0.4	0.5	0.3
# Observations / non-detects	16/0	11/0	12/0	16/0	11/0	8/0	16/0	12/0	10/0	9/0
Base Flow Sampling	0.3			0.2		2.5	0.1	0.3		0.3
Dry Weather Data - Watershed Programs	0.3						0.2	0.5		

Total Phosphorus (Total P)	Monitoring Station									
DL = 0.05 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.52	0.22	0.23	0.33	0.61	0.57	0.85	0.22	0.27	0.22
Maximum (mg/l)	2.04	1.20	3.30	1.10	0.92	1.30	3.25	0.70	0.72	0.88
Minimum (mg/l)	0.08	0.07	0.06	0.18	0.36	0.23	0.23	0.08	0.11	0.06
# Observations / non-detects	19/0	11/0	12/0	16/0	11/0	8/0	19/0	15/0	10/0	12/0
Base Flow Sampling	0.08			0.38		1.40	0.24	0.17		0.08
Dry Weather Data - Watershed Programs	0.13						0.15	0.13		0.06

Orthophosphate (Ortho P)	Monitoring Station									
DL = 0.01 - 0.05 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.09	0.07	0.04	0.07	0.08	0.12	0.11	0.06	0.06	0.08
Maximum (mg/l)	0.71	0.29	0.12	0.29	0.24	0.88	0.80	0.36	0.80	0.20
Minimum (mg/l)	0.02	0.02	0.01	0.03	0.02	0.03	0.01	0.02	0.01	0.03
# Observations / non-detects	19/0	11/2	12/4	16/1	11/1	8/0	19/1	15/1	11/1	12/0
Base Flow Sampling	0.06			0.18		0.24	0.19	0.05		0.06
Dry Weather Data - Watershed Programs	0.06						0.04			<0.016

Fecal Coliform Bacteria	Monitoring Station									
	R1	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (colonies/100 ml))	3,068	1,398	1,289	1,309	377	304	1,013	941	695	430
Maximum (colonies/100 ml)	36,000	26,400	9,000	20,000	11,900	40,900	74,898	26,000	41,000	1,410
Minimum (colonies/100 ml)	260	43	60	32	10	10	110	230	60	47
# Observations / non-detects	18/0	14/0	12/0	14/1	12/0	11/1	21/4	15/1	13/0	13/3
Base Flow Sampling	482						68	520		580
Dry Weather Data - Watershed Programs	490						28	1,555		

E. Coli Bacteria	Monitoring Station									
	R1	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (colonies/100 ml))	1,946	6,452	1,233	1,291	95	3,942	673	915	261	348
Maximum (colonies/100 ml)	7,800	18,100	1,520	2,400	1,800	4,200	16,900	3,400	2,300	1,110
Minimum (colonies/100 ml)	200	2,300	1,000	490	1,800	3,700	360	360	10	42
# Observations / non-detects	8/1	2/0	2/0	3/0	2/1	2/0	8/1	7/2	3/0	7/2
Base Flow Sampling	345			5			54	620		467

Total Oil & Grease	Monitoring Station									
DL = 0.5 - 5.0 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	1.0	2.1	2.2	2.9	4.2	3.1	3.9	-	5.4	-
Maximum (mg/l)	2.2	31.0	5.7	9.9	16.0	4.9	28.0	4.1	15.0	1.0
Minimum (mg/l)	0.61	0.80	1.40	0.90	2.00	1.60	1.10	0.70	3.00	0.60
# Observations / non-detects	17/7	12/1	12/1	11/0	12/1	11/0	18/3	15/10	13/1	13/10
Base Flow Sampling	<DL			1.183216		7.3	<DL	<DL		0.41833

Total Petroleum Hydrocarbons (TPH)	Monitoring Station									
DL = 0.5 - 5.0 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.8	1.3	1.6	1.9	2.7	2.4	2.7	-	3.6	-
Maximum (mg/l)	1.6	16.0	3.0	5.3	12.0	3.7	16.0	2.1	11.0	0.8
Minimum (mg/l)	0.50	0.70	1.00	0.60	2.00	1.30	0.80	0.60	2.80	0.80
# Observations / non-detects	17/8	12/3	12/1	11/1	12/2	11/0	18/4	15/10	13/2	13/12
Base Flow Sampling	<DL		1				<DL	<DL		6.519202

Table 6-4 (Cont'd) Stormwater Quality Data Summary (1991-1998)

Total Cadmium (Cd)	Monitoring Station									
DL = 0.0002 - 0.001 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.0002	0.0003	0.0004	0.0005	0.0030	0.0019	0.0007	-	0.0010	-
Maximum (mg/l)	0.0010	0.0010	0.0020	0.0077	0.0160	0.0045	0.0080	0.0026	0.0046	0.0007
Minimum (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# Observations / non-detects	19/7	11/5	12/3	16/3	12/1	8/0	19/4	16/6	12/2	13/7
Base Flow Sampling	0.0001			0.0003		0.0006	0.0001	0.0001		0.0001
Dry Weather Data - Watershed Programs										<0.0001

Total Copper (Cu)	Monitoring Station									
DL = 0.001 - 0.004 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.016	0.008	0.015	0.029	0.048	0.033	0.021	0.008	0.027	0.006
Maximum (mg/l)	0.063	0.049	0.061	0.100	0.120	0.100	0.055	0.015	0.130	0.021
Minimum (mg/l)	0.006	0.004	0.003	0.010	0.021	0.013	0.006	0.003	0.008	0.002
# Observations / non-detects	19/0	11/1	12/0	16/0	12/0	8/0	19/0	16/0	12/0	13/0
Base Flow Sampling	0.005			0.071		0.039	0.005	0.004		0.003
Dry Weather Data - Watershed Programs							0.003			< 0.0004

Total Lead (Pb)	Monitoring Station									
DL = 0.001 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.016	0.009	0.037	0.082	0.050	0.022	0.044	0.006	0.031	0.003
Maximum (mg/l)	0.140	0.038	0.290	0.270	0.170	0.093	0.215	0.025	0.080	0.017
Minimum (mg/l)	0.002	0.003	0.014	0.024	0.016	0.008	0.020	0.001	0.013	0.001
# Observations / non-detects	19/1	11/0	12/0	16/0	12/0	8/0	19/1	16/0	12/0	13/1
Base Flow Sampling	0.001			0.004		0.004	0.000	0.001		0.001
Dry Weather Data - Watershed Programs							<0.02			0.005

Total Silver (Ag)	Monitoring Station									
DL = 0.0002 - 0.001 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.0002	-	-	0.0002	0.0004	-	-	-	-	-
Maximum (mg/l)	0.0012	0.0002	0.0018	0.0010	0.0023	0.0008	0.0012	0.0061	0.0004	0.0001
Minimum (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# Observations / non-detects	19/11	12/11	13/9	17/8	13/4	9/7	19/12	16/11	13/10	13/12
Base Flow Sampling	<DL	<DL	<DL		<DL	<DL	<DL	<DL	<DL	<DL
Dry Weather Data - Watershed Programs							<0.002			

Total Zinc (Zn)	Monitoring Station									
DL = 0.001 - 0.01 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.08	0.09	0.16	0.19	0.56	0.31	0.15	0.03	0.19	0.02
Maximum (mg/l)	0.35	0.31	0.92	0.52	8.10	0.63	0.41	0.08	0.73	0.11
Minimum (mg/l)	0.02	0.04	0.04	0.09	0.19	0.13	0.07	0.02	0.05	0.01
# Observations / non-detects	19/0	11/0	12/0	16/0	12/0	8/0	19/0	16/0	12/0	13/1
Base Flow Sampling	0.01			0.10		0.05	0.02	0.01		0.00
Dry Weather Data - Watershed Programs										0.001

Table 6-4 (Cont'd) Stormwater Quality Data Summary (1991-1998)

Dissolved Cadmium (Cd)	Monitoring Station									
DL = 0.0002 - 0.004 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	-	-	0.0003	0.0003	0.0015	0.0005	0.0002	-	-	-
Maximum (mg/l)	0.0007	0.0007	0.0013	0.0005	0.0057	0.0008	0.0003	0.0002	0.0009	0.0004
Minimum (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# Observations / non-detects	19/16	11/10	12/5	16/8	12/2	8/3	19/9	15/14	12/7	13/10
Base Flow Sampling	<DL			<DL			0.000112	<DL		<DL

Dissolved Copper (Cu)	Monitoring Station									
DL = 0.001 - 0.005 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.004	0.004	0.006	0.008	0.007	0.007	0.004	0.003	0.006	0.003
Maximum (mg/l)	0.046	0.016	0.110	0.020	0.031	0.020	0.010	0.009	0.037	0.006
Minimum (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# Observations / non-detects	19/1	11/1	12/1	16/1	12/0	8/0	19/1	16/0	12/1	13/1
Base Flow Sampling	0.003			0.011			0.004	0.003		0.003
Dry Weather Data - Watershed Programs							0.002			

Dissolved Lead (Pb)	Monitoring Station									
DL = 0.001 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.001	-	0.002	0.005	0.001	0.001	0.001	0.001	0.002	0.001
Maximum (mg/l)	0.100	0.008	0.018	0.012	0.009	0.007	0.004	0.004	0.008	0.007
Minimum (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# Observations / non-detects	19/9	11/6	12/3	16/1	12/4	8/3	19/6	16/8	12/2	13/6
Base Flow Sampling	0.0003			<DL			<DL	0.0004		<DL

Dissolved Silver (Ag)	Monitoring Station									
DL = 0.0002 - 0.001 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	-	-	-	-	-	-	-	-	-	-
Maximum (mg/l)	0.0003	0.0000	0.0002	0.0013	0.0005	0.0005	0.0004	0.0012	0.0006	0.0010
Minimum (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# Observations / non-detects	19/14	11/11	12/11	16/12	12/9	8/6	19/14	16/14	12/11	13/12
Base Flow Sampling	0.0004			<DL			<DL	<DL		<DL
Dry Weather Data - Watershed Programs							< 0.002			

Dissolved Zinc (Zn)	Monitoring Station									
DL = 0.001 - 0.01 mg/l	*R1*	*R2*	*C1*	*C2*	*I1*	*I2*	*M1*	*M2*	*T1*	*OP1*
Median (mg/l)	0.011	0.040	0.076	0.082	0.339	0.140	0.033	0.010	0.077	0.008
Maximum (mg/l)	0.260	0.130	1.000	0.190	7.300	0.280	0.087	0.030	0.478	0.050
Minimum (mg/l)	0.003	0.018	0.009	0.019	0.115	0.058	0.007	0.006	0.028	0.005
# Observations / non-detects	19/1	11/0	12/0	16/0	12/0	8/0	19/0	16/1	12/0	13/2
Base Flow Sampling	0.002			0.044			0.009	0.002		0.002
Dry Weather Data - Watershed Programs							0.003			

DL = detection limit.
At each station, the stormwater values reported are the lognormal median, maximum, and minimum concentrations; no median values were calculated when over 50% of the values were non-detects.
The total number of sample tests for each parameter ("observations") is displayed along with the corresponding number of samples which produced non-detects.
When more than 1 base flow sample was available, the value shown is a geometric mean.
Cell shading indicates updated data.
Sources of dry weather data include the City of Portland's watershed monitoring programs for the Tualatin Basin, Balch Creek, Johnson Creek, and the Columbia Slough.

Table 6-5
Comparison of Stormwater Data with Acute DEQ and EPA Criteria

Number of Exceedances / Number of Observations

Monitoring Station	TSS	Fecal Coliform	E. Coli	Total Oil and Grease	Dissolved Cadmium (Cd)	Dissolved Copper (Cu)	Dissolved Lead (Pb)	Dissolved Silver (Ag)	Dissolved Zinc (Zn)
Standard or Criteria	*130 mg/l*	*200 /100ml*	*406 / 100 ml*	*10 mg/l* [B]	*hardness dependent* [C]	*hardness dependent* [C]	*hardness dependent* [C]	*hardness dependent* [C]	*hardness dependent* [C]
In-Pipe Stations									
Residential (R-2)	1 / 11	12 / 14	2 / 2	2 / 12	0 / 11	5 / 11	0 / 11	0 / 11	6 / 11
Commercial (C-1)	3 / 12	9 / 12	2 / 2	0 / 12	0 / 12	5 / 12	1 / 12	0 / 12	11 / 12
Commercial (C-2)	3 / 16	12 / 14	3 / 3	0 / 11	0 / 16	3 / 16	0 / 16	0 / 16	5 / 16
Industrial (I-1)	5 / 11	8 / 12	1 / 2	3 / 12	7 / 12	9 / 12	0 / 12	1 / 12	12 / 12
Industrial (I-2)	4 / 8	8 / 11	2 / 2	0 / 11	0 / 8	4 / 8	0 / 8	0 / 8	8 / 8
Mixed (M-1)	16 / 19	16 / 21	5 / 8	2 / 18	0 / 19	8 / 19	0 / 19	1 / 19	10 / 19
State Highway Corridor (T-1)	4 / 12	10 / 13	2 / 3	5 / 13	1 / 12	6 / 12	0 / 12	0 / 12	10 / 12
In-Stream Stations									
Residential (R-1)	13 / 19	18 / 18	5 / 8	0 / 17	0 / 19	8 / 19	1 / 19	0 / 19	1 / 19
Mixed (M-2)	3 / 16	14 / 15	3 / 7	0 / 15	0 / 15	1 / 16	0 / 16	0 / 16	0 / 16
Open Space (OP-1)	4 / 13	8 / 13	3 / 7	0 / 13	0 / 13	0 / 13	0 / 13	0 / 13	0 / 13
TOTALS	**56 / 137**	**115 / 143**	**28 / 44**	**12 / 134**	**8 / 137**	**49 / 138**	**2 / 138**	**2 / 138**	**63 / 138**

Comparison of Dry Weather Data with Chronic DEQ and EPA Criteria

Number of Exceedances / Number of Observations

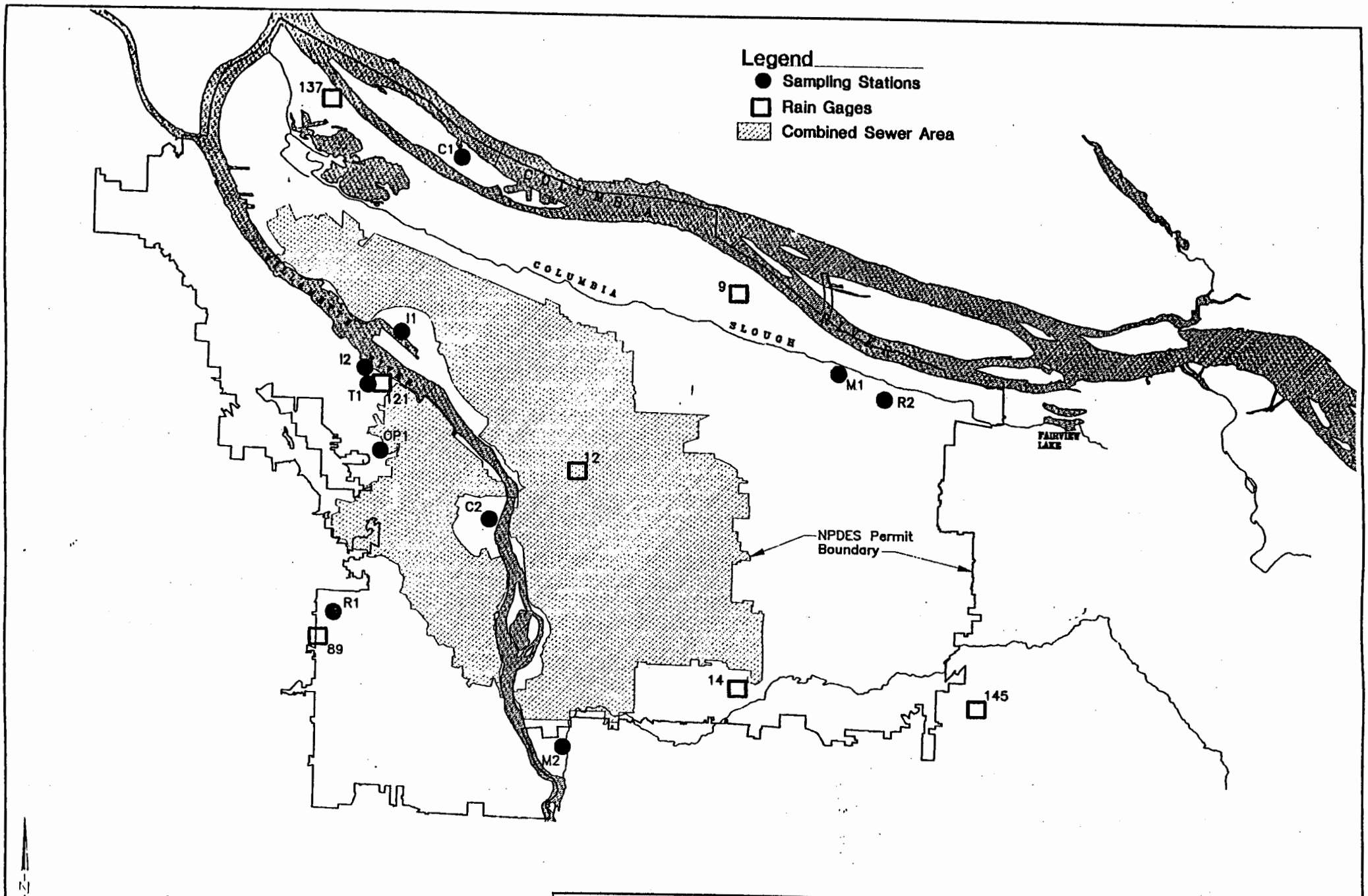
Monitoring Station	TSS	Fecal Coliform	E. Coli	Total Oil and Grease	Dissolved Cadmium (Cd)	Dissolved Copper (Cu)	Dissolved Lead (Pb)	Dissolved Silver (Ag)	Dissolved Zinc (Zn)
Standard or Criteria	*130 mg/l*	*200 /100ml*	*406 / 100 ml*	*10 mg/l* [B]	*hardness dependent* [C]	*hardness dependent* [C]	*hardness dependent* [C]	*hardness dependent* [C]	*hardness dependent* [C]
In-Pipe Stations									
Mixed (M-1)	0 / 3	0 / 2	0 / 2	0 / 3	0 / 2	1 / 2	0 / 2	0 / 2	0 / 2
Commercial (C-2)	0 / 3	0 / 2	0 / 2	0 / 3	0 / 2	0 / 2	0 / 2	0 / 2	0 / 2
Industrial (I-2)	0 / 3	0 / 2	0 / 2	0 / 3	0 / 2	0 / 2	0 / 2	0 / 2	0 / 2
In-Stream Stations									
Residential (R-1)	0 / 3	2 / 2	1 / 2	0 / 3	0 / 2	1 / 2	0 / 2	0 / 2	0 / 2
Mixed (M-2)	0 / 3	2 / 2	1 / 2	0 / 3	0 / 2	1 / 2	0 / 2	0 / 2	0 / 2
Open Space (OP-1)	0 / 3	2 / 2	1 / 2	1 / 3	0 / 2	1 / 2	0 / 2	0 / 2	0 / 2
TOTALS	**0 / 18**	**6 / 12**	**3 / 12**	**1 / 18**	**0 / 12**	**4 / 12**	**0 / 12**	**0 / 12**	**0 / 12**

Shaded cells indicates updated data for Permit Year 3.

[A] TMDL standard for the Tualatin River.

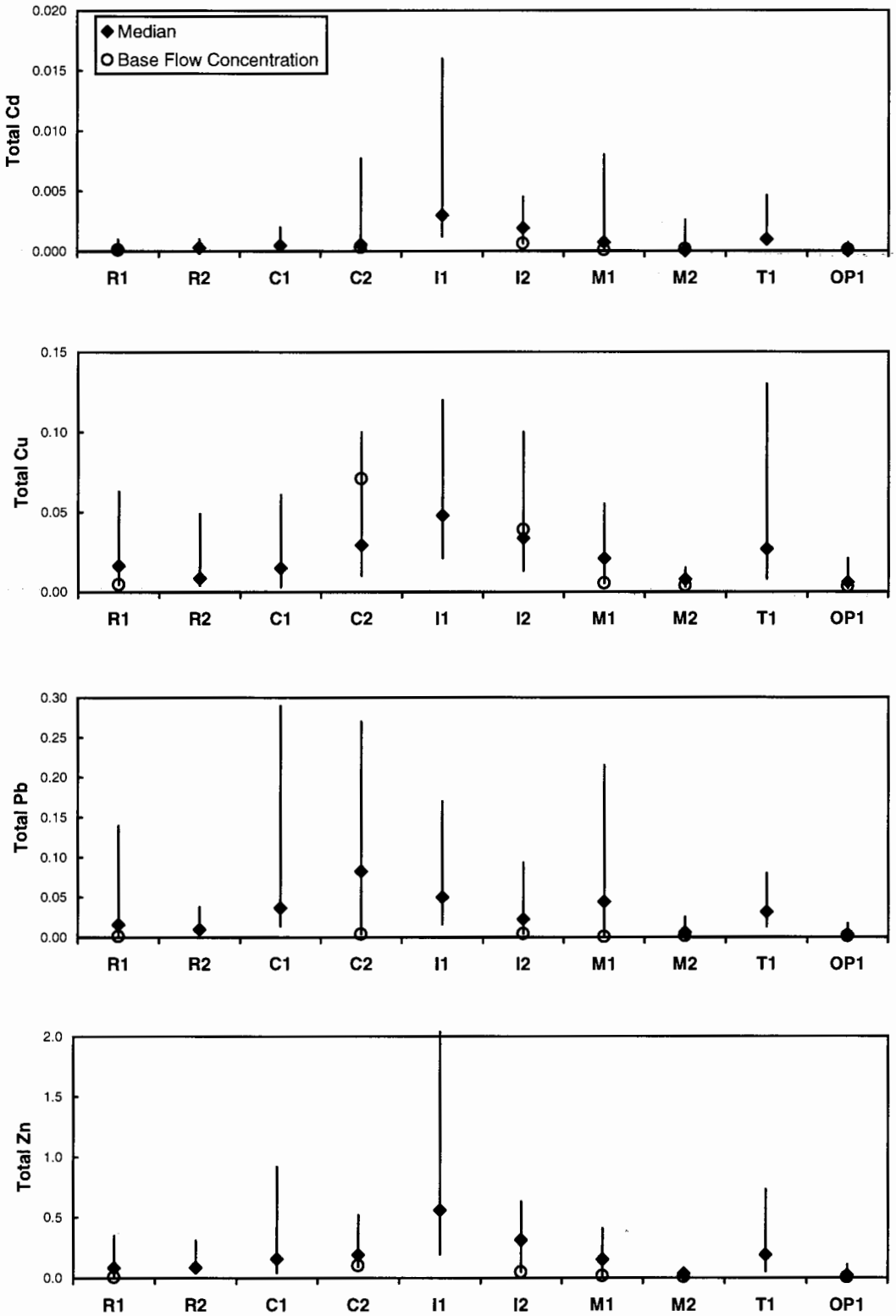
[B] Discharge limitation specified by DEQ for NPDES industrial stormwater permits.

[C] Criteria is computed for 25 mg/L or greater hardness.



BUREAU OF ENVIRONMENTAL SERVICES Portland, Oregon	Portland Stormwater Sampling Stations	Figure 6-1

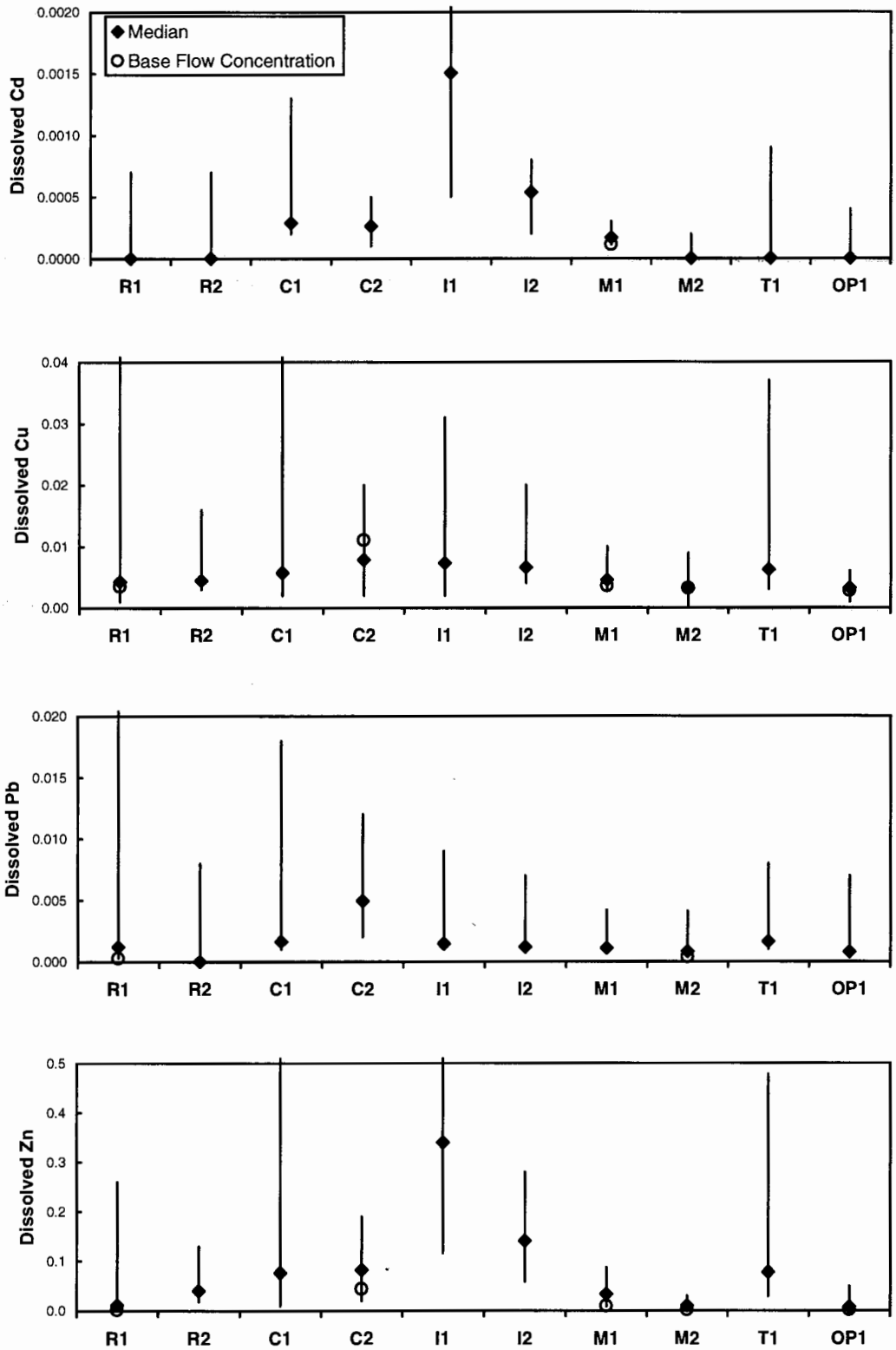
Figure 6-2a
Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Total Heavy Metals



Notes:
The concentrations of all parameters are in mg/L
The upper range of concentrations at some stations is not displayed so that the relative differences are more apparent.
Values for stations M1, M2, R1, and OP1 have been updated to include Permit Year 3 monitoring data.

Sumgraph.xls:Metals
9/17/98

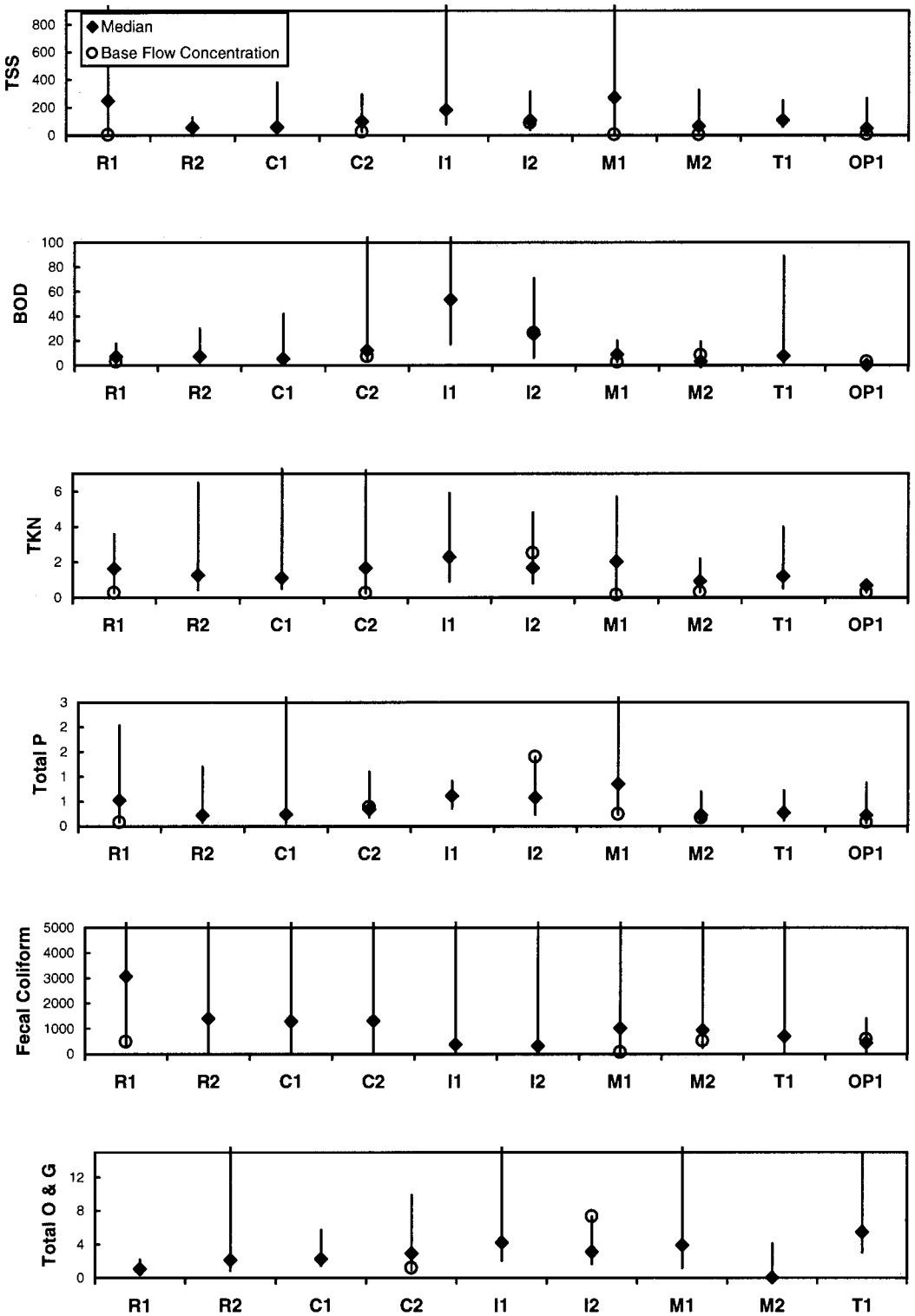
Figure 6-2b
Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Dissolved Heavy Metals



Notes:
The concentrations of all parameters are in mg/L
The upper range of concentrations at some stations is not displayed so that the relative differences are more apparent.
Values for stations M1, M2, R1, and OP1 have been updated to include Permit Year 3 monitoring data.

Sumgraph.xls:dissMetals
9/17/98

Figure 6-3
Maximum, Minimum, Median Stormwater and Base Flow Concentrations of Selected Conventional Parameters



Notes:
The concentrations of all parameters are in mg/L, except for fecal coliform, which is expressed in colonies/ 100 mL.
The upper range of concentrations at some stations is not displayed so that the relative differences are more apparent.
Values for stations M1, M2, R1, and OP1 have been updated to include Permit Year 3 monitoring data.

Sumgraph.xls:CONV
9/17/98

7.0 COLLABORATION WITH OREGON DEQ AND ACWA (TASK 6)

During Permit Year 3, the City was an active participant in ACWA's stormwater subcommittee. The City also provided support to the ACWA stormwater subcommittee with respect to monitoring. The City developed a matrix to show all the stormwater monitoring activities that are currently being conducted or are planned to be conducted by the NPDES Phase 1 jurisdictions (within the State of Oregon). The purpose of the matrix was to identify whether or not jurisdictions are duplicating any efforts with respect to monitoring and whether or not there are monitoring gaps that should be filled. Many of the Phase 1 jurisdictions are currently revising their NPDES stormwater monitoring plans. The City-prepared matrix was used by several of these jurisdictions in support of preparing their revised stormwater monitoring plans.

8.0 REFERENCES

1. Brown, Whitney, "Settling", Watershed Protection Techniques Technical Note No. 83, Volume 2, No. 3, February, 1997.

2. City of Portland, "NPDES Annual Compliance Report", Section VIII, Monitoring Program, September, 1996.

3. Strecker E.W., Wu B., Iannelli M., "Analysis of Oregon Urban Runoff Water Quality Monitoring Data Collected From 1990 to 1996", Prepared for The Oregon Association of Clean Water Agencies (ACWA), Woodward-Clyde Consultants, June, 1997.

Appendix A

Existing Water Quality Data Sets

A-1 Industrial Discharge Elimination Program (IDEP)

A-2 Non-Stormwater Discharges

A-3 Walnut Park Infiltration Facility

A-4 Parkrose Bio-Swale Monitoring Project

A-5 Port of Portland BMP Monitoring

A-1 Industrial Discharge Elimination Program (IDEP)

Summary of Illicit Discharge Elimination Data

Outfall ID#	Date	Type of site	Dominant land use	Flow observed	Odor	Color	Clarity	Floatables	Biological	Deposits/Stains	Vegetation condition	Structural condition	Ph	Temp	Fecal coliform	Residual chlorine	Conductivity
113	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
113	09/24/97	Manhole	Industrial	FALSE									0	0		0	0
100	07/28/97	Manhole	Industrial	TRUE									7.1	63	<10	0.09	214
100	09/24/97	Manhole	Industrial	TRUE									7.4	68	18	0.06	116
101	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
101	09/24/97	Outfall	Industrial	FALSE									0	0		0	0
103	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
103	09/24/97	Manhole	Industrial	FALSE									0	0		0	0
104	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
104	09/24/97	Manhole	Industrial	FALSE									0	0		0	0
104a	07/31/97	Manhole	Industrial	TRUE									6.5	60	63	0.32	220
104a	08/15/97	Manhole	Industrial	TRUE									6.4	59	25	0.05	222
104a	09/24/97	Manhole	Industrial	TRUE									6.3	60	10	0.07	220
104a	09/29/97	Manhole	Industrial	TRUE									7.1	62	10	0.03	220
104b	07/31/97		Industrial	FALSE									0	0		0	0
104b	09/24/97		Industrial	FALSE									0	0		0	0
108	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
108	09/24/97	Manhole	Industrial	TRUE									6.6	68	380	0.07	205
110a	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
110a	09/24/97	Manhole	Industrial	TRUE									6.2	61		0.06	176
111b	09/24/97	Manhole	Industrial	TRUE									0	0	30,000	0	0
112	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
112	09/24/97	Manhole	Industrial	FALSE									0	0		0	0
14	07/14/97	Outfall	Industrial	FALSE	None				None	None	None	Normal	0	0		0	0
14	09/03/97	Outfall	Industrial	FALSE									0	0		0	0
14	10/20/97	Outfall	Industrial	FALSE									0	0		0	0
16	07/14/97	Outfall	Industrial	FALSE									0	0		0	0
16	09/03/97	Outfall	Industrial	TRUE	Musty	Clear	Clear	Garbage	Iron Bacteria	Garbage	Inhibited Growth	Normal	6.1	63	90	0.25	450
19	07/14/97	Manhole	Industrial	TRUE	None	Brown	Suspended solids	Iron bacteria	Iron Bacteria	Iron Bacteria	None	Normal	6.8	62	440	0.09	295
19	08/13/97	Manhole	Industrial	TRUE									6.9	63	360	0.08	280
19	09/03/97	Manhole	Industrial	TRUE									7	60	42000	0.06	186
19	09/29/97	Manhole	Industrial	TRUE									9.5	62	10	0	720
19a	07/14/97	Manhole	Industrial	FALSE									0	0		0	0
19a	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
19a	09/29/97	Manhole	Industrial	FALSE									0	0		0	0
22	07/14/97	Outfall	Industrial	FALSE									0	0		0	0
22	08/13/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	Iron Bacteria	Iron Bacteria	None	Normal	6.6	67	58	0.07	475
22	09/03/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	Iron bacteria	Iron Bacteria	Iron Bacteria	None	Normal	6.7	68	27	0.08	200
22	09/29/97	Outfall	Industrial	TRUE	Musty	Clear	Clear	None	None	None	None	Normal	7	64	54	0.08	380
22b	07/14/97	Outfall	Industrial	TRUE	None	Orange	Suspended solids	Iron bacteria	Iron Bacteria	Iron Bacteria	Normal	Normal	7	57	<10	0.08	883
22b	08/13/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	Iron bacteria	Iron Bacteria	Iron Bacteria	Normal	Normal	7	63	25	0.03	970
22b	09/03/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	Iron bacteria	Iron Bacteria	Iron Bacteria	Normal	Normal	7.1	60	150	0.03	882
22b	09/29/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	None	Iron Bacteria	Iron Bacteria	None	Normal	7.3	62	200	0.01	880
22c	07/14/97	Outfall	Industrial	TRUE	Musty	Orange	Suspended solids	Iron bacteria	Iron Bacteria	Iron Bacteria	Normal	Normal	6.5	58	99	0.03	375
22c	09/03/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	Iron bacteria	Iron Bacteria	Iron Bacteria	Normal	Normal	6.8	60	10	0.01	470
34a	07/16/97	Outfall	Industrial	FALSE									0	0		0	0
34a	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
34a	09/03/97	Outfall	Industrial	FALSE									0	0		0	0
34a	10/20/97	Outfall	Industrial	FALSE									0	0		0	0

Summary of Illicit Discharge Elimination Data

Outfall ID#	Date	Type of site	Dominant land use	Flow observed	Odor	Color	Clarity	Floatables	Biological	Deposits/Stains	Vegetation condition	Structural condition	Ph	Temp	Fecal coliform	Residual chlorine	Conductivity
44	07/28/97	Manhole	Industrial	TRUE									7.4	69	<10	0.07	430
44	08/13/97	Manhole	Industrial	TRUE									6.8	67	60000	0	180
44	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
44	09/29/97	Manhole	Industrial	FALSE									0	0		0	0
44	10/20/97	Manhole	Industrial	FALSE									0	0		0	0
49	09/04/97	Outfall	Commercial	FALSE									0	0		0	0
49	10/20/97	Outfall	Industrial	FALSE									0	0		0	0
52a	07/30/97	Manhole	Industrial	FALSE									0	0		0	0
52a	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
52a	10/20/97	Manhole	Industrial	FALSE									0	0		0	0
52c	07/30/97	Manhole	Industrial	FALSE									0	0		0	0
52c	09/03/97	Manhole	Industrial	FALSE									0	0		0	
53a	07/30/97	Outfall	Industrial	TRUE	Musty			Iron bacteria	Iron Bacteria	Iron Bacteria	None	Normal	7.8	88	220	0.06	175
53a	09/03/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	Iron bacteria	Iron Bacteria	Iron Bacteria	Normal	Normal	7.6	87	45	0.03	150
53b	07/30/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	None	None	None	Normal	7.5	70	<10	0.09	80
53b	09/03/97	Outfall	Industrial	TRUE	Musty	Clear	Clear	Iron bacteria	Iron Bacteria	Iron Bacteria	None	Normal	7.5	72	150	0.02	650
53c	07/30/97	Outfall	Industrial	FALSE									0	0		0	
53c	09/03/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	None	Sediment	Normal	Normal	7.1	69	9	0.01	180
53d	07/31/97	Manhole	Industrial	FALSE										0		0	0
53d	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
53e	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
53e	09/03/97	Outfall	Industrial	FALSE									0	0		0	0
54a	07/28/97	Manhole	Industrial	FALSE									0	0		0	0
54a	08/14/97	Manhole	Industrial	FALSE									0	0		0	0
54a	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
54a	09/24/97	Manhole	Industrial	FALSE									0	0		0	0
55a	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
55a	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
56a	07/31/97	Outfall	Industrial	FALSE										0		0	0
56a	09/03/97	Outfall	Industrial	FALSE									0	0		0	0
56c	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
56c	09/03/97	Manhole	Industrial	FALSE									0	0		0	0
56d	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
60a	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
60b	09/08/97		Industrial	FALSE									0	0		0	0
60C	07/28/97	Outfall	Industrial	FALSE									0	0		0	0
60c	08/09/97	Outfall	Industrial	TRUE									6.8	63	9	0.04	215
60c	08/15/97	Outfall	Industrial	TRUE	Musty	Clear	Clear	None		Iron Bacteria	Excessive Growth	Normal	7	69	7	0.04	250
60c	09/29/97	Outfall	Industrial	TRUE	Musty	Orange	Cloudy	None	Iron Bacteria	Iron Bacteria	None	Normal	7.8	68	10	0.07	193
60d	09/08/97	Outfall	Industrial	FALSE									0	0		0	0
65a	09/08/97	Manhole	Industrial	TRUE									7.8	60	10	0.17	216
66	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
66a	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
67	07/14/97	Manhole	Industrial	FALSE									0	0		0	0
67	08/15/97	Manhole	Industrial	FALSE									0	0		0	0
67	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
68	07/28/97	Manhole	Industrial	TRUE									6.5	68	<10	0.05	197
68	08/15/97	Manhole	Industrial	TRUE									6.5	63	100	0.09	310
68	09/08/97	Manhole	Industrial	FALSE									0	0		0	0

Summary of Illicit Discharge Elimination Data

Outfall ID#	Date	Type of site	Dominant land use	Flow observed	Odor	Color	Clarity	Floatables	Biological	Deposits/Stains	Vegetation condition	Structural condition	Ph	Temp	Fecal coliform	Residual chlorine	Conductivity
69	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
70	09/08/97	Manhole	Industrial	TRUE									6.8	67	10	0.07	290
70	09/24/97			FALSE									6.7	65	10	0	240
72	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
73a	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
74	07/14/97	Outfall	Industrial	TRUE	None	Clear	Clear	None		Other	None	Normal	6.3	76	9	0.01	268
74	08/15/97	Outfall	Industrial	TRUE	Sewage	Clear	Cloudy	None	Bacteria/Algae	Sediment	None	Normal	6.5	63	2200	0.06	290
74	09/08/97	Outfall	Industrial	TRUE	Musty	Grey	Cloudy	None	None	Sediment	None	Normal	7	65	36	0.01	265
74	09/24/97	Outfall	Industrial	TRUE	Musty	Brown	Cloudy	None	None	None	None	Normal	7.1	70		0.08	177
75	07/14/97	Manhole	Industrial	FALSE									0	0		0	0
75	08/15/97	Manhole	Industrial	FALSE									0	0		0	0
75	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
75	09/24/97	Manhole	Industrial	TRUE									0	0		0	0
76	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
77	07/14/97	Manhole	Industrial	FALSE									0	0		0	0
77	08/18/97	Manhole	Industrial	TRUE									7.4	68	560	0.09	115
77	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
77	09/24/97	Manhole	Industrial	TRUE									7.1	75	54	0.08	90
78	07/14/97	Outfall	Industrial	FALSE									0	0		0	0
78	08/15/97	Manhole	Industrial	TRUE									7	67	2	0.4	170
78	09/08/97	Outfall	Industrial	TRUE	Musty	Clear	Clear	None	None	None	None	Normal	6.7	63	10	0.07	260
78	09/24/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	None	None	None	Normal	6.5	63	10	0.05	255
79	09/08/97	Other	Industrial	FALSE									0	0		0	0
80	07/14/97	Manhole	Industrial	TRUE									6.05	65	<10	0.28	285
80	08/15/97	Manhole	Industrial	TRUE									6.4	65	115	0.1	290
80	09/08/97	Manhole	Industrial	TRUE									6.6	67	27	0.04	284
80	09/24/97	Manhole	Industrial	TRUE									6.5	65	10	0.08	280
81	09/08/97	Other	Industrial	FALSE									0	0		0	0
82	09/08/97	Other	Industrial	FALSE									0	0		0	0
84	07/14/97	Manhole	Industrial	TRUE	Sewage	Brown	Suspended solids						7.1	66	>60000		1111
84	08/15/97	Manhole	Industrial	TRUE									7.7	67	60000	0	106
84	09/08/97	Manhole	Industrial	TRUE									0	0		0	0
84	09/24/97	Manhole	Industrial	TRUE									0	0		0	0
86	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
87	09/08/97	Outfall	Industrial	FALSE									0	0		0	0
88	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
89	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
90	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
92	09/08/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	None	None	Excessive Growth	Normal	7.2	63	18	0.03	210
93	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
93	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
94	07/31/97	Manhole	Industrial	TRUE									6.3	58	18	0.15	205
94	08/15/97	Manhole	Industrial	TRUE									6.3	58	35000	0.09	215
94	09/08/97	Manhole	Industrial	TRUE									6.4	59	10	0.09	200
96	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
97	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
98	07/31/97	Manhole	Industrial	FALSE									0	0		0	0
98	09/08/97	Manhole	Industrial	FALSE									0	0		0	0
99	07/31/97	Outfall	Industrial	FALSE									0	0		0	0

Summary of Illicit Discharge Elimination Data

Outfall ID#	Date	Type of site	Dominant land use	Flow observed	Odor	Color	Clarity	Floatables	Biological	Deposits/Stains	Vegetation condition	Structural condition	Ph	Temp	Fecal caliform	Residual chlorine	Conductivity
99	09/24/97	Manhole	Industrial	FALSE									0	0		0	0
H1	07/31/97	Outfall	Commercial	TRUE									7.6	70	150	0.04	205
H1	09/22/97	Outfall	Commercial	TRUE	None	Clear	Clear	None	None	None	None	Normal	7.1	70	>1200	0.07	60
J19	07/17/97			TRUE									7.5	65	140	0.02	165
J19	09/22/97	Manhole	Commercial	TRUE									7.5	59	47	0.05	165
J20	07/17/97	Outfall	Industrial	FALSE						None	Inhibited Growth	Normal	0	0		0	0
J20	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
J20	10/15/97	Outfall	Industrial	FALSE									0	0		0	0
J22	07/17/97			FALSE									0	0		0	0
J22	09/22/97		Industrial	FALSE									0	0		0	0
J22	10/15/97		Industrial	FALSE									0	0		0	0
J3	07/17/97	Outfall	Industrial	FALSE						Sediment	Normal	Normal	0	0		0	0
J3	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
J3	10/15/97	Outfall	Industrial	FALSE									0	0		0	0
J32	07/17/97	Outfall	Commercial	FALSE						None	None	Normal	0	0		0	0
J32	09/22/97	Outfall	Commercial	FALSE									0	0		0	0
J33	07/17/97	Outfall	Commercial	TRUE	None	Clear	Clear	None	Bacteria/Algae	Sediment	None	Normal	6.1	60	200	0.09	170
J33	09/22/97	Outfall	Commercial	TRUE									6.6	63	4	0.03	75
J4	07/17/97	Outfall	Industrial	FALSE						Sediment	Inhibited Growth	Normal	0	0		0	0
J4	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
J4	10/15/97	Outfall	Industrial	FALSE									0	0		0	0
J5a	07/17/97	Outfall	Industrial	FALSE						Sediment	Normal	Normal	0	0		0	0
J5a	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
J5a	10/15/97	Outfall	Industrial	FALSE									0	0		0	0
J5a	10/15/97	Outfall	Industrial	FALSE									0	0		0	0
J5b	07/17/97	Outfall	Industrial	FALSE						Sediment	Normal	Normal	0	0		0	0
J5b	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
JCESP	07/17/97	Outfall	Industrial	TRUE									0	0		0	0
JCF	07/17/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	None	None	Inhibited Growth	Normal	6.5	62	140	0.01	255
JCF	09/22/97	Outfall	Industrial	TRUE	None	Clear	Clear	None	None	None	None	Normal	6.8	57	50	0.05	260
JESP	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
JESP	10/15/97	Outfall	Industrial	FALSE									0	0		0	0
M1	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
M1	09/22/97	Outfall	Industrial	TRUE	None	Orange	Cloudy	None	Iron Bacteria	Iron Bacteria	None	Normal	6.8	78	7	0.01	300
M2	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
M2	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
M3	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
M3	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
S1	07/28/97	Outfall	Industrial	FALSE									0	0		0	0
S1	09/22/97	Manhole	Industrial	TRUE									7.3	68	4	0.08	45
S2	07/31/97	Outfall	Industrial	TRUE	Musty	Clear	Clear	Garbage	None	Garbage	None	Normal	7	80	<9	0.07	42
S2	09/22/97	Outfall	Industrial	FALSE	None				Bacteria/Algae	Garbage	Normal	Normal	0	0		0	0
S4	07/31/97	Outfall	Industrial	FALSE										0		0	0
S4	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
S5	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
S6	07/31/97	Outfall	Industrial	FALSE									0	0		0	0
S6	09/22/97	Outfall	Industrial	FALSE									0	0		0	0
100	06/17/98	Manhole	Industrial	Yes									6.3	64	210	0.01	120
101	06/17/98	Manhole	Industrial	No													

Summary of Illicit Discharge Elimination Data

Outfall ID#	Date	Type of site	Dominant land use	Flow observed	Odor	Color	Clarity	Floatables	Biological	Deposits/Stains	Vegetation condition	Structural condition	Ph	Temp	Fecal coliform	Residual chlorine	Conductivity
103	06/17/98	Manhole	Industrial	No													
103	06/17/98	Manhole	Industrial	No													
104	06/17/98	Manhole	Industrial	No													
104A	06/17/98	Manhole	Industrial	Yes									6.2	61	5	0.00	215
104B	06/17/98		Industrial														
108	06/17/98	Manhole	Industrial	Yes									6.3	61	570	0.0	207
110A	06/17/98	Manhole	Industrial	Yes									6.1	59	2	0.0	189
111B	06/17/98	Manhole	Industrial	Yes									6.3	60	9	0.36	206
112	06/17/98	Manhole	Industrial	No													
113	06/17/98	Manhole	Industrial	No													
16	06/01/98	Outfall	Industrial	No													
18	06/01/98	Outfall	Industrial														
19	06/01/98	Manhole	Industrial	Yes									6.6	58	6000	.01	150
19A	06/01/98	Manhole	Industrial	No													
22	06/01/98	Manhole	Industrial														
34	06/29/98	Outfall	Industrial	No													
44	06/01/98	Manhole	Industrial														
50	06/29/98	Manhole	Industrial	Yes									6.99	64	760	0.03	39
54A	06/01/98	Manhole	Industrial	No													
65A	06/01/98	Manhole	Industrial	No													
70	06/01/98	Manhole	Industrial	Yes									6.4	62	11	.07	270
74	06/01/98	Outfall	Industrial	Yes	None	Clear	Clear	None	None	Sediment	Normal	Normal	7.0	68	68000	.03	240
77	06/01/98	Manhole	Industrial	Yes									6.6	76	4	.33	40
78	06/01/98	Outfall	Industrial	Yes	None	Clear	Clear	None	None	None	None	Normal	6.4	64	4	.04	255
79	06/17/98		Industrial														
8	06/29/98	Manhole	Commercial	No													
80	06/01/98	Manhole	Industrial	Yes									6.3	72	17	.08	300
81	06/17/98		Industrial														
82	06/17/98	Manhole	Industrial	No													
84	06/01/98	Manhole	Industrial	No													
86	06/17/98	Manhole	Industrial	No													
87	06/17/98		Industrial														
88	06/17/98	Manhole	Industrial	No													
88A	06/17/98	Manhole	Industrial	No													
89	06/17/98	Manhole	Industrial	No													
90	06/17/98	Manhole	Industrial	No													
92	06/17/98	Manhole	Industrial	Yes									6.3	61	2	0.04	212
93	06/17/98	Manhole	Industrial	No													
94	06/01/98	Manhole	Industrial	Yes									6.3	68	3	.07	140
96	06/17/98	Manhole	Industrial	No													
98	06/17/98	Manhole	Industrial	No													
J19	06/29/98	Manhole	Commercial	Yes									7.31	66		0.05	183
J20	06/29/98	Outfall	Industrial	No													
J22	06/29/98		Commercial														
J3	06/29/98	Outfall	Industrial	No													
J32	06/29/98	Outfall	Commercial	Yes									7.15	66		0.03	83
J33	06/29/98	Outfall	Commercial	Yes									6.17	70		0.06	165
J4	06/29/98	Outfall	Industrial	No													
J5A	06/29/98	Outfall	Industrial	No													

Summary of Illicit Discharge Elimination Data

Outfall ID#	Date	Type of site	Dominant land use	Flow observed	Odor	Color	Clarity	Floatables	Biological	Deposits/Stains	Vegetation condition	Structural condition	Ph	Temp	Fecal coliform	Residual chlorine	Conductivity
J5B	06/29/98	Outfall	Industrial	No													
JCF	06/29/98	Outfall	Industrial	Yes	Musty	Clear	Clear	None	Bacteria/Algae	None	None	Normal	6.6	63		0.05	258
JESP	06/29/98	Outfall	Industrial	No													

A-1

List of COP Outfalls

Class:	COP#:	Location:	Pipe size:
A	16	NW 26TH AVE @ FRONT AVE	36
A	18	NW FRONT AVE @ GUNDERSON	72
A	19	NW FRONT AVE @ KITTRIDGE	42
A	22	NW FRONT @ DOANE	60
A	50	N BRADFORD @ SALEM AVE (WPCL)	30
A	44	N. RIVER ST @ HARDING AVE	12
A	45	N ESSEX AVE	27
A	65A	NE 17TH & ARGYLE	42
A	70	2939 NE ARGYLE ST	24
A	74	6850 NE 47TH AVE	12
A	77	NE 59TH PL	30
A	94	NE SUMNER @ 117TH AVE	30
A	110A	NE 148TH, SE SIDE	54
A	111B	NE 158TH, SW SIDE	36
A	J4	SE 82ND @ HARNEY, SW SIDE	21
A	J33	SE CIRCLE AVE	42
A	H1	1525 N HAYDEN ISLAND DR., SW crnr, near ramp 7	36
B	34A	SE SALMON ST @ WILLAMETTE RIVER	18
B	10A	1200 NW FRONT AVE	30
B	14	1700 NW FRONT AVE	30
B	19A	NW FRONT AVE @ KITTRIDGE	36
B	22B	NW FRONT AVE @ WACKER	48
B	22C	NW FRONT AVE @ WACKER	84
B	M1	N BASIN AVE, W OTFL	60
B	M2	N BASIN AVE, MDL OTFL	60
B	M3	N BASIN AVE, NW OF EMERSON ST	60
B	S1	N LAGOON @ DOLPHIN	36
B	S2	N LAGOON AVE, BTWN COMRC & BALLAST	36
B	S4	N CHANNEL AVE, BTWN LAGOON & BASIN	15
B	S5	N CHANNEL AVE @ BALLAST	36
B	S6	N CHANNEL @ SHIPYARD	36
B	48	N VAN HOUTEN PL	30
B	49	S OF N VAN BUREN @ BRADFORD, N OF RR TRACKS	36
B	52	N ALTA @ BRADFORD	36
B	52A	S END OF N ST LOUIS ST	36
B	52C	S OF 10838 N LOMBARD ST	42
B	60A	END OF N LEADBETTER @ MARINE DR	72
B	60C	N MARINE DR @ BURLINGTON NORTHERN	60
B	60B	N MARINE DR, NEAR POP BERTH 607	54
B	60D	N MARINE DR @ FORCE AVE	12
B	53	N EDISON @ RENO	30
B	53A	N RAMSEY AVE @ RIVERGATE	42
B	53B	S OF SLOUGH UNDER LOMBARD BRIDGE	54
B	53C	N OF SLOUGH UNDER LOMBARD BRIDGE	48
B	53D	N COLUMBIA BLVD & LOMBARD	42
B	53E	ST JOHNS LANDFILL, W OF BRIDGE	30
B	54	ST JOHNS LANDFILL, BTWN BRIDGE & 53E	30
B	54A	N SWIFT CT	48
B	55A	N UPLAND DR, N OF RR TRACKS	36
B	56A	N BLOSS AVE	36
B	56C	N PORTLAND RD @ TAFT	36
B	56D	755 NE COLUMBIA BLVD	30
B	66	NE 21ST & ARGYLE, SE OF BRIDGE	64

List of COP Outfalls

Class:	COP#:	Location:	Pipe size:
B	66A	NE 23RD @ RIVERSIDE	18
B	67	2519 NE ARGYLE ST	30
B	68	2705 NE ARGYLE ST	24
B	69	NE 28TH @ RIVERSIDE, N BANK	24
B	72	W OF NE 33RD, N OF ARGYLE	21
B	73A	NE 42ND AVE @ BUFFALO SLOUGH	36
B	75	NE CORNFOOT RD @ 55TH AVE	12
B	76	NE SKYPORT WY	18
B	77A	E. OF NE 59TH PL, S. SIDE OF SLOUGH	
B	77B	NE 66TH AVE	
B	77C	NE COLWOOD WY	
B	78	NE 78TH CT	18
B	79	NE 85TH @ MARX	18
B	80	NE MARX ST @ 87TH AVE	12
B	81	NE MARX PL	12
B	82	NE MARX PL @ 90TH AVE	12
B	84	NE 92ND AVE @ MARX ST	18
B	86	NE 95TH @ COLFAX	15
B	87	NE 98TH @ COLFAX	12
B	88	NE 105TH, N SIDE OF SLOUGH	12
B	88A	NE 105TH, S SIDE OF SLOUGH	
B	89	NE 105TH, UNDER I-205 OVERPASS	24
B	90	NE CLARK, 105TH @ I-205	12
B	92	NE 112TH @ MARX PL	21
B	93	NE 115TH, N OF SUMNER	18
B	96	NE AINSWORTH CIRCLE	42
B	98	NE 121ST AVE @ SUMNER	15
B	99	NE 122ND AVE, SW SIDE	18
B	100	NE 122ND AVE @ SW SIDE OF SLOUGH	60
B	101	NE 122ND AVE, NE SIDE	18
B	103	NE 124TH @ AIRPORT WY, NEAR DANNER	36
B	104	NE 128TH @ WHTKR WY, N SIDE @ MILLER PAINT	36
B	104A	NE 128TH @ MARX ST	36
B	104B	NE 128TH @ WHTKR WY, S SIDE	54
B	108	NE 138TH, SW SIDE	60
B	112	NE 162ND @ MASON	30
B	113	E OF 162ND, 1300 OFF SANDY BLVD	72
B	JESP	8400 SE 26TH PL, EAST SIDE PLATING	15
B	JCF	SE 44TH AVE @ UMATILLA ST	48
B	J3	SE 82ND @ HARNEY, NW SIDE	16
B	J5A	SE 82ND @ HARNEY, NE SIDE	16
B	J5B	SE 82ND @ HARNEY, SE SIDE	21
B	J20	SE 106TH @ FOSTER, NE OF BRIDGE	18
B	J22	W OF SE 108TH @ FOSTER	72
C	8	SW HARBOR WY @ MILL ST	54
C	J19	SE 100TH @ KNAPP	42
C	J32	SE CIRCLE AVE	48

A = Priority outfalls
B = Industrial outfalls
C = Commercial Outfalls

A-2 Non-Stormwater Discharges

A-2
Non Stormwater Discharge Monitoring Data

SAMPLE DATE	LOCATION	PARAMETER	RESULT	UNIT	MRL	ANALYSIS METHOD
6/24/98	Portland Building	CADMIUM	2.8	µg/L	0.1	EPA 200.8
6/24/98	Portland Building	CHROMIUM	2.97	µg/L	0.2	EPA 200.8
6/24/98	Portland Building	CONDUCTIVITY (FIELD)	444	µmhos/cm	1	SM 2510 B
6/24/98	Portland Building	COPPER	397	µg/L	0.2	EPA 200.8
6/24/98	Portland Building	LEAD	12.8	µg/L	0.1	EPA 200.8
6/24/98	Portland Building	MOLYBDENUM	1550	µg/L	0.1	EPA 200.8
6/24/98	Portland Building	NICKEL	2.96	µg/L	0.2	EPA 200.8
6/24/98	Portland Building	pH (FIELD)	7.3	pH Units	0.1	SM 4500-H B
6/24/98	Portland Building	TIN	<0.200	mg/L	0.2	EPA 200.7
6/24/98	Portland Building	ZINC	9200	µg/L	0.5	EPA 200.8
6/30/98	Portland Building	CADMIUM	3.23	µg/L	0.1	EPA 200.8
6/30/98	Portland Building	CHROMIUM	3.55	µg/L	0.2	EPA 200.8
6/30/98	Portland Building	CONDUCTIVITY (FIELD)	466	µmhos/cm	1	SM 2510 B
6/30/98	Portland Building	COPPER	370	µg/L	0.2	EPA 200.8
6/30/98	Portland Building	LEAD	18.4	µg/L	0.1	EPA 200.8
6/30/98	Portland Building	MOLYBDENUM	1690	µg/L	0.1	EPA 200.8
6/30/98	Portland Building	NICKEL	3.59	µg/L	0.2	EPA 200.8
6/30/98	Portland Building	pH (FIELD)	7.3	pH Units	0.1	SM 4500-H B
6/30/98	Portland Building	TIN	<0.200	mg/L	0.2	EPA 200.7
6/30/98	Portland Building	ZINC	7000	µg/L	0.5	EPA 200.8
6/22/98	Water Quality Lab	CADMIUM	0.1	µg/L	0.1	EPA 200.8
6/22/98	Water Quality Lab	CHROMIUM	<0.2	µg/L	0.2	EPA 200.8
6/22/98	Water Quality Lab	CONDUCTIVITY (FIELD)	36	µmhos/cm	1	SM 2510 B
6/22/98	Water Quality Lab	COPPER	11.4	µg/L	0.2	EPA 200.8
6/22/98	Water Quality Lab	LEAD	0.57	µg/L	0.1	EPA 200.8
6/22/98	Water Quality Lab	MOLYBDENUM	<2	µg/L	0.1	EPA 200.8
6/22/98	Water Quality Lab	NICKEL	0.27	µg/L	0.2	EPA 200.8
6/22/98	Water Quality Lab	pH (FIELD)	5.9	pH Units	0.1	SM 4500-H B
6/22/98	Water Quality Lab	TIN	<0.200	mg/L	0.2	EPA 200.7
6/22/98	Water Quality Lab	ZINC	5680	µg/L	0.5	EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	<0.1	µg/L	0.1	EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	<0.1	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	Not Reportable	RPD		EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	10	µg/L		EPA 200.7
6/30/98	Water Quality Lab	CADMIUM	11.2	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	112	%REC		EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	10.1	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CADMIUM	25.4	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	<0.2	µg/L	0.2	EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	<0.2	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	Not Reportable	RPD		EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	10	µg/L		EPA 200.7
6/30/98	Water Quality Lab	CHROMIUM	11.2	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	112	%REC		EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	9.96	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CHROMIUM	24.5	µg/L		EPA 200.8
6/30/98	Water Quality Lab	CONDUCTIVITY (FIELD)	23	µmhos/cm	1	SM 2510 B
6/30/98	Water Quality Lab	COPPER	13.1	µg/L	0.2	EPA 200.8
6/30/98	Water Quality Lab	COPPER	13.4	µg/L		EPA 200.8
6/30/98	Water Quality Lab	COPPER	2.264	RPD		EPA 200.8
6/30/98	Water Quality Lab	COPPER	10	µg/L		EPA 200.7
6/30/98	Water Quality Lab	COPPER	24.6	µg/L		EPA 200.8
6/30/98	Water Quality Lab	COPPER	123.5	%REC		EPA 200.8
6/30/98	Water Quality Lab	COPPER	10.1	µg/L		EPA 200.8
6/30/98	Water Quality Lab	COPPER	24.7	µg/L		EPA 200.8
6/30/98	Water Quality Lab	LEAD	0.32	µg/L	0.1	EPA 200.8
6/30/98	Water Quality Lab	LEAD	0.34	µg/L		EPA 200.8
6/30/98	Water Quality Lab	LEAD	6.061	RPD		EPA 200.8
6/30/98	Water Quality Lab	LEAD	10	µg/L		EPA 200.7
6/30/98	Water Quality Lab	LEAD	11.5	µg/L		EPA 200.8
6/30/98	Water Quality Lab	LEAD	111.7	%REC		EPA 200.8
6/30/98	Water Quality Lab	LEAD	10	µg/L		EPA 200.8
6/30/98	Water Quality Lab	LEAD	24.7	µg/L		EPA 200.8

A-2
Non Stormwater Discharge Monitoring Data

SAMPLE DATE	LOCATION	PARAMETER	RESULT	UNIT	MRL	ANALYSIS METHOD
6/30/98	Water Quality Lab	MOLYBDENUM	<0.1	µg/L	0.1	EPA 200.8
6/30/98	Water Quality Lab	MOLYBDENUM	<0.1	µg/L		EPA 200.8
6/30/98	Water Quality Lab	MOLYBDENUM	Not Reportable	RPD		EPA 200.8
6/30/98	Water Quality Lab	MOLYBDENUM	10	µg/L		EPA 200.7
6/30/98	Water Quality Lab	MOLYBDENUM	10.3	µg/L		EPA 200.8
6/30/98	Water Quality Lab	MOLYBDENUM	103	%REC		EPA 200.8
6/30/98	Water Quality Lab	NICKEL	0.25	µg/L	0.2	EPA 200.8
6/30/98	Water Quality Lab	NICKEL	0.21	µg/L		EPA 200.8
6/30/98	Water Quality Lab	NICKEL	17.391	RPD		EPA 200.8
6/30/98	Water Quality Lab	NICKEL	10	µg/L		EPA 200.7
6/30/98	Water Quality Lab	NICKEL	11.2	µg/L		EPA 200.8
6/30/98	Water Quality Lab	NICKEL	109.7	%REC		EPA 200.8
6/30/98	Water Quality Lab	NICKEL	9.87	µg/L		EPA 200.8
6/30/98	Water Quality Lab	NICKEL	24.6	µg/L		EPA 200.8
6/30/98	Water Quality Lab	pH (FIELD)	6.5	pH Units	0.1	SM 4500-H B
6/30/98	Water Quality Lab	TIN	<0.200	mg/L	0.2	EPA 200.7
6/30/98	Water Quality Lab	ZINC	3250	µg/L	0.5	EPA 200.8
6/30/98	Water Quality Lab	ZINC	3240	µg/L		EPA 200.8
6/30/98	Water Quality Lab	ZINC	0.308	RPD		EPA 200.8
6/30/98	Water Quality Lab	ZINC	50	µg/L		EPA 200.7
6/30/98	Water Quality Lab	ZINC	3310	µg/L		EPA 200.8
6/30/98	Water Quality Lab	ZINC	130	%REC		EPA 200.8

A-3 Walnut Park Infiltration Facility

Walnut Park Infiltration Facility

A-3

ANALYTE	RESULT	UNIT	MRL	METHOD
TKN	2010	mg/Kg	91	EPA 351.2
Sieve #4 (>4750)	4.4	Fract %		ASTM D422M
Sieve #10 (4750-2000 µm)	8.6	Fract %		ASTM D422M
Sieve #20 (2000-850 µm)	7.6	Fract %		ASTM D422M
Sieve #40 (850-425 µm)	4.3	Fract %		ASTM D422M
Sieve #60 (425-250 µm)	3.1	Fract %		ASTM D422M
Sieve #140 (250-106 µm)	9.5	Fract %		ASTM D422M
Sieve #200 (106-75 µm)	6.3	Fract %		ASTM D422M
Sieve #230 (75-62.5 µm)	3.1	Fract %		ASTM D422M
phi 4 (62.5-31.2 µm)	32.1	Fract %		ASTM D422M
phi 5 (31.2-15.6 µm)	7.5	Fract %		ASTM D422M
phi 6 (15.6-7.8 µm)	3	Fract %		ASTM D422M
phi 7 (7.8-3.9 µm)	1.5	Fract %		ASTM D422M
phi 9 (1.9-0.9 µm)	1.5	Fract %		ASTM D422M
phi 10 (<0.9 µm)	1.5	Fract %		ASTM D422M
PETROLEUM OIL HYDROCARBONS	134	mg/Kg	20	DEQ 418.1M
CADMIUM	1.03	mg/Kg	0.5	EPA6010/6020
COPPER	32.7	mg/Kg	0.5	EPA6010/6020
LEAD	25.7	mg/Kg	10	EPA6010/6020
ZINC	129	mg/Kg	1	EPA6010/6020
TKN	429	mg/Kg	65	EPA 351.2
Sieve #4 (>4750)	15	Fract %		ASTM D422M
Sieve #10 (4750-2000 µm)	23.1	Fract %		ASTM D422M
Sieve #20 (2000-850 µm)	22.4	Fract %		ASTM D422M
Sieve #40 (850-425 µm)	6.3	Fract %		ASTM D422M
Sieve #60 (425-250 µm)	2.8	Fract %		ASTM D422M
Sieve #140 (250-106 µm)	4.5	Fract %		ASTM D422M
Sieve #200 (106-75 µm)	2.3	Fract %		ASTM D422M
Sieve #230 (75-62.5 µm)	1.3	Fract %		ASTM D422M
phi 4 (62.5-31.2 µm)	10	Fract %		ASTM D422M
phi 5 (31.2-15.6 µm)	4.4	Fract %		ASTM D422M
phi 6 (15.6-7.8 µm)	1.6	Fract %		ASTM D422M
phi 7 (7.8-3.9 µm)	1.2	Fract %		ASTM D422M
phi 8 (3.9-1.9 µm)	0.8	Fract %		ASTM D422M
phi 9 (1.9-0.9 µm)	0.4	Fract %		ASTM D422M
phi 10 (<0.9 µm)	1.2	Fract %		ASTM D422M
PETROLEUM OIL HYDROCARBONS	56.4	mg/Kg	20	DEQ 418.1M
CADMIUM	1.48	mg/Kg	0.5	EPA6010/6020
COPPER	23.5	mg/Kg	0.5	EPA6010/6020
LEAD	17.6	mg/Kg	10	EPA6010/6020
ZINC	96.9	mg/Kg	1	EPA6010/6020
TKN	72	mg/Kg	58	EPA 351.2
Sieve #4 (>4750)	13.8	Fract %		ASTM D422M
Sieve #10 (4750-2000 µm)	32.4	Fract %		ASTM D422M
Sieve #20 (2000-850 µm)	29.9	Fract %		ASTM D422M
Sieve #40 (850-425 µm)	9.8	Fract %		ASTM D422M
Sieve #60 (425-250 µm)	3.3	Fract %		ASTM D422M
Sieve #140 (250-106 µm)	2.4	Fract %		ASTM D422M
Sieve #200 (106-75 µm)	0.9	Fract %		ASTM D422M

Walnut Park Infiltration Facility

A-3

ANALYTE	RESULT	UNIT	MRL	METHOD
Sieve #230 (75-62.5 µm)	0.5	Fract %		ASTM D422M
phi 4 (62.5-31.2 µm)	4.2	Fract %		ASTM D422M
phi 5 (31.2-15.6 µm)	0.5	Fract %		ASTM D422M
phi 7 (7.8-3.9 µm)	0.3	Fract %		ASTM D422M
phi 8 (3.9-1.9 µm)	0.5	Fract %		ASTM D422M
phi 9 (1.9-0.9 µm)	0.3	Fract %		ASTM D422M
phi 10 (<0.9 µm)	0.5	Fract %		ASTM D422M
PETROLEUM OIL HYDROCARBONS	<20.0	mg/Kg	20	DEQ 418.1M
CADMIUM	0.917	mg/Kg	0.5	EPA6010/6020
COPPER	21.8	mg/Kg	0.5	EPA6010/6020
LEAD	<10.0	mg/Kg	10	EPA6010/6020
ZINC	75.7	mg/Kg	1	EPA6010/6020

A-4 Parkrose Bio-Swale Monitoring Project

A-4
Analytical Summary Parkrose Bioswale
FY 1997-98 Storm Events

Grab Parameters	Units	STORM EVENT 1 1/6/98			STORM EVENT 2 3/21/98			STORM EVENT 3 5/19/98		
		INLET	OUTLET	% Removal	INLET	OUTLET	% Removal	INLET	OUTLET	% Removal
pH (FIELD)	pH Units	6.8	6.5	NA	6.2	6.1	NA	5.6	6.4	NA
DISSOLVED OXYGEN (FIELD)	mg/L	11.8	11.7	NA	11.1	11.1	NA	7.7	9.2	NA
TEMPERATURE (FIELD)	Deg. C	8.1	8.2	NA	11.8	11.6	NA	12.3	11.4	NA
CONDUCTIVITY (FIELD)	µmhos/cm	33	34	NA	13	12	NA	37	17	NA
BOD5	mg/L	3	3	~0	2	<2	~0	8	6	25
COD	mg/L	29	31	-7	10	10	~0	63	51	19
TOTAL SUSPENDED SOLIDS	mg/L	21	73.3	-249	12	13	-8	36	34	6
TOTAL OIL & GREASE	mg/L	<5	<5	~0	<5	5.1	-2	<5	<5	~0
E. COLI	CFU/100 ml	370	2000	-441	EST 150	320	~ -113	EST 1400	EST 1400	~0
HARDNESS	mg CaCO3/L	10.4	14.0	NA	5.2	4.8	NA	9.4	6.0	NA
COPPER	µg/L	4.39	6.2	-41	2.68	2.36	12	10.2	8.18	20
ZINC	µg/L	22.4	51.6	-130	21.8	20.8	5	52.2	36.8	30
CADMIUM	µg/L	<0.1	<0.1	~0	<0.1	<0.1	~0	0.12	<0.1	~17
LEAD	µg/L	4.73	5.49	-16	4.02	1.53	62	6.09	5.04	17
COPPER, DISSOLVED	µg/L	2.27	2.39	-5	1.54	1.64	-6	4.14	3.03	27
ZINC, DISSOLVED	µg/L	5.87	20.3	-246	10.4	16.0	-54	25.5	25.6	0
CADMIUM, DISSOLVED	µg/L	<0.1	<0.1	~0	<0.1	<0.1	~0	<0.1	<0.1	~0
LEAD, DISSOLVED	µg/L	0.47	0.66	-40	<0.1	0.11	-10	0.48	0.31	35
Lab ID		FO980002	FO980003		FO980421	FO980422		FO980833	FO980834	

NA - Not Applicable

A-5 Port of Portland BMP Monitoring

Port of Portland BMP Sampling Results

Oil Water Separater 660 - CPS (4/23/98)				
Parameter	**Method**	**MRL Units**	**Inlet**	**Outlet**
TSS mg/L	EPA 160.2	10.0	82	10
pH	NA	NA	7.2	NA
Oil & Grease (mg/L)	EPA 1664	5.00	228.00	ND
TPH Polar (mg/L)	EPA 1664	5.00	38.50	NA w/ND
TPH non-polar (mg/L)	EPA 1664	5.00	189.00	NA w/ND
Benzene (mg/L)	EPA 8020A	0.500	ND	ND
Toluene (mg/L)	EPA 8020A	0.500	ND	ND
Ethylbenzene (mg/L)	EPA 8020A	0.500	ND	ND
Xylene (mg/L)	EPA 8020A	1.00	ND	ND
Flow Rate	NA	NA	NR	NR

Stream Guard Type II-O Catch Basin Filter (5/29/98)					
Parameter	**Method**	**MRL Units**	**Inlet 1**	**Inlet 2**	**Outlet**
TSS mg/L	EPA 160.2	10.0	77.0	35.0	25.0
pH	NA	NA	7.6	6.9	6.9
Oil & Grease (mg/L)	EPA 1664	5.00	15.0	5.98	ND
TPH polar (mg/L)	EPA 1664	5.00	8.53	ND	NA w/ND
TPH non-polar (mg/L)	EPA 1664	5.00	6.45	5.98	NA w/ND
Cadmium (mg/L)	EPA 200.8	0.00100	0.0029	0.001	0.0016
Lead (mg/L)	EPA 200.8	0.00100	0.045	0.0250	0.0113
Nickel (mg/L)	EPA 200.8	0.00200	0.0133	0.0109	0.00830
Zinc (mg/L)	EPA 200.8	0.00500	0.264	0.255	0.256
Flow Rate (cfs)	Mannings	NA	NR	NR	0.034

Stormceptor STC-4800 (4/3/98)				
Parameter	**Method**	**MRL Units**	**Inlet**	**Outlet**
TSS (mg/L)	EPA 160.2	10	ND	ND
pH	NA	NA	NA	6.9
Oil & Grease (mg/L)	EPA 1664	5.00	ND	ND
copper (mg/L)	EPA 200.8	0.00100	0.0160	0.0197
lead (mg/L)	EPA 200.8	0.00100	0.0035	0.00320
zinc (mg/L)	EPA 200.8	0.00500	0.862	1.40
flow (cfs)	Mannings	NA	NA	1.000

* Addional iinformation collected ast time of sample.
NR = not recorded
NA = not applicable
ND = below the laboratory detection limit

Appendix A

CITY OF PORTLAND NPDES STORMWATER PERMIT

SEP 07 1995

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

DAVID KLIEWER PE
STORMWATER/WATERSHED DIVISION MANAGER
CITY OF PORTLAND
BUREAU OF ENVIRONMENTAL SERVICES
1120 SW FIFTH #400
PORTLAND OR 97204

Re: Municipal Separate Storm Sewer Discharge Permit
File Number 108015
Multnomah County

We have completed our review of your permit application and the comments received regarding the preliminary draft permit which was mailed to you for review on January 6, 1995, as well as comments received during the May 3 public hearing and participation period, and have issued the enclosed National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit.

We greatly appreciate the effort the City and Co-permittees have expended in putting together what we hope will be a model storm water program.

This permit will be considered as the final action on permit application number 995938.

If you are dissatisfied with the conditions or limitations of this permit, you have 20 days to request a hearing before the Environmental Quality Commission or its authorized representative. Any such request shall be made in writing to the Director and shall clearly state the grounds for the request.

You are urged to carefully read the permit and take all possible steps to comply with the conditions established. If you have questions regarding the permit, please contact Paul Keiran at (503) 229-5937.

Sincerely,

Neil J. Mullane

Neil J. Mullane, Manager
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js
Enclosure

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DEQ-1

COPY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

Department of Environmental Quality
Northwest Region Office
2020 S.W. Fourth Avenue, Suite 400, Portland, OR 97201
Telephone: (503) 229-5263

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

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ISSUED TO CO-PERMITTEES:

City of Portland
1120 SW Fifth Avenue
Room 400
Portland OR 97204-1972

Multnomah County

Port of Portland

Oregon Department of Transportation

Multnomah County Drainage District #1

Peninsula Drainage District #1

Peninsula Drainage District #2

SOURCES COVERED BY THIS PERMIT:

All Existing and New Discharges of Storm Water From the Municipal Separate Storm Sewer System Within the City of Portland Urban Services Boundary

RECEIVING STREAM INFORMATION:

Basin: Willamette, Columbia
Subbasin: Lower Willamette and Tualatin
Stream: Willamette River*#, Columbia River*#, Columbia Slough*, Fanno Creek#, Balch Creek*, Johnson Creek*, Tryon Creek*, Smith Lake, Bybee Lake

Hydro Code: 22=-WILL, 10=-COLU
County: Multnomah

* These water bodies have been designated, or drain to water bodies that have been designated, as water quality limited.

Total Maximum Daily Loads/Waste Load Allocations/Load Allocations have been established for these water bodies.

DESCRIPTION OF SYSTEM:

Municipal Separate Storm Sewer System

EPA REFERENCE NO: ORS 108015

Issued in response to Application No. 995938 received May 26, 1993 and Addendum No. 1 to the application, dated May 17, 1994.

This permit is issued based on the land use findings in the permit record.

Tom Bispham
Tom Bispham, Administrator
Northwest Region

September 7, 1995
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the co-permittees are authorized to implement a storm water management program to reduce the contribution of pollutants in storm water to the maximum extent practicable and to discharge storm water to public waters in conformance with all the requirements and conditions set forth in the attached schedules as follows:

	Page
Schedule A - Controls and Limitations	2
Schedule B - Minimum Monitoring and Reporting Requirements	3
Schedule C - Compliance Conditions and Schedules	*
Schedule D - Special Conditions	4
General Conditions	Attached

* The standard Schedule C is omitted from this permit because the Storm Water Management Program and addenda (SWMP) identifies the compliance items and schedules required by the co-permittees and Schedule B requires an annual status report on the SWMP.

SCHEDULE A

Controls and Limitations for Storm Water Discharges from Municipal Separate Storm Sewer Systems

1. The co-permittees shall maintain compliance with this permit and implement the Storm Water Management Program and addenda (SWMP) as submitted in the National Pollutant Discharge Elimination System (NPDES) permit application Parts 1 and 2 (including amendments) currently approved by the Department, and hereby incorporated into this permit by reference, in order to comply with the following conditions required by the Clean Water Act:

   a. Reduce the discharge of pollutants to the maximum extent practicable from the municipal separate storm sewer system (MS4).

   b. Effectively prohibit non-storm water discharges into the MS4 unless such discharges are otherwise permitted by an existing NPDES permit or special permit issued for short term activities pursuant to OAR 340-14-050. The following category of non-storm water discharges need not be prohibited from entering the MS4, provided appropriate control measures (if needed) to minimize the impacts of such sources, are developed under the SWMP: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; air conditioning condensate; irrigation water; springs; water from crawl space pumps; footing drains; lawn watering; individual residential car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; street wash water and discharges or flows from fire fighting activities only where such discharges or flows are identified as significant sources of pollutants to waters of the United States.

   Each co-permittee shall be deemed to be in compliance with (a) and (b) above by implementing the SWMP for the MS4s within the co-permittees' jurisdiction.

2. The Department has developed or will be developing total maximum daily loads (TMDLs) including a subsequent implementation program for several of the receiving streams listed on page 1 of this permit. The Department will enter into a memorandum of agreement (MOA) with each of the designated management agencies that describes the activities that they will complete and the time frames for completion of these tasks. The Department will utilize the MOAs in conjunction with this permit as the regulatory tool to insure compliance with the stormwater component of the TMDL program. The MOAs will establish mutually agreeable commitments for each jurisdiction. Compliance with the stormwater component of the MOA will constitute compliance with the TMDL provision of this permit.