
Chambers-Clover Creek Watershed Management Committee

Watershed Action Plan

A Water Quality Plan for Reducing Nonpoint Pollution

October 1997

Prepared by:

Pierce County Public Works and Utilities
Water Programs Division
4910 Bristonwood Drive West
Tacoma, Washington 98467
(253) 798-2725

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Chambers-Clover Creek Watershed Management Committee

Paul Nee, Pierce County Conservation District, Chair
Al Schmauder, Clover Creek Council
Dr. Willie Joel Smitherman, Education
Pete Echols, Classic Country Club
Gerald Sorensen, Pierce County Cattlemen's Association
Lucy Cerqui, King/Pierce County Farm Bureau
Richard A. Swift, Steilacoom Lake Improvement Club
Charles Douthwaite, Business
Christy Strand and Greg Zentner, City of Tacoma
Phil Crawford, Fort Lewis
Ken Canfield, Pierce County Surface Water Management
Erin Hoiland, Puyallup Tribe
Don Perry, Pierce County Water Resources
Nedda Turner, Tacoma-Pierce County Health Department

Alternates

| | |
|---------------------|----------------|
| Bart Madison | Paul D Russell |
| Dave Goughnour | Russ Ladley |
| John Loughlin Smith | James Hoyle |
| Sally Sharrard | Lyle Anthony |
| Thomas Lowry | |

Contributing Staff:

Roy Huberd, Senior Planner, Project Supervisor
Barbara Ann Smolko, Associate Planner, Research/Writer
Travis Young, Associate Planner, Research/Writer
Bob Dieckmann, Environmental Educator
Mary Knackstedt, Environmental Educator
Karen Trueman, GIS Support
Sandra Melo, Planning Intern
Terri Ranger, Support Staff
Maridon Danielsen, Support Staff

Water Programs Manager

Gerald M. Hendricks, P.E.

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EXECUTIVE SUMMARY

There can be no mistaking that the Chambers-Clover Creek Watershed is urban. A raindrop falling in this watershed is more likely to land on a parking lot, a road, a roof, or a lawn than on anything else. For many years, residents have thought the problem was only a matter of moving those unwanted raindrops to someplace more convenient. But that is changing.

The lakes and streams in the Chambers-Clover Creek Watershed offer much more than stormwater conveyance. Tens of thousands of people use Lake Steilacoom, American Lake, Spanaway Lake, and the part of Puget Sound which is in the watershed on an annual basis for swimming, fishing, and boating. Chambers Creek supports runs of Chinook, Coho, Chum, Pink, and Steelhead salmon. The groundwater underlying the watershed is the only source of drinking water for more than 168,000 people. Watershed residents are not turning a blind eye to the importance of streams in their community. Clover Creek Council is one of the most active stream advocacy groups in the state. For these reasons and more, people have come together to create the Chambers-Clover Creek Watershed Action Plan in order to protect the watershed and the many benefits it provides. It is the vision of the Chambers-Clover Creek Watershed Management Committee that has driven the creation of this plan, and they see a watershed which can and will benefit from its implementation.

The soul of this document is in the *action items*; these are recommendations for certain groups or agencies to change their activities or initiate activities in order to improve water quality. The action items describe regulatory activities, programmatic, educational, operational, research, or capital improvement activities. Action items are assigned lead implementors, cooperators, an estimated cost, a potential funding source, a suggested type of funding, a description of its benefits, a type of source control, a time frame for implementation, and an anticipated start up date.

This Watershed Action Plan contains 56 Action Items describing various types of efforts to directly or indirectly improve water quality. The watershed committee avoided duplicating or creating unnecessary expense in expanding government programs. Significant effort was spent in identifying private solutions to water quality problems and in coordinating and improving **existing** programs.

If all action items are implemented, the total estimated financial cost of this plan is \$2,200,000 million dollars.

Each lead implementor was requested to provide a letter of concurrence. The letter is intended to obligate those individuals to take action and follow through on their respective portion of the plan.

FACTS ABOUT THE WATERSHED

A watershed is the geographic region that drains water (and everything water carries) into a river, stream, or body of water. Since all land within a watershed drains to a common outlet, every activity on land has a potential to be a source of nonpoint pollution and to affect the entire watershed. According to the Puget Sound Action Team, more than half of all water pollution now comes from nonpoint sources, which generally include such activities as: agriculture, forestry, boats and marinas, on-site sewage disposal, stormwater, household hazardous waste, gravel mining, yard chemicals, and other sources. A single incident performed by one person may not have any noticeable impact, but the combined effect of many people performing the same action results in significant pollutant loading. For example, one car with an oil leak probably would not influence Puget Sound, but 100,000 leaking cars could produce enough oil to threaten life in nearby streams.

The Chambers-Clover Creek Watershed extends from the town of Ruston on Commencement Bay, south to DuPont, and then east to Frederickson, covering approximately 95,345 acres of land (149 square miles). Seven municipalities, three military reservations, and one drainage district, as well as Pierce County, have jurisdiction concerning water quality. The cities include: Tacoma, Ruston, Fircrest, University Place, Lakewood, Steilacoom, and DuPont. University Place and Lakewood incorporated at the end of the watershed action planning process in 1996.

The Chambers-Clover Creek drainage is considered to be two systems: the Steilacoom Lake Subwatershed (Clover Creek), and the Chambers Bay Subwatershed, which is below the lake. (Chambers Creek flows from Steilacoom Lake to Chambers Bay.) The surface waters of Tacoma West Subwatershed and the American Lake Subwatershed are not connected to Chambers Creek or Clover Creek. However, ground water connects all major lakes in the watershed. Tacoma West Subwatershed is made up of short drainages flowing directly to Puget Sound. The State of Washington has designated the watershed as Water Resource Inventory Area 12 (WRIA 12).

More than 267,000 people live within the area. Population in the Chambers-Clover Creek Watershed is projected to increase by 97,000 to 360,000 people by the year 2020. Almost the entire watershed falls within the Comprehensive Urban Growth Area proposed by the Pierce County Council. This area is expected to accommodate most of the county's future urban services and land uses. Most of the remaining watershed is built up, or has large portions of federally reserved land.

Approximately 55% of the watershed (52,000 acres) is open natural cover or forest land. Less than half of this forest and natural cover (21,000 acres) is federally managed and not available for development. Much of the future development will be focused on approximately 30% of the watershed (25,800 acres) in the Steilacoom Lake (Clover Creek) Subwatershed. Substantial areas have been set aside for commercial and industrial uses. One-third of the future population (115,000) will reside in the Clover Creek/Lake Steilacoom Subwatershed by the year 2020. In order to accommodate this

growth and future commercial zones, built-up or urban land cover will replace forested and natural cover. When that development occurs, runoff characteristics will convert from those associated with existing natural cover to those associated with urban runoff. The result will be increased nonpoint pollution.

EXISTING WATERSHED POLLUTION PROBLEMS

Water quality in the Chambers Clover Creek Watershed has deteriorated substantially as the area has become urbanized over the past century. Fish habitat has been impaired and native runs have substantially declined; in the cases of the Chambers-Clover Creek early coho run (*O. kisutch*) and the Chambers-Leach Creek summer chum run (*O. keta*), they are extinct.

Fishing and swimming have been periodically limited within many of the streams and lakes in the watershed. Compliance with State Surface Water Quality Standards (WAC 173-201a) for fecal coliform organisms, dissolved oxygen, temperature, pH, turbidity, and toxic metals have been exceeded within many streams and lakes. Chambers, Clover, and Sequelitchew Creeks have all been found to have fecal coliform bacteria levels consistently exceeding state maximums. Toxic metal contamination has occurred on the Asarco Superfund site in the Tacoma West Subwatershed, but also at other locations in the Chambers-Clover Creek Watershed. Concentrations of copper exceeding chronic toxicity levels were found at several locations along Clover Creek. Concentrations of zinc exceeding acute toxicity levels were found on the North Fork of Clover Creek. An area of Pierce County including the Chambers Clover Creek Watershed has been designated a Sole Source Aquifer by the Environmental Protection Agency because of its vulnerability to contamination. Remediation of groundwater contamination from three dangerous organic chemicals began in 1981. Shallow and deep aquifer contamination by nitrates and chlorides have also been a concern.

In response to the Federal Clean Water Act, the Washington State Legislature in 1982 created RCW 90.70, which led to the creation of WAC 400-12 by the Puget Sound Action Team. WAC 400-12, the Nonpoint Rule, authorizes local governments and state agencies to establish planning processes leading to the implementation of watershed action plans for the purpose of reducing nonpoint pollution.

Pierce County was selected as the lead agency to coordinate the ranking and action plan development process. Decisions on the order and rank of watersheds in 1989 were based, primarily, on the degree of degradation, the potential for preservation, and the beneficial uses in need of protection.

The Chambers-Clover Creek Watershed was selected in Pierce County for the second watershed planning effort following the Lower Puyallup Watershed.

PUBLIC INVOLVEMENT AND COORDINATION

A committee of 13 people was created in 1993 by the Pierce County Council and became the Chambers-Clover Creek Watershed Management Committee (CCCWMC).^{*} The Committee has produced two documents: the Watershed Characterization which describes conditions within the watershed; and the Chambers Clover Creek Watershed Action Plan. The Characterization is summarized in the following Chapter 2.

All meetings were advertised and open to the public. More public meetings were held to allow people the opportunity to comment on the Preliminary Draft Chambers-Clover Creek Watershed Action Plan. Strong coordination and communication with all stakeholders - those who might have something to gain or lose in the watershed - was emphasized. This included people from the private sector, and federal, state, and local governments.

PLAN IMPLEMENTATION

The Action Plan includes a program for implementation and monitoring. Action items for implementing the overall Action Plan were developed and lead implementors will be asked to concur with those strategies as well as those that relate to specific sources. The most significant strategy for implementation involves the creation of a Basin Advisory Council in Chambers-Clover Creek Watershed. They would oversee implementation of the plan in cooperation with Pierce County. Pierce County will facilitate the completion of action items and foster funding sources to cover implementation costs.

APPROVALS

The Washington State Department of Ecology approved the Chambers-Clover Creek Watershed Action Plan on October 6, 1997. The plan received SEPA review and was accepted as an addendum to the "Final Environmental Impact Statement, Comprehensive Plan for Pierce County, Washington" and the "Final Supplemental Environmental Impact Statement for Pierce County, Washington" on March 5, 1996.

^{*} Originally known as the Tacoma Watershed Management Committee.

KEY TO ACRONYMS

| | |
|---------|--|
| BMP | Best Management Practice |
| BAC | Chambers-Clover Creek Basin Advisory Committee |
| CCC-WMC | Chambers-Clover Creek Watershed Management Committee |
| CFSA | Consolidated Farm Services Agency |
| CO-OP | Pierce County Cooperative Extension |
| DNR | Washington Department of Natural Resources |
| DOH | Washington Department of Health |
| ECOLOGY | Washington Department of Ecology |
| EPA | Environmental Protection Agency |
| FPA | Forest Practices Act |
| GIS | Geographic Information Systems |
| GMA | Growth Management Act |
| IAC | Inter-Agency Committee for Outdoor Recreation |
| MPD | Metropolitan Parks District |
| MSD | Marine Sanitation Device |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| PALS | Pierce County Planning and Land Services Department |
| PC | Pierce County |
| PCCD | Pierce County Conservation District |
| PIE | Public Involvement and Education grant |
| PSAT | Puget Sound Action Team |
| QA/QC | Quality Assessment/Quality Control |
| RCW | Revised Code of Washington |
| SWM | Surface Water Management Entities |
| TPCHD | Tacoma-Pierce County Health Department |
| USDA | United States Department of Agriculture |
| USGS | United States Geological Survey |
| UW | University of Washington |
| WAC | Washington Administrative Code |
| WDFW | Washington Department of Fish and Wildlife |
| WFFA | Washington Farm and Forestry Association |
| WRD | Water Resources Department, Pierce County |
| WSU | Washington State University Cooperative Extension |

CHAPTER 7: STORMWATER/EROSION ACTION ITEMS

Stormwater in the Chambers-Clover Creek Watershed generally refers to the pattern of water flow as a result of human impact. This is a very significant issue because of the urban nature of the watershed, the potential financial costs of stormwater control, and stormwater's potentially deleterious effects on soil, habitat, fisheries, and water quality. The nonpoint pollution source categories described under WAC 400-12 of Agriculture & Forestry, On-site, and Other are mainly indistinct from the nonpoint pollution source category of Stormwater. Failures in the first three categories all contribute to Stormwater problems.

REVIEW OF ISSUES

Stormwater impacts water quality and habitat in two ways: pollutant loadings and quantity of flow. These two elements are closely linked because water quality often deteriorates during flood events.

In flood events, pollutants which are not commonly exposed to surface waters may enter a stream. High flow levels may cause streambanks to erode, increasing sediments, and may encourage people to alter natural drainage courses in an effort to minimize the amount of land impacted by flooding. The probability of flooding is increased by land development and impervious surfaces. Impervious surfaces increase the amount of stormwater flowing into a natural system because less water is being absorbed into the soil or by plants. Because impervious surfaces cause the stormwater to reach the creek all at once, streams will carry higher flow levels but for shorter periods of time. This results in scouring of the creek bed, high sediment levels, and degradation of stream banks. Increased sediments, altering natural drainage courses, and degrading streambanks all negatively impact habitat. Clearing land aggravates flooding conditions as well by making soil available for transport into drainage systems. The sediment impairs the functioning of manmade storm management systems by silting up retention basins and decreasing the carrying capacity of streams.

Water Quality

Water quality problems associated with stormwater include pollutants associated with urban runoff, "first flush" conditions, and groundwater contamination.

Urban Runoff

Contaminants typically associated with urban stormwater include suspended sediments, nutrients, pathogens, organic compounds, and metals. While some of these pollutants can be associated with rural uses, organic compounds and metals are most often associated with urban land uses. The quality of stormwater runoff from forested areas is generally high.

Development results in an increase in impervious area which, in turn, results in increased pollutant loading to stormwater runoff. The nutrient loading in runoff (phosphorus, nitrogen) from impervious surfaces is notably higher. The loading of metals such as zinc and lead also increases with higher rates of impervious cover but not at the same high proportional rate as nutrients. (Montgomery, 1991 A, 7-1)

Land uses not only reflect the amount of impervious surfaces and their subsequent potential for contributing to nonpoint pollution, but also the quality and makeup of stormwater. The following description of pollutants generated by land use categories was taken, in part, from the Pierce County Storm Drainage and Surface Water Management Plan.

Residential: Runoff from residential areas will generally contain increased levels of coliform bacteria, nitrates (from lawn and garden fertilizers), pesticides (from lawn and garden applications), metals (from automobile emissions and runoff from degrading metallic surfaces), and oil and grease from leaking engines or dumping of waste oil.

Commercial: Commercial areas typically have stormwater runoff with relatively high concentrations of metals, oil and grease. These contaminants typically are derived from parking lot runoff which empties into storm drains.

Industrial: Industrial areas typically have high concentrations of metals and certain hydrocarbons. Industrial facilities where stormwater comes into contact with process materials can be a substantial localized source of pollutants in stormwater runoff. Residential, commercial, and industrial land uses total about 39,000 acres or 40% of the watershed.

Agriculture: Agricultural areas, including cropland and pasture, tend to have increased concentrations of suspended sediments, nutrients (nitrates and phosphates), coliform bacteria, organic compounds from pesticides and fertilizers, and higher oxygen demand in stormwater runoff. Even though few commercial farms function in the watershed, about 10,000 acres, or 11% of the watershed is used agriculturally.

Forested: Undisturbed forest lands typically have very low pollutant concentrations during storm runoff. However, activities such as logging result in increases in suspended sediments and nutrients, particularly nitrates and phosphates. Increased suspended sediments result from soil disturbance. Nitrates and phosphates are also released when the native soils are disturbed. Forests account for 19% of the watershed. Most of the forest area is in the American Lake Subwatershed. (Montgomery, 1991 A, 7-1)

"First Flush" Conditions

One vehicle for contamination is "first flush" conditions where a residue of pollutants will build up on impervious surfaces during a dry spell. The first storm will flush a concentration of these substances into the waterways, sometimes delivering a damaging or lethal dose of pollutants to fish and other organisms. Several "fish kill" events have occurred in recent years on Clover Creek after first flush conditions. Careful site planning and treatment of stormwater are needed to protect natural drainage systems and habitat. (Pierce County, 1994, II-78)

Groundwater Contamination

An additional factor in the Chambers-Clover Creek Watershed is groundwater recharge. Land uses which contaminate surface stormwater can eventually cause contamination of groundwater in aquifer recharge areas. A previous lack of adopted standards and the scattered nature of urban development in unincorporated Pierce County has resulted in smaller, site-specific systems for handling stormwater runoff. These systems often use ground disposal with percolation devices such as dry wells, or release stormwater into the natural surface drainage system. In some cases, localized flooding occurs as these "dry wells" and surface conveyances both prove inadequate to accept the volume of storm events. (Pierce County, 1994, II-78)

Percolation systems demand continued maintenance by Pierce County, private developers, or property owners. They do not adequately treat and cleanse the water of contaminants before it enters the groundwater supply. This is particularly serious in the Chambers Clover Creek Watershed because much of the underlying soils are highly permeable and allow for the infiltration of surface waters into the shallow groundwater. The preceding On-site Sewage Chapter provides a more detailed discussion of groundwater contamination and aquifer protection. The aquifer is equally at risk from on-site sewage and stormwater pollutants because potential sources of drinking water are effected and the pollutants travel through the shallow ground water into the area lakes and streams. (Pierce County, 1994, V-3)

Presently 55% (51,800 acres) of the Chambers-Clover Creek Watershed is forested and grassland. Urban land uses are expected to increase throughout the watershed and especially in the Clover Creek Subwatershed. Sixtytwo percent of this Subwatershed is currently forest and grassland, but extensive areas are zoned for future commercial use.

Stormwater impacts all land within a watershed. There is no jurisdiction upon which rain does not fall. In an effort to limit the scope of this section, it will focus on those agencies which address nonpoint pollution problems associated with *urban* and *suburban* stormwater runoff. Urban stormwater problems most often stem from increases in impervious surfaces and vehicular pollutants.

EXISTING PROGRAMS

United States Environmental Protection Agency (EPA): EPA administers the Federal Clean Water Act. The Act is the major federal authority for water quality protection. It authorized the National Pollutant Discharge Elimination System (NPDES) permitting program. The program requires all point source generators to obtain permits for their discharges. The permits are conditioned to include sampling requirements and restrictions on the amount of pollutants to be discharged. In the last few years, NPDES permitting expanded to include the discharges of municipal storm drain systems. Local jurisdictions are responsible for the quality of the stormwater they convey into local waterbodies. Noncomplying jurisdictions could face substantial fines if they do not meet the requirements of their permits. Fines will put pressure on jurisdictions to resolve problems with private landowners who may be contributing to permit noncompliance. Jurisdictions within the watershed which are currently required to submit NPDES applications include Pierce County, the City of Tacoma, McChord Air Force Base, and Ft. Lewis. Eventually, all jurisdictions may be required to participate.

Washington State Department of Ecology: While EPA is the lead agency for NPDES permits, it is Ecology's responsibility to review, condition, and issue the permits. Locally, general NPDES permits are required of many existing industrial and commercial operations. NPDES permits are required for construction activities disturbing 5 acres or more. Municipal permits issued to local jurisdictions having populations over 100,000 will require high standards of water quality to be maintained.

Ecology's Water Quality Program has developed the State Stormwater Manual which sets design standards for stormwater systems. Pierce County requires these standards be adhered to in Aquifer Recharge Areas and Sensitive Areas. The Chambers-Clover Creek Watershed is one of two Aquifer Recharge Areas in Pierce County. All local jurisdictions are required to adopt the Manual's design standards or standards of equal or greater stringency. See below under "Pierce County Surface Water Management" for more information on this subject.

Washington State Dept. of Community Development, Growth Management

Division: The Division is responsible for coordinating and advising jurisdictions in the development of each county's comprehensive plan to satisfy the Growth Management Act. In response to the Growth Management Act, cities and counties were required to create land use controls and direct capital improvement planning. The Pierce County Comprehensive Plan was completed December, 1994.

The Growth Management Act has required all of the counties surrounding Puget Sound to institute Critical Areas Ordinances for the protection of certain environments and sensitive areas such as riparian zones, wetlands, and floodplains. All of the jurisdictions within the watershed have responded to that requirement. Efforts have been made to encourage consistency between the different jurisdictions' ordinances.

Washington State Dept. of Community Development, Emergency Management

Division: This Division has the authority to designate flood plains and flood response.

Washington State Department of Fish and Wildlife: Fish and Wildlife has the authority to issue Hydraulic Project Approvals for all construction activities that occur within streams and on shorelines.

Washington State Puget Sound Water Quality Authority (PSWQA): PSWQA drafted many of the stormwater requirements. PSWQA was originally established in 1983 by the Puget Sound Water Quality Act (RCW 90.70). PSWQA was restructured in 1985 and charged with developing and overseeing the implementation of a comprehensive management plan for Puget Sound and its related waterways. PSWQA has prepared the 1991 Puget Sound Water Quality Management Plan which includes four program elements related to surface water management.

- SW 1 Required operation and maintenance programs and runoff ordinances: stormwater programs for counties and cities.
- SW 2 Starting with from six of the larger cities in the basin and four other cities, required comprehensive urban stormwater programs.
- SW 3 Required the use of technical manuals and assistance on stormwater and erosion controls by local jurisdictions.
- SW 4 Required Ecology to prepare rules, guidelines, and model ordinances for SW-1 and SW-2. (Pierce County 1991, A)

Washington State Department of Transportation (DOT): DOT has a major role in stormwater control because of the runoff from all the state highways it has built.

Pierce County Department of Planning and Land Services: The Pierce County Comprehensive Plan was developed by PALS. It contains four specific objectives concerning stormwater in the land use and environmental sections of the plan. These are *Lu - Sw Objectives* 80 - 84. Other important parts of the Environmental Element of the Plan call for watershed planning and protection of water quality, (*ENV Objective* 5, 6, and 8). Most of the watershed except for comparably small areas of the north fork of Clover Creek and the southeast corner of the watershed, lies within the Urban Growth Area Boundary of the Pierce County Comprehensive Plan. Details of land use zoning, parcel size, and future development arising out of the Comprehensive Plan can be found in Chapter 5.

The Shoreline Management Use Regulations for Pierce County are administered by PALS. These regulate all development proposals within 200 feet of the ordinary high water mark of all streams and rivers with average flows greater than 20 cubic feet per second, lakes greater than 20 acres in size, and Puget Sound. Wetlands associated with any of these shorelines are also subject to shoreline review.

Stormwater Design Manual: Pierce County and the City of Tacoma each developed their own stormwater manuals to replace the State Stormwater Manual. The manual calls for Basin Planning and recommends overall policies for stormwater management. Implementation will require reviewing and updating drainage, erosion control, and

clearing/grading ordinances. Also, design standards for drainage construction, Best Management Practices for new construction, and operation and maintenance (O&M) standards for both public and private drainage systems, and Best Management Practices for new construction will be implemented.

City of Tacoma Public Works Department:The Public Works Department manages stormwater for the City of Tacoma through a Stormwater Utility. In some areas, such as the Foss drainage basin, stormwater is collected and is piped directly to Puget Sound. In other areas, such as the T-Street Gulch, stormwater is discharged to a stream which is eventually collected in a large pipe and released to the Puyallup River. The City also has several large detention basins that collect water from the Flett and Leach creek drainage basins. These detention basins discharge stormwater to Flett Creek which then flows into Chambers Creek and out into Puget Sound.

The City of Tacoma has received its NPDES permit from the Department of Ecology, and has submitted its Stormwater Management Manual to the Department of Ecology for review. The Manual consists of three volumes: a Design Manual; a Stormwater Pollution Prevention Manual (a Guide to Best Management Practices for Industries, Businesses, and Homeowners); and a Comprehensive Stormwater Management Plan.

Municipal Stormwater Management: There is some effort for local communities to adopt the Pierce County-Tacoma Manual. Most jurisdictions have some type of inventory of existing stormwater facilities but updates need to be made and plans created to replace inadequate facilities, particularly those that interfere with fish passage. It is unknown if the smaller jurisdictions will accept either the Pierce County or Tacoma Stormwater Manuals. The existing stormwater permit requirements of the Department of Ecology will help the smaller urban areas more effectively manage stormwater.

Pierce County Public Works Surface Water Management Section (SWM): The largest stormwater management utility in the watershed is the Pierce County Public Works Surface Water Management Section (SWM). It was established in 1988.

A *Comprehensive Storm Drainage Master Plan* was prepared by SWM in 1991. The Plan applies to unincorporated areas of Pierce County. The plan includes both nonstructural (i.e. education, regulatory) and structural approaches to addressing stormwater issues. The SWM Plan identifies \$55,000,000 in needed capital improvement projects, \$32,000,000 of that being high priority work proposed to be completed within a six year period. Operating funds for SWM are collected based on a flat service charge for residences and a service charge based on impervious surface area for all other land uses.

NPDES-mandated Water Quality Programs are a significant component of SWM (they comprise 35% of the basic programs and 2% of the Optional Capital Improvement Programs). SWM has developed and established a water quality sampling plan to more clearly identify stormwater pollutant problems in the subwatersheds, and to establish

baselines for determining the effectiveness of existing and proposed Best Management Practices.

Education is a significant within SWM. It is coordinated with other jurisdictions and includes training programs for builders and other professionals, public awareness campaigns, student groups, and formal classes.

Drainage Districts: One Drainage District (19), lies within the Chambers Clover Creek Watershed. It was created in 1922. It encompasses the North Fork tributary to Clover Creek and parts of Parkland, Midland, and a small portion of the City of Tacoma. Its purpose is to improve and maintain drainage systems within specific geographic areas.

PROBLEM DEFINITION

1. Historical emphasis on growth and development has failed to protect the area's natural resources. This has resulted in water quantity and quality problems [excessive polluted runoff].
2. Current and historical conditions have resulted in too much run off and polluted waters. There is currently a lack of jurisdictional coordination including inadequate regulations and enforcement.
3. Comprehensive environmental education programs are needed. These programs should integrate quantity and quality issues.

GOALS

1. Establish, Consistent, Predictable, Affordable and Maintainable Standards.
2. Manage Watershed Through Multi-Jurisdictional Cooperation.
3. Establish and Maintain Sustainable Biological Diversity in the Watershed.
4. Healthy Watersheds, Water Quality and Adequate Quantity Year Round.
5. Create Comprehensive Ongoing Educational Programs.

OBJECTIVES

1. Emphasize Ecosystems and the Environment.
2. Develop and Implement Stormwater Erosion Best Management Practices (BMP).
3. Improve Water Quality Enforcement Programs in the Watershed.
4. Educate the Public and Decision Makers in Water.
5. Increase funding for Water Quality Protection.
6. Do Planning On Watershed Basis.
7. Encourage Public Involvement and Public Support.
8. Create Incentive Programs to Preserve and Protect Natural Resources.
9. Develop a coordinated and streamlined approach for all agencies to enforce water quality.

ACTION ITEMS

SW 1 ANALYZE WATERSHEDS AND DEVELOP BASIN PLANS TO RESTORE INDIVIDUAL STREAMS

Analyses of stream drainages would be conducted on an as-needed basis. The analyses would be comprehensive, scientific assessments based on techniques outlined in *Environmental Objective 6*, and in *Land Use-Stormwater Objective 81.1, .2, .3, and .4* of the Pierce County Comprehensive Land Use Plan. Selected analyses would provide the basis for urban and rural watershed restoration programs. Watershed restoration programs would prescribe structural and non-structural changes to improve habitat, water quality, and water quantity within stream reaches. The structural changes will include extent and design of natural vegetation buffers and riparian corridors, and design of stormwater facilities. The non-structural changes would include coordination and development of community involvement, environmental education, and other changes in how people use the land.

Minimum requirement #9 of the Pierce County Stormwater Design Manual calls for Basin Planning. "Watershed restoration programs" will meet the definition for "Basin Plans":

"Watershed-based basin plans may be used to modify any or all of the Minimum Requirements, provided that the level of protection for surface or ground water achieved by the basin plan will equal or exceed that which would be achieved by the Minimum Requirements in absence of a basin plan. Basin plans shall evaluate and include, as necessary, retrofitting of BMPs for existing development and/or redevelopment in order to achieve watershed-wide pollutant reduction goals."

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|----------------------------------|--|
| Lead Implementor: | PC Public Works and Utilities, Fort Lewis, all Cities |
| Cooperators: | All local governments |
| Estimated Cost: | \$5,555 |
| Potential Funding Source: | Ecology, EPA, local governments |
| Potential Funding Type: | Grants, local governments' SWM funds |
| Benefit: | Increased coordination, education, improved design standards and habitat |
| Type of Source Control: | Capitol Improvement, research, natural buffers, education |
| Time Frame: | Ongoing |
| Startup Date: | 12/1/95 |

SW 2 SUPPORT ORDINANCES AND ACTIONS IMPLEMENTING AND/OR ADOPTING THE PIERCE COUNTY OR CITY OF TACOMA STORMWATER MANAGEMENT MANUAL

Support ordinances and actions implementing either the Pierce County or City of Tacoma Stormwater Management Manuals, both of which include water quality requirements. Jurisdictions should continue to develop, complete, and adopt stormwater design manuals.

The ordinances and actions would coordinate existing enforcement programs of fines and citations. Enforcement penalties are outlined in the Pierce County Stormwater Management Manual and in the City of Tacoma's ordinance titled Sewage Disposal and Drainage Regulations and Rates, Including Industrial Wastewater Pretreatment Program, Chapter 12.08. Enforcement will be coordinated with education where possible.

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|----------------------------------|--|
| Lead Implementor: | Pierce County Water Resources, City of Tacoma |
| Cooperators: | All other local governments |
| Estimated Cost: | None  |
| Potential Funding Source: | Ecology, local governments |
| Potential Funding Type: | Grants, local governments' SWM funds |
| Benefit: | Improved design standards and habitat |
| Type of Source Control: | Regulatory |
| Time Frame: | Ongoing |
| Startup Date: | 9/1/95 |

SW 3 PIERCE COUNTY COUNCIL WOULD ADOPT AN OPEN SPACE PUBLIC BENEFIT RATING SYSTEM

A Public Benefit Rating System would provide an incentive for maintaining open space and habitat areas within urban settings by allowing for property tax reductions.

The Pierce County Comprehensive Land Use Plan *Land Use-Open Space Objective 57*, Revised Code of Washington (RCW) Article 84, Washington Administrative Code (WAC) Article 458, and Pierce County Code Chapter 2.114 determine property types which qualify for open space taxation: The open space statute defines *open space-timberland*, *open space-agriculture*, and *open space - open space*. The County Council may choose to create a Public Benefit Rating System as defined under the RCW. *Open space - open space* is the only classification that would be affected by a Rating System.

The Planning Department would develop an *Open Space Plan*, with appropriate participation from the public and the Planning Commission. The Plan would identify open space priorities for the community based on a survey of valued features. The characterization portion of this Watershed Action Plan and relevant research material developed for the land use element of the Pierce County Comprehensive Land Use Plan could be used to identify significant features. Once identified, these features would be prioritized and assigned numeric values which would allow for the grading of parcels. The ability of a parcel to protect and enhance water quality should be identified as a significant feature and incorporated into the rating system.

This grading systems may also be used to prioritize land being considered for acquisition by the County. An official open space map should be established which would identify both parcels in open space taxation and areas which the County would like to preserve as open space.

The Assessor/Treasurer Department would be involved in the development of the plan to ensure that the Rating System is workable and reduces taxes. The impact to remaining taxpayers as the tax burden is shifted would be considered. Overall public access requirements under RCW 84 would be examined. The rating system should go before the Council for adoption

Upon adoption, the planner implementing the program would assess and grade each parcel based on the priorities outlined in the Benefit Rating System. These rating would be presented to the Planning Commission and the County Council for approval. The rating would then be used by the assessor to determine an appropriate level of taxation benefit to the property owner. If a Rating System is established in this county, each parcel currently under open space - open space would have to be rated under the Public Benefit Rating System as a matter of law. The taxpayer would then have the opportunity to accept the rating or no

longer participate in the program. However, those who choose to no longer participate would not owe compensating tax because it is a legislative change.

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| Lead Implementor: | PC Planning and Land Services (PALS) |
| Cooperators: | PC Assessor/Treasurer |
| Estimated Cost: | \$40,000 a) 1/2 for Study b) 1/2 to change the ordinance |
| Potential Funding Source: | Pierce County |
| Potential Funding Type: | General fund |
| Benefit: | BMP implementation and riparian zone revegetation; preserving the original flora along creeks while benefiting property owners |
| Type of Source Control: | Voluntary incentive |
| Time Frame: | One time |
| Startup Date: | 1/1/96 |

SW 4 MAINTAIN BENEFICIAL VEGETATION IN ROADSIDES, BANKS, AND DRAINAGES, AND LIMIT HERBICIDE USE

Ninety percent of the roadside ditches and embankments in Pierce County are sprayed. Management of roadside vegetation would emphasize limiting the use of herbicides and incorporate the following efforts:

- A. Riparian vegetation would be planted and maintained in manmade and natural drainages. This includes selecting inexpensive indigenous plants useful as water purifiers. *Salal* is an example. Maintaining and planting vegetation would occur in a manner which does not increase flooding or reduce safe visibility for motorists.
Note: Human consumption of roadside plants or berries is not endorsed;
- B. Preserving or restoring trees and indigenous vegetation in areas adjacent to creeks and natural drainages would be encouraged. Areas farther from fish-bearing streams would require less riparian plant restoration. "Man-made" facilities such as stormwater retention ponds would be used in these areas;
- C. Groups and individuals would be encouraged to adopt roads;
- D. Design standards will be established for major roads to encourage manual/mechanical maintenance. Walking and bicycling paths would also be considered in these designs.

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| Lead Implementor: | Chambers-Clover Creek Basin Advisory Committee |
| Cooperators: | All local governments, drainage districts, Tacoma Public Works, Fort Lewis |
| Estimated Cost: | None |
| Potential Funding Source: | Local governments |
| Potential Funding Type: | Existing programs |
| Benefit: | Decrease herbicide use, increase riparian habitat, increase sense of citizen "ownership" |
| Type of Source Control: | Capital Improvement |
| Time Frame: | Ongoing |
| Startup Date: | 9/1/95 |

SW 5 ENCOURAGE RETROFITTING PROGRAMS FOR EXISTING STORM DRAIN SYSTEMS TO IMPROVE WATER QUALITY AND HABITAT

Jurisdictions would maintain and continue existing retrofitting programs for storm drain systems because of their importance to water quality. Retrofitting is the process of going in and upgrading an existing facility so that is able to function more effeciently or provide benefits that its original technology does not support. Pierce County Storm Drainage and Surface Water Management (SWM) and the cities' utility departments within this watershed have established scheduled, capital facilities budgets for their retrofitting programs.

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| Lead Implementor: | Pierce County, Fort Lewis, McChord AFB, DuPont, Steilacoom, Lakewood, University Place, Fircrest, Ruston, Tacoma |
| Cooperators: | Drainage districts |
| Estimated Cost: | None |
| Potential Funding Source: | Local governments |
| Potential Funding Type: | Local governments' SWM funds |
| Benefit: | Improved storm drain systems for water quality and fish access |
| Type of Source Control: | BMPs |
| Time Frame: | Ongoing |
| Startup Date: | Existing Program |

SW 6 ESTABLISH OIL LEAK (DRIP) TESTING AS PART OF AUTOMOBILE EMISSION TESTING

The State Legislature would amend the state law requiring automobile emission inspections to include inspection for automobile leaks. Leaks would be identified while the air emission test is in progress. The rationale behind this action is to stop the pollutants at the source rather than dealing with its effects.

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| Lead Implementor: | PC State Legislators |
| Cooperators: | Washington State Legislature |
| Estimated Cost: | \$20,000 |
| Potential Funding Source: | Washington State Department of Licensing, motorists |
| Potential Funding Type: | Inspection fees |
| Benefit: | Increase awareness, reduce contamination in runoff |
| Type of Source Control: | Regulatory, enforcement |
| Time Frame: | Ongoing |
| Startup Date: | 6/1/96 |

SW 7 ENCOURAGE THE ESTABLISHMENT OF STREAM TEAMS IN ALL JURISDICTIONS

The Stream Team adult volunteer program currently serves Puyallup, Tacoma, and Pierce County. Stream Team volunteers identify and gather information on potential water quality problems. The Stream Team Coordinator supports volunteers and organizations wishing to perform such tasks as stenciling storm drains, water quality sampling, and habitat and riparian zone assessment. The municipalities of DuPont, Steilacoom, Lakewood, University Place, Fircrest, and Ruston would develop or expand the existing Stream Team volunteer program in their jurisdictions. All jurisdictions will work towards establishing an integrated, coordinated funding system to help support the existing program.

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| Lead Implementor: | PC Conservation District |
| Cooperators: | All local governments, NRCS, Tacoma Public Works |
| Estimated Cost: | \$5,000 per jurisdiction |
| Potential Funding Source: | EPA, Ecology, utility budgets, cities and towns |
| Potential Funding Type: | Grants, local governments' SWM funds |
| Benefit: | Data collection and assessment resulting in identification of problem areas, implementation of BMPs, changes in behavior |
| Type of Source Control: | Education, monitoring, enforcement |
| Time Frame: | Ongoing |
| Startup Date: | Existing program |

SW 8 ESTABLISH LAND USE DESIGN STANDARDS WHICH REDUCE IMPERVIOUS SURFACE AREA

Land use regulations, development standards, and design standards would be reviewed by Pierce County, DuPont, Steilacoom, Lakewood, University Place, Fircrest, Ruston, and Tacoma to reduce impervious area. Both Pierce County and the Tacoma Stormwater Design Manuals would also be subject to modified standards.

Land Use Regulations would be reviewed by the jurisdictions to reduce impervious area, including:

- A. The types of land uses allowed in jurisdictional areas, such as industrial, commercial, and residential uses;
- B. Minimum lot sizes allowed by certain zones.

Development/Design Standards that have direct impacts on the quantity and quality of water within the watershed would be reviewed by the jurisdictions. Where possible, replace impervious surfaces with gravel, lattice-lawns or grass-crete, increased vegetation, or similar approaches focusing on:

- 1) sidewalk construction
- 2) curb and gutter construction
- 3) retention/detention ponds
- 4) the percentage (%) of lot coverage
- 5) street width
- 6) building setbacks from streams
- 7) road sides
- 8) off street parking
- 9) parking lots, building/parking ratios.

Land use design standards outside of urban growth areas would be the least restrictive. It is expected that the cost of this review would be absorbed in existing staff assignments.

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| Lead Implementor: | BAC (Chambers-Clover Creek Basin Advisory Committee) |
| Cooperators: | All local governments, Tacoma Public Works |
| Estimated Cost: | None |
| Potential Funding Source: | Local governments |
| Potential Funding Type: | General allocation funds |
| Benefit: | Reduce stormwater runoff and increase on-site vegetation |
| Type of Source Control: | Research, coordination, regulation |
| Time Frame: | One time |
| Startup Date: | 1/1/96 |

SW 9 PURSUE MANAGEMENT SOLUTIONS FOR HANDLING VACTOR WASTE

Pierce County staff will investigate solutions to the management of vactor waste now being collected in Pierce County and associated jurisdictions. These wastes are commonly collected by eductor trucks which spray water in storm drainage facilities (catch basins) to loosen collected sediments, and then pump the water and sediments out.

Appropriate, long range disposal methods need to be established for both the liquid and solid wastes resulting from this process. The slurry pumped out (vactor waste) is generally a combination of many substances, in need of long range management.

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| Lead Implementor: | Pierce County Public Works |
| Cooperators: | All other local governments who want to join |
| Estimated Cost: | \$40,000 |
| Potential Funding Source: | Ecology |
| Potential Funding Type: | Grants, local contributions |
| Benefit: | Long range management of vactor waste |
| Type of Source Control: | Uncertain |
| Time Frame: | As soon as possible |
| Startup Date: | 1/97 |