
(Draft) Section 3**BACKGROUND**

LEGAL AUTHORITY AND SCOPE

Chapter 86.26 of the Revised Code of Washington (RCW) requires that counties requesting financial and government participation for flood control assistance provide a flood hazard management plan (FHMP), approved by the Department of Ecology (Ecology), in consultation with the Department of Fish and Wildlife. RCW 86.26.105 states that an FHMP must be completed and adopted within 3 years of the award of a Flood Control Assistance Account Program (FCAAP) flood control maintenance grant. This program is discussed in detail below. Although Grays Harbor County has not received funding for countywide flood hazard management planning, it has been awarded FCAAP monies to address localized drainage issues and to develop a smaller-scale flood hazard management plan for the South Beach area. This follows a similar plan completed in 1995 for the Grayland area to the south. Eventually, with additional funding, a Countywide FHMP will be completed.

As fully detailed in Chapter 173-145 of the Washington Administrative Code (WAC), the FHMP must include several key elements. Broadly, these elements are as follows:

- Determination of the need for flood control work.
- Watershed descriptions, including the identification of specific problem areas, historical and potential flood damage, the documentation of applicable regulations, and goals for the planning area.
- Alternative flood control work.
- Identification of potential impacts of instream flood control measures to instream uses and resources.

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- Definitions for the coverage area of the comprehensive plan.
 - Conclusions and proposed solution(s).

The FHMP is also an element of Grays Harbor County's plan to meet the intent of the 1990 Growth Management Act (GMA). Under the GMA, all counties with a population of at least 50,000 people and a population increase of more than 17 percent in the last 10 years must adopt a countywide comprehensive plan. Although Grays Harbor County does not fall into this category, it has chosen to initiate planning to achieve the intent of the GMA.

Sponsorship of Local Government

This FHMP was developed in accordance with Ecology's *Comprehensive Planning for Flood Hazard Management (CPFHM)* approach for an FHMP. In that document, the following steps are outlined for successful completion of a plan.

1. Establish the citizen and agency participation process.
2. Set flood hazard management short- and long-term goals and objectives.
3. Inventory and analyze physical conditions.
4. Determine the need for flood hazard management measures.
5. Identify alternative flood hazard management measures.
6. Evaluate alternative measures.
7. Hold public alternative evaluation workshop(s).
8. Develop flood hazard management strategies.
9. Complete draft Comprehensive Flood Hazard Management Plan and State Environmental Policy Act (SEPA) documentation.
10. Submit the final Comprehensive Flood Hazard Management Plan to Ecology.

11. Hold a public hearing and pass the "intent to adopt" resolution.
12. Notify Ecology that the final plan is adopted.

PROJECT BACKGROUND

In 1990, Grays Harbor County initiated a process to prepare a comprehensive utilities plan for water supply, sewers and drainage. As part of this process, the County conducted a series of public meetings in April 1991. The meetings were held not long after the serious floods of late 1990, and discussions of drainage and flooding issues dominated the meetings. In response, the County has placed increased emphasis on planning for solutions for drainage.

The residents of the South Beach area were one of the groups that expressed the need for solutions to drainage problems. This plan is a direct response to that expression of need. The County applied for and received a grant from Ecology to prepare a Flood Hazard Management Plan for South Beach.

The drainage problems that affect the most people in the South Beach area, and are potentially the most hazardous, are areas of ponding along SR 105 (see Figure 2-1). The balance of the problems are relatively localized. While a few occur along the drainage channel that flows north through the area into Westport, others are unrelated to the channel; most of these problems affect only one or two properties. The exception is flooding experienced in the Cohasset Dunes area, where 10 to 15 properties are subject to varying degrees of flooding resulting primarily from the blockage of historical drainage pathways by fill placement and/or beach accretion. Section 5 of this plan describes identified problem areas in greater detail.

Need for Plan

Rapid development and severe flooding in portions of the Pacific Northwest have caused flood hazard management to become a priority for Washington's state and local governments. Citizens and public officials are increasingly aware of the interrelationship of comprehensive planning, stormwater management, resource preservation, and flood damage protection. Within this context, it is also acknowledged that floods are natural events, and often it is human

activities that must be managed to minimize the watershed impacts that make flooding a serious hazard.

The State of Washington has made grant funds available to help communities and local governments comply with state statutes calling for watershed-based flood protection activities. To qualify for these funds, an FHMP must be developed to ensure that an overall watershed approach to flood hazard management is being taken. Because activities throughout the watershed can directly and indirectly impact localized flood control projects, a complete understanding of the drainage basin, including its soil types, land uses, and hydrology are imperative. Poor management in one part of the watershed can adversely affect drainage and result in flooding in another part.

This FHMP addresses the watershed contributing to the South Beach area and evaluates the potential for flooding and its impacts. It proposes possible structural and alternative management solutions to reduce flood hazards.

Principles of Comprehensive Flood Hazard Management

Flood hazard management is an important planning tool because it encompasses not only the designated floodplain, but environmental and economic issues and land uses beyond the floodplain.

This FHMP recognized or worked to meet the following fundamental principles, which are elaborated upon in Appendix A:

- It is often more cost-effective and beneficial to accommodate a waterway's dynamic nature.
- The causes of flood damage must be identified and understood early in the planning process.
- Public and agency participation are an important part of the FHMP process.
- Issues of construction, maintenance, funding, and public approval should be thoroughly examined during the alternative selection process.

- Modifications to and preservation of natural hydrologic processes can help meet other resource protection goals.
- FHMPs can be a vehicle to improve interdepartmental coordination.
- Comprehensive planning solutions should be included in the FHMP.

Flood Control Assistance Account Program

The Flood Control Assistance Account Program (FCAAP) provides matching reimbursable grants for county and local jurisdictions' planning and maintenance efforts to reduce flood hazards and damages.

Administered by Ecology's shoreland and coastal zone management program, FCAAP promotes a watershed approach to minimizing flood hazards. To be eligible for funding, jurisdictions must participate in the National Flood Insurance Program. The maximum amount of initial emergency funds available per county is \$500,000 per biennium, subject to availability. Grants for up to 50 percent of eligible maintenance and construction costs and up to 80 percent of emergency flood repair costs are also provided, subject to availability.

PLANNING PROCESS

As detailed in Ecology's *Comprehensive Planning for Flood Hazard Management*, public and agency participation is critical to a flood hazard management plan's success for several reasons:

1. Proposed measures will affect many local property owners, and their support will be needed.
2. WAC 173-145-070 calls for the review of all FCAAP projects by associated state agencies and affected parties. Therefore, appropriate public agencies, such as the State Department of Fisheries and Wildlife, the Department of Natural Resources, affected Native American tribes, and other public entities should be involved throughout the process for plan formulation and comments.

3. Special interest groups such as the Audubon Society, recreation clubs or associations, real estate development interests, and business organizations may also have an interest in the plan, and their objectives should be considered.
4. Because watersheds typically cross jurisdictional lines, representation from neighboring local governments must be incorporated into the planning process.
5. The plan must ultimately be adopted by the local government; therefore, it is important to build support among the local constituency.
6. The planning process offers an opportunity for educating the public on the issues, opportunities, and public responsibilities of flood hazard management.

Public and Agency Participation

In keeping with Ecology's guidance for flood hazard management planning, the County worked actively to involve members of the South Beach community in identifying flooding problems and advising on potential solutions. Four public meetings were held to gather input for development of the draft FHMP. The meetings were publicized in the South Beach Bulletin and the Aberdeen Daily World and were conducted at Westport City Hall. The four meetings are summarized briefly below; full meeting notes and attendance lists are provided in Appendix E. A summary of the public meeting held in June 1997 to receive comments on the draft FHMP will be included in the final version of the plan adopted by the Grays Harbor County Board of Commissioners.

In addition to members of the public, a number of public agency officials attended the meetings. Agency representation and issues included the Washington State Department of Transportation (flooding on SR 105); the Washington State Parks and Recreation Department (flooding at Twin Harbors State Park); and the City of Westport (flows entering Westport city limits through the drainage channel serving both South Beach and Westport residents). No Native American consultation was conducted, as no tribes are located in the South Beach area.

As an additional forum for public comment, the County distributed a survey in May 1997 requesting feedback on proposed flood hazard management solutions, funding mechanisms, and the overall planning process. The survey was advertised in the South Beach Bulletin and

sent to all people who had attended a public meeting or asked to be included on the mailing list. Survey results are also summarized below. A copy of the survey form is included as Appendix F to this document.

Meeting 1—April 16, 1996

This meeting introduced the FHMP project and its goals, and began the process of defining existing flooding problems and their contributing factors. Approximately 13 people attended the meeting. Problems the group identified included areas of ponding along SR 105, flooding (including one structure) in the vicinity of Cohasset (Fake) Lake, and flooding on both sides of the highway at Twin Harbors State Park. There was general agreement that highway and structure flooding were the highest priorities, with remaining flooding problems more in the "nuisance" category.

In terms of contributing factors to flooding, attendees noted the accretion of sand blocking former drainage outlets through the dunes and identified several culverts potentially undersized or at the wrong elevation. It was also observed that drainage flow under Shafer Road/SR 105, which has historically been considered a dividing line for north-south flows, may actually move in either direction beneath the highway, depending on storm conditions and recent beaver activities in the area.

Meeting 2—December 30, 1996

At this meeting, more information on specific flooding locations was collected, and the locations of some previously identified problems were defined more specifically. The approximately 14 people present reaffirmed that a major concern was to eliminate the flooding on SR 105 south of the spur. Information obtained from hydrologic modeling of Winter Creek was also presented to calibrate it with the group's observations; the consensus was that model results were underestimating actual conditions. This was attributed to the fact that closure of the tide gates in Westport tends to back up water into the system, causing the drainage channel to overflow at various locations. It was suggested that lighter tide gates might facilitate flows out of the system and help to reduce problems upstream along the channel. (Note: This possibility was considered by the consultants, but in reviewing fiberglass tide gate information, it was determined that the heavier existing tide gates likely operate efficiently, and replacement

with a lighter material would be of little benefit.) The City is contemplating construction of a retention/detention facility on approximately 10 acres of low-value wetlands it owns near the tide gates.

A representative of the City of Westport voiced concerns about the channeling of additional water from the South Beach area through Winter Creek and the tide gates. It was suggested that consideration be given to re-establishing a historical drainage ditch from Twin Harbors State Park through Roberts Ranch, discharging above the south tide gates. Other suggestions included the use of a natural open channel down the south side of the SR 105 spur for drainage to the estuary.

Meeting 3—February 26, 1997

Approximately 28 people attended this meeting, which began with an overview of the results of previous meetings and a discussion of flooding problem areas not previously identified. In particular, many residents of the Cohasset Dunes area were present at the meeting. They reported widespread flooding throughout the interdunal area, including Great Dane Lane, Cohasset Dunes Lane West, an unnamed private drive, and Grey Gull Lane. One landowner reported pumping floodwater into a containment pond around the clock for the month of February. Grey Gull Lane had recently been almost entirely flooded, with up to 2 feet of water submerging the roadway.

A number of conceptual engineering solutions were presented at the meeting, with the caution that they would require more examination for feasibility, desirability, and cost. Some solutions involved the identification of feasible conveyance routes for removal of floodwaters, while others would require the elevation of structures, pumping of floodwaters, or berming. The group provided information to assist in refining the solutions, including proposed and ongoing drainage projects by entities other than the County.

Also discussed were policy issues and funding for the plan recommendations. In general, policies will be centered around the enforcement of existing regulations and permitting processes designed to control development in the floodplain, as well as on streamlining coordination among County departments and, where appropriate, among jurisdictions.

Funding options discussed included County taxes, County/State road maintenance funds, State grants and loans, and self-funded solutions such as local improvement or drainage districts.

Meeting 4—March 26, 1997

Approximately 16 people attended this meeting. The discussion began with a presentation of example solutions to nine of the 18 documented flooding areas within the FHMP study area. These locations were selected because of their similarity to the non-selected sites, their relative importance in terms of safety, health, or property damage, and the importance indicated by attendees at prior meetings. Conceptual solutions with very rough order-of-magnitude costs were developed and presented for the nine areas. (Note: It was later decided that two of these solutions (N & O) would be dropped from the planning effort because they are outside of the South Coastal FHMP planning area.)

An overview of policy and other non-structural solutions to flooding problems was also presented. It was noted that the efficacy of policies and regulations are constrained by two major factors: the fact that much of the South Beach area is floodplains or wetlands, and that the County is limited in its ability to constrain property owners' development of their land. The general types of policies or approaches that could address flooding were described, followed by a summary of the existing regulations designed to implement these approaches. Potential future solutions listed included uniform enforcement of existing regulations; coordination of flood hazard planning with land use planning; potential revisions to FEMA floodplain designations; protection of important natural drainage channels; and consideration of voluntary flood storage conservation easements.

Funding issues from Meeting 3 were briefly revisited, with an emphasis on the citizen-driven funding mechanisms such as LIDs or drainage districts. Discussion centered on the fact that such cooperative efforts require a good deal of consensus-building to initiate and maintain. It was agreed that the FHMP would, to the extent possible, include costs for each flood hazard solution on a per-benefited-homeowner basis, so that the financial implications of cooperative funding could be better assessed.

Survey Results

Approximately 40 surveys were mailed in early May 1997 to South Beach residents who had attended the public meetings on the FHMP and to others who requested a copy. The surveys listed the potential engineering and policy solutions that had been developed during the planning effort and asked for residents' opinions regarding funding of the potential solutions. Preferences and priorities on various types of structural and non-structural solutions were solicited. A copy of the survey form is included in Appendix F.

Eight surveys were returned, along with one letter discussing issues related to the survey; these are also included in Appendix F. The respondents who identified their locations lived either along SR 105 between Shafer Road and Salt Aire Shores or in the Cohasset Dunes area. Because of the small number of responses, the results were not compiled for detailed analysis, but were evaluated qualitatively. They are summarized by subject area below.

- **Funding methods:** Three respondents supported areawide cost-sharing for South Beach flooding problems; one supported cost-sharing within neighborhoods; and one felt individuals should fund their own solutions. In addition, one respondent suggested a Countywide levy to address all County flooding problems, and another suggested that collaboration should occur at neighborhood and areawide levels with funding from County, state, and federal government.
- **Funding levels:** Respondents were asked how much (if at all) they would be willing to pay on an annual basis for 10 years to fund a variety of types of flood control projects. Over 75 percent were willing to pay to solve problems on SR 105, with preferred payment levels ranging from \$10 to \$40 per year. Approximately 50 percent indicated willingness to fund solutions for their neighborhoods; preferred payment levels ranged from \$50 to \$300 per year. For projects that would benefit all identified problem areas, 50 percent expressed a willingness to pay for solutions at levels from \$40 to \$100.
- **Policy priorities:** Although responses were scattered, there was some consensus for three policy solutions: uniform enforcement of regulations to limit floodplain and wetland filling; strengthening of existing fill limitations; and identification and protection of important drainage channels. Several residents also placed a high priority on reevaluating FEMA

floodplain boundaries. Flood hazard education programs were not viewed as a high priority by any respondents.

- **Opportunities for planning input:** All of the respondents had attended at least one of the public meetings. About half felt that there should have been more opportunities for participation, with the remainder indicating that the opportunities had been just about right.
- **Other:** Several respondents wrote on issues of particular concern to them. Two expressed the opinion that the County should enforce its own regulations more effectively, including those related to filling of wetlands and other areas. Blockage of natural interdunal channels by road construction was also mentioned. A property owner in the Cohasset Dunes area expressed concern over the environmental impacts of pumping water to the ocean, one of the solutions proposed for flooding in that area.

Overview of Technical Planning Methods

Preparation of the FHMP required technical analyses to forecast flooding levels. The first step was to prepare a project base map with topography provided by the County. Then, more detailed topographic information of the main drainage channel (Winter Creek) was obtained by field surveys. Rainfall records for the area were obtained and analyzed. Computer models were then used to forecast runoff, to test the ability of the drainage system to convey the runoff and to forecast flood levels. The results of the models were verified by comparing them with the residents' observations of flooding. For the local drainage issues, simple methods and computer modeling of hydrology were used to estimate peak flows resulting from the local rainfall.

Winter Creek Channel Analysis

It was clear from the first public meeting that flooding of Winter Creek was less of a concern to residents than localized flooding along SR 105 and other areas. For this reason, and in keeping with the intent of the scope of work, a simple analysis of Winter Creek was performed. Two computer models were used in the evaluation. The first, HEC-1, estimates the amount of runoff entering the system. The second, Flow Master (by Haested Methods), uses the results of the first and evaluates the capacity of the channel to convey that water to the bay. To begin the

hydrologic analysis, the watershed contributing to Winter Creek in the South Beach area was delineated. Stormwater runoff depends on not only the amount of precipitation but also the characteristics of the land upon which the precipitation falls. Impervious and steeply sloped areas will produce more runoff than well-vegetated flatter areas. For this reason, the following characteristics of the watershed were evaluated to create the input data for the hydrologic modeling (HEC-I):

- Land use
- Soil type
- Topography
- Precipitation patterns

Using the model, peak flows and times of these peaks for the following design were evaluated throughout the main drainage channel. These data were obtained from the closest precipitation gage, the Grayland station.

- 2-year event (3.0 inches precipitation in 24 hours)
- 5-year event (3.5 inches precipitation in 24 hours)
- 10-year event (4.0 inches precipitation in 24 hours)
- 25-year event (5.0 inches precipitation in 24 hours)
- 100-year event (6.0 inches precipitation in 24 hours)

Verification of the modeling results was based on engineering judgment and flood history recollections of participants in the committee meetings.

The results of the hydrologic analysis were used along with the following information, to estimate the expected water surface elevations in the channel during storm events:

- Cross-section data at approximately 15 sections along Winter Creek
- Topographical maps with overbank land elevations
- Visual field observations of roughness characteristics within the channel and on the overbanks

The hydraulic evaluation was performed using Flow Master's Manning's Equation based channel and culvert capacity tools. No attempt to consider backwater effects was made during this simple analysis. Verification of the model was based on engineering judgment, the high water recollections of South Beach area residents and agency officials.

Local Drainage Issues

Seven sites of frequent local flooding were analyzed as part of this FHMP. The sites were chosen as examples of modifications to alleviate flooding at these and other areas in the South Beach area.

- ABCE: SR 105 Between Shafer Rd. and Salt Aire Shores
- I: Cohasset Dunes
- L: 233 Chehalis
- Q: SR 105 Between Chehalis and Shafer Rd.
- R: 1814 Olympia St.
- X: Apple Maggot Ditch

The existing runoff conveyance at these sites was evaluated, modifications to the existing drainage systems were developed, and cost estimates for these modifications were generated.

The hydrologic conditions at each of these example sites were evaluated using the same parameters discussed above. Survey data for the areas were reviewed to assess the existing condition of the drainage systems, and limited visual field inspections were also performed at some of the sites. Mannings Equation was used at all sites to determine the ditch and pipe sizes necessary to provide adequate stormwater conveyance for the 10-year design storm.

DESCRIPTION AND CHARACTERISTICS OF PLANNING AREA

Planning Area Boundaries

South Beach is an unincorporated community located in the southwestern portion of Grays Harbor County along SR 105. Typically, the name "South Beach" refers to an area containing Westport, the area to the south, and Grayland; however, for the purposes of this study, it refers to the area bounded on the north by the City of Westport and roughly on the south by Salt Aire Shores. Figure 3-1 shows the general study planning area boundaries. It also shows the difference between this study (Phase II) and the previous study in the Grayland area (Phase I).

Topography

The FHMP study area is characterized by flat, low-lying areas supporting many localized depressions, and wetlands. The elevation throughout this portion ranges from sea level to approximately 40 feet. The higher elevations represent ridges of sand dunes bordering the ocean, the built-up areas along SR 105.

Soils Characterization

Throughout Grays Harbor County, sands, sandstone, and glacial runoff constituents make up the parent material of the lowland soils, while the mountainous regions are underlain by sandstone and basalt. The marshy portions of South Beach are likely composed of silt, peat, and clay parent material.

Based on the soil maps prepared by the US Department of Agriculture (USDA) and the US Soil Conservation Service (SCS), the following generalizations can be made about the study area:

- **Majority of Study Area:** Portions have very deep, somewhat poorly drained soils, other portions are formed in sand that would typically be well drained, but because of the high water table, tend to be saturated most of the year
- **Marshlands:** Soils are nearly level, very deep, and poorly drained.

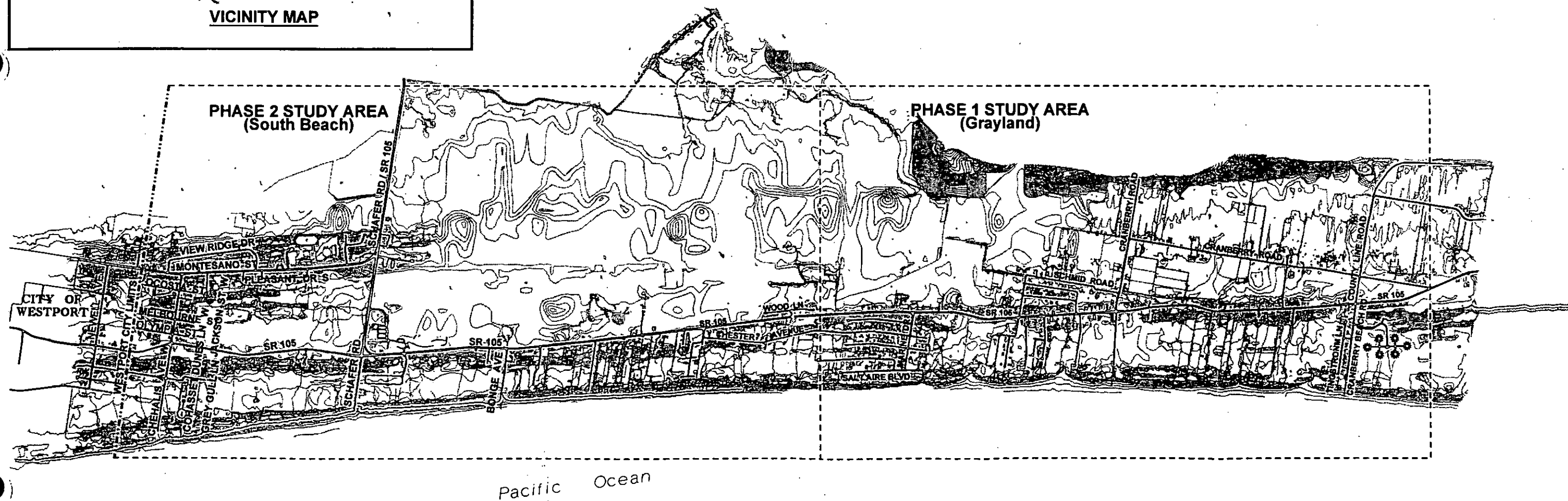
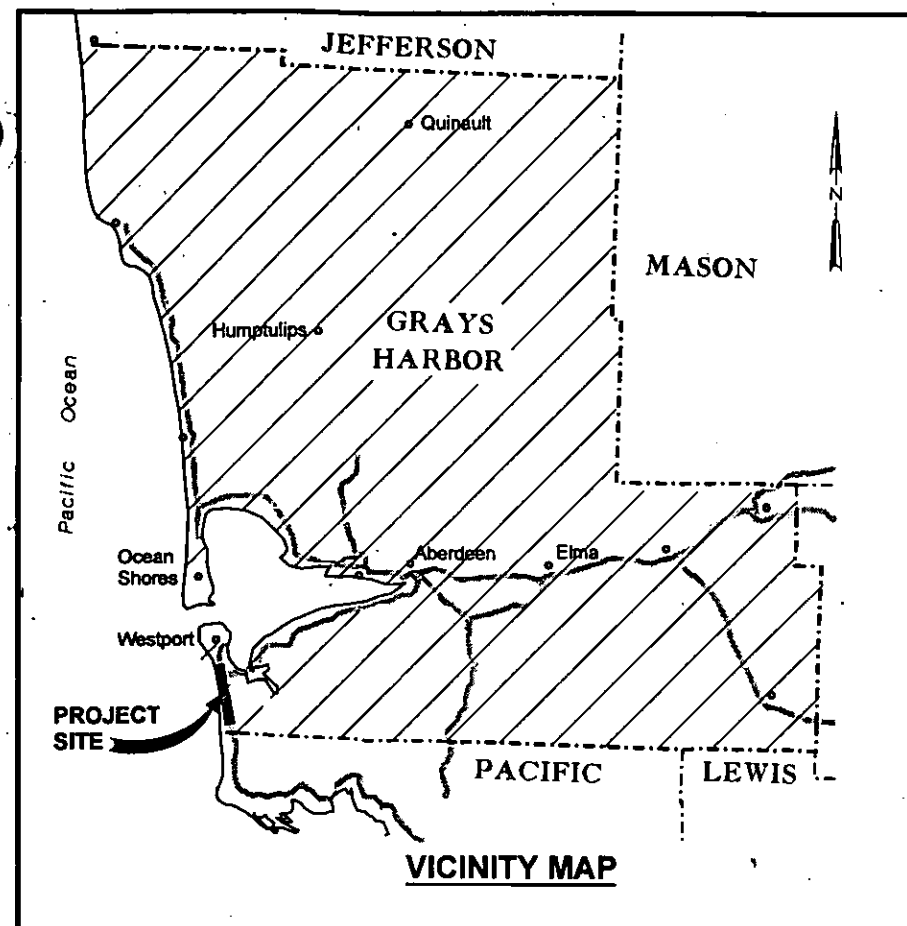
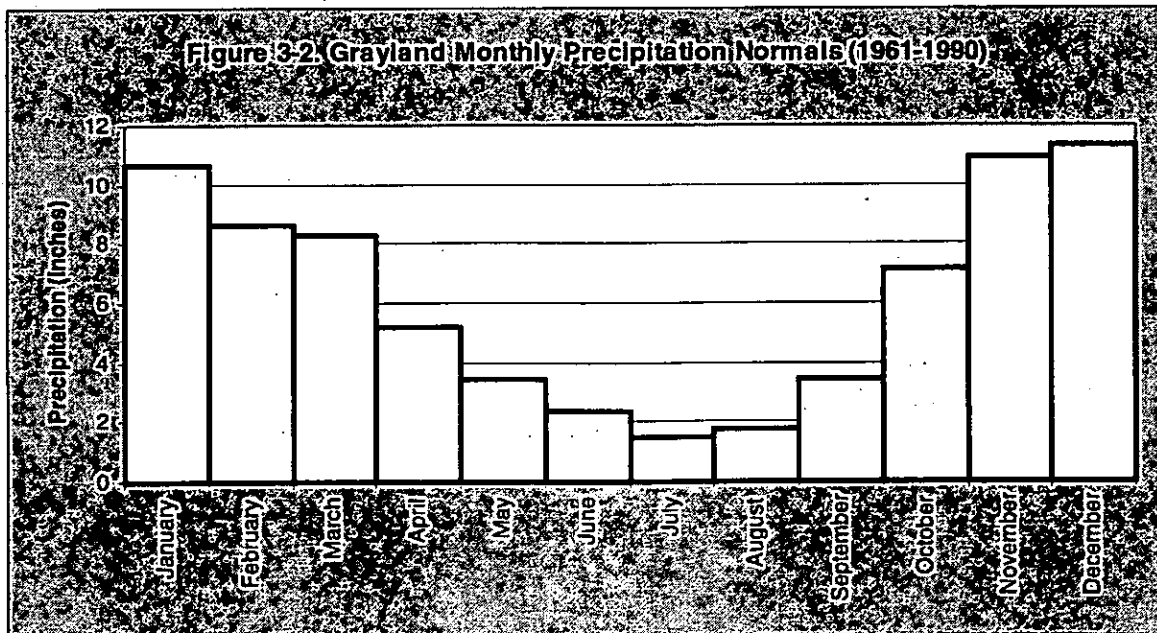


Figure 3-1
Phase 1 & Phase 2
Study Area Boundaries

Climate

As a coastal community along the Pacific Ocean, South Beach is influenced by the prevailing wind direction, the surface temperature of the Pacific Ocean, the Coast and Cascade Ranges, and the position and intensity of the large high- and low-pressure centers over the ocean. The air is generally moist, and the fluctuation in annual temperature is moderate. Summers in South Beach are relatively cool and dry, and the winters are mild, wet and cloudy.

Figure 3-2 shows the monthly average precipitation in Grayland, just south of South Beach along the coast (this is the closest precipitation gaging station to the South Beach study area). Annual average precipitation is listed by the National Oceanic and Atmospheric Administration as 74.59 inches, with 80 percent occurring between October and March. The month of December typically has the maximum average precipitation, but localized flooding is an issue throughout the fall and winter. The water table in the flat lowland areas near SR 105, where most of the community is centered, is relatively high in the winter months. Infiltration and runoff of surface water cannot readily occur; therefore, the frequent winter rainfalls produce localized pools of standing water and result in peak flows throughout the existing drainage system.



Hydrology and Watershed Characteristics

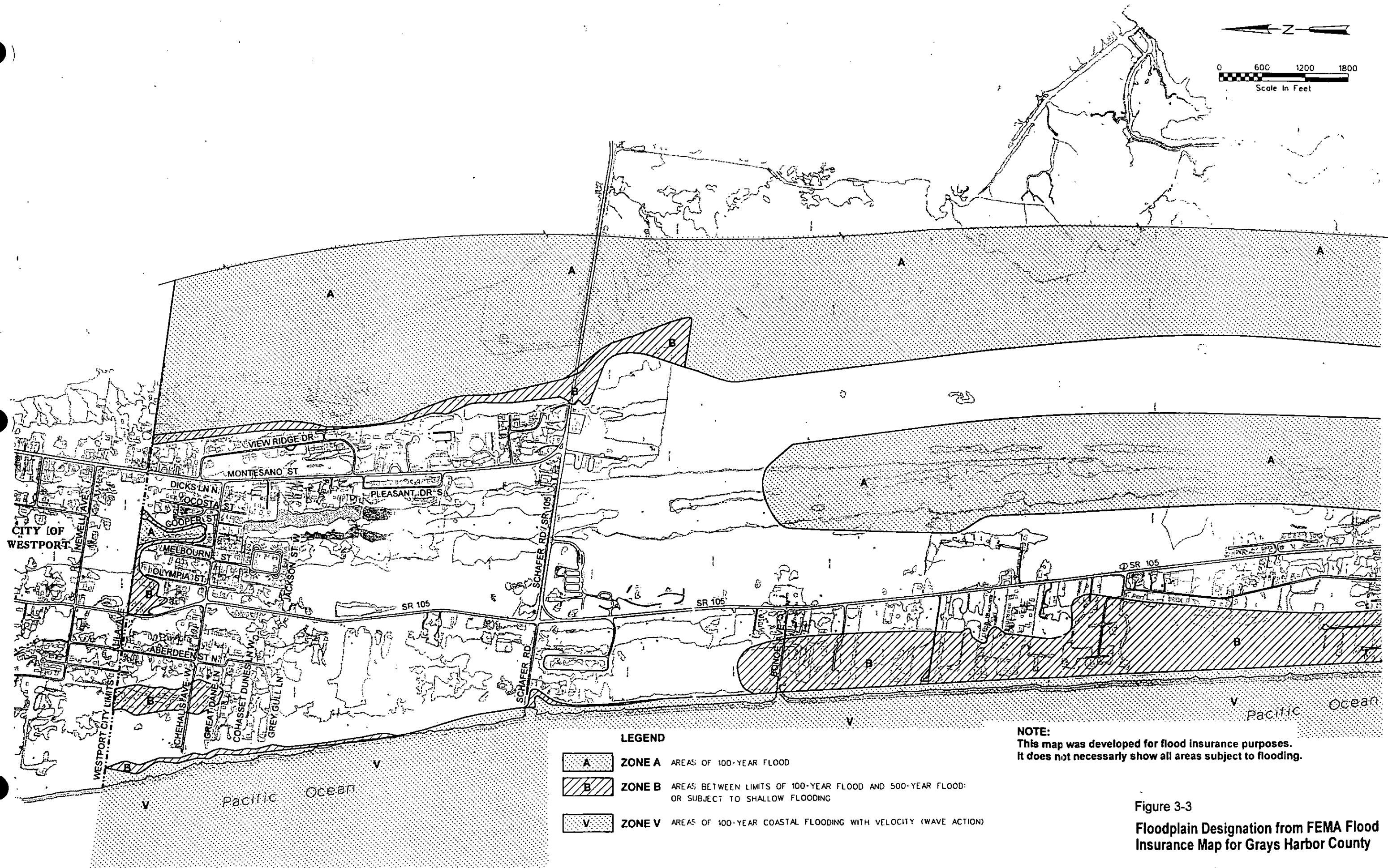
Although none of the County's major rivers lie within the study area, South Beach has diverse surface water features. The Pacific Ocean borders the community on the west and provides a number of recreational activities such as clamming and sightseeing. Small lakes, wetlands, and drainage channels cover the low-lying interior.

Extreme tide levels in Grays Harbor are reported by the Federal Emergency Management Agency (FEMA) as follows:

- 10-year high tide: 8.8 feet above mean sea level
- 50-year high tide: 9.7 feet above mean sea level
- 100-year high tide: 10.0 feet above mean sea level
- 500-year high tide: 10.5 feet above mean sea level

Extreme values in an average year range from -9.0 feet (low tide) to 6.5 feet (high tide) above sea level.

The presence of significant floodplains and wetlands throughout the South Beach area is indicative of the area's propensity toward regional flooding. Flooding in South Beach occurs mainly during the winter months, when high tides and winter storm winds combine with the heavy seasonal rainfall to create coastal flooding. The 1986 FEMA *Flood Insurance Study for Grays Harbor County, Washington (Unincorporated Areas)* documents the extent of the 100- and 500-year floodplains in Grays Harbor County. Figure 3-3 shows the floodplain boundaries for the South Beach area. These limits were established in accordance with FEMA's national standards for flood hazard management purposes (the 100-year event) and additional risk indicators (the 500-year event). In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year boundary is shown. Occasionally, small areas within the floodplain boundaries may lie above the flood elevations. These locations were not shown in Figure 3-3.



the original FEMA maps due to limitations of the map scale and/or a lack of detailed topographical data.

Because of Grays Harbor County's coastal location, the potential for tsunami hazards was also discussed in the FEMA flood insurance study. The analysis was based on the report *Type 16 Flood Insurance Study: Tsunami Predictions for the West Coast of the Continental United States* (U.S. Army Corps of Engineers, 1978). The report concluded that the elevation of tsunami-caused flooding at the 100-year recurrence level is lower than that caused by winter storms. Tsunamis are not considered to be a significant hazard for the South Beach community, which is afforded a reasonable level of protection by the coastal dunes.

Encroachment on floodplains, whether by structures or fill material, reduces flood-carrying capacity, increases flood heights and velocities and increases flood hazards in areas outside of the encroachment. Floodplain boundaries can be an important management tool in balancing the economic gain from floodplain development against the resulting increase in flood hazard. As discussed later in this chapter, development in the FEMA-mapped floodplain in the County is governed by special permitting requirements that limit filling and provide other safeguards.

As seen in Figure 3-3, up to 200 feet of the beach area and portions of the lowlands east of SR 105 are well within the 100-year floodplain. Between the coastal floodplain and SR 105, areas designated as Zone B cover several of the existing structures in South Beach. These areas are designated as Zone B because they are subject to 100-year flooding with average depths less than one foot, or with a contributing drainage area less than 1 square mile.

The low-lying areas of South Beach support a number of wetlands (identified by the presence of standing water during the growing season, hydric soils and hydrophytic vegetation). These wetlands, shown in Figure 3-4, can provide significant natural stormwater storage and attenuation of stormwater runoff peaks. Because wetlands are a habitat for many species of wildlife and perform many useful water quantity and quality functions, regulations exist to prevent changes in their natural characteristics. This means that draining, filling, or otherwise dramatically altering their hydrology is not permitted.

Biological Resources

Vegetation

The vegetation within the South Beach area is generally a function of the land use; a mix of urban development, undeveloped, uncultivated land and logged areas. There are no agricultural uses of land within the study area beyond the small homeowner gardens that are characteristic of urban development. The only vegetation of significance in terms of this FHMP relate to wildlife habitat and are addressed in the Wetland Resources and Wildlife sections below.

Fisheries Resources

Because changes in existing hydrologic patterns in a watershed can directly impact fish and aquatic wildlife, the FHMP must take their habitats and sustainability into account. Species that are listed as endangered, threatened, sensitive, or candidate by the Washington State Department of Fish and Wildlife (WDFW) must be identified and considered in any improvement projects that would impact their viability. Additionally, if a species priority habitat (e.g., the breeding habitat of a particular unlisted fish) is identified within a proposed improvement area, special steps must be taken before habitat changes are implemented (if they are allowed at all).

Region 6 of the WDFW was contacted by the consultants to determine fish usage in the study area watershed. Winter Creek likely supports coho, chinook, steelhead and other valuable fisheries resources; however, there are no known listed species in the local drainage channels or Winter Creek. Before implementing any structural improvement projects, it is recommended that the Regional Office of the Washington Department of Fish and Wildlife be contacted to check the status of affected waterways.

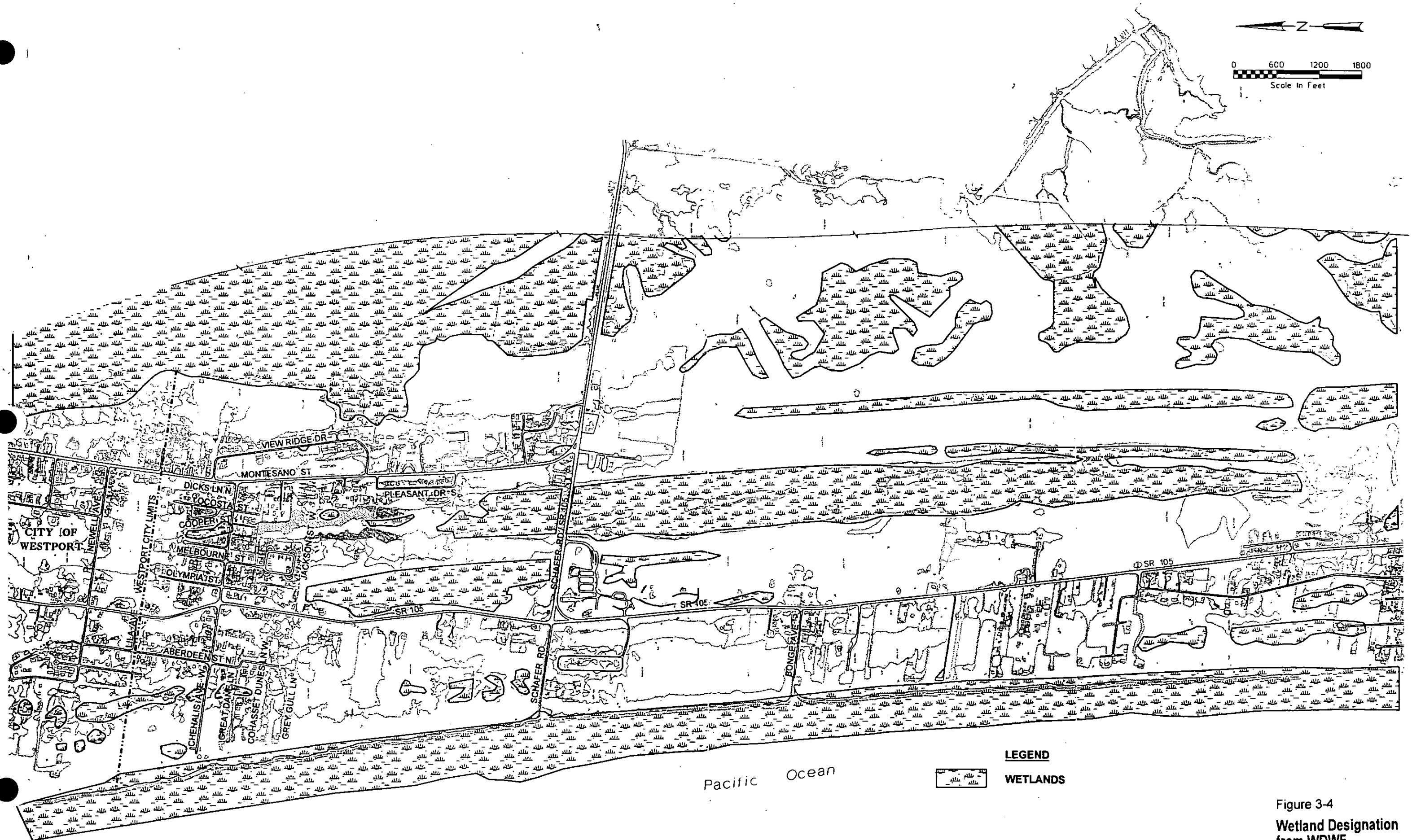


Figure 3-4
Wetland Designation
from WDFW

Wetland Resources

Wetlands having any of the following criteria are described by WDFW as priority areas:

- Comparatively high wildlife density or species diversity
- Important wildlife breeding habitat or seasonal ranges
- Limited availability
- High vulnerability to habitat alteration

Although there are many productive wetlands throughout the South Beach study area, none are known to be ranked as priority wetlands. The WDFW has emphasized that for the proposed improvement projects in South Beach, drainage systems should not drain wetlands. Additionally, no ditch cleaning or dredge spoils should be side-cast into any wetlands.

Wildlife

Peregrine falcons, a WDFW-listed species, have been identified along the dunes west of SR 105, to the south of the project area. Similarly, the spruce forests in the area have been identified as a potential habitat of the Marbled Murrelet, a listed bird species. Although there have been no registered sightings within the South Beach project area, their possible presence should be considered. If improvements to drainage have a potential to disturb these birds during feeding or migration, an Endangered Species Act Section 7 consultation will be required. There are also a number of shorebirds that use the beaches on the western portion of the study area, particularly during the migration period. In general, before major drainage improvements are undertaken, a consultation with the Regional Office of the WDWF is recommended.

According to the USDA/SCS Soil Survey for the area, the following broad categories for habitat exist in Grays Harbor County. Based on the land use and soil types in South Beach, these are probable habitats for the study area.

- **Habitat for Openland Wildlife** - meadows and areas that are overgrown with grasses, weeds and/or shrubs. These areas produce grains, seeds, grasses,

legumes, and wild herbaceous plants that attract wildlife (California quail, pheasant, meadowlark, robin, field sparrow, crow, killdeer, and rabbit).

- **Habitat for Woodland Wildlife** - regions of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. These areas attract pigeon, ruffed grouse, woodpeckers, mountain beaver, squirrels, black-tailed deer, and black bear.
- **Habitat for Wetland Wildlife** - open, marshy, or swampy shallow water with typical wetland vegetation (hydrophytic sedges, rushes, grasses, and shrubs). Some of the wildlife attracted to these regions includes ducks, geese, herons, shore birds, kingfisher, muskrat, mink, and beaver.

Current and Projected Population

The current population estimation for the South Beach FHRP study area was provided by the Grays Harbor Regional Planning Commission, using Washington State Office of Financial Management (OFM) census tract information. Because the census tracts are delineated differently than the study area's boundaries, the following figures are approximations.

- Population: 1165
- Housing Units: 940

Like many portions of Grays Harbor County, South Beach is influenced by the tourist industry seeking Pacific Ocean beach access and activities. The area also relies partially on the timber industry. Population projections are difficult to make because these influences are highly variable from year to year. Because no population predictions exist specifically for the South Beach area, several different local predictors for the entire county of Grays Harbor were examined. Within the same county, unincorporated and incorporated areas tend to have different growth rates because of the availability of land, the economic draw, and other factors. For this reason, only those growth rates for unincorporated areas within Grays Harbor County were considered. Three sources for population projections were found to suggest reasonable rates of growth. They are as follows:

- Washington State Office of Financial Management (OFM) 1990-1994 Census Data
- *Grays Harbor County Capital Facilities Plan* (CH2M HILL, 1994) - Projections based on historical population in Grays Harbor County, OFM population projections for Grays Harbor County and surrounding counties, Washington State Superintendent of Public Instruction enrollment forecasts for school districts within the County, Grays Harbor Regional Planning Council population information, and Port of Grays harbor estimates of industrial development.
- *Utilities Comprehensive Plan: Grays Harbor County* (Parametrix, 1991) - Projections based on data from the U.S. Census Bureau and Grays Harbor County Regional Planning Commission.

After compiling the statistics, general population growth rates of 1.5 percent to reach 1997 populations and 1.3 percent for the remainder of the planning period (until 2001), and 1.10 percent for the 20-year period were selected. These rates assume medium growth in the South Beach area. High and low rates should also be considered (with the former being approximately 5 percent higher than the medium rate, and the low rate assumed to be zero), but for the purposes of this FHMP, a medium rate has been selected. This will give a somewhat conservative stormwater sizing input, yet should not result in an unnecessarily oversized and/or costly drainage system, should improvements for the future be made.

Using the data described above, the future population at the end of the 2001-2015 planning period is estimated to be roughly 1590. This would equate to approximately 1280 housing units (based on the ratio of population to housing units at the time of the study).

Land Use

Current Land Use

Land use in the South Beach area is characterized by scattered residential development, which increases in density at the north end of the study area near Westport. Several pockets of denser residential development also occur in subdivisions, such as Cohasset Dunes. A small amount of commercial development is located along SR 105, and Twin Harbors State Park is located at the junction of SR 105 and Schafer Road. The balance of the area is undeveloped, with large tracts of open space (primarily wetlands) east of SR 105 and open dune areas to the west.

Future Land Use

The South Beach planning area falls under the countywide zoning code for Grays Harbor County (title 38 of the County code). The majority of the area is zoned as R3, Resort/Residential, with some small areas allowing commercial development. Based on the assumed growth rate, it can be estimated that there will be a slight increase in the urban land use. It is likely that the increased urbanization will encroach only slightly on the undeveloped portion of the study area. Although impacts from future growth are not predicted to be dramatic, planning efforts and recommendations in this FHMP will also address new development.

REGULATORY OVERVIEW

Federal, state and local regulations directly affect flood hazard management and improvements to local drainage systems. These regulations are in place to ensure that all development, changes in land use, and utility improvements give proper consideration and planning to potential impacts to human safety and convenience and natural resources. The regulations

pertaining to stormwater runoff collection and conveyance can be grouped into the following four major categories:

- Land Use Management
- Resource Management
- Environmental Protection
- Flood Hazard Management

The laws under each of these categories and their implementation mechanism are summarized in Table 3-1. More detailed explanations of the regulations, their rationale, and the responsibilities of the jurisdictions can be found in Appendix B.

**Table 3-1
Regulations Pertaining to Flood Hazard Management**

Law	Brief Summary	Implementation
Land Use Management		
Comprehensive Plan/Growth Management Act (State)	Gives long-range direction and guidance for systematic growth and development. Countywide planning required.	NA
Zoning Ordinance (County)	Regulates land uses and densities. Implements growth management policies of the Comprehensive Plan.	By County, through zoning codes
Uniform Building Code (County adopts by ordinance)	Provides jurisdictions with an adoptable set of building regulations.	Building officials
Subdivision Ordinance (County)	Sets procedures for land division. Includes drainage plans and drainage system standards.	By County
Washington State Shoreline Management Act (SMA) (State)	Establishes priority of shoreline uses to preserve natural resources. Regulates development in shoreline area.	By State and local, through WAC 173-14, 16, 17, 18, 19, 20 and 22
Shoreline Master Program (County and Local)	Mandated by the SMA as the principal planning tool to protect shoreline resources.	By County and local through WAC 173
Resource Management		
Hydraulic Code (State)	Preserves fish and wildlife by requiring a permit for any work using, diverting, or changing the flow or bed of any waters of the State.	By State (DFW) through WAC 220-110 and Hydraulic Permit Approval
Section 404-Clean Water Act (Federal)	Maintains the biological integrity of the nation's waters (including wetlands and adjacent tributaries) through actions such as the regulation of dredge/ fill materials.	By Federal (COE) through 40 CFR
Section 401-Clean Water Act (Federal)	Federal permit prerequisite certification process for discharge into a waterbody. Important in the construction phase of flood hazard protection measures.	By Federal through 40 CFR, also State through WAC 173-201
Section 10-Rivers and Harbors Act (Federal)	Prohibits unauthorized obstruction or alteration of navigable US waters.	By Federal (COE) through 33 CFR 320-330

Table 3-1
Regulations Pertaining to Flood Hazard Management

Law	Brief Summary	Implementation
Environmental Management		
National Environmental Policy Act (Federal)	Requires Federal agencies to consider environmental impacts of projects requiring agency permits.	By Federal and CEQ through 40 CFR 1500-1508
Washington State Environmental Policy Act (State)	Requires agencies to determine (and make information available to the public about) the environmental impact of actions for which they issue permits. For significant adverse impacts, agencies mandated to require mitigation.	By State (Dept. of Ecology) through WAC 197-11 and WAC 400-04-902
Executive Order 11990 (Federal) and Executive Order 90-40 (State)	Mandate that agencies exercise to the extent permissible, their powers to require mitigation, and condition, deny or appeal permits, for all adverse impacts to wetlands.	All levels
Executive Order 11988 (Federal)	Mandates that agencies exercise to the extent permissible, the avoidance of adverse impacts from their activities in floodplains.	All levels
Flood Hazard Management		
National Flood Insurance Program (Federal)	Makes affordable flood insurance available to communities that have adopted approved floodplain management regulations.	By State and County/ local through zoning and floodplain restrictions
State Floodplain Management (State)	Adopts the NFIP minimum standards, and also prohibits new or substantially improved residential development in any designated floodway.	State (Dept. of Ecology) and Local through WAC Ch. 173-158, zoning and floodplain restrictions
Floodplain Management Ordinance (Local)	Requires development permits to restrict dangerous uses due to water or erosion hazards	By County through zoning code

Notes:

DFW = Washington State Department of Fish and Wildlife.
 COE = Army Corp of Engineers.
 CEQ = Council on Environmental Quality.
 Ecology = Washington State Department of Ecology.
 WAC = Washington Administrative Code.
 CFR = Code of Federal Regulations.