

2. BACKGROUND OF THE PLANNING AREA

This chapter first describes the environmental, demographic, and land use conditions of Clallam County. Then the potential for siting new solid waste management facilities in Clallam County is discussed, based in large part on these conditions.

2.1 DESCRIPTION OF THE PLANNING AREA

An understanding of environmental, demographic and land use conditions in Clallam County is important in this process because it provides a point of reference for discussions of existing solid waste practices and future solid waste handling needs. To address the primary aspects of environmental conditions in Clallam County, this section is divided into two parts: the natural environment and the human environment. The description of the natural environment includes a brief review of topography, geology, soils, and climate. The second part covers the demographic and land use characteristics of Clallam County.

2.1.1 Natural Environment

Clallam County is located on the Olympic Peninsula in the northwestern corner of Washington State. The County is bordered by the Pacific Ocean to the west, the Strait of Juan de Fuca to the north, and Jefferson County to the east and south. The Olympic Mountains form a significant geographic barrier across most of the southern part of the county. Eighty miles separate the western and eastern boundaries. Clallam County encompasses a total of 1,750 square miles.

2.1.1.1 Topography

The topography of Clallam County is extremely varied, with a range in elevation from sea level to over 7,000 feet above sea level. The dominant topographical feature is the Olympic Mountains, which comprise a major portion of Clallam County and neighboring Jefferson County to the south. These mountains are a densely timbered wilderness with numerous streams and steep slopes. The remaining area of Clallam County is rugged foothills and coastal terraces. Two large lakes, Lake Ozette and Lake Crescent, and several smaller lakes are located in the county.

2.1.1.2 Geology and Soils

The Olympic Peninsula is a region of complex geologic history. Bedrock sequences of sedimentary, igneous, and metamorphic rocks occur on the Peninsula in a variety of stages of deformation as a result of major tectonic activity. Repeated glaciation of the area has modified older bedrock deposits and left behind deposits of unconsolidated clay, silt, sand and gravel on much of the lowlands and foothills of the Olympic Peninsula.

Two major bedrock features occur on the Olympic Peninsula: the peripheral rocks and the core rocks. The peripheral rocks are Miocene to Eocene in age and consist of sandstone, argillite, and conglomerate that are layered with basaltic volcanic rocks of the Crescent Formation. The peripheral rocks are folded and faulted, but in general are stratigraphically continuous. The core rocks are also Miocene to Eocene in age but are much more deformed than the peripheral rocks. Metamorphic lithology and textural characteristics are very common in the core rock assemblages.

2.1.1.3 Climate

The climate of Clallam County is primarily maritime in character with cool dry summers and wet mild winters. The Olympic Peninsula has the widest range of rainfall in the United States, however, and in Clallam County the average annual rainfall varies from 16 inches in Sequim (in the eastern part of the county) to 130 inches in Olympic National Park (in the western part of the county). The average number of days in which there is 0.1 inch or more of rain is approximately 160 days in the western part of the County, 79 days in Port Angeles and 57 days in Sequim. Temperatures are mild in the non-mountainous portion of Clallam County, averaging approximately 49° F over the year. The typical range between high and low daily temperatures is 12 degrees in the winter and 21 degrees in the summer. Temperature extremes throughout a year are rarely less than 15° F or more than 96° F in the populated portions of the county.

Snowfall is heavy in the mountainous regions, and at higher elevations it remains until late in the summer. During many winters little or no snow is experienced at lower elevations.

2.1.2 Human Environment

2.1.2.1 Current Population/Demographics

The Washington Office of Financial Management's Official April 1, 2005 Estimate indicates that the population of Clallam County was 66,800 people in 2005 (OFM 2005). Table 2-1 shows the county's population distribution.

The largest of Clallam County's three incorporated areas, Port Angeles, has 28 percent of the population. The other two incorporated areas, Sequim and Forks, contain 7 and 5 percent of the county's population, respectively. Over half of the county's population (60 percent) is located in the unincorporated areas. Over the past 25 years, the population over 65 years of age has been steadily increasing as a percentage of the total population.

Table 2-1. Clallam County Population by Area

	1990 ^a	2000	2005
Incorporated Areas:			
Forks	2,838	3,120	3,125
Port Angeles	17,710	18,397	18,640
Sequim	3,617	3,617	4,730
Subtotal, Incorporated	24,165	25,851	26,495
Tribes	2,289 ^b	3,244 ^c	3,173 ^d
Unincorporated Areas:			
Subtotal, Unincorporated	32,039	38,328	40,305
Other Unincorporated	25,975	35,084	37,132
Clallam County, Total	56,204	64,179	66,800

Source: Office of Financial Management, Forecasting Division June 28, 2005.

^a From "1997 Population Trends", by the State of Washington, Office of Financial Management, September 1997, unless otherwise noted.

^b Figure for residents of Native American heritage from 1990 census data (USDC 1991).

^c Figure for residents of Native American heritage from 2000 census data (USDC 2001).

^d Estimated figure based on 1980, 1990 and 2000 data.

2.1.2.2 Future Population/Demographics

Table 2-2 shows previous and projected population figures for Clallam County. Evaluating trends in population is useful for estimating future solid waste generation. The Office of Financial Management estimates that the population of Clallam County will reach 77,749 people by 2025 (OFM 2005). This is an increase of approximately 16 percent over the 20-year planning period of this CSWMP. It is assumed that waste quantities generated in Clallam County will increase in proportion to this amount (by about 16 percent), before any impacts caused by expanded waste prevention and recycling activities are taken into consideration.

Table 2-2. Clallam County Population Trends

Year	Total Population	Percent Change ^a
1960	30,022	n/a
1970	34,770	15.8
1980	51,648	48.5
1990	56,204	8.8
2000	64,179	14.2
2010	67,754 ^b	5.6
2020	74,349 ^b	9.7
2025	77,749 ^b	4.6

^a Percent change calculated by dividing the increase from the previous year by the amount in the previous year.

^b From "Historical and Projected Population for Growth Management and Other Purposes", by the State of Washington, Office of Financial Management, February 2002 (intermediate series).

2.2 EVALUATION OF POTENTIAL SITES FOR SOLID WASTE FACILITIES

2.2.1 Solid Waste Facility Siting Process

No new public facilities are proposed in the CSWMP. However, any new public or private facilities sited in the future will have to meet the state and local standards current at that time. State standards include the following:

- Criteria for Municipal Solid Waste Landfills (WAC 173-351), which address siting, design, and operation of municipal solid waste (MSW) landfills.
- Solid Waste Handling Standards (WAC 173-350), which address siting, design and operation of other solid waste handling facilities, such as transfer stations, compost facilities, and limited purpose facilities.

Local standards include the Clallam County Solid Waste Regulations (Chapter 41.10 of the Clallam County Code) which specifies local solid waste standards, Clallam County Zoning Code (Chapter 33 of the Clallam County Code,) and the Clallam County Comprehensive Plan (Section 31), which designate solid waste disposal facilities as conditional uses in all forestry and rural residential zones, and in certain other zones. Other local land use plans may apply depending on whether the proposed site(s) are in a city's jurisdiction.

The siting process for a new solid waste facility would usually include the following steps below. These steps typically apply to solid waste landfills, but could generally apply to other facilities (e.g., composting, recycling, etc.).

Step 1: Site Identification

For a public facility, the process of identifying sites may include soliciting nominations from citizens and interested parties, identifying major landholders and city/County properties, and other activities to initially identify as many sites as practical. For a private site, the site selection process may consist primarily of an inventory of sites currently available for purchase.

Step 2: Broad Site Screening

The second step typically involves evaluating potential sites for “fatal flaws”, such as unsuitable neighboring land use, distance from the point of waste generation, site size, or presence of slopes, floodplains, wetlands, surface water, or shorelines. For a public site, the goal should be to retain up to 12 sites after this step is completed. For a private facility or other cases where there may be only a few sites to begin with, one or two sites should survive this evaluation.

Step 3: Detailed Site Ranking

After sites with fatal flaws have been eliminated, the remaining sites should be evaluated using more detailed criteria such as the availability of utilities (water, sewer, and electricity), traffic impacts and road access, and other factors affecting the ability to develop and use the site. For a publicly owned site, no more than four sites should remain after this step is completed.

Step 4: Detailed Site Evaluation

The final step in evaluating sites involves assessing impacts in accordance with the State Environmental Policy Act. This step should result in the recommendation of a preferred site.

Step 5: Siting Decision

The decision to proceed with a recommended site should be based on environmental, engineering, cost, and political factors. At this point, more detailed plans and drawings can be developed, the permit process can begin, and other documents and approvals (such as an Environmental Impact Statement, if required) can be sought.

2.2.2 Solid Waste Facility Siting Factors

A new MSW landfill located in the County would be required to meet the siting standards listed in WAC 173-351-130 and -140. These standards meet or exceed the federal regulations under the Resource Conservation and Recovery Act (RCRA), Subtitle D (40 CFR Part 258).

Other solid waste facilities that are required to comply with WAC 173-350 (e.g., composting, recycling, inert waste), must meet the siting standards listed in WAC 173-350. Generally, these are listed in WAC 173-350-040, Performance Standards. Specific requirements are listed in:

- WAC 173-350-210 (Recycling),
- WAC 173-350-220 (Composting),
- WAC 173-350-230 (Land application),
- WAC 173-350-240 (Energy recovery and incineration facilities),
- WAC 173-350-300 (On-site storage, collection, and transportation standards),
- WAC 173-350-310 (Intermediate solid waste handling facilities – e.g. transfer stations and drop boxes),

- WAC 173-350-320 (Piles used for storage or treatment)
- WAC 173-350-330 (Surface impoundments and tanks)
- WAC 173-350-350 (Waste tire storage and transportation)
- WAC 173-350-360 (Moderate risk waste handling)
- WAC 173-350-400 (Limited purpose landfills), and
- WAC 173-350-410 (Inert waste landfills).

The subsections below describe the siting standards for landfills listed in WAC 173-351-130 and -140. There may be other issues that affect other solid waste handling facilities, however, these are not listed below for simplicity purposes. Siting for other waste handling facilities must meet requirements in WAC 173-350 as well as any other local and federal regulatory requirements.

2.2.2.1 Soils and Geology

The soils and underlying geology are important considerations for solid waste management facilities. Geology, groundwater, and the availability of appropriate soils are critical factors. The appropriate type of soil varies somewhat depending on the type of solid waste handling facility, but any structure, such as a transfer station or recycling center, must be built upon a stable foundation. The soils in Clallam County are generally acceptable for foundations.

A variety of soils are required for the construction and operation of a landfill. Silts, clay or claylike soils are used for landfill liners and final cover (caps) because these fine-grained soils tend to retard the movement of precipitation, gas, and leachate. Porous soils, such as sands and gravels, are undesirable because these may permit rainfall to enter the landfill (increasing leachate and gas production) and allow the uncontrolled migration of landfill leachate and methane gas. Thus, sand or gravel is not suitable for landfill cover or liners; however, gravel is often used for intermediate cover because it provides better traction for landfill machinery in wet weather. Coarse-grained materials such as sand and gravel, common in Clallam County, can also be used for gas venting and leachate collection systems. Detailed soils studies would be necessary for evaluating potential sites for landfills.

2.2.2.2 Groundwater

Distance to groundwater, measured in feet or in terms of the time that surface water takes to travel through the soil to the groundwater, is an important criterion for the siting of solid waste disposal facilities. Shallow layers of groundwater and/or short travel times are a problem due to the risks associated with spills and contaminated runoff from waste facilities. Other factors, such as existing and potential beneficial uses of the groundwater, are also significant considerations, especially if the groundwater is, or could be, used for drinking water. A large percentage of the population in Clallam County depends on private wells for drinking water supplies. Groundwater must also be considered when siting or designing landfills because shallow groundwater can result in higher construction and maintenance costs, interfere with excavation, and require non-standard foundations.

2.2.2.3 Flooding

Areas known to experience flooding are not good sites for solid waste facilities. Solid waste facilities often entail risks not associated with other types of development, such as the potential to create contaminated runoff. Additionally, solid waste facilities must remain operational during and after natural disasters to handle the large amount of debris that may be created.

2.2.2.4 Surface Water

Two large lakes, Lake Ozette and Lake Crescent, and several smaller lakes are located in the county. Numerous creeks and rivers are also present, generally draining from interior areas to the coastline. Regulatory standards require that new MSW landfills be located more than 200 feet from surface waters, thus eliminating a substantial amount of land for a water-rich area such as Clallam County.

2.2.2.5 Slope

Much of Clallam County is mountainous with slopes that are prohibitive for landfills and other solid waste disposal facilities. Steep slopes pose problems for site development and future access to the site. The lower valleys and coastal terrace areas have gentler slopes; therefore, these areas could receive consideration for siting solid waste handling facilities. However, these areas also have high value for other purposes, such as agriculture and housing.

2.2.2.6 Cover and Liner Materials

Cover and liner materials are important because their presence at landfill sites reduces the cost of construction, operations, and maintenance. These materials include silt and clay for liners and caps; sand and gravel for gas venting, leachate collection, and road construction; and a variety of materials that can be used for intermediate cover. Clay is a scarce material in parts of Clallam County, in which case synthetic liners may be more cost-effective to use for landfilling operations.

2.2.2.7 Capacity

The Criteria for Municipal Solid Waste Landfills specify various landfilling requirements based on size. For example, landfills that receive 100 tons per day or more of solid waste must meet the extensive requirements for landfill operations as shown in Chapter 173-351 WAC. If a new landfill were constructed to serve only a part of Clallam County, the capacity may be less than this and it could be designed to less stringent standards. Even with fewer controls, however, the cost of constructing and operating a landfill, on a per ton basis, increases rapidly as the size of the landfill decreases. On a per ton basis, it is likely that any savings incurred for less stringent design requirements would be more than offset by the lower economies of scale.

2.2.2.8 Climatic Factors

Most of Clallam County receives extremely high amounts of precipitation, which poses a serious problem for MSW landfills due to the potential for generation of large quantities of leachate. Other types of solid waste handling facilities are less affected, but care must still be taken to avoid surface water contamination by runoff. The eastern side of the county, especially in the area of Sequim, receives low amounts of rainfall, but again much of the land in this area has considerable value for other purposes (agricultural and residential usage).

2.2.2.9 Land Use

Existing land use in Clallam County ranges from the relatively dense residential, commercial and industrial development in the Port Angeles and Sequim areas to the undeveloped land and forested areas of the Olympic Mountains. The wood products industry has historically been a major factor influencing the development in the county. Historic communities are found along the shores of the Strait of Juan de Fuca, the Sol Duc River, and the Forks Prairie.

The City of Port Angeles, which is centrally located along the east-west transportation corridor with an active port and harbor, continues to be the center of economic activity.

A breakdown of the county's land area by ownership reveals that only a small portion of the County is available for private ownership. Approximately 48 percent of all land in the County is under federal ownership, including portions of the Olympic National Park and Forest, Native American reservations, and various Coast Guard installations. Olympic National Park is a major presence drawing over 3 million visitors annually. Approximately 14 percent of the County is in state ownership and 25 percent is owned by timber companies.

In addition to Port Angeles, development has occurred in two smaller incorporated areas, Forks and Sequim, and in a number of rural residential areas. The land use pattern to the east was primarily agricultural, with a present trend towards residential development. West of Port Angeles, there are several resort developments as well as isolated timber and commercial fishing areas. The larger communities in the west end include Forks, Lake Pleasant, LaPush, Sekiu, Clallam Bay, Neah Bay, and Joyce. To the east of Port Angeles are Sequim and a number of smaller communities.

2.2.2.10 Air Emissions and Air Quality

At present, the Olympic Region Clean Air Agency (ORCAA) is monitoring Clallam County for particulate levels to verify the area is meeting ORCAA air quality goals. Fugitive road dust is a contributor to particulate values, and in winter it is probable that woodstove emissions are a significant contributor.

Many of the air quality regulations are directed at major sources of air pollutants. Major sources in Clallam County are K Ply Inc and Nippon Paper Industries in Port Angeles, which are both subject to Federal Clean Air Act Title V (Public Law 88-206, 77 Stat. 392. December 17, 1963, 42 U.S.C. 7401 et seq., as amended) Air Operating Permits (<http://www.orcaa.org/aop.html>; accessed June 2006).

Historically, manufacturers of shingle and shake roofing materials in western Clallam County burned wood waste in wigwam or cyclone burners that were "grandfathered" by existing regulations. However, current regulations prohibit the open burning of mill waste (WAC 173-400-050). As of the last plan update (2000), the few older ones that were grandfathered were being used less. In July 2005, ORCAA enforced a federal standard that removed any such grandfathering of these wood burners. Currently, these manufacturers are long hauling wood waste throughout the region. The City of Forks and Port of Port Angeles are pursuing the development of a biomass-to-energy facility, using gasification or incineration processes permitted by the U.S. Environmental Protection Agency (EPA) or ORCAA, to handle cedar waste as well as other portions of the mill waste generated in western Clallam County and Jefferson County. See Section 5.5.

Siting and operating a new landfill, new solid waste facility, or biomass-to-energy could impact air quality. Dust, gases, odors, particulates, and vehicle emissions are all potentially increased by solid waste operations. In certain cases, however, the centralization of such emissions is often preferable to the historical diffuse burning of waste. Any proposal not already being evaluated as part of the existing regulatory process (i.e., through EPA or ORCAA) should be studied by the SWAC for net air quality impacts.

2.2.2.11 Summary of Siting Factors

Based on the preceding discussion of siting factors, it can be concluded that only very limited portions of Clallam County would be available for siting a MSW landfill; other potential solid waste facilities may be evaluated on a case-by-case basis. Most of the southern portion of the County is undesirable for large facilities due to its mountainous terrain. This area is also generally not available because it falls within the Olympic National Forest or National Park boundaries.

The western half of the County is not appropriate for siting a MSW landfill due to the high amounts of rainfall received, up to 130 inches per year. This amount of precipitation complicates runoff and leachate controls for disposal sites. Although solid waste handling facilities could be located on the west end of the County, these facilities should be restricted to transfer stations or other operations with low potential for generation of contaminated runoff. Facilities such as transfer stations also need to be conveniently located for public use and typically require less acreage. Local conditions will further restrict potential siting areas, however, including conditions such as current and adjacent land use, surface water, potential for flooding, and public opposition.

The eastern half of the County is climatically and geographically more suitable for solid waste disposal facility locations. However, the County would in all probability not be successful in siting a MSW landfill because of more prevalent agricultural and residential use, zoning, growth pressures, and the stated goal of the Clallam County Comprehensive Plan to “...encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks...”.

In conclusion, siting a new MSW landfill in Clallam County is not considered feasible. Siting of other solid waste facilities should be considered on a case-by-case basis.

2.2.3 Facility Construction, Capital Acquisition, and Financing

RCW 70.95.090(3)(c) requires that this plan address six-year construction and capital acquisition programs for facilities that may be considered. RCW 70.95.090(3)(d) requires that the plan provide information about financing both capital costs and operational expenditures of the proposed solid waste management system. However, no new public facilities are proposed. Chapter 10 provides information on programs costs and financing.