CHAPTER 1

WATER SYSTEM DESCRIPTION

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WATER SYSTEM DESCRIPTION

OBJECTIVE

SCOPE OF WORK

This Water System Plan (Plan) is an update of previous Water System Plans prepared for and adopted by the North Beach Public Development Authority~~Water District~~ (NBPDA~~WD~~) in accordance with requirements set forth in Chapter 246-290 WAC (Water Regulations). This Plan is intended to meet all requirements of Part 246-290-100 WAC (Planning Requirements) and as further detailed in the Washington State Department of Health (DOH) Water System Planning Handbook, as well as the needs and concerns of the NBWD Board and Staff. In addition, this Plan addresses State Environmental Policy Act (SEPA) requirements as set forth in Chapter 173-802 WAC.

CHAPTER OBJECTIVE

The objective of this chapter is to present background information for the NBWD Plan. Subjects covered include the following:

- Ownership and Management
- System Background
- Codes and Bylaws
- Water Rights
- Inventory of Existing Facilities
- Related Planning Documents
- Existing Service Area Characteristics
- Service Area Agreements
- Service Area Policies
- Complaints

Later chapters of this Plan assess the projected water system demands, and current water system capabilities and limits relative to projected demand and regulatory requirements. Chapters address water use efficiency (conservation) requirements, water source protection requirements, water system operations program requirements, and water system design standards. The final chapters of the Plan evaluate capital and non-capital improvement options for the NBWD water system, present a schedule for completing the preferred improvement options, evaluate the cost impact of the improvement schedule on the NBWD budget, and present a financing program for implementing the Plan.

OWNERSHIP AND MANAGEMENT

SYSTEM NAME AND DOH ID NUMBER

The water system name on the DOH water system database is North Beach Water, and the DOH ID No. is 63000C. North Beach Water was formed from two neighboring water

systems, Ocean Park Water Company (OPWC, DOH ID No. 63000C)) and Pacific Water Company (PWC, DOH ID No. 20051V). NBWD retains the DOH identification number of OPWC, while PWC was inactivated on the DOH data system. DOH data system information on the wells, storage and source water quality history of the PWC was transferred to North Beach Water.

TYPE OF OWNERSHIP

The District is a public entity and a political subdivision of Pacific County (the County). The District is headed by three Commissioners chosen by general election of registered voters in the District boundaries. Decisions regarding the District management, operation, policies, rates and budget, are made by the Commissioners.

MANAGEMENT STRUCTURE AND DECISION-MAKING PROCEDURES

In addition to the three elected District commissioners, District staff consists of a General Manager, an Office Manager, a Billing Clerk, a Field Supervisor, and a Treatment Plant Operator. The Commissioners directly hire the General Manager and approve policy which guides the General Manager in the hiring of ~~hire~~ all other District staff ~~subject to recommendation of the Manager~~. The General Manager is responsible for day to day operations of the water system, and reports directly to the Commissioners. All other staff personnel report to the General Manager. At the writing of this plan the Commissioners and staff are as follows:

Commissioner ..... Brian Sheldon
Commissioner ..... Gwen Brake
Commissioner ..... Glenn Ripley
General Manager..... William “Bill” Neal
Office Manager ..... Jack McCarty
Billing Clerk..... Lisa Larcom
Field Supervisor ..... Robert “Bob” Hunt
Treatment Plant Operator..... Nick Morrison
~~Operator ..... Jason Crisifulli~~

WATER FACILITIES INVENTORY FORM

The DOH Water Facilities Inventory (WFI) form for North Beach Water was, as of this writing, last updated on May 5, 2014. A copy of the WFI form is included in Appendix A of this Plan. The WFI form indicates the following:

Primary Contact and Ownership Information

Owner:.....North Beach Water District
Primary Contact: .....William M. Neal III (General Manager)
Mailing Address:.....P.O. Box 618
Street Address: .....25902 Vernon Ave. Ste C
Ocean Park, WA 98640
Daytime Phone:.....(360) 665-4144
Mobile Phone:.....(360) 244-0068

Satellite Management Agency

The system is not owned, operated or managed by a Satellite Management Agency.

System Characteristics

System service characteristics include Hospital/Clinic, Residential, Commercial/ Business, Industrial, School, Day Care, Food Service/Food Permit, Lodging, Other (church, fire station, etc.), 1,000 or more person event for 2 or more days per year, and Recreational/RV Park.

Water System Ownership

Ownership is a Special District.

Source Information

Eleven sources are indicated, all wells, eight of which are located in the north well field in the SW¼ of the NE¼ of Section 28. Three additional wells are located in the south well field, two wells in the SE¼ of the NE¼ of Section 33, and one well in the NW¼ of the NE¼ of Section 33, all in Township 12 North, Range 11 West. One well in the south well field is indicated as inactive and emergency use only, while the remaining ten wells are indicated as permanent active sources. Well source capacities are indicated as ranging from 30 gpm to 123 gpm, and well depths to the first open interval are indicated as ranging from 41 feet to 127 feet. The combined capacity of all active wells, as indicated on the WFI, is 925 gpm. The inactive well is indicated as 80 gpm.

Water Services

A total of 3,194 service connections is indicated, including 1,510 full-time and 1,090 part-time single family residential connections, 94 full-time and 425 part-time residential units in 14 Apartments, Condos, Duplexes and/or Dorm units, and 75 Institutional, Commercial/Business, School, Day Care, and/or Industrial Services connections. It is also indicated that the number of approved connections is unspecified.

Population Served

A full-time residential population of 4,010 is indicated. A part time residential population is indicated as ranging from 500 in winter months to 3,000 in summer months. Temporary and transient population is indicated as ranging from 2,200 per month in winter months to 10,000 per month in summer months. A regular non-residential population is indicated as ranging from 490 per month in July to 750 per month in September.

SYSTEM BACKGROUND

HISTORY AND SETTING

Location

The North Beach Water District is located on the North Beach Peninsula (also known informally as the Long Beach Peninsula) north of the City of Long Beach. The service area extends from the City of Long Beach on the south, delineated by Cranberry Road, approximately 8 miles to Joe John's Road on the north, and the entire width of the North Beach Peninsula, which varies from about two miles wide at Cranberry Road to about 1.3 miles wide at Joe John's Road. The location of the NBWD water system is shown in Figure 1-1.

History

The NBWD water system was formed by the merger of two investor owned water systems, Ocean Park Water Company (OPWC, ID No. 63000C) and Pacific Water Company (PWC, ID No. 20051V). OPWC was formed in 1962 with initial plans to serve 300 customers. The first water system plan for OPWC was completed in 1966. The company changed ownership in 1979, and by 1998 it had expanded to serve over 2,200 customers.

PWC was originally formed as Ocean Bay Water Company in 1970. Ocean Bay Water Company was formed utilizing existing aging infrastructure from the vacated Rushlight dairy farm (AKA John Paul dairy farm). The first water system plan for Ocean Bay Water Company, completed in 1981, planned to serve 279 customers. Ocean Bay Water Company was purchased by PWC in 1987.

In 2004, PWC and OPWC entered into an intertie agreement by which PWC would construct a reservoir and water transmission line to provide fire flow to OPWC. Construction of the intertie was completed in May 2007.

Also in 2004, the North Beach Public Development Authority (NBPDA) was formed for the purpose of assisting the community of Ocean Park to acquire ownership of the water utilities serving the community. In February 2006, the NBPDA acquired ownership of

both PWC and OPWC, and the combined system was named North Beach Water. A water system plan for North Beach Water was completed in 2008.

In 2008 the NBWD was formed, ownership of the North Beach Water system was transferred to NBWD, and the NBPDA was disbanded. The combined North Beach Water system retains the identification number of 63000C from the Ocean Park Water Company, and the Pacific Water Company identification number of 20051V has been inactivated.

Since the original formation of the OPWC in 1962 and the PWC in 1970, both systems have added water sources, water storage, water pumping, and water distribution facilities. The North Well Field (NWF), including wells N-1, N-2, N-3, N-4, N-5, N-6, N-7 and N-8, was originally part of the OPWC system. The South Well Field (SWF), including wells S-1, S-2 and S-4, was originally part of the PWC system. Three 179,000-gallon reservoirs located at the NWF Site were originally part of the OPWC system, and one 211,000-gallon reservoir, located at the SWF, was originally part of the PWC system. All reservoirs are ground level with booster pumps to provide system pressure. The NWF booster pump system was part of the OPWC system and the SWF booster pump system was part of the PWC system. In 2002, both OPWC and PWC added treatment for iron and manganese. The treatment system at the NWF was originally part of the OPWC system and the treatment system at the SWF was originally part of the PWC system.

Setting

The climate is classified as the Marine West Coast type, characterized by cool, dry summers and moderate winters, accompanied by considerable rainfall. The majority of the 80 inches annual precipitation occurs during October through April. Temperatures are moderate in winter, 40 degrees to 50 degrees F, and warm during July and August, 70 degrees to 80 degrees F.

Topography of the NBWD area is shown in Figure 1-2. Elevations generally range from sea level to a high elevation of about 40 feet, with an average elevation of about 20 feet above sea level, although there is one high point that exceeds 60 feet in elevation between Loomis Lake and Sandridge Road. Large sand dunes parallel the ocean beach area with lakes, marshes and manmade drainage canals located within the interdunal depressions. Major lakes in the area include Loomis Lake, Island Lake, Lost Lake, Tape Lake, Cranberry Lake, and Mallard Lake. Further inland, boggy areas exist.

The geology of this area was first documented in a 1977 report prepared by the U.S. Department of the Interior, Geologic Survey, titled *Groundwater Resources of the North Beach Peninsula, Pacific County, Washington,* report number 77-647. That report, however, is out of publication. More recently, the U.S. Geological Survey published a 1995 report, titled *Groundwater Flow and Water Quality in the Sand Aquifer of Long Beach Peninsula, Washington,* report number 95-4026. This latter report is the only available comprehensive ground water study of the local aquifer.

Soils are primarily deeply weathered and eroded basalt-derived fine sand, gravel, and clay. The upper soil strata are predominantly dune sand with clay lenses to depths of 80 to 180 feet before silt, blue and gray clay, and gravel deposits are reached that extend to basalt layers near a depth of 700 feet.

ADJACENT PURVEYORS

Water purveyors in the vicinity of NBWD are depicted in Figure 1-3. WFI forms for purveyors near NBWD are included in Appendix A and described below.

Oysterville – DOH ID #29240X

This water system is located north of NBWD, and serves a development known as Espy Ridge Tracts. Information regarding this system was obtained from the WFI form for this system, updated June 14, 2013. The WFI indicates that the Oysterville water system is owned by Oysterville Water NP Corp., a homeowners association. According to the WFI, this system serves 26 full-time single-family residential connections, 42 part-time single-family residential connections, no multi-family connections, no recreational connections, and one commercial connection, for a total of 69 active connections, and is approved for up to 99 connections. The WFI indicates a full-time residential population of 70 people, a part-time residential population ranging from 10 to 25 people for 5 to 10 days per month, and a transient population of 90 people per month. The source of supply is a single, 69-foot drilled well with a reported capacity of 40 gallons per minute (gpm). The WFI indicates that no treatment is provided, and that there is 60,000 gallons of storage provided.

Surfside Homeowners Association – DOH ID #86470Y

This water system is located north of NBWD, and serves the Surfside Estates subdivision as well as several smaller neighboring developments. Information regarding this system was obtained from the WFI form for this system, updated November 6, 2013. The Surfside water system is owned by Surfside Homeowners Association, a non-profit corporation. According to the WFI, this system serves 552 full-time single family residential connections, 679 part-time single family residential connections, 32 apartments, condos or duplexes in 5 multi-family buildings, 948 recreational services, and 6 commercial services, for a total of 2,217 services. The WFI indicates a full-time residential population of 1,405 and a part time residential population ranging from a low of 300 individuals in the winter, to a high of 2,000 individuals in the summer. The WFI further indicates a transient population ranging from 2,000 per month in winter to a high of 10,000 per month during summer. The WFI indicates that the Surfside Homeowners Association water system has seven wells ranging in depth from 180 to 193 feet, with production rates ranging from 120 to 175 gpm. The WFI indicates that the system provides 630,000 gallons of water storage, and provides treatment including chlorination

and filtration. The treatment system is for removal of iron and manganese from the source water.

City of Long Beach – DOH ID #48000M

This water system is located south of NBWD, and serves the City of Long Beach. Information regarding this system was obtained from the WFI form for this system, updated November 15, 2013. The City of Long Beach water system is owned by the City of Long Beach, a Code City. According to the WFI, this system serves 1,835 full-time single family residential connections, and 238 commercial services, for a total of 2,073 services. The WFI indicates a full-time residential population of 3,854 and a transient population ranging from 3,000 per month in winter to a high of 15,000 per month during summer. The WFI indicates that the City of Long Beach water system has four surface water sources with capacities ranging from 125 gpm to 686 gpm, and an intertie with the City of Ilwaco with a capacity of 800 gpm. The WFI indicates that the system provides 2,000,000 gallons of water storage, and provides treatment including chlorination and filtration. The treatment system is for compliance with surface water treatment requirements.

Other Water Systems

Based on the WSDOH Sentry Internet system there are an additional 13 small public water systems listed as existing within or near the area served by NBWD. These systems are Group B water systems and small Group A water systems. Table 1-1 lists the other small water systems in the vicinity of NBWD.

TABLE 1-1

Other Water Systems In or Near NBWD Service Area

DOH ID No.	System Name	Group	Residential Population	Total Connections
02243Y	Andersens RV Park	A	0	63
37320E	Ocean Bay Mobile & RV Park	A	5	39
667643	Peggs Oceanside Trailer Park	A	2	32
62998X	Ocean Park Retreat Ctr and U M Cmp	A	0	31
158136	Cranberry RV & Trailer Park	A	6	27
20275P	Dunes Bible Camp	A	6	25
07151C	Dunes Loomis Lake	A	2	13
758878	Sands Motel	B	8	11
655150	Pacific West Mobile Home Park	B	18	10
77757F	Shady Dell Condominiums	B	8	5
76890Y	Sea Mist Apartments	B	10	5
07512C	Blue Horizon Apartments	B	15	5
37094X	Ocean Spray Cranberries	B	0	1

WATER RIGHTS

NBWD has a total of five water rights covering its eleven wells. Four of these water rights (G2-00759C, G2-21399C, G2-25737C, and G2-27073C) come from the OPWC system and one (G2-00174C) comes from the PWC system. Total water available under these rights is 1,100 gpm and 696 ac-ft/yr.[1] Copies of water rights certificates are included in Appendix B.

[1] Ac-ft/yr is acre-feet per year. One acre-foot is the amount of water required to cover one acre of area one foot deep. This volume is 43,560 cubic feet. At 7.48052 gallons per cubic foot, on acre-foot is 325,851.4 gallons. One ac-ft/yr is a continuous flow rate of 0.62 gpm. 696 ac-ft/yr is a continuous flow rate of 431.5 gpm.

TABLE 1-2

Summary of Water Rights

Number	POW (1)	Location of POW (2)	Priority Date	Q_i (3), gpm	Additive Q_a (4), ac-ft/yr	Non-Additive Q_a (5), ac-ft/yr
G2-00174C	S-1, S-2, S-4	N½ NE¼ Section 33	12/15/1969	500	168	
G2-00759C	N-1, N-2, N-7, N-8	SW¼ NE¼ Section 28	7/14/1965	200	320	
G2-21399C	N-3, N-6	SW¼ NE¼ Section 28	8/23/1973	100	128 (6)	32 (6)
G2-25737C	N-4	SW¼ NE¼ Section 28	10/22/1980	130	(7)	140
G2-27073C	N-5	SW¼ NE¼ Section 28	3/16/1987	105		252
G2-29907P	N-3, N-4, N-5, N-6, N-7, N-8	SW¼ NE¼ Section 28	3/10/2000	65	80 (8)	
Total Water Rights				**1,100**	**696 (9)**	

(1) POW is Point (or Points) of Withdrawal

(2) All POW locations are in Township 12N Range 11W

(3) Q_i is shorthand for instantaneous water right, the maximum instantaneous rate of withdrawal allowed under the specified water right.

(4) Q_a is shorthand for annual water right, the maximum amount allowed to be withdrawn in a calendar year under the specified right. Additive water rights, formerly referred to as Primary water rights, may be added to other water rights.

(5) Non-Additive water rights, formerly referred to as Supplemental water rights, may not be added to other water rights.

(6) The face of Water Right Certificate G2-21399 indicates an annual right of 160 ac-ft/yr, with no indication of primary, supplemental, additive or non-additive annual quantities. However, under Provisions of Permit G2-21399P issued 8/16/1974, and Certificate G2-21399C issued 11/29/1978, it is stated that the total annual right under water rights G2-21399 and G2-00759 is 448 ac-ft/yr, which makes 32 ac-ft/yr of water right G2-21399 supplemental, or non-additive. Re-issued Certificate G2-21399, dated 12/2/2002, lacks this statement in the provisions, but does state, "All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below," and no exception to this provision is noted.

(7) There is nothing on the face of Certificate G2-25737C to indicate that this right is supplemental or non-additive to prior rights, however, under the provisions of this right it is stated, "Under existing rights there is 448 acre-feet per year as primary right for municipal supply." Also, in the Report of Examination for this right it is recommended that "total annual withdrawal shall not exceed 448 acre-feet per year."

(8) On Permit G2-29907 under *QUANTITY, TYPE OF USE, PERIOD OF USE*, it is stated, "Both Qi and Qa are additive quantities to the 4 existing certificates for the North Wellfield, totaling 600 gpm and 515 afy." However, on request, Ecology has reviewed this and determined that the stated 515 afy (ac-ft/yr) is in error, and the total annual quantity for the North Wellfield is 528 ac-ft/yr. See copy of email correspondence, dated June 11, 2014, in Appendix B.

(9) Total water rights for both well fields is the sum of 168 ac-ft/y for the south well field plus 528 ac-ft/yr for the additive rights of the north well field, for a total of 696 ac-ft/yr.

INVENTORY OF EXISTING FACILITIES

SOURCE FACILITIES

NBWD has a total of eleven water wells, one of which is listed as inactive and emergency only. The wells are centered at two locations, the NWF and the SWF, as described in History above. The wells of the NWF were the sources of supply for OPWC, and the wells of the SWF were the sources of supply for PWC. The eight wells in the NWF are designated wells N-1 through N-8, and the wells in the SWF are designated wells S-1, S-2 and S-4. (There is currently no well S-3.) Well N-5, N-6 and N-8 are shown in Figure 1-4, below. Copies of well construction reports for all of these wells are included Appendix B. Pertinent information about the wells is summarized in Table 1-3.

FIGURE 1-4

North Well Field

TABLE 1-3

Existing Water Sources

Source Name	DOH Source ID No.	Year Drilled	Casing Diameter, inches	Depth, feet	Screened Interval	Applicable Water Rights	Installed Pumping Capacity (gpm) [1]
N-1	S-01	Unknown	8 [2]	80 [2]	59-79 [2]	G2-00759C	100
N-2	S-02	Unknown	6	122	105-120 [3]	G2-00759C	100
N-3	S-03	Unknown	Unknown	124	114-124	G2-21399C, G2-29907P	90
N-4	S-04	1981	8	120	100-120	G2-25737C, G2-29907P	135
N-5	S-05	1986	8	124	104-124 [4]	G2-27073C, G2-29907P	135
N-6	S-07	1996	8	130	107-127	G2-21399C, G2-29907P	110
N-7	S-08	Unknown	6	120	100-120	G2-00759C, G2-29907P	65
N-8	S-09	1996	8	130	106-126	G2-00759C, G2-29907P	90
S-1	S-10	1964	8	56	41-56	G2-00174C	30
S-2	S-11	1964	8	100	85-100	G2-00174C	60
S-4	S-12	1996	8	121	101-121	G2-00174C	80 [5]
Total Installed Source Pumping Capacity							**915**
Total Installed Source Pumping Capacity with Largest Source out of Service							**780**

(1) Well pumping capacities for Wells N-1 and N-2 are based on capacities reported in the Water Facilities Inventory form. Well pumping capacities for Wells N-3 through N-8 are based on field observations on December 14, 2011.

(2) An undated well log identified in the 2007 water system plan as NWF Well No. 1 indicates the well as having a ten-inch casing, drilled to a depth of 276 feet, completed at 102 feet, and screened between 82 and 102 feet. However, a video inspection of the well dated 3/16/2007 found the well casing to be 8 inches and to be screened between 59 feet and 79 feet.

(3) Drilled depth is based on an undated, non-standard well construction record identified as Well #2 on Ocean Park Water Company letterhead. Well diameter and screened interval is based on video inspection dated 3/16/2007.

(4) Well log indicates no screen is installed. However log also indicates well is cased to 104 feet and completed at 124 feet, so it is presumed that the well is screened between 104 and 124 feet.

(5) 80 gpm is the previously reported capacity for this well, but it is currently listed as inactive and emergency only due to an elevated level of manganese and declining productivity, so this amount is not added to the total installed pumping capacity.

Wells N-1, N-2 and N-3 are the system's oldest wells. Wells N-1 and N-2 do not have 100 feet of sanitary control area. Well N-3 has the highest level of manganese and is the most difficult to treat of all the wells. Wells S-1 and S-2 have both significantly lost capacity. The 2007 Water System Plan reported that Well S-1 originally had a capacity

of 140 gpm, but had declined at the time to 40 gpm due to clogging by iron bacteria. As shown above, Well S-1 is now reported as having only 30 gpm capacity. The 2007 Water System Plan reported that well S-2 originally had a capacity of 250 gpm, but had declined at the time to 80 gpm. As shown above, Well S-2 is now reported as having only 60 gpm capacity. NBWD has drilled and tested three new wells in the South Well Field area and plans to put them into service in the near future.

TREATMENT

Two water treatment systems are provided, one at each well field, for the purpose of iron and manganese removal. The two systems are similar in design, the major difference being that the NWF treatment system is larger than the SWF treatment system, due to the higher production capacity of the NWF. Both treatment systems use ozone as an oxidizing agent, polymer as a filtration aid, and a granular media filtration using a manganese oxide filter medium similar to manganese greensand.

Ozone is generated on site as needed using an air compressor, an oxygen separator, and five ozone generators at the NWF site, and one ozone generator at the SWF site. Ozone is injected into the water and the water subsequently flows up through an ozone contact tank. On exiting the ozone contact tank, polymer is injected into the water and the water then flows down through filtration tanks.

Gray and Osborne, Inc. conducted a pilot test of the treatment plant in 2013 to determine the efficacy of ozone in the removal of iron and manganese. The pilot test compared the use of ozone as an oxidant and a polymer to the use of ambient air as an oxidant alone. The pilot test concluded that, with the exception of well number N-3, the use of ambient air as an oxidant can remove iron and manganese from the raw water at each well in the North Wellfield as well or better than the use of ozone as an oxidant with or without a polymer. Iron levels were treated to below the treatment goal of 0.1 mg/L. Manganese levels were treated to below the treatment goal of 0.02 mg/L. The percent of manganese removal was greater using ambient air as the oxidant compared to ozone whereas the percent of iron removal was on a par with ozone. Based on the result so the pilot test the District has discontinued using ozone as an oxidant at the North Wellfield. Treatment Plant.

The NWF treatment system consists of four filter trains and the SWF system consists of one filter train, with each filter train consisting of a single 345-gallon ozone contact tank followed by three 345-gallon filter vessels operating in parallel. The NWF treatment system is shown in Figure 1-5, below.

FIGURE 1-5

North Well Field Treatment System

Filters at both sites need to be backwashed to remove trapped particulate matter. Two pumps at the NWF site and one pump at the SWF site are dedicated to filter backwash. Filter tanks are backwashed one at a time by switching valves on the tanks to allow reverse flow through the tank. Backwash water from each facility is discharged to a nearby depression where is percolates into the ground.

STORAGE

The NBWD has a total of four reservoirs. All reservoirs are cast-in-place concrete Mount Baker Silos. Three reservoirs are located at the NWF site and one reservoir is located at the SWF site. The NWF reservoirs were all constructed in 1990. All are 26 feet in diameter by 45 feet tall, with nominal capacities of 179,000 gallons each. The SWF reservoir was constructed in 2006, is 30-feet in diameter by 50 feet tall, with a nominal capacity of 211,000 gallons. The combined total gross storage volume is 748,000 gallons. All reservoirs are equipped with interior and exterior ladders with access control, locking access hatches, screened downward-opening vents, and exterior water level indicators. Each reservoir is valved separately from the system to allow for

isolation of any reservoir for service. The NWF and SWF reservoirs as shown in Figures 1-6 and 1-7, below.

FIGURE 1-6

North Reservoirs

FIGURE 1-7

South Reservoir

BOOSTER STATIONS

The storage reservoirs, as described above, are not tall enough to provide adequate system pressure by gravity, so all water must be continuously pumped into the water distribution system to maintain system pressure. The NBWD has two booster pump stations, one located at each well field. The NWF booster pump system consists of eight electric motor driven booster pumps ranging in power 5 hp to 25 hp~~, plus one 30 hp gasoline engine driven booster pump~~. All electric powered pumps at the NWF are switched with across-the-line starters, and are set to start in sequence when the pressure at the pump station drops to or below 60 psi. Pumps turn off in sequence when the pressure reaches 75 psi, or when the flow drops below the set point for each pump. ~~Two additional pumps at the NWF site are dedicated to backwashing filters and are not used to pump to the distribution system.~~

The SWF booster pump system consists of four electric motor driven booster pumps: two 10 hp pumps and two 30 hp pumps. The two 10 hp pumps are controlled by variable

speed drives such that the pump speeds vary to maintain a constant system output pressure of 70 psi. The two 30 hp pumps are switched by solid state "soft" starters.

TABLE 1-4

Pumping Facilities

Pump ID	Pump Make and Model	Horse-power	Starter Type	Start Criteria	Stop Criteria	Capacity, gpm
North Well Field Booster Pumps						
N-1	Peerless PE-503	5	Hard	≤60 psi	≥70 psi	109
N-2	Peerless PE-833	7.5	Hard	≤58 psi	≥75 psi	120
N-3	Peerless C-820A	15	Hard	≥205 gpm	<205 gpm	280
N-4	Peerless C-825A	25	Hard	≥500 gpm	<500 gpm	500
N-5	Peerless C-825A	25	Hard	≥1,000 gpm	<1,000 gpm	500
N-6	Peerless PE-833	7.5	Hard	≤60 psi	≥75 psi	120
N-7	Peerless PE-833	7.5	Hard	≤58 psi	≥73 psi	120
N-8	Peerless PE-833	7.5	Hard	≤56 psi	≥71 psi	120
Subtotal, NWF ~~electric pumps only~~						1,869
~~N-9~~	~~Berkeley B21/2 ZQM-30~~	~~30~~	~~Gasoline engine~~	~~Manual~~	~~Manual~~	~~200~~
~~Subtotal, NWF electric and gasoline powered pumps~~						~~2,069~~
South Well Field Booster Pumps						
S-1	PACO 10-12709ES	10	VFD	≤60 psi	≥70 psi	175
S-2	PACO 10-12709ES	10	VFD	≥175 gpm	<175 gpm	175
S-3	PACO 10-30707ES	40	Soft	≥350 gpm	<350 gpm	750
S-4	PACO 10-30707ES	40	Soft	≥750 gpm	<750 gpm	750
Subtotal SWF Pumps						1,850
Total NWF and SWF ~~without gasoline engine powered pump~~						3,719
~~Total NWF and SWF with gasoline engine powered pump~~						~~3,919~~
Total capacity with largest pump out of service						~~32,169~~969

The NWF and SWF booster pump stations are shown in Figures 1-8 and 1-9 below.

FIGURE 1-8

North Well Field Booster Pump Station

FIGURE 1-9

South Well Field Booster Pump Station

BACKUP POWER SUPPLY

Four emergency standby generators are provided to keep the water system operation in the event of a power outage. Two 150 KW diesel generators are located at the NWF, one Katolight and one Caterpillar. One 150 KW Katolight diesel generator and one 30 KW generator are located at the SWF. These generators are capable of powering all facilities at both well sites with the exception of Well S-2. Well S-2 is located remote from the remainder of the SWF facilities and has a separate electrical service, so cannot be powered from the main SWF site. All four generators have automatic start and power transfer capabilities on loss of power to the site. The SWF 150 KW generator is shown in Figure 1-10, below.

FIGURE 1-10

South Wellfield 150 KW Generator

TRANSMISSION AND DISTRIBUTION SYSTEM

Description

Transmission and distributions facilities consist of over 25 miles of pipes ranging in size from 2 inches to 12 inches in diameter. Piping installed prior to 1980 was a mixture of asbestos concrete (A-C) pipe and polyvinyl chloride (PVC) pipe. In the early 1980s the standard was changed to a minimum of 160 psi pressure rated PVC pipe. Distribution system facilities are shown in Figure 1-11.

Pipe Inventory

Based on system mapping the water distribution system consists of just over 56 miles of water main ranging in size from 2 inch to 12 inch. Over half of the system is 2 inch water main. Almost 18 percent is 6-inch and just over 15 percent is 8-inch water main. Table 1-5 summarizes the system water distribution system composition by size.

TABLE 1-5

Pipe Size and Length

Pipe Diameter (inches)	Approximate Length of Pipe in System (lineal ft.)	Approximate Length of Pipe in System (miles)	Percent of System
2	153,200	29.02	51.7%
3	1,100	0.21	0.4%
4	38,600	7.31	13.0%
6	52,700	9.98	17.8%
8	45,100	8.54	15.2%
12	5,700	1.08	1.9%
Total	296,400	56.14	100.0%

INTERTIES

NBWD currently has no interties with neighboring water utilities. To make an intertie viable, the water mains feeding to the intertie location need to be capable of transmitting enough water to make the intertie worth considering. Currently there is a separation of approximately 1.2 miles by road between the adequately sized water mains in NBWD and Surfside HOA water systems, approximately 2 miles between NBWD and Oysterville Water, and approximately 2.7 miles between NBWD and City of Long Beach water mains. The cost of installing water mains for these distances make interties between these utilities infeasible at this time. If and when development brings existing water mains closer, interties may become feasible in the future.

RELATED PLANNING DOCUMENTS

PREVIOUS WATER SYSTEM PLANS

In 2007 a water system plan for North Beach Water was prepared by TJF & Associates of Olympia, Washington. That plan was approved by DOH by letter dated November 12, 2008. The 2007 Plan was the first plan prepared for the combined OPWC/PWC water system. Prior to the 2007 Plan, water system plans had been prepared separately for OPWC and PWC. According to the 2007 Plan, the first water system plan for OPWC was approved by the State Board of Health January 31, 1966, and the last water system plan prepared by OPWC was dated December 1998. Also according to the 2007 Plan, the first water system plan prepared for OBWC (former name of PWC) was approved on July 23. 1981, and the last water system plan prepared for PWC was completed in August 1994.

COORDINATED WATER SYSTEM PLAN

Economic and Engineering Services, Inc. in Association with American Engineering Associates, Pacific County Long Beach Peninsula Coordinated Water System Plan (PCCWSP), August 1985.
This document was developed to coordinate the planning and development of water facilities in order to provide future water service in the most efficient and effective manner possible. It outlines physical features, land use and zoning, population, water consumption, and describes existing water systems. It provides specific information regarding source, storage, distribution system requirements, minimum design standards, service areas, and review procedures. It discusses regional issues and provides recommendations. The Pacific County Long Beach Peninsula Coordinated Water System Plan was never adopted by Pacific County, so while it is a useful source of information, it has no legal standing.

GMA RELATED PLANS, POLICIES, AND DEVELOPMENT REGULATIONS

Pacific County, Washington – Comprehensive Plan, Final Draft, October 1998.
This document is intended as a reference guide to the public and is intended to notify citizens, the development community, builders, and other government agencies of how the county is directing its energies and resources to manage growth. It seeks to establish a clear intent and policy base that can be used to develop and interpret county regulations.

Pacific County, 1998 GMA Comprehensive Plan Final Environmental Impact Statement, August 1998.
This document includes the mandated elements on land use and rural areas, critical areas and resource lands, housing, transportation, capital facilities, and utilities. The document also includes a section on Siting Essential Public Facilities.

ADJACENT PURVEYOR WATER SYSTEM PLANS

Two other water systems in the vicinity of NBWD are required to complete a water system plan, including Surfside HOA on the north and City of Long Beach on the south.

WATERSHED PLANNING – WRIA 24, WILLAPA

Willapa Watershed, WRIA 24, is a non-2514 planning basin. There are no watershed-planning activities related to this basin.

ANALYSIS OF COMPATIBILITY WITH EXISTING PLANS

Pursuant to the GMA, Pacific County and its constituencies worked together to adopt *County-Wide Planning Policies*. These policies address issues such as urban growth, affordable housing, economic development, and public facilities to achieve consistency

between County and City Comprehensive Plans. It is the intent of this Water System Plan to be consistent with county wide planning policies.

EXISTING SERVICE AREA CHARACTERISTICS

Historically, Pacific County has been dominated by the timber and shellfish industries. As the timber industry has subsided in the area, the overall economic base for the county has declined. The North Beach Peninsula relies predominantly on tourism, cranberry production, shellfish industry, retirement and government employment for its economic base, and the North Beach Peninsula has ~~become~~ historically been a popular tourist destination. NBWD serves a large number of seasonally occupied homes and tourism related businesses.

EXISTING SERVICE AREA

WAC 246-290-010 defines "Existing Service Area" as "a specific area within which direct service or retail service connections to customers of a public water system are currently available." For water service to be currently available to a parcel, the parcel must be already served, or a water main must front the property. The current existing service area is shown in Figure 1-12.

FUTURE SERVICE AREA

Future Water Service Area is defined in WAC 246-290-010 as "a specific area a public water system plans to provide water service. This is determined by a written agreement between purveyors under WAC 246-293-250 (Water Utility Coordination Act) or by the purveyor's elected governing board or governing body if not required under WAC 246-293-250." All future service area boundaries were tentatively established by the *Pacific County Long Beach Coordinated Water System Plan* (PCCWSP). The NBWD Future Water Service Area extends approximately eight miles from Cranberry Road on the south to Joe John's Road on the north, and from the Pacific Ocean on the west to Willapa Bay on the east, a distance that varies from approximately 1.3 to 2.1 miles. The area encompassed is approximately 8,500 acres. A map of the existing and future NBWD service area is provided in Figure 1-12.

RETAIL SERVICE AREA

Retail Service Area is defined in WAC 246-290-010 as "the specific area defined by the municipal water supplier where the municipal water supplier has a duty to provide service to all new service connections. This area must include the municipal water supplier's existing service area and may also include areas where future water service is planned if the requirements of RCW 43.20.260 are met." Since NBWD does not wholesale water to any other water purveyor, the existing retail service area is synonymous with the existing service area, and the future retail water service area is synonymous with the future service area.

SERVICE AREA AGREEMENTS

An Interlocal Service Area Agreement normally formalizes service area boundaries in a Critical Water Supply Service Area. However, since the Pacific County Commissioners have never formally adopted the *Pacific County Long Beach Coordinated Water System Plan* (PCCWSP)~~Long Beach Peninsula CWSP~~, there is no binding mandate to honor service area boundaries. It has, nevertheless, been the practice of purveyors on the Long Beach Peninsula to honor the service areas designated by the *Pacific County Long Beach Coordinated Water System Plan* (PCCWSP)~~CWSP~~, and there are no known territorial disputes regarding service areas.

EXISTING LAND USE

NBWD service area contains a mix of land uses. The system serves 2,600 single family residences, 519 residences in multi-family housing units, and 75 non-residential connections. Existing land use is shown in Figure 1-13.

ZONING AND FUTURE LAND USE

The *Long Beach Peninsula Comprehensive Land Use Plan* sets forth zoning for the service area. This document was adopted in October 1998. The most recent amendment to County Zoning was Land Use Ordinance No. 153, adopted on March 8, 2004. Zoning in the NBWD service area is primarily Rural Residential (RR-1) and Restricted Residential (R-1), with substantial areas also zoned Agricultural (AG), Aquaculture (AQ), and Conservation (CD). There are also areas zoned Resort (R3) and two areas zoned Industrial (IND). Zoning is shown in Figure 1-14.

WATER SYSTEM POLICIES

The Planning Handbook recommends that water system plans address, at a minimum, the following water system policies:

- Wholesaling Water
- Wheeling Water
- Annexation
- Direct Connection and Satellite/Remote Systems
- Design Performance Standards
- Surcharge for Outside Customers
- Formation of Local Improvement Districts Outside Legal Boundaries
- UGA
- Late-Comer Agreements
- Oversizing
- Cross-Connection Control Program

- Extension
- Duty to Serve

The *Pacific County Long Beach Peninsula Coordinated Water System Plan* (PCCWSP), while never formally adopted, has been used as a guide for service area boundaries and extension policies. In addition, the NBWD has adopted a written set of Rules and Regulations, most recently revised September 16, 2013. These regulations address many water service area policies. The following sections discuss the policies of NBWD with regard to the above items

PACIFIC COUNTY COORDINATED WATER SYSTEM PLAN

The establishment of service area boundaries by the *Pacific County Long Beach Peninsula Coordinated Water System Plan* (PCCWSP)~~CWSP~~ includes two basic obligations:

- County and state government should recognize each utility as the responsible agency for providing all public water service within the designated area by Interlocal Agreement, and,

- It is the utility's responsibility for providing satisfactory water service within a reasonable time frame to customers within that geographical area designated as their future service area.

If the *Pacific County Long Beach Peninsula Coordinated Water System Plan* (PCCWSP)~~CWSP~~ had been adopted for this geographical area, no new water systems would be allowed within a utility's designated future service area unless the existing utility was unable or unwilling to provide service. The County and utilities in the ~~Long~~ North Beach Peninsula have been operating in the spirit of the 1985 *Pacific County Long Beach Peninsula Coordinated Water System Plan* (PCCWSP)~~CWSP~~, although, since the plan was never adopted by the County, it has no legal standing.

NBWD RULES AND REGULATIONS

The NBWD Rules and Regulation address a wide range of water system operations, maintenance and customer relations issues. These rules and regulations cover many, though not all, of the service area policies listed above from the Planning Handbook, as well as many issues not listed in the Planning Handbook. A copy of the NBWD Rules and Regulation is included in Appendix C of this Plan. Following is a summary of how the NBWD Rules and Regulations address the policy list from the Planning Handbook.

Wholesaling Water

NBWD Rule 1.01.210 addresses wholesaling of water. The rule includes Paragraphs A through G. The first sentence of paragraph A reads as follows:

> "The Board may, at its discretion, authorize water service to a community or number of individual users to be furnished through a common meter upon finding that service through individual meters is not practical."

The rule goes on to spell out specific conditions to be met by wholesale customers.

Wheeling Water

Wheeling of water consists of allowing two outside water systems to exchange water through the NBWD water system pipes. NBWD does not currently wheel water and has no formal policy regarding this issue. NBWD will evaluate any future requests to wheel water through the NBWD system on a case-by-case basis.

Annexation

Parcels not currently included in the NBWD district boundaries must annex to the District to receive direct water service from the District.

Direct Connection and Satellite/Remote Systems

NBWD will provide piped water to any platted parcel on request for service and payment of applicable fees. If water mains are not present at the parcel, the applicant may apply to extend water mains as necessary to obtain service, or the applicant may request that NBWD install a water main extension at the applicant's cost. NBWD does not wish to have separate water systems installed within their service area and does not wish to be a satellite water system operator.

Design Performance Standards

NBWD has developed minimum water system construction standards. A copy of these standards is included in Appendix D. An outline of these standards is provided Chapter 7.

Surcharge for Outside Customers

NBWD does not provide water service outside of its jurisdictional boundary and therefore has no outside rates.

Formation of Local Improvement Districts Outside Legal Boundaries

Cities form Local Improvement Districts and special purpose districts from Utility Local Improvement Districts, or ULIDs. The NBWD corporate boundaries encompass the entire NBWD future service area. Therefore, there should be no future instance in which NBWD provides water service outside their corporate boundaries. If circumstances

should change in the future, it is anticipated that any area outside the District corporate boundaries would need to annex to the District as a condition of service. In that case it is anticipated that annexation would occur prior to establishment of a ULID, and the ULID would not be formed outside the district boundaries. However, if and when this circumstance should occur, the details would need to be worked out at that time.

UGA

The Planning Handbook explains the UGA questions as whether or not the District will help finance water main extensions that help to meet the water service goals of the UGA. NBWD Rules and Regulations Section 1.01.260 *Service Connection – No main in street* states that water main extensions shall be installed at the cost of the party requesting water service. The only exception to this is section 1.01.240 which allows for low income property owners to make installment payments on connection charges.

Late-Comer Agreements

Late-comer agreements are addressed in NBWD Rules and Regulations Section 1.01.260. An individual installing a water main may request a latecomer agreement requiring properties fronted by the water main installed by the developer to pay a portion of the cost of the water mains as a condition for connecting to the water main. Latecomer agreements are effective for a period of up to fifteen years.

Oversizing

NBWD has no written policy concerning oversizing waterlines. Oversizing is not likely to become an issue for NBWD unless major extensions are made in the future into undeveloped areas. Where oversizing of developer constructed waterlines is in the best interest of the water utility, the NBWD will consider funding the additional cost of larger lines and appurtenances on a case by case basis.

Cross-Connection Control Program

NBWD Rules and Regulations Section 1.01.100 address cross connections control. The rule states that cross connections are prohibited, and that owners of existing or potential cross-connection hazards that cannot be eliminated must have a proper backflow prevention device installed, inspected, and regularly tested. Chapter 6 further elaborates on program details.

Extension

NBWD Rules and Regulations Section 1.01.260 address water main extensions. The rules state, in part, that water main extensions shall be constructed by the District or in accordance with the Rules and Regulations of the District and subject to approval of the District Manager. A party wishing water service where there is no existing water main

may request the District to extend the water main, or may install the water main using a private contractor, subject to District approval. In either case, service will be provided after the main has been installed and tested, and the party requesting service has paid all applicable fees and reimbursed the District for its costs.

The District established a Customer Generated Infrastructure Agreement policy on July 22, 2013 with the adoption of Resolution 18-2013 and amended the policy on April 21, 2014 with the adoption of Resolution 10-2014. The policy is designed to promote the installation of water mains on the many streets, roads, and lanes off of SR 103 and Pacific County roads where the District has a water main. The policy allows a percentage (30%) of the property owners on a road to request a water main be installed on their road and, provided certain conditions are achieved, the District will install the water main and develop a pro rata cost for each property on the road, street, or lane. The requesting property owners enter into an agreement with the District agreeing to pay their pro rata share and apply for a water connection as soon as the water main is accepted by the District. The District records a notice identifying the pro rata amount as a facilities charge for all non-requesting properties on the road, street, or lane that will be paid in addition to any other connection charges current at the time of application.

Duty to Serve

The North Beach Water District recognizes its duty to provide water service within its designated service area in a timely and reasonable manner, as required by the Municipal Water Law.

CONDITIONS OF SERVICE

Purveyor Responsibilities

NBWD will provide service for lots within NBWD service area subject to the availability of water and the number of approved connections permitted by DOH, payment of fees as adopted by the NBWD Board, and, if necessary, completion of any water main extension necessary to obtain water service.

Customer Responsibilities

NBWD Rules and Regulations spell out numerous responsibilities that customers have to NBWD. Some of these responsibilities are summarized below:

Code Section	Customer Responsibility
1.01.060	Use water only for the purposes specified in their application for service
1.01.070	Not waste water
1.01.075	Maintain the service line between the water meter and place of use
1.01.090	Restrict irrigation water usage during fire emergencies
1.01.100	Prevent cross connections
1.01.140	Allow for inspection of premises for conformance with rules
1.01.160	Maintain separation of sewer facilities from water facilities
1.01.340	Pay water service charges when due

CONNECTION FEE SCHEDULE

Two fees are applicable to new water service connections: Water installation Fee and General Facilities Charge. These fees are set by District Regulations 1.01.190 and 1.01-350, respectively. Connection fees are summarized in Table 1-6 below.

TABLE 1-6

Connection Fee Schedule

Connection Fee	¾-Inch Meter	1-Inch Meter	1½-Inch Meter	2-Inch Meter	3-Inch Meter	4-Inch Meter
Meter Installation Fee	$650	$800	$1,500	$2,500	(1)	(1)
General Facilities Charge	$1,234	$2,075	$4,140	$6,337	$7,209	$10,914

(1) Priced at time of request

METER AND MATERIAL SPECIFICATIONS

All materials and methods must comply with the NBWD standard specifications, as outlined in Chapter 7. A copy of these standards is included in Appendix E.

CONSENT AGREEMENTS FOR INSPECTION, MAINTENANCE AND REPAIRS THAT DISRUPT SERVICE

NBWD Rules and Regulations Section 1.01.120 states that the district may reduce or interrupt water service without prior notice in emergency situations.

CROSS-CONNECTION CONTROL REQUIREMENTS

Applications for water service are screened by NBWD to determine whether NBWD will require cross-connection control devices as a condition of service. Cross-connection control Rules and Regulations are included in Section 1.01.100 of the NBWD Rules and Regulations.

DEVELOPER EXTENSION REQUIREMENTS, DESIGN STANDARDS, FINANCIAL RESPONSIBILITY, P.E. DESIGN REQUIRED

NBWD Rules and Regulations section 1.01.260 outlines the requirements for design and construction of water mains to be installed by developers and other independent third parties.

COMPLAINTS

POLICY FOR DEALING WITH COMPLAINTS

Complaints may be submitted in writing at the NBWD office, called in by phone to the NBWD Office, or sent in by email to the NBWD Office. Complaints are forwarded to the District Manager for investigation. The Field Supervisor makes contact with the complainant, investigates the complaint when necessary, resolves the complaint when possible, or recommends a solution to the District Manager. The District Manager is responsible for recording the resolution of the complaint in the complaint log. Complaints unresolved by the Field Supervisor or the District Manager may be appealed to the NBWD Board.

COMPLAINT RECORD KEEPING

Telephone and written complaints are logged by NBWD office staff and forwarded to the General Manager and the Field Supervisor. The telephone logs and written complaints are maintained in the business office.